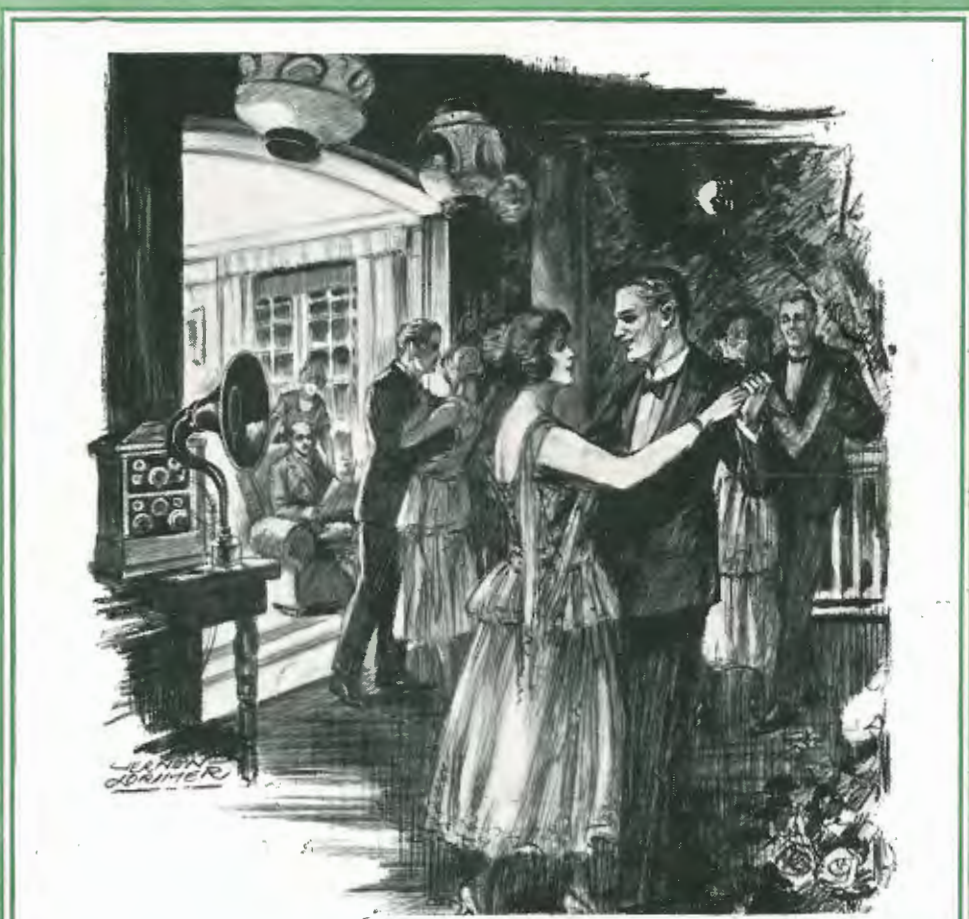


RADIO

IN AUSTRALIA
& NEW ZEALAND

Incorporating "5th LIAISON AND ART"

VOL. I. DECEMBER 26, 1923 No. 20



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

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S. E. TATHAM.

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CONTENTS

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Volume I.	DECEMBER 26, 1923	Number 20
		PAGE.
Radiatorial—		
	The Wonder that will not Pass	475
	Unity Amongst Experimenters	475
	Sydney's Big Radio Exhibition	476
	Exhibitors' Stands at Radio Exhibition	481
	A Victorian Enthusiast	488
	Wireless Concert at Newcastle	488
	Wireless Stations in Eastern Pacific	489
	Adelaide "Listens In"	489
	Broadcasting in N.Z.	490
	Queensland Wireless Institute	490
	Amateur Radio Tests	491
	Wireless Demonstration in Adelaide	492
	Wireless in N.Z.	493
	Australia and Wireless	494
	Queensland Enthusiasts Experiments	495
	Instruction for the Beginner	496
	Broadcasters (Sydney), Ltd.	497
	The Experimenters' Corner	498
	Federal Council of Experimenters	499
	United Distributing Company, Ltd.	500
	Movements of Wireless Officers... .. .	501
	Notes and News from W.A.	502
	South Australian Wireless Institute	502
	Queries Answered	503

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The Wonder that will not Pass.

THE frequency with which we are reminded that "the marvels of one age are the commonplace of the next" makes even the most thoughtless in our midst wonder when a halt is going to be called in the march of human ingenuity.

IN the rush and bustle of modern life we are too near, and frequently too careless, to what is going on around us to realise fully what we owe to our scientists and inventors.

THAT we are ever progressing, ever discovering new ways and means of overcoming hitherto insuperable difficulties in our march to the lofty summit to which worldly ambition points is now accepted as a matter of course.

IF those who passed down the sunset trail of life a hundred years ago were alive to-day, what a different world would confront them!

PROBLEMS which, probably, had never presented themselves during their lifetime have since arisen and been solved, and still the march goes on.

NEW discoveries have been made in the fields of science, medicine and surgery, vastly improved methods of production have revolutionised our agricultural and industrial activities, and the new means of communication and transportation bear no relation to the old.

THE late war taught us many things, and although while it raged the energies of the world's greatest nations were concentrated on the destruction of human life, its cessation found our medical and scientific men better equipped than before to attack and overcome many hitherto baffling problems.

Unity Amongst Experimenters.

THE need for a Federal Council, representative of the various amateur radio bodies throughout Australia, has received the serious attention it merits during the past few weeks.

THE Controller of Wireless (Mr. J. Malone) is anxious that such a body should be formed at the earliest date in order that in his dealings with experimenters he may be assured of unanimity on their part.

THE Wireless Institute of Australia is the only body which at present can claim representation in all States, and it is therefore in an ideal position to propound a scheme under which all amateur radio bodies can affiliate for the purpose of electing a body representative of Australian experimenters.

OF the many outstanding discoveries of the last century, the wireless transmission of sound, which is yet only about 25 years old, is unquestionably the most wonderful and important.

WHEN the efforts of men like Hertz, Branly, Rathenau, Marconi and others, whose names do not occur at the moment, first gave the world a hint of the possibilities of wireless communication the public at large was not sufficiently interested to treat their observations with more than sceptical indifference.

LATER, when Marconi developed the discovery to the stage of practical utility, people began to take notice, but it was not until wireless had proved itself as a life saver at sea and a factor in instantaneous communication over long distances, right down to its newest development—broadcasting—that the public as a whole realised its full value.

EVEN now there is no suggestion that wireless has been developed to the peak of its possibilities, but even assuming there is no further progress, it stands out as one of the world's greatest wonders of all time.

WE may admire the skill of our medical men, marvel at the ingenuity of our inventors, wax enthusiastic over the courage of our aviators, but words fail utterly to express our wonder when we pause to realise what wireless communication is, and what it means to mankind.

OUT of the myriad wonders of a wonderful age it stands out as one that will never pass.

THERE is a strong feeling amongst the members of radio clubs that to be acceptable any such scheme must provide for all outside bodies maintaining their identity and independence. This feeling is due to the knowledge that centralised control invariably kills enthusiasm rather than to any feeling that the Institute would not properly safeguard the interests of those Clubs which would look to it for effective representation.

THERE are so many points of common interest for amateur radio bodies that no great difficulty should be experienced in electing a council from their ranks which will merit the confidence of the amateur movement throughout Australia and the respect of the wireless authorities.

Sydney's Big Radio Exhibition

Wonderful Success

Large Enthusiastic Crowds from December 3rd to 8th.

HELD in Sydney under the auspices of the N.S.W. Division of the Wireless Institute of Australia, the recent Wireless and Electrical Exhibition was successful beyond the most sanguine expectations of the promoters. The original estimate of the promoters both as regards attendance and the financial result was, of course, conservative and it is gratifying to know that it has been exceeded by over 300 per cent. Naturally the attendance was greatest towards the week-end. On the Friday evening the attendance was greatest, at one stage over 1200 people being actually in the hall.

As an educational feature alone the Exhibition more than fulfilled expectations. The general public having read so much about "Radio" naturally expected a lot, hence, although it was the intention of the Institute at the outset that no demonstration



Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Patron of the Wireless Institute of Australia.

casting from Broadcasters, Sydney, Ltd.

Two sets were used for this purpose by the Wireless Institute. One a five-valve neutrodyne, set up on the demonstration platform without any aerial and operating a pair of large

type Western Electric Loud Speakers which gave forth a very large volume. The other arrangement consisted of an ordinary two-coil single valve circuit working from a short temporary aerial just outside the building, the received speech and music being passed through a Western Electric Power Amplifier (four stages), and thence into the hall through four large type projectors. This latter arrangement was sufficient to more than fill the hall with sound. Unfortunately great difficulty was experienced owing to the fact that the City Council sub-station immediately at the rear of the hall caused great interference. However, the result was satisfactory, considering the difficulties and that "static" throughout the whole week was particularly bad and troublesome.

The various standholders also made hurried temporary arrangements and



The Hon. Dr. Earle Page, Acting Prime Minister and Federal Treasurer of the Commonwealth of Australia, who officially opened the Wireless Exhibition.

of Broadcasting would be given, it immediately became clear that the public demand for it was such that it was imperative to make hasty arrangements to tune in broad-



Mr. J. Malone, M.I.R.E., M.I.E.E., Chief Manager of Telegraphs and Wireless in Australia, who assisted the Wireless Institute in every possible way to make the Exhibition a success.



The Hon. W. G. Gibson, Postmaster-General of the Commonwealth of Australia, whose Department administers the wireless regulations and who, in his official capacity, did his utmost to assist the Exhibition.

tuned in the broadcasting, on the whole, very satisfactorily. It must, however, be remembered that at the time of the Exhibition, Broadcasters,

Sydney, Ltd. had not got properly going and subsequent transmissions have considerably improved.

It was unfortunate that Farmer's Broadcasting Service had not commenced at the time the Exhibition was held.

One of the outstanding features of the Exhibition was the wonderful co-operation between the standholders and the spirit in which they threw themselves into the venture, thereby contributing to its success. From an electrical point of view alone the Exhibition was more than satisfactory, many useful adaptations of electricity, hitherto never placed so con-



Mr. Charles D. Maclurcan, President of the Wireless Institute of Australia, N.S.W. Division and member of the Management Committee of the Exhibition.

ous exhibits. That so many distinguished people patronised the Exhibition clearly indicates how hungry we all are for electrical knowledge, and the public were afforded the most comprehensive method of making

themselves acquainted with some of the hidden mysteries of nature and science by the alliance of the two sides of electrical enterprise in the Wireless and Electrical Exhibition.

At the back of the perfect display was the months of hard and unrelenting labour by the Management Committee and the official organiser, and it can be fairly stated they deserve the highest possible praise for the excellent organisation, lay-out and decoration of the Exhibition, which compared more than favourably with any exhibition ever held in Australia, and the opinion was freely expressed by those who had the privilege of attending similar exhibitions in Eng-



Mr. E. B. Crocker, Vice-President of the Wireless Institute of Australia, N.S.W. Division, and owner and operator of experimental station 2BB.

spicuously before the public, received their full measure of support. What may be called a portion of the housewife's economic education was fully exemplified in the electrical displays. Apart from the domestic appliances many other electrical adaptations were demonstrated, including X-rays and Ultra Violet Rays, etc.

The Wireless Institute compiled a duty roster amongst its members, and it speaks volumes for their enthusiasm that there was no hitch whatsoever in any of the arrangements. Among the many duties of the Institute's officials was that of conducting distinguished visitors round and explaining and demonstrating the vari-



Mr. Phil Renshaw, the genial Hon. Secretary of the Wireless Institute of Australia, N.S.W. Division, and owner and operator of experimental station 2DE.



Mr. Basil Cooke, F.R.A.S., Vice-President of the Wireless Institute of Australia, N.S.W. Division, and manager of Messrs. David Jones' Radio Department.

land and America that the Australians put up an even better display than those overseas.

Peculiarly enough, the conditions in Australia are unique as compared with other more settled portions of the world and we are building up our own particular characteristics to suit our own conditions, hence the value of the vast number of really fine experimental wireless and electrical laboratories spread throughout our country. The experimenters' exhibits alone indicated the truth of this, and it is safe to assume that with such a sincere body of experimenters Aus-

tralia may face the future sure of her place in the front rank of Scientific Research.

It is a great pity that space will not permit us to go into details respecting the merits of the experimental gear exhibited, but the display itself was sufficient to make the man in the street wake up and take notice. In fact, he was brought face to face with a new phase of wireless and electricity compared to what he has pictured and now realises the sincerity behind the experimental movement, which has been fostered so patiently and successfully during the last 15 years by the Wireless Institute.

In conclusion, we congratulate the Institute on its enterprise and look forward to the development of wireless in Australia with the utmost confidence now that an opportunity has occurred of showing the great strength of this wonderful movement.

Experimenters' Exhibits

THE experimenters' exhibits at the recent Wireless and Electrical Exhibition held at the Sydney Sydney Town Hall proved to be of



Mr. O. F. Mingay, Hon. Treasurer of the Wireless Institute of Australia, N.S.W. Division, and member of the Management Committee of the Exhibition. Mr. Mingay is manager of the Burgin Electric Co's. Wireless Department.

tremendous interest. Some excellent work was shown and it was very good evidence of the capabilities of the experimenters in and around Sydney. Over 120 exhibits were on view, but a number were non-competitive,



Major H. Newman, a Councillor of the Wireless Institute of Australia, N.S.W. Division, who was a member of the Management Committee of the Exhibition.

Prizes were awarded as follows:—

TRANSMITTER.

First Prize, L. Schultz (call sign 2LO). This transmitter employed tube modulation, four valves, two as oscillators and two as modulators. Altogether there were four metres and seven controls, the whole being very neatly mounted on polished ebonite.

MULTI-VALVE SETS.

First prize, E. W. Crolley. This set consisted of three valves, one as a detector, and two audio frequency amplifiers. Tuning range from 150 to 500 metres. Prize was awarded for neat workmanship.

Second Prize, A. E. Starkey. Three valves, one as detector and two audio frequency amplifiers. Tuning effected with honeycomb coils and variable condenser. Prize was awarded for the splendid material used.

Third Prize: H. E. Grigg. The receiver employed three valves and crystal. Prize was awarded on account of the set being entirely home made.

SINGLE VALVE SETS.

First Prize, H. Turner. This receiving set secured the maximum number of points for the splendid lay-out and simplicity of the set which uses dry cell tubes.

Second Prize, G. Blanchard. This set also employed a dry cell tube. Prize awarded for neatness.

Third Prize, J. J. Ashton. The whole of the set was home-made and the switch arrangements were quite unique. Prize awarded for simplicity.

CRYSTAL SETS.

First Prize, A. L. Prince. This receiver was portable and the tuning arrangements were quite novel, consisting of basket coils all home-made.

Second Prize: G. Blanchard. The set was entirely home-made. Prize awarded for compactness.

Third Prize, R. Wyatt. Prize awarded for simplicity and efficiency of the crystal detector.

AMPLIFIERS.

First Prize, H. K. Thomas. This amplifying unit which consisted of two stages of audio-frequency amplification was accorded great praise by the judges, it being considered one of the neatest pieces of apparatus exhibited. It is also interesting to note that it was the only amplifier for consideration so far as prizes were concerned.



Mr. Frank H. Daniell, a young electrical engineer, of Sydney, who was the official organiser for the Wireless Institute. The success of the Exhibition was largely due to Mr. Daniell's fine efforts.

ISOLATED APPARATUS.

First Prize, H. A. Stowe. Direct reading wave-meter and capacity bridge.

Second Prize, H. C. Laphorne. Accumulator "B" Battery,



Mr. R. B. Hungerford, Managing Director of the Western Electric Co. (Australia), Ltd., a member of the Management Committee of the Exhibition.

GENERAL EXHIBITS.

Space will not permit us dealing with each individual exhibit, but the following will give some idea of the variety of apparatus entirely made by experimenters that was on view, together with the owner's name:—

O. Sandel (2UW). 20 watt transmitter with tube modulation, using kenotrons as rectifiers. This set has been successful in communicating with New Zealand; R. D. Charlesworth (2C1), non-competitive; 25 watt transmitter and receiver, the whole built on the unit panel system. The complete change over from transmitting to receiving is operated by one single switch. The receiver consists of four valves, one as a radio frequency amplifier, one detector and two low frequency amplifiers. 2C1 regularly communicates with New Zealand. R. C. Marsden (2JM), non-competitive; 10 watt telephony transmitter, mounted on radion panel, with grid modulation. A neutrodyne 5-valve receiver also mounted on a radion panel. N. Jacobs, 3-valve receiver, mounted on xylonite. The Illawarra Radio Club, 3-valve receiver built on unit principle and made by club members. H. A. Stowe, 3-valve home-made neutrodyne re-

ceiver; The Waverley Radio Club, 3-valve receiver, using radio and audio frequency amplification, entirely built by members; W. Cottrell, 3-valve receiver mounted on xylonite panel; J. W. Robinson, 5-valve receiver, two steps of radio and two steps of audio frequency amplification, the whole being mounted on one panel; Phil Renshaw (2DE), non-competitive. Valve transmitter, operating on six-volt battery, high tension supply secured from Ford coil. 2DE has been successful in communicating with Melbourne. H. R. Gregory (2ED), non-competitive; unit system receiver employing five valves, one radio, one as detector and three audio, tuning effected by honeycomb coils with variable condenser; J. A. Beer, 4-valve reflex neutrodyne; H. A. Stowe (2CX), 5-valve receiver, two radio, one detector and two audio, entirely home-made, fitted in writing bureau; W. H. Barker, one valve receiver; E. J. T. Moore, frame aerial; H. Perry, loose coupler and crystal detector; P. Sewell (2CJ), 3-valve neutrodyne receiver; R. Addison,



Mr. Edward E. Hirst, Managing Director of the British General Electric Co., Ltd., a member of the Management Committee of the Exhibition.



Mr. E. T. Fisk, Managing Director of Amalgamated Wireless (Australasia), Ltd., a member of the Management Committee of the Exhibition.

single valve set, using two honeycomb coils and condensers; Miss F. V. Wallace, crystal receiver mounted on and in a lady's xylonite toilet set—very neat and secures good results; C. F. A. Luckman, portable crystal set; P. Kelso, one crystal receiver; H. R. Gregory (2ED) large loose coupler tunes up to 8000 metres; Neutral Bay Radio Club, 3-valve, two circuit receiver, A. & B. batteries controlled by telephone jacks. This set was entirely made by members of the Neutral Bay Club, and is being presented to the Blind Institution. R. W. Sharp, 3-valve receiver; C. Trimmington, four valve neutrodyne receiver, and a Cockaday receiver; W. R. Drew, 3-valve receiver; —. Stilley, receiver using reinartz circuit entirely mounted on glass panel; E. B. Crocker (2BB), non-competitive 10 watt transmitter, two single valve receivers, a resistance box and a wave meter; B. S. Low, loose coupler and crystal detector; H. Laphorne, single valve receiver; —. Caldwell, single valve receiver; R. T. Black, receiver using ST100 circuit, mounted on phonograph case; E. J. Fox, loose coupler, crystal detector; R. Addison, a single valve receiver; A. V. Badger, a short wave tuner; H. R. Gregory (2ED), power transformer.



Some of the Experimenters' Exhibits at the Wireless and Electrical Exhibition.

NOVELTY SETS.

F. C. Jones (20G) exhibited three novelty sets, which in addition to being very unique, were very skilfully made:

(a) Known as the *Le "Noise" Ette*. This set consisted of a crystal detector, fixed condenser and inductance coil and was built entirely in a walnut shell. Connected to an aerial 100 ft. long and waterpipe for earth, it will receive signals up to 600 metres.

(b) Cupid set, consisting of the same components as that used in the *Le "Noise" Ette*, but mounted in a lady's ring case. The *Cupid* set will tune to 460 metres.

(c) Consisted of components similar to those used in A & B, except that it was mounted in an ordinary shaving stick box, and was capable of tuning to 360 metres.

WAR RELICS.

The Sydney University kindly loaned for exhibition a complete transmitting and receiving set, including an aeroplane generator that was captured by the Australian Imperial Forces from a German aeroplane. This attracted considerable attention.

HISTORICAL GEAR.

Mr. G. C. Hamilton loaned the Institute quite a lot of interesting his-

torical apparatus which included a Marconi Magnetic Detector, Wheatstone ABC dial station, Kelvin balancers and one of the original de Forest two element valves.

Mr. Malcolm Perry also loaned the following historical apparatus: Portion of the original aerial wire used by him at Randwick in 1905, a coherer, crystal detector and spark gap used by him in 1905, a badge of the Institute issued in 1911, copy of the Wireless Institute Operating Certificate issued in 1912, and a copy of the Wireless Institute Call Letter Book issued in 1912.

Among other numerous exhibits were crystals from the Mining Museum in Sydney.



Other Experimenters' Exhibits.

Exhibitors Stands at Radio Exhibition.

Varied and Interesting Displays.

The exhibitors' stalls at the big wireless and electrical exhibition held in the Sydney Town Hall from December 3 to 8 provided an object lesson in the uses to which electricity is now put in everyday home and office life.

In wireless apparatus the display ranged from a simple crystal receiving set encased in a walnut shell—just think how tiny it was—to the big commercial

sarily brief, but nevertheless will give some idea of how well the radio and electrical supply houses of Sydney embraced the opportunity of showing the thousands of visitors to the Exhibition what they could do to make Australian homes modern as regards communication and comfort.

The stands are dealt with in the order in which they were numbered.

culated to give a realistic impression of "listening-in" in the real home atmosphere.

The interior of the cottage was tastefully furnished by Messrs. Beard Watson, Ltd., and three distinct types of high-class receiving sets were displayed:—"Radiola," Radiophone," and Gecophone."

Every facility was provided for securing information, paying subscriptions and license fees, and ordering sets for the firm's broadcasting service which is now in operation.



Radio Company Limited.

apparatus capable of receiving and transmitting over thousands of miles. The countless accessories needed wherever wireless work is undertaken were prominently featured, and the visitor who came to learn the why and wherefore of radio went away more impressed than ever regarding the future of wireless in Australia.

The electrical devices for adding to the comfort and convenience of home life well-merited the wide attention bestowed upon them. It would be almost impossible to particularise the various articles displayed, but the apparatus ranged from an electric kettle or jug, which will give boiling water in a few minutes, to a handsome stove, in which a meal for six could be tastefully cooked by electricity in a short time at a minimum cost. Fans, radiators, toasters, vacuum cleaners, etc., were, of course, in abundance.

The following details regarding the exhibits on the various stalls are neces-

FARMER & COMPANY, LTD.
The tastefully arranged cottage display of Farmer & Company, Ltd., was cal-

RADIO CO., Ltd.

An important feature of this firm's display was the sectional broadcast receiver. The idea is to provide a low-priced set in the first instance, and allow of further sections being added as greater sensitivity is required. This is a decided boon to purchasers who desire to operate economically. The display attracted considerable attention.

WIRELESS SUPPLIES, LTD.

The "Volmax" apparatus featured by Wireless Supplies, Ltd., comprised experimental and broadcast receivers and the numerous accessories which form part of the stock of every well-equipped radio supply house.

NEW SYSTEM TELEPHONES PTY., LTD.

This firm was awarded first prize for the most attractive stall at the exhibition.

The display was certainly an excellent one, and many well-deserved congratulations were showered upon those responsible.



United Distributing Co., Limited.



L. P. R. Bean and Co., Limited.

A special feature was made of T.M.C. apparatus, which is of a type that will uphold the Company's reputation for high-class service under all circumstances. A novelty in wireless headphones for ladies was also shown by this firm. The 'phones are on a spring which holds them close to the ear as in the ordinary headset, but instead of going over the top of the head and disarranging the hair, the 'phones are held by means of a handle in the centre of the spring, under the chin. These 'phones are easy to adjust and very comfortable.

WARBURTON, FRANKI. LTD.

The Weston electrical apparatus manufactured by the Weston Electrical Instrument Co. of Newark, N.J., U.S.A., formed the major part of the above Company's display.

The exhibit included samples of thermocouple antennae ammeters, filament volt and ammeters, D.C., and the Company's latest production—"The Weston Junior"—a range of portable instruments, light in weight, occupying small space and of unequalled accuracy.

Campbell automatic rapid electric cook stoves and Delco-light complete lighting and power plants were also demonstrated.

AUSTRALECTRIC, LTD.

This Company handles practically everything in electrical apparatus and labour saving devices, and in order that the display might be as instructive as possible the stall was set up as an electric kitchen, where such utensils as electric cooking ranges, automatic electric fireless cookers, vacuum cleaners, dish washers, electric irons, washing machines, etc., were on view and were continually being demonstrated.

UNITED DISTRIBUTING CO., LTD.

The display of the above Company covered the whole range of wireless apparatus from the various standard parts required to build a home-made set to elaborately built "Radiovox" receivers which are specially designed to give the best possible results in the reception of

broadcast programmes. These receivers are built in Australia, and demonstrations of their quality are given daily at the Company's Showroom, 28 Clarence St., Sydney.

BIDEN & ROBERTS.

This well-known firm displayed electrically equipped Indian motor cycles, complete sets of electrical equipment for attaching to Indian motor cycles, Wico batteries, generators, magnetos and spark plugs.

L. P. R. BEAN & CO., LTD.

"Audiola" receiving sets, Stromberg Carlson headphones, and Coto Coil radio accessories were conspicuous exhibits on the well-arranged stall of this Company.

A complete range of domestic electrical equipment attracted the attention of the women-folk who thronged all sessions of the exhibition, and doubtless many husbands found unexpected calls on their bank accounts as a result of the tempting display of home comforts and labour-saving devices.

The Cook Lightning Arrester R-72, which is supplied with every "Audiola" provides an absolute protection against lightning. It is one of the numerous lines manufactured by the Cook Electric Co. of Chicago, for whom L.P.R. Bean & Co. act as Australian representatives.

BURGIN ELECTRIC CO.

No less than eight types of broadcast receiving sets figured on the stall of the Burgin Electric Co.

A fine exhibit of experimental equipment included batteries, buzzers, inductance coils, fixed, variable and vernier condensers, and the hundred and one other articles which go to make up a complete stock. Experimental receiving and transmitting sets and materials for aerial erection were also shown.

THE WIRELESS PRESS.

The magazines featured by the Wireless Press included "Radio," "The Wireless Age," "Wireless World," and "The Wireless News" (published daily on N.Z. and trans-Pacific passenger ships).

Other features of the display included the Marconi International Code, the New Commercial Telegraphic Code and wireless gramophone records. The Wireless Press carries the largest stocks of wireless books in Australia.

HARRINGTONS, LTD.

A complete range of radio equipment figured on this Company's stand. It has carried its well-known reputation for service in the photographic world into the field of radio, and makes a speciality of instruction in the operation of radio receivers



The Burgin Electric Company.

Winning Displays at the Exhibition



The Blue Ribbon for the most attractive stand was awarded to this exhibit of New System Telephones Pty., Ltd.



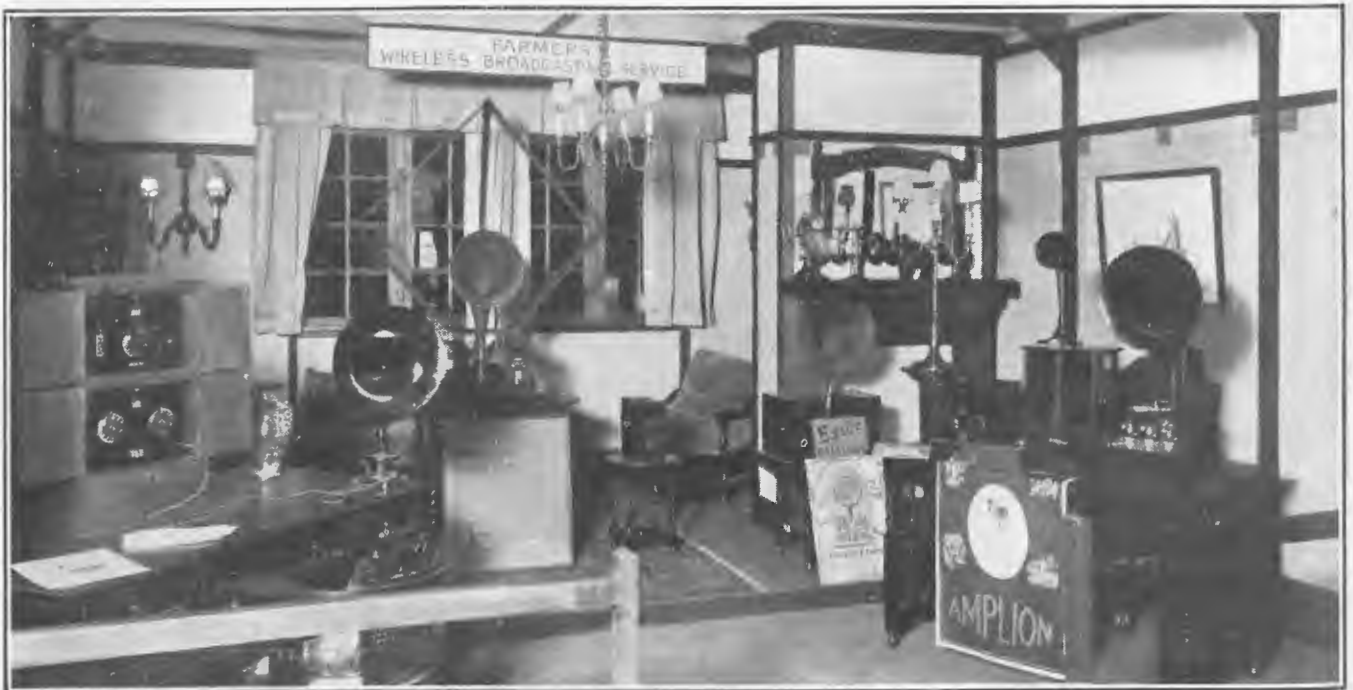
The Red Ribbon for the second most attractive stand was awarded to Amalgamated Wireless (Australasia), Limited. The photo. shows their four stands.

Distinctive

Displays



The Yellow Ribbon for the third most attractive display was secured by this exhibit of Messrs. David Jones, Limited.



The splendid display of Messrs. Farmer and Company, Limited.



The Wireless Press.

AUSTRALIAN GENERAL ELECTRIC CO., LTD.

In addition to the special display of electric equipment for the home this firm made a prominent feature of General Electric Motors and B.T.H. products. Tungar rectifiers, which are being extensively used for charging radio batteries, were also well to the fore.

UNIVERSAL ELECTRIC CO.

A full range of all standard lines of radio apparatus, together with a special display of their variable condensers manufactured in Australia attracted keen interest at this firm's well-arranged stall.

"HECLA" ELECTRICAL APPLIANCES.

If there are not many more homes in N.S.W. electrically equipped since the exhibition it is no fault of the "Hecla" Co., who made an attractive display of their well-known appliances. One particularly interesting feature was the "Hecla" electric stove, which is solidly constructed and has a cooking capacity of from six to eight persons.

Howard F. Hudson, 352 Kent St., Sydney, is the N.S.W. factory representative.

FRED. S. LEE, LTD.

This stand featured Dorman & Smith fuses and fittings, Nalden Bros. & Thompson M.C.S. instruments, Bates expanded steel poles and fittings, Jeffrey Dewitt extra high tension disc insulators, A.C.E.C. electric motors, knife switches, star-delta, and rotor starters, circuit breakers, wireless and other insulators.

W. HARRY WILES.

Wireless receiving sets, detecting and

the catchy alliterative phrase "Wiles Wonderful Wireless."

"Everything electrical" might have been aptly applied to the display outside of the wireless apparatus.

RADIO HOUSE.

Radio House displayed Manhattan loud speakers, wireless batteries, broadcast receiving sets of various designs, medical Faradic apparatus, domestic electric apparatus, paper shades, kettles, fans, irons, etc.

CONTINENTAL RADIO CO.

This firm represents many reputable American radio supply houses, and the display consisted of a wide range of apparatus suitable for the construction of experimental sets.

DAVID JONES, LTD.

A comprehensive range of apparatus marked the display of David Jones, Ltd. This firm has signalled its entry into the radio field by stocking a complete range of all radio equipment of approved makes. The Exhibition afforded an opportunity for making an excellent display, which attracted great attention.

PARKINSON (AUST.), LTD.

"Parkinson" motors are built to standardised designs and machined to gauges so that all spare and replacement parts are interchangeable. This, and many other features regarding the firm's products excited a good deal of interest at their stand.

The Sydney distributors are Messrs. Noyes Bros.



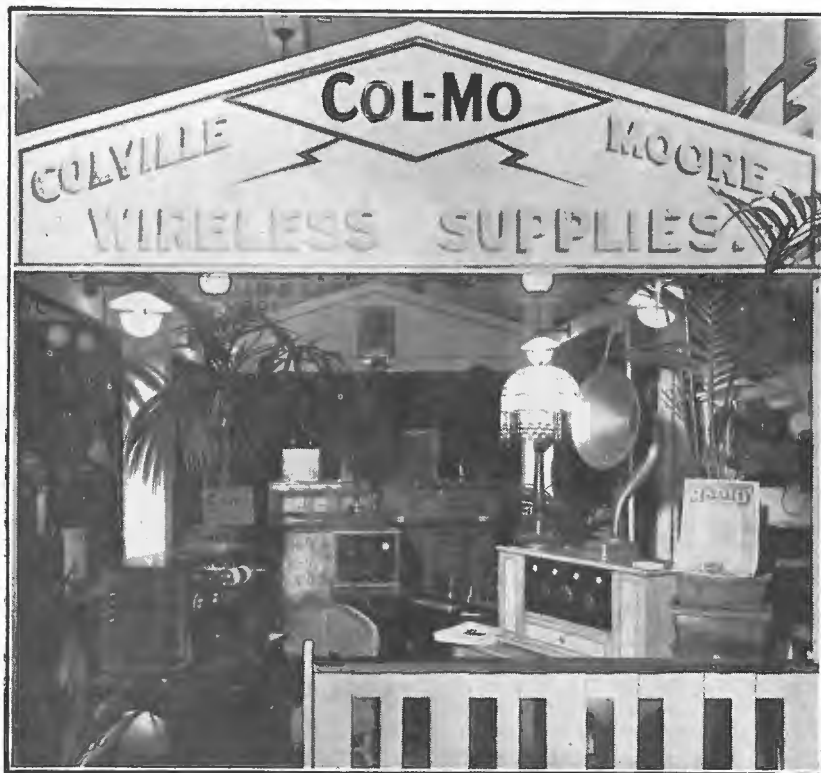
W. Harry Wiles.



The British General Electric Co's. stand.



Display of the Western Electric Co. (Australia), Limited.



The Colville-Moore Wireless Supplies.

COLVILLE-MOORE WIRELESS SUPPLIES.

The "Col-Mo" broadcast receiving sets figured prominently on this firm's stand. The handsomely engraved cabinet sets evoked much favourable comment, and backed up by the claim that out of the hundreds of sets sold—many to inexperienced users—not a single complaint has been received, it is easy to understand that would-be purchasers were strongly attracted.

RAMSAY SHARP & CO., LTD.

A full range of broadcast receiving sets, radio accessories, loud speakers, S. H. Couch Co.'s automatic telephone systems, American electric long distance telephones, Burn's Hi-Lo adjustable telephone brackets, and electric irons, fans and general electrical accessories, made up an interesting display which attracted the keen interest it merited.

BENNETT & WOOD, LTD.

C.A.V. batteries, manufactured by C. A. Vanderell & Co., Ltd. made up the principal exhibit in Bennett & Wood's stall. The batteries are constructed of the well-known C.A.V. "Grid" type plates, and incorporate non-corroding lugs and spray arresters.

BRITISH GENERAL ELECTRIC CO., LTD.

The "Gecophone" broadcast receiving set figured prominently in this Co.'s display, and the demonstrations of its simplicity and efficiency excited the keenest interest.

All wireless accessories were also displayed, and the Osram lamp, "Magnet"

electric apparatus, Peel-Conner telephones and "Wilton" power plants helped to make up one of the most interesting and comprehensive exhibits at the exhibition.

ANTHONY HORDERN & SONS, LTD.

As might be expected, this firm arranged a complete and attractive display in which a full range of radio apparatus and electrical equipment for the home figured. Electrical motor accessories were also a prominent feature.

AMALGAMATED WIRELESS (AUST.), LTD.

Every branch of radio work, including marine, inland and broadcasting equipment was exhibited by this Company.

The marine apparatus included a life-boat set, marine direction finder, tug-boat set, and a P.I. valve receiver.

The inland radio equipment featured amongst other things the "Wireless Call Bell," which is one of the newest developments of radio. It obviates the necessity for an operator remaining on duty continuously in order that he might receive all calls intended for him.

The broadcasting display featured "Radiola" valve and crystal sets which are very efficient in the reception of broadcast programmes.

GIBSON, BATTLE & CO., LTD.

Exide batteries, which supplied the energy for that famous radio call for help sent out by operator Jack Binns, of the "S.S. Republic", formed the principal display on Gibson, Battle's stand. The record of service of these batteries in radio work is a long and creditable one.

WESTERN ELECTRIC CO. (AUST.), LTD.

The Western Electric Co. made a special display of Western Electric wireless apparatus, consisting of valve detectors and tuners, crystal and valve amplifier sets, low frequency amplifiers, loud speakers, cabinet receiving sets, batteries, etc.

A full range of electrical equipment for the home was also displayed.

MESSRS. GODFREY, LTD.

This firm made an excellent display of tubular fuses, circuit breakers, rotor starters, knife switches, auto starters, etc.

The wireless accessories consisted of transmitting keys, choke coils, transformers (modulation and power), rheostats, knobs, terminals, etc., and vacuum pumps. The exhibit supplied a striking illustration of the range and quality of Australian manufactures.



Amalgamated Wireless (Aust.), Ltd., Broadcasting Display.

A Victorian Enthusiast

Mr. John E. Dane

Owner of Three Receiving Sets

VICTORIA is noted for the number and enthusiasm of its wireless experimenters. What they have done in radio work is known throughout the whole of Australia and far beyond, and it is probable that many more honours will be won there in the near future.

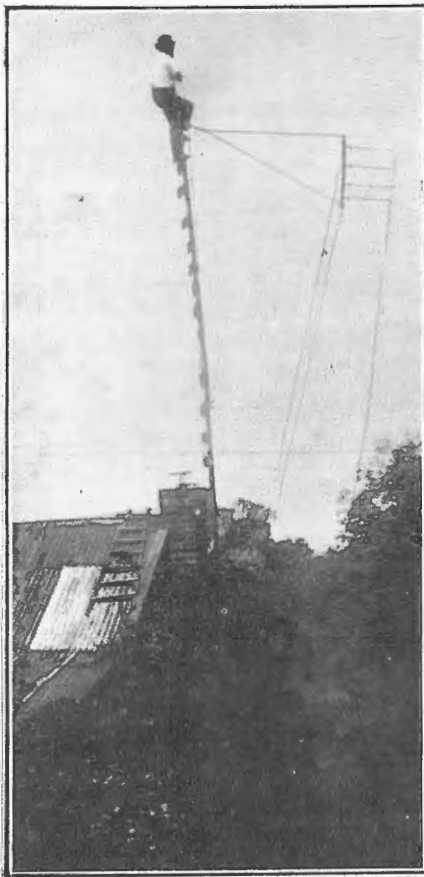
One of the most enthusiastic of their number is Mr. John E. Dane, of 501 Latrobe Street, Melbourne, who boasts no less than three sets; one at his country residence, Nar-nar-goon, another at his city home in Toorak Road, and the third at his business premises at Latrobe Street.

The installations at Mr. Dane's two private residences consist of A.W.A. 3-valve panel units with a 4-wire inverted L aerial 120 feet long and 80 feet high.

After carrying out a good deal of experimental work and obtaining some excellent results, Mr. Dane set to work to build his own receiver.

This is of the panel design and consists of three valves; one UV 200 soft radiotron as detector, and two hard UV 201 radiotrons as audio frequency amplifiers.

This set has been installed at Mr. Dane's business premises where it is being used for demonstration purposes. The excellent workmanship has evoked much well-merited praise,



Mr. Dane erecting the aerial at his country residence at Nar-nar-goon, Victoria.

and the results achieved have made Mr. Dane justifiably proud of his work.

The call letters of his station are 3JD, and it is anticipated that at an early date he will have his transmitting set, which he intends building himself, in operation.

Mr. Dane is senior partner of the firm of Dane, Taylor & Co., who have recently been appointed sole Victorian agents for Edison storage batteries and Thomas A. Edison, Ltd.

Mr. Dane has also been appointed a distributor for Amalgamated Wireless Ltd. in Victoria, and with his knowledge, ability and enthusiasm, there is little doubt that he will make a big success of the undertaking.

Up-to-date Entertainment

A Washington (U.S.A.) radio firm has hit upon the novel idea of supplying a radio concert to any particular home just for the evening if it is so desired.

The firm will instal the receiver in the home, and supply a programme suitable for a social evening. A guarantee of "success or no charge" is the firm's slogan.

Wireless Concert at Newcastle

Listeners-in at Newcastle were treated to something exceptional recently, when Mr. McGrath, manager of the Strand Theatre, and his orchestra broadcasted some excellent musical items from Mr. N. P. Olsen's wireless station at Waratah. The orchestra, under Mr. Harold Vincer, played the musical score from "Robin Hood," also several other overtures

and selections. Other items broadcasted were a 'cello solo, by Mr. Jack Webb; violin solo by Miss Christie, and piano solos by Mr. Harold Vincer.

Mr. McGrath spoke over the radio-telephone to all "listeners in" and, yielding to numerous-requests by telephone and a considerable amount of en-

couragement from the rest of the company, he was persuaded to sing "An Old-Fashioned Town" and "Believe Me, If All Those Endearing Young Charms," which carried through the ether with remarkably clarity.

The local amateurs are unanimous that the programme was absolutely the best they have ever heard.

Wireless Stations in Eastern Pacific

N. Z. Government Moves

IT is pleasing to note that the New Zealand Government has decided to erect two wireless stations in the Eastern Pacific. The object is to stimulate the production of fruit in islands that are immune from such pests as the fruit fly, as well as assist in the general trade between the islands and the Dominion.

The two stations are to be established at Aitutaki and Mangaia, the latter being an important island of the lower Cook group, whilst Aitutaki, which is 140 miles from Raratonga, combines the features of the volcanic island and the atoll. The question of linking up the islands in the Cook group was brought before the Minister in Charge of the Cook Islands Administration, on his recent visit to the islands. Immediately upon his return to the Dominion he placed the matter before the Cabinet which at once approved of a wireless station at each of the places mentioned at a cost of £1,000 each. The new stations will give direct communication with

Raratonga which has a first-class radio station for communicating with the outer world. This will be a great boon to the trading population of the two islands, which during the hurri-

SEASON'S GREETINGS.



The Proprietors, Editor and Staff of "Radio" extend their best wishes for a Merry Xmas and a bright and prosperous New Year to all readers.

cane season are not visited by boats for three or four months. Hitherto the fruit traders especially have been at a great disadvantage, not knowing when to expect the steamers, and too often whole cargoes have been con-

demned upon arrival in New Zealand on account of their decomposed state.

The Cook Island Department has now got three scholarship pupils from Raratonga, who have completed their course at St. Stephen's School, Auckland. These lads are now at the wireless college in Wellington being trained for work in connection with the proposed two new stations at the Cook Islands.

Niue, the scene of several wrecks, will also be provided with wireless in the near future. In this case there is great difficulty in administration on account of its isolation. The nearest territory administered by New Zealand is Western Samoa, 350 miles distant. Owing to the cost of operation due to the necessity of having two European operators there, there has been some hesitancy in installing a wireless station, but should the training of the Raratonga lads prove successful, as it promises to be, there should be no difficulty in providing suitable operators for Niue.

Adelaide "Listens In"

High Class Concert Broadcasted

The concert in aid of Minda Home, given by the Adelaide Competitive Choir and assisting artists in the Town Hall on December 8, was broadcasted by the Bald Motor and Electrical Works. This was the first time a Town Hall concert had been transmitted, and the good, all-round qual-

ity of the musical programme was enjoyed locally and at centres in at least two other States. The Competitive Choir, under Mr. O. H. Finlayson, sang a number of Ballarat test pieces, and songs and duets by several of the prize-winning soloists there added to a programme well

worth "listening in" to. Acknowledgment came from four stations in New South Wales, one in Ballarat, and from quite a number of listeners in the metropolitan area that the concert had been heard exceptionally well.

"Burginphone" Broadcast Receivers

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These Receivers have passed the Government test.

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We Specialise in Experimental Receivers and Transmitters of all Designs.

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Wireless Engineers, Manufacturers and Suppliers,

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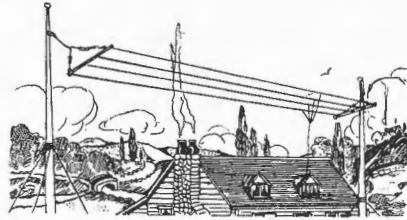
Broadcasting in N. Z.

Move for Better Service

Problem of Finance

Most of the New Zealand broadcasting stations have no definite schedule of transmissions, but an effort is being made to arrange a roster which will provide for smooth and efficient working.

1YA, Auckland, which was dismantled for a time has resumed operations, whilst the Otago Radio Association has notified the Post and Telegraph Department that its transmitting apparatus has been dismantled for the time being. Mr. L. Whyte, who controls 1YA, returned to Auckland from Wellington recently and reported that an attempt was being made in the Empire city to reorganize the broadcasting stations throughout New Zealand with a view



to giving a more satisfactory service to "listeners in" and obtaining better financial support for the broadcasting companies.

It is proposed that in each of the four centres, Auckland, Wellington, Christchurch and Dunedin there shall be only one commercial broad-

casting station to be financed by a levy on all license holders. The idea is to transmit, say, three nights a week, giving market reports between 6.30 and 8 p.m., followed by musical and other items. Further musical programmes are favoured for the afternoons for the benefit of restaurants and tea rooms.

After Government sanction to the proposal has been obtained full details will be published. Objection to the scheme is raised on many sides on the score that it would be too much of a monopoly, but it is to be hoped that out of the discussion some satisfactory arrangement will be arrived at towards improving broadcasting generally.

Queensland Wireless Institute

In a report to the December meeting of the Queensland Wireless Institute, the secretary (Mr. A. N. Stephens) stated that, although a debit of approximately £11 still remained the fact that their indebtedness had been reduced from £52/10/- since

March last was cause for congratulation.

The report also dealt with the activities of the Division during the past year, and a tribute was paid to those members and others who had generously assisted in the matter of

lectures, demonstrations, etc.

Reference was made to the preparations for the holding of demonstrations at Coolangatta during the holiday season, for which special permission was granted by the Controller of Wireless.



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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.

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Interstate:—BRISBANE: S. H. Smith, Radio House. ADELAIDE: Chas. Atkins & Co. PERTH: T. Muir & Co., 89 William Street. MELBOURNE: Homecrafts, 211 Swanston Street.

Amateur Radio Tests.

On Sydney-'Frisco Voyage.

An Important Undertaking.

WHEN the R.M.S. *Tahiti* leaves Sydney for San Francisco towards the end of February, 1924, she will have on board two well-known Sydney experimenters, Mr. C. Maclurcan and Master Jack Davis, and a fully equipped low-power wireless receiving and transmitting set.

The idea is to conduct tests on the voyage to and from America with a view to determining the practical utility of low-power sets in commercial radio work.

Mr. Maclurcan, who has secured some remarkable results in low-power transmission, is of the opinion that something should be done to test its practical value in every-day work.

His contention is that there is a very big field for research in low-power, short-wave sets, and that the ideal conditions on shipboard will enable definite results to be obtained. In his efforts to prove this he found a valuable and enthusiastic ally in Amalgamated Wireless (Aust.) Ltd.

The company has undertaken to erect a replica of Mr. Maclurcan's station on board the *Tahiti*, and in combination with Jack Davis of Sydney, Mr. Maclurcan is confident of obtaining results of very great value to both experimental and commercial wireless by the time the *Tahiti* completes her return journey across the Pacific.

VALUE OF TESTS.

If wireless is to prove the great blessing to mankind for which it seems destined it is essential that it should be made as cheap as possible.

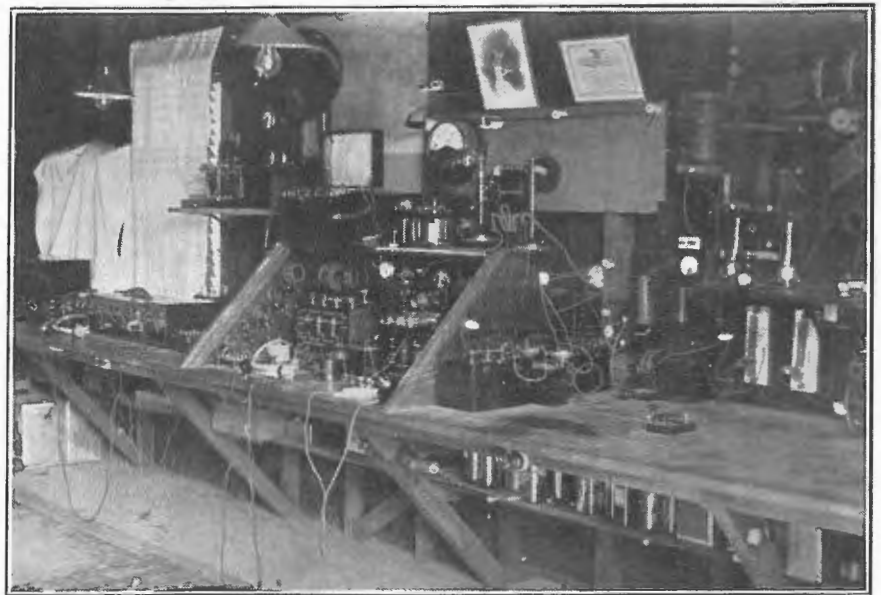
There are so many homes in the backblocks of Australia where wireless communication would prove a God-send that it might reasonably be regarded as a national undertaking to make it available as cheaply as possible to all who require it.

It is only by continued experiment that methods can be devised to cheapen the cost of apparatus, and there are many who believe that in the near future a discovery will be made regarding the utility of low-power sets which will practically revolutionise wireless. If such proves to be the case it will be a great thing for all concerned.

that can be secured from 10 watt and 100 watt sets, both for daylight and night transmission, not using super-sensitive receiving gear, but utilising a single valve set such as can be operated by the average person.

APPARATUS ON "TAHITI."

The apparatus on the *Tahiti* will consist of a separate receiving and



General view of Mr. Charles Maclurcan's station (2CM) at Strathfield, N.S.W., showing apparatus which will be used in conjunction with the tests on board the R.M.S. "Tahiti" during the forthcoming test trip.

Up to the present there has been very little done in the way of obtaining definite data of the range of low-power sets, hence those about to instal transmitters have had to turn to high-power apparatus to make certain of results, and, as in most things, high power means high cost.

In the tests which are to be conducted on board the *Tahiti* an effort will be made to determine the ranges

transmitting set, with a cage aerial erected from the mainmast. A tuned counterpoise will be used.

The call sign will be 2CDM. Tests will be carried out with Mr. Maclurcan's own station at Strathfield, and definite schedules will also be worked with Australian, New Zealand and American experimenters.

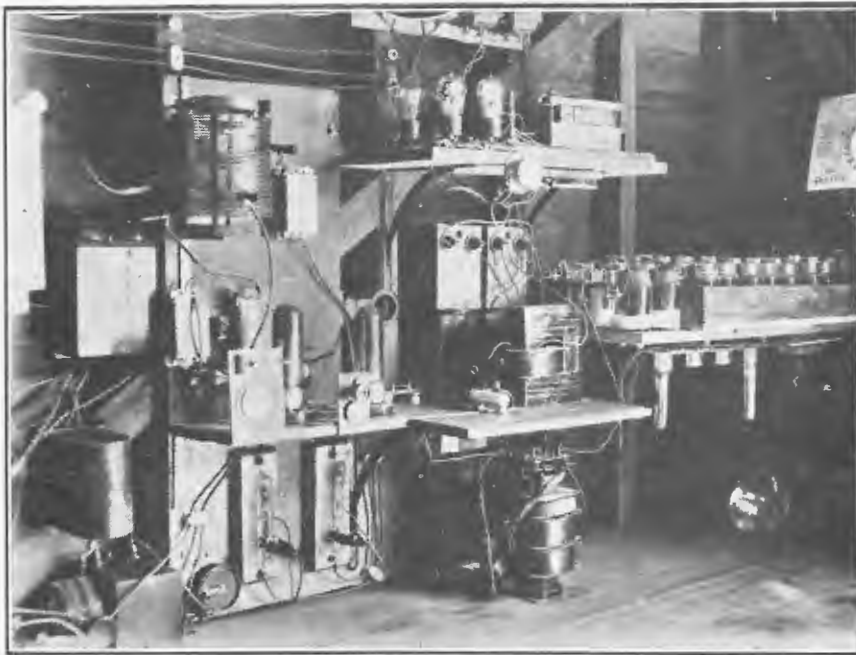
Wireless Demonstration in Adelaide

Mr. J. N. Bald, proprietor of the Bald Motor and Electrical Works, in a letter to the Editor claims that he was the first to give a wireless demonstration from a motor car in Adelaide.

On October 9 last, he states, he erected an aerial on a motor car, and with the aid of a "loud speaker" gave a wireless concert in Rundle Street between 12 and 2 p.m. Subsequently he drove through the streets, and the music from the car could be heard over 100 feet away, despite the traffic. Later on he gave further demonstrations which were equally successful.

AERIAL FOR COOLANGATTA.

Coolangatta (Qld.) has been promised an innovation in the form of an aerial which will be available to wireless enthusiasts in this popular surfing resort during the holiday season. Mr. Powell, it is reported, has given evidence of his interest in the science by offering to erect such an aerial in the town, and should the proposed scheme be put into operation, an added attraction will have undoubtedly been added to Coolangatta.



This photograph shows the 100 watt transmitter at 2CM which will be used for wireless telegraphy only. On a wave of 210 metres this set radiates 5 amps. It will be used at Strathfield only to send on a regular schedule to the R.M.S. "Tahiti" while crossing the Pacific.

All signal strengths will be measured by audibility meter, and day and night ranges logged.

Signal fading at low-wave lengths—a vitally important point—will receive particular attention, and any other phenomena will be noted.

CONTINUOUS WATCH.

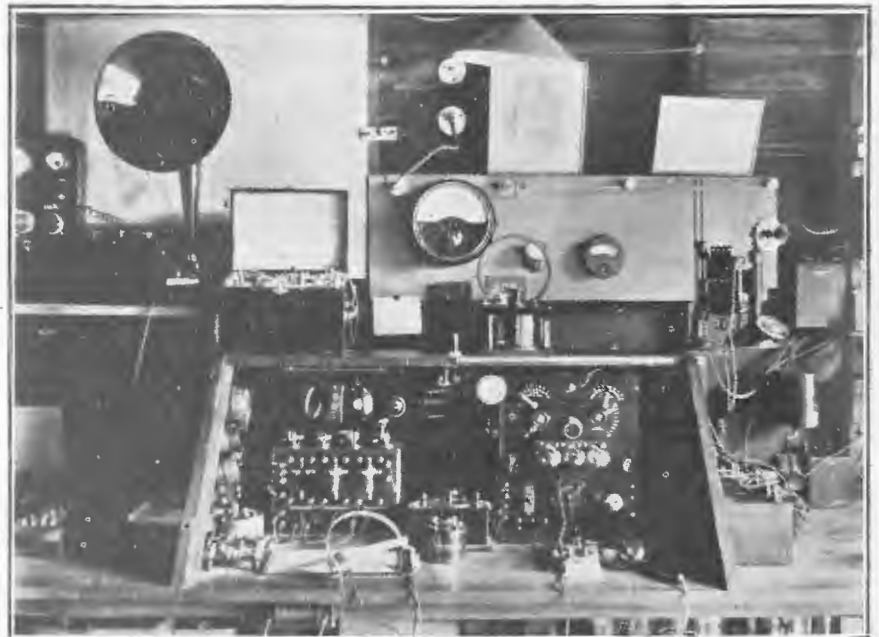
A continuous watch will be kept while in communication, and, although no attempts at record breaking, or transmission over any specified distance will be made, it is expected that much good work will be accomplished.

The station to be built on the *Tahiti* will be erected by Amalgamated Wireless Ltd. and being a replica of Mr. Maclurcan's private station at Strathfield will be erected under his supervision.

The wave-length to be used on the trip will probably be about 200 metres and the power 10 watts. This will be the first occasion on which an amateur set has been installed on an ocean-going vessel.

With two such skilled experimenters as Mr. Maclurcan and Jack Davis as operators, it may be confidently as-

sumed that the attention of many thousands of wireless enthusiasts will be focussed on the *Tahiti* as she speeds across the Pacific.



Low power sending and receiving apparatus at 2CM. The 10-watt transmitter is at the right, and a similar set, now being manufactured, will be used for both wireless telegraphy and telephony on board the "Tahiti." This set radiates 1½-amps. on a wave-length of 230 metres.

Wireless in N. Z.

(By Our Special Correspondent.)

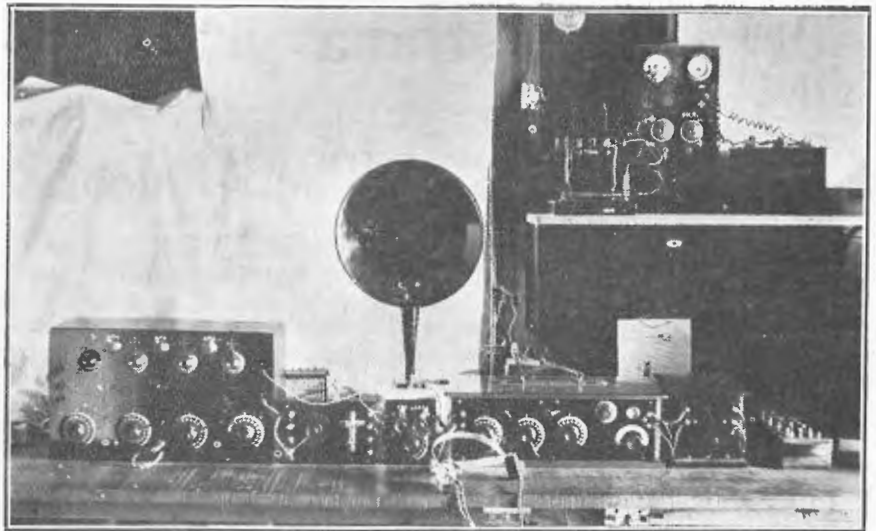
BROADCASTING has been somewhat dull in the Auckland district during the past month, mainly owing to the closing down for a time of 1YA, and a general slackness on the part of several of the chief clubs. The former station has now resumed operations, but it will require a united effort on the part of wireless enthusiasts generally to place matters on a satisfactory footing. It is to be hoped that such a move will be made before Christmas.

Several Auckland firms intend making a display of apparatus at the forthcoming Agricultural Show, with the hope of enlisting the sympathy and support of the farming community who, for the most part, are keen to acquire a working knowledge of wireless.

The Christchurch Radio Society has been putting in some excellent work in broadcasting and the regularity of its transmissions is much appreciated. The Society broadcasts at 8 p.m. on Wednesdays and Saturdays and on alternate Sundays. It first works on CW for five minutes and then stands by for the same period. At half-past ten broadcasting ceases and CW is worked for a quarter of an hour. The wave-length is 250 metres, but may be altered to 300 metres. The call sign is 3AC, and the power 15 watts.

Several interesting reports are supplied by New Zealanders in regard to transmission and reception. Mr. Wm. Ward, of Tariki Taranaki, continues to obtain excellent long distance results. He has been successful in receiving broadcast from the two Los Angeles stations, KFT and FG. He states that using four valves, two high frequency detectors, and one audio frequency, KFT is audible with the 'phones 6in. from the ears.

Another well-known wireless enthusiast, Mr. F. C. Reardon, of Grey Street, Auckland, supplies particulars of results obtained by him using a single circuit crystal set. He claims to hear all the chief stations in the Pacific, and most Australian stations, including Darwin, Broome and Perth. He picks up Morse from the Pacific liners over considerable distances, and has followed the *Niagara* for seven days out of Auckland, or a distance



A view of the receiving equipment at 2CM. The set on the right will be used at Strathfield to receive signals from the experimental transmitting set (2CDM) on board the "Tahiti."

of over 2,000 miles. He has heard other Union Company steamers at similar distances.

At the exhibition of hobbies held in connection with Boys' Week, the following prizes were awarded in the wireless division: Working drawing, Francis Bell; Crystal Set, G. Sharewood; Honeycomb Coil, K. O'Brien; Single Valve Set, H. Yeatman; Variocoupler, A. Mellars; Special Prize, 3-Valve Set, E. C. Brown. The remarks of the judges were highly congratulatory.

Experimenters at Seaside.

A party of well-known Brisbane experimenters, consisting of Messrs. W. Finney, Wynard-Joss, Reid, Didams, and Pass spent the week-end at Redcliffe recently, working in con-

junction with 4CM, operated by Mr. T. M. B. Elliott, and the results obtained were of such a highly satisfactory nature that the party proposes to embark on a like adventure to one of the mountain resorts in the near future.

A temporary aerial was erected on arrival on Saturday night, one end being secured to a large tree, and the other to a temporary pole at the house end. During the evening both vocal and instrumental items came through with distinct clarity, amateur stations on Morse also being heard from both New South Wales and Victoria, and a faint speech from a Victorian amateur station. The tests were continued from midnight to 7 o'clock on Sunday morning. New Zealand and Sydney stations were called throughout the test, and hopes are entertained that 4CM's signals have been picked up in the Dominion.

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Australia and Wireless.

The Outlook.

By GEORGE A. TAYLOR

SHAKESPEARE, with all the license of fancy by which a poet can exaggerate, made Puck say: "I'll put a girdle round about this earth in forty minutes." What would the Great Bard have said if a prophet had told him that within three centuries that girdle could go round the earth by wireless in less than one-seventh of a second? Or what would he have said if he had been taken in hand by one of the officials at the recent Wireless Exhibition in Sydney and shown the remarkable mechanical devices that can transmit the human voice and give other wonders with the greatest of ease?

The success of that Wireless Exhibition was most encouraging to those who have worked with the science in development of Australian broadcasting free of interruption, for with wireless we are entering a stage of history that will mean more for Australia than it has meant for other countries.

Australia is indeed a remarkable country, for though our aborigines are the last survivors of primitive man, and Australia is practically the oldest of the continents, yet it lay in the southern seas until discovered by civilization a century and a half ago. To-day Australia stands as the newest of nations, with only a small population of 5,662,124 scattered over a surface almost as large as Europe, with its population of 475,183,776!

Our great area poetically entitled by Alfred Deakin as the "Land of Magnificent Distances," called for something that could quickly join its scattered people; and so with wireless, that without any solid link, can carry messages with the speed of 186,000 miles per second to the furthest corner of Australia, we have a factor that will eliminate the word "distance" from any reference to our Great Continent.

Distance from the headquarters of the Empire has always been a drawback to Australia, but when we have a medium that will shoot around the earth in one-fiftieth part of a second, we have something that can be widely utilised for Empire development.

It does not seem long in the history of the world since oversea friends

it is but a few years back when the great ship the "Waratah," probably with a broken propeller, drifted in the southern seas without ever being heard of again, owing to the fact that she was not fitted with wireless gear.

With the minimum of power to-day we find our young, enthusiastic experimenters transmitting messages half way across the world. We are also seeing drawings and pictures transmitted by wireless, and at the last Pan-Pacific Science Congress it was shown how natural coloured photographs could be shot across the earth and reproduced in all their natural colours at a distant centre on the same day that the event happened thousands of miles away.

The 14,000 people who visited the recent wireless exhibition in Sydney were no doubt impressed by the significant importance of wireless and its simplicity, but few could understand that that simplicity of wireless was a secret till within a quarter of a century ago, when Hertz investigated the peculiar effects an electric spark had upon surrounding instruments, and so explained what other Professors, such as Henry, Faraday, and Maxwell had noted. Then began a series of exciting developments, in which Sir Oliver Lodge and other great ones shone, until Marconi came on the scene in 1896 and quickly in his remarkable series of experiments proved that wireless had possibilities hitherto undreamt of.

Much progress has been made in Australian wireless activity so that to-day Australian broadcasting has a basis for transmission and reception different to any other part of the world, and which we are all hoping shall give Australia with her freedom of thought and freedom of action a lead in the world's broadcasting science. We are looking forward most



Mr. George A. Taylor, President of the Association for the Development of Wireless in Australia, New Zealand and Fiji.

were met with a welcome handshake when they landed from the ship; but to-day a radio message shoots through the ether and gives the happy greeting far away. For the recent Pan-Pacific Science Congress all of the delegates were welcomed by wireless. One cannot help thinking, when referring to this aspect of wireless, that

eagerly to the wide spreading of broadcasting as it would be worth while to Australia for the speedy sending of news and valuable information with market prices to distant country districts (will be of great value to country residents, while in the widest transmission of music, song and story many of the pleasures and attractions of city life will be spread throughout the country, thus in a way making country life brighter and curbing the attractions of the city which so often unfairly reduce country population.

I am particularly keen on broadcasting helping in this aspect of country life, not only from a residential point of view but also as regards the establishment and maintenance of country factories. In our sparsely populated continent it is ever desirous to see the best use made of efficient apparatus that will mean the saving of labour that can be placed to other developmental work.

In this respect I look to wireless to be of great assistance particularly with regard to country development. The day is fast approaching when the transmission of power by wireless may make it cheap enough to enable factories to be economically worked in districts where products to be machine-treated are grown, thus saving much money on freight, loss of time, and other incidental expenses of present production.

In this respect the drift of country factories to the city is very important, there being 211 less in the country to-day than there were ten years ago, and one of the reasons for this "trek to town" is the lack of knowledge of possibilities.

We who experiment in wireless welcome the display of broadcasting of sound with the hope that the latter may become a link to the possibility of the broadcasting of power; in fact, Australian Governments should give this aspect of the matter keen consideration, for Australia calls for a national scheme of cheap power production.

We, however, must be particularly careful in public exhibitions during the period of our experimental work, for it must be confessed that some of the broadcasting displays that have been before the public of late have not been worthy of the great possibilities the science holds. The enthusiasm of experimenters is to blame

Queensland Enthusiasts' Experiments

Successful Week-end Outing

On Saturday, December 8, a party consisting of Messrs. A. W. Joss, W. Finney, R. Riddams, L. Pass, R. F. Reid, T. M. B. Elliott, A. East and F. Hoe left Brisbane by cars for the Tambourine Mountains to carry out extensive experiments.

Two sets, the property of Major A. W. Joss, comprising a Crossley two-valve set and one of his own construction (three-valve), together with a Magnavox, were taken aboard the cars, and on arrival at the hotel a temporary aerial was erected.

On Saturday night considerable difficulty was at first experienced with "static," which was very prevalent, but at length better results were obtained, and the broadcast programme from Sydney was picked up fairly distinctly. Some Post Office signals, and an experimental record from 4CM were also received, and until a late hour interesting experiments were conducted with these stations.

for this poor display, and it would be well worth while for this enthusiasm to be curbed so that no displays of broadcasting should be given the public unless it be of the best, both in tone and quality.

In the preliminary work of every great science much experimental work has to be done, but those who have heard poor results in broadcasting should not condemn the science, but should wonder at the fact that sound can be transmitted, and once that factor is well in hand purity of tone will rapidly follow.

In this respect mention should be made of the recent Exhibition, where some of the sound reproductions were most unsatisfactory. The public, however, generously recognised that it was a wonderful factor calling for the best of encouragement, and we may be sure that as the public has the decision of success or otherwise of any industry it will not hesitate to help to the best success in wireless, for we are standing facing the future with a remarkable grip of the ether giving us the greatest conquest man has yet achieved.

On Sunday night the full programme from 4CM, together with messages from numerous amateur stations, was received, and a large crowd gathered in the vicinity of the hotel to listen to the entertainment.

Tambourine was left on Monday morning, and a quick run made back to the city.



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Diamond Fibre is an ideal insulating material, manufactured in sheets, rods, tubes. From **Sheets** are made switch-bars, washers, gaskets, slots, buttons, wedges, cleats, etc. From **Rods** are made bushings, knobs, pins, handles, bars, etc. From **Tubes** are made conduits, flashlight tubes, bushings, etc.

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40 King Street, Sydney

Instruction for the Beginner.

Simple Facts that All May Understand.

A STUDY of the diagram (No. 4) which appears on this page will furnish the beginner with a fairly definite understanding of the actual apparatus employed in producing wireless waves.

A key, induction coil, condenser, spark gap, aerial tuning inductance, aerial and earth are all shown in their proper relation to each other, and a simple explanation of their separate functions will help the beginner immensely in his struggle to see light.

The key, which is merely a hand-operated switch, is so arranged that dots and dashes can be formed with it. When the lever is pressed down the circuit is closed, and current from the batteries flows into the induction coil, which may be regarded simply as a device to increase or "step up" the voltage of an electric current.

From the induction coil the current passes into the condenser which will hold a certain amount of electricity at a given pressure. In other words, it has a definite "capacity," which, in turn, depends upon the size of the condenser. When this limit has been reached the current is discharged and rushes from one side of the circuit to the other by means of the spark gap. This process continues until the current is exhausted. It is, perhaps, as well to mention that when fully charged a condenser can discharge and recharge itself many thousands of times in the space of a second, but each successive charge becomes weaker.

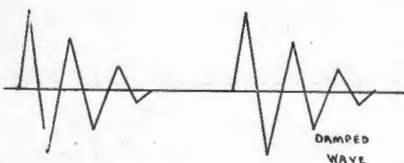


Fig. 5.—Illustrating damped waves.

From the foregoing it is clear that the condenser, when used in the circuit as shown, is merely there for the purpose of producing high-frequency alternating currents. These currents rush around what is known as the "closed oscillatory circuit" at tre-

(This is the second of a series of simple articles for the absolute novice in wireless. We believe there are thousands of men, young and middle-aged, who are anxious to make a study of radio, but do not know where to begin. It is for their especial benefit that these articles are being written.)

mendous speed, the frequency depending upon the size and nature of the wire—otherwise resistance—length of wire (inductance) and size of condenser (capacity).

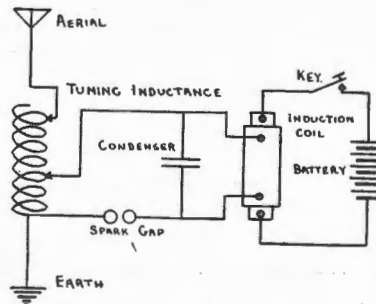


Fig. 4.

To produce currents of extremely high frequency and correspondingly low wave-length, a small condenser and a small amount of extra-large wire should be used. This condenser would fill rapidly and the currents produced would rush to and fro with very little resistance.

In studying the diagram the open oscillatory circuit will be noticed. The actual process of inducing these currents into the open oscillatory circuit will be explained later. The aerial, or open circuit, is tuned to the closed circuit, otherwise the currents would not flow through it.

The aerial circuit might aptly be termed the open door to the ether, for it is through it that the high-frequency currents rush into space at the terrific speed of 186,000 miles per second.

To discover the meaning of "damped" waves which are produced by a wireless transmitter it is necessary to turn to the condenser. It has already been stated that the condenser pro-

duces currents which gradually fade out as they rush from one side to the other. In other words, they are "damped out." This "damping" effect is noticeable in the waves they produce in the ether. After rushing to and fro they gradually fade away and another wave starts.

An undamped wave, on the contrary, does not fade, it is continuous. It maintains its original intensity until cut off entirely. These undamped waves are rapidly replacing the other variety in radio work. They are produced by special apparatus, quite distinct from that just referred to.

Still another method of creating wireless waves is by the "arc." These waves are continuous and to understand how they are generated a simple explanation of how an arc light works will suffice. When two carbon rods are connected up to a source of controlled current an arc will be produced between them when their ends touch and are drawn apart. When this arc is established, electricity will continue to flow across the heated gap.

To produce an appreciable amount of disturbance in the ether the arc alone will not suffice—it must have a condenser and inductance connected up or "shunted across it." Immediately this is done the condenser starts to fill and discharge, but the discharge differs from that which occurs when the condenser is used in connection with an inductance coil. The con-

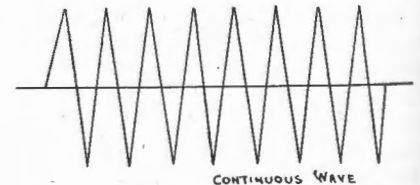


Fig. 6.—Illustrating continuous waves.

denser will produce a continuous discharge if direct current is used in connection with the arc, and if it is then connected up to the aerial continuous (C.W.) waves will be sent out.

(Continued on page 500.)



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Broadcasters (Sydney) Ltd.

Officially Opened

P.M.G. Offers Congratulations

On Thursday evening, December 13, the Postmaster-General (Hon. W. G. Gibson) officially opened the broadcasting station erected and operated by Broadcasters (Sydney), Ltd., in conjunction with Smith's Newspapers, Ltd.

The station is situated on the roof of the "Daily Guardian" office in Phillip Street, Sydney, and daily experimental transmissions were carried out for some weeks prior to the official opening, with marked success. Special preparations had been made to ensure the speeches and musical programme for the opening evening being heard over a wide area, and by many people who have not the good fortune to possess a receiving set in their own homes.

Several Sydney theatres installed broadcast receivers specially for the occasion, and an open air concert was given in Martin Place, where a big crowd congregated.

In emphasising that "the day when technical knowledge was necessary on the part of those engaged in both the reception and the transmission of radio messages is past," Mr. Gibson aptly expressed the present position in regard to wireless.

Continuing, he pointed out the great interest which is now taken in the utterances of public men and overseas visitors, and declared that broadcasting provided the one and only means by which practically a whole continent could hear, not a reproduction, but the actual utterance, of the speech or item they wished to hear.

In concluding, Mr. Gibson offered all concerned in the enterprise his heartiest congratulations, and expressed the hope that the public would avail themselves of the up-to-date and speedy means of communication which the station offered.

Sir Joynton Smith, chairman of directors of Smith's Newspapers, Ltd., said he hoped that "listeners-in" would derive much pleasure and profit from the broadcasting station.

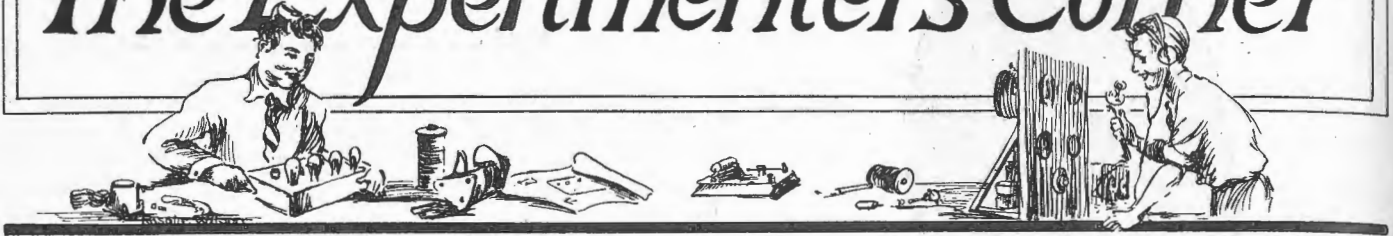
A varied programme of vocal and instrumental items was then transmitted.

Waverley Radio Club

A large batch of correspondence was read at the meeting on December 13. A letter from Farmer & Company, Ltd., was included, asking the Club's co-operation in the firm's broadcasting tests. The secretary was instructed to acknowledge the letter, and say that the members would do their best.

The Treasurer (Mr. Marsland) presented his monthly interim report. Messrs. Burrows and Simpson were elected auditors. The following meeting being the last one in the year, the presidential and committee elections will be held. All members are requested to be present.

The Experimenters' Corner



VALVE TRANSMITTERS AND GRID LEAKS.

THE usual method employed by experimenters in connecting up the grid leak resistance in transmitting circuits is to place it as a shunt path directly between the grid and filament terminals. In this position it will absorb considerable energy, for in addition to the direct current which flows as a consequence of the negative charge which accumulates on the grid there is also a high frequency component from the reaction coil. The former current is essential for the satisfactory operation of the valve as an oscillator, but the

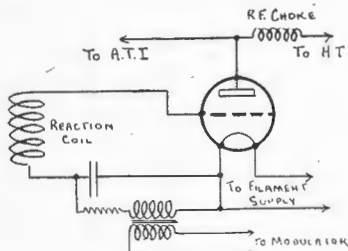


Fig. 1.

latter represents a direct loss which is reflected in a reduced output to the aerial system.

It is possible by means of radio frequency chokes inserted between the grid terminal and the resistance to reduce this loss to a very small amount. A suitable winding for this choke consists of 250 turns of No. 36 d.c.c. wire wound on a three-inch

tube. This data is for a coil suitable for operation between the wavelengths of 200 and 300 metres, but if other waves are to be employed for transmission the turns should be in proportion.

A more satisfactory method is to connect the leak resistance and the modulation transformer, as shown in Figure 1. This places it in series with the reaction coil, and no radio frequency energy is lost or has to be choked back by special windings. The grid condenser and leak should be connected exactly as shown, for if it is placed in the high potential lead between the reaction coil and grid there will be formed a capacity shunt path through the modulation transformer and the operator's body, which will result in considerable loss of energy, notwithstanding the possibility of receiving unpleasant shocks.

AN EXPERIMENTAL VARIABLE CONDENSER.

The beginner in radio as soon as he graduates from a crystal to a valve receiver finds that a variable condenser is essential if the short wave radio 'phone stations are to be tuned in with any degree of satisfaction. At this stage of development the financial outlay for a ready made article is liable to over modulate the banking account, and a cheaper substitute would be very welcome.

In Figure 2 details are given for

the construction of a cheap and efficient variable condenser which, if carefully made, will make a useful piece of apparatus for an experimental station. The most expensive article required is the glass cylinder which is an ordinary, straight lamp-glass as used for vertical incandescent mantles. Its diameter will vary slightly with different makes, an average value being in the neighbourhood of two inches. Over the entire length and covering half the circumference of the cylinder is placed a layer of heavy tinfoil. A good adhesive is Secotone or Le Pages Glue. Shellac is not very satisfactory, owing to it becoming brittle and liable to flake when dry. The rotary plate is attached to a wooden rod which must be a smooth fit inside the glass tube. If unable to get a rod turned to size

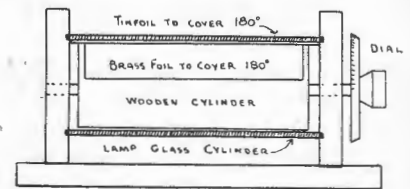


Fig. 2.

by a friend possessing a lathe select one slightly smaller and build it up by gluing on sufficient layers of brown paper. Bake this composite tube dry before putting it into use. Heavy tin or light brass foil is used for the rotary element. In each end of

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the wooden cylinder is inserted a $\frac{1}{4}$ in. brass rod, which provides the bearings and a shaft to carry the indicating dial or knob. The end cheeks have a narrow groove cut in them to provide a supporting surface for the glass cylinder.

The capacity of this type of condenser with a glass six inches long, two inches diameter and approximately $\frac{1}{16}$ inch thick will be 0.0003 microfarads or slightly less than a 23 plate variable.

"And where do you say that station is situated?" said an aristocratic lady, as she was permitted to "listen in" to a musical Telefunken note. "In Germany, Madam." "Of course. How thoughtless of me. Knowing the Germans are musical, I might have concluded that."

DAVID JONES' RADIO SECTION,

Directed by
Mr. F. Basil Cooke, F.R.A.S.

Special Christmas Display

For Christmas Week a special showing will be made of experimental sets and accessories. A 5-valve set, completely assembled but readily accessible, is on view for inspection, demonstrating just what parts are necessary for a complete set of from 1 to 5 valves. The highest grade materials only are used in the construction of this set, and for instructional purposes the layout and wiring can be plainly followed. The expert advice of Mr. Cooke is available at all times, and every assistance will be given to make your own sets. A full range of accessories is always in stock.

DAVID JONES'
Radio Department,
22 York Street, Sydney.

Federal Council of Experimenters.

Queensland Institute Discussion

Direct or Proxy Representation?

The business at the final meeting of the year of the Queensland Wireless Institute centred chiefly on a letter from the Controller of Wireless in the matter of Queensland representation on the Federal Council.

The secretary (Mr. A. N. Stephens) propounded a scheme which he hoped would meet with the approval of the Institute, and eventually with the whole of the amateur bodies throughout the Commonwealth. In it provision was made for one representative of each club in the various States to be appointed to a State committee, under the chairmanship of some disinterested public man, preferably a Federal Parliamentarian, to which each individual grievance or a request would be brought. The various matters would then be considered by the committee, whose decision in the matter of carrying the complaint (or request) to the Federal Council would be final.

From this committee two representatives would be sent to Melbourne to personally represent the whole of the amateurs in their respective States. He claimed that such a procedure would obviate the necessity for two distinct bodies from the one State adopting antagonistic views, to the detriment of the science as a whole. If each club were to appoint proxies, with little or no conception of Queensland conditions, they could not hope to secure the furtherance of their aims, and there was a distinct possibility of one proxy being appointed by two bodies with diametrically opposed viewpoints.

He further suggested that the committee be empowered to levy 1/- on the whole of the various clubs' members, to defray the expenses of the delegates to Melbourne.

The meeting considered the proposal at length, but eventually its adoption was out-voted, and a letter was despatched to Mr. Kingsley Love, of Melbourne, asking him to appoint

two proxies to vote on behalf of the Institute.

The scheme presents several interesting features, and it would perhaps be worthy of deep consideration by the various clubs throughout the Commonwealth, as without doubt, if such a course were decided upon, the meetings of the Council could be conducted in a much more efficient manner. The delegates, representing as they would their respective States as a whole, with instructions from their parent bodies in the matter of voting, would know exactly in what position they stood in relation to the whole of the amateurs in the various States. Thus unanimity could be reached in a comparatively short space of time.

NEWCASTLE CITY COUNCIL.

Wireless Plant for Council's Sports Ground.

The Council is prepared to consider proposals, with quotations, for the provision and installation of Wireless Receiving Sets, with public address or loud speaker systems attached, for the purpose of giving Open-air Wireless Entertainments to the public on the above-mentioned grounds, such programmes to be received from one or more of the Sydney broadcasting stations as may be arranged by the Council, and also capable of being used as loud speaking equipment to amplify direct speech.

Correspondence is invited from interested firms, to whom further particulars will be supplied on application to the undersigned.

By order of the Council,

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Daily Telegraph Building,
KING STREET, SYDNEY.

Instruction for the Beginner.

(Continued from page 496.)

The task of producing continuous waves on a scale to be of commercial value presented great difficulty at the outset. It was realised that a mechanically-driven generator was necessary to produce the high-frequency currents required. After many years a high-frequency alternator was designed which has proved of inestimable value in long-distance commercial wireless work.

Still another method of producing continuous waves has been devised, viz., by vacuum tubes. This will be dealt with later.

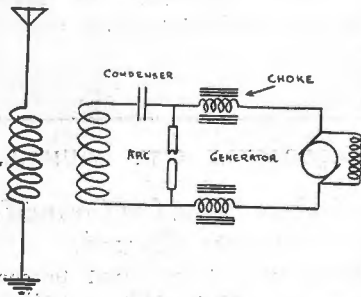


Fig. 7.—Showing diagram of arc transmitter.

The next point to be considered is the reception of the wireless waves, and for this purpose a receiving set, as illustrated, is necessary. Here again an aerial and earth are both required. It will be noticed that a tuning coil or "tuning inductance" as it is generally called, is connected to the aerial. On this coil is a slider which is used to adjust the amount of wire used. In other words by adjusting the slider in various positions on the coil the amount of wire in the circuit can be increased or decreased accordingly. The tuning coil plays a very important part in the aerial circuit. Through it the aerial can be

"tuned" to receive the oncoming wireless waves or, on the other hand, to allow them to pass by.

Tuning is very important, and after all, very simple. All wireless waves are measured in metres and a metre is 39.37 inches. Thus a wave of 200 metres would be 656 feet long. In order that a wave of this length might be received the aerial must be tuned to 200 metres. If there is a condenser in the aerial circuit it will affect the reception. Thus it is evident that capacity in the form of condensers alters the wave-length of an aerial. Condensers in the receiving circuit can be tuned to correspond with the wave-length of the aerial. In the case of an aerial of the dimensions just mentioned it will be necessary to adjust the condenser and tuning coil until the inductance and capacity will be equivalent to 200 metres of wire. In this connection the size of wire is important, as if it is too small it will choke off the oscillations too quickly.

The importance of tuning can best be emphasised by pointing out that if a signal on a 300 metre wave is transmitted reception will not take place in the case of an aerial tuned to 250 metres provided the tuning is sharp.

The wave which started from the transmitter as an electric current again resumes an electrical form in the receiving set. It is, however, in a very weak form, and extremely sensitive instruments would be required to measure it.

The current in the aerial circuit induces a similar current in the closed circuit." For the moment let us assume that the latter has been tuned into resonance with the former. In the second circuit is a detector which

is used in conjunction with a telephone receiver. The detector treats the current in a way which makes it audible in the 'phone receiver.

Detectors play a vitally important duty in their treatment of the high-frequency alternating current which is vibrating at such a high speed as to render audibility impossible if it were allowed to go directly into the 'phone receivers. A detector is com-

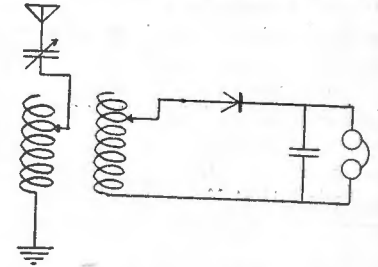


Fig. 8.—Circuit of crystal receiving set.

posed of a small crystal, such as galena or carborundum reposing in a metal cup with a tiny wire or spring resting on its surface. This crystal acts as a check on the high-frequency current by allowing it to pass freely in one direction only. Thus, an intermittent direct current is produced. The intermittency is due to the fact that half of the current which attempts to flow back from whence it came is entirely cut off. The vibratory effect is thus halved, and the flow into the telephone receivers produces audible and intelligible sounds.

It might be as well to emphasise here that wireless waves travel in all directions. A transmitting station with a range of 500 miles will be audible to all receivers with properly-tuned sets within that radius.

(To be continued.)

United Distributing Company Ltd.

This Company is a 20-year-old Australian concern, which has undertaken wireless in a big way as manufacturers and wholesalers. Exhibits on their stand at the Wireless Exhibition were devoted principally to sets priced at from £20 to 125 guineas. The first set shown in illustration of the stall on page 481 is a 4-valve mahogany cabinet; the next a 3-valve cabinet on stand (with cupboards on each side of panel). On top of this cabinet is the 1-valve set, and next to it a 2-valve (model B), one of the most unique of the popular priced sets on display.

Next on the right is Model A phonograph cabinet, with concealed loud speaker, sounding board in cover and 4in. horn amplification. On the extreme left is the only portable model exhibited at the show—an attractive travelling case, which requires only a few moments to set up. It is 2-valve, leather cupboard, with separate compartment for headphone in front and compartment in the back for aerial equipment.

Mr. L. D. Rudolph is founder of the Company, also the United Distributing Company, Chicago (manufacturers of the

well-known United transformers, condensers and other parts), and it is through his experience in America that the Australian Company has engaged so heavily in Radio manufacture in Sydney. The experience of several American experts has been supplemented by the advice of British and Australian Radio engineers, as well as that of an experienced cabinet designer, the combination resulting in an attractive variety of Radiovox sets. The Company has a branch in Melbourne, and is arranging for representation, both for sets and parts, in all other Australian centres.

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Movements of Wireless Officers

Mr. H. S. Chown signed off s.s.
Emita, at Sydney, November 19.

Messrs. C. E. Robison and L. C.
Coleman signed off s.s. *St. Albans* as
2nd and 3rd operators respectively, at
Sydney, November 26.

Mr. C. E. Robison relieved Mr. T.
Bannister on s.s. *Bombala*, at Syd-
ney, November 27.

Mr. L. C. Coleman relieved Mr. E.
J. Giles on s.s. *Waikouaiti*, at Sydney,
November 27.

M. A. S. Dening signed off s.s. *Gil-
gai*, as Senior Operator, at Sydney,
November 27 and relieved Mr. G. I.
Betteridge on s.s. *Mataram*, at Syd-
ney, on the same date.

Mr. R. P. Ginders signed off s.s.
Moeraki, at Wellington, November 21,
and signed on s.s. *Waitemata*, at Wel-
lington same date.

Mr. H. J. Byrne signed off s.s. *Wai-
temata*, at Wellington, November 21,
and signed on s.s. *Moeraki*, at Wel-
lington same date.

Mr. W. H. Harris, who was reliev-
ed by Mr. T. Bannister on s.s. *Marella*,
at Sydney, November 30, proceeded
on Home Port leave.

Mr. W. V. Neill terminated service
November 30.

Mr. H. K. Wadsworth signed on
s.s. *Dongarra* as Junior Operator, at
Melbourne, November 30.

Mr. S. J. McVeigh signed on s.s.
Dilga, at Sydney, November 30.

Mr. J. Elmore signed off s.s. *Parat-
tah* as Senior Operator, at Melbourne,
November 27 and proceeded to Port
Pirie to join s.s. *Kathlemba*.

Mr. F. A. Noar relieved Mr. A. C.
Torrens on s.s. *Corio*, at Newcastle,
December 4.

Mr. A. C. Torrens signed on s.s.
Waikawa, at Newcastle, December 4.

Mr. T. W. Bearup signed off s.s.
Boonah as Senior Operator, at Syd-
ney, December 3.

Mr. H. F. Hartley signed off s.s.
Makura as Senior Operator at Syd-
ney, December 3, and relieved Mr. E.
J. Glaisher on s.s. *Waiotapu*, at Syd-
ney, December 4.

Mr. P. B. C. Holdsworth relieved
Mr. B. A. Taylor on s.s. *Jervis Bay* as
3rd Operator, at Sydney, December 4.

Mr. H. W. Barnfield signed on s.s.
Makura as Senior Operator, at Syd-
ney, December 4.

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Notes and News from W.A.

(By Our Special Correspondent.)

THERE is a movement on foot in W.A. to form a "Clubs' Executive" to meet once a month for the purpose of discussing business of interest to the various clubs.

Since the last issue of *Radio*, another club has been formed in West Perth—Leederville district. About 30 amateurs attended the inaugural meeting convened by Mr. P. C. Lindsay (late of the Marconi International Marine Communication Co., London).

Another club is to be formed at Cottesloe-Claremont at an early date. At the seventh general meeting of the Mt. Lawley Radio Club, 14 new members were elected as follows:—Messrs. A. Stevens, R. J. Stevenson, E. J. A. Bayley, H. Barton, J. D. Walsh, J. McKinlay, W. A. Starr, L. Pym, H. A. Stockall, S. H. Hearne, O. Bowyer, J. S. Allen, G. Emery, N. Greer and at the eighth meeting five new members were elected:—Messrs. E. N. Doust, S. J. A. Mais, J. M. Harvey, H. E. Woodhead and W. H. Wallace.

Owing to lack of time in which to attend to the business of the club, the



secretary, Mr. C. H. Snowden, asked for four months' leave, which was granted. Mr. E. J. A. Bayley was unanimously elected acting-secretary for that period. All correspondence is now to be addressed to him at No. 2 Norfolk Street, North Perth.

Mr. W. R. Phipps delivered a lecture on the "Construction of a Step-down Transformer" at the last general meeting of the Subiaco Radio Society.

Nine new members were elected at the last meeting of the Goldfields

Radio Society, after which Mr. Mac Dougall, A.I.E.E., delivered a lecture on "Resonance and the Effect of Inductance and Capacity."

The great exhibition organised by the Wireless Institute is set down for early in the new year. The members of the Wireless Development Association are assisting the Institute Council.

W.A. Transmitters

The following are the names, call letters, times and wave-lengths of the three experimental transmitting stations operating in West Australia.

The time given in each instance is Perth standard time. For the information of "listeners in" around Sydney it might be mentioned that Sydney is two hours ahead of Perth.

6AG—W. E. Coxon, Sunday and Friday, 8 p.m., on 440 metres.

6AB—C. Cecil, Monday and Thursday, 8 p.m., on 440 metres.

6BN—A. E. Stevens, Wednesday, 8 p.m., 440 metres.

South Australian Wireless Institute.

The December meeting of the S.A. Division of the Wireless Institute was held at the University of Adelaide on December 5.

Letters were received from the Controller of Wireless, and the Victorian and New South Wales Divisions, emphasising the advisability of forming a Federal council of representatives of each division.

The matter was referred to the next Council meeting.

Three new members were admitted and four other applications were received.

The secretary read a revised list of rules, which were considered and finally adopted.

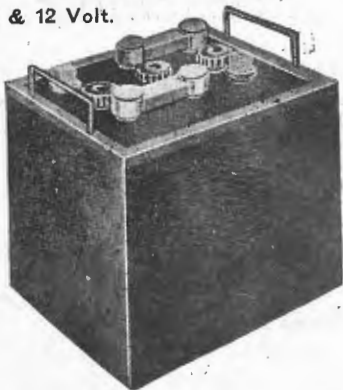
It was decided that the January meeting be held on the second, instead of the first, Wednesday in the month.

Mr. McKenzie then explained the con-

struction and working of a Federal 58DX receiver. The design and workmanship of the Federal apparatus is particularly good. Mr. McKenzie was able to tune in station 5AG, who kindly transmitted music for the occasion.

Mr. Barker then gave a short address on his experiences in connection with high power wireless with the Radio Corporation of America, and dealt with the broadcasting position in the States.

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Queries Answered

S. W. S. (Hunter's Hill) submits plan of proposed aerial and asks approximate natural wave-length.

Answer: The aerial you propose erecting will be an excellent one for transmitting and will have a natural wave-length of approximately 180 to 200 metres.

"Radio" (Taree) forwards particulars of Neutrodyne receiver which he is constructing and asks: (1) How can wave-length be increased to 1,100 metres? (2) Could more than two high-frequency valves be used.

Answer: Neutrodyne circuits are only useful when amplifying very short waves where the inter-electrode reaction of the valve becomes troublesome. Use a simple transformer coupling with 200 to 220 turns on primary and secondary mean diameter six centimetres, and tuning condenser 0.0003 microfarads variable.

H. C. H. (Sydney) asks how to construct fixed condensers of .0004, .0003, .005, .006, .0002, 0.25, 0.006, 0.005 and 0.0004 microfarads?

Answer: With the following formula you can calculate the capacity of any condenser:

$$C \text{ mf} = \frac{K A (n-1)}{4 \text{ Pi } T \times 900,000}$$

Where A=area of one plate in sq. centimetres.

n=total number of plates.

T=thickness of dielectric in centimetres, and

K=Specific Inductive factor of dielectric which is approximately 2 for waxed paper, 5 for glass and 6 to 8 for mica.

K. M. (Mascot) asks details for constructing rectifier for 240 volts A.C.

Answer: Assuming that you require this rectifier for the purpose of charging a storage battery, you will need at least four jars in series to operate direct from the 240 volt alternating current mains. The current should be regulated by means of a series resistance, such as one 50 c.p. carbon filament lamp for every half ampere. The electrodes should consist of lead and aluminium sheets 6in. x 3in. immersed in a saturated solution of borax made slightly alkaline by the addition of strong ammonia solution of 0.880 specific gravity. Use quart size Leclanche jars for the containers.

T. W. T. (Whangarei, N.Z.) asks: (1) On what wave-length will Farmer's Broadcasting Station transmit? (2) Would a three-valve receiver using transformers, be as efficient as a three-valve tuned anode receiver; is the former easier to work?

Answer: (1) The wave-length for Farmer's 5 K.W. station will be 1100 metres. (2) There is practically no difference between transformer and choke coupling as regards the results obtained, although with choke coupling it will be found difficult to apply a stabilising grid potential if more than one valve is used. For stability on short wave-lengths use the circuit described on page 375 issue *Radio* No. 16.

S. S. (Drummoynne), referring to answer "R.P.G.," issue *Radio* No. 15, giving table for winding honeycomb coils, asks: (1) Would placing honeycomb coil of 75 turns in series with primary of a vario-coupler with wave-length of 200-500 metres, tune to 1200 metres; if not, what size coil would

be required? (2) What gauge and amount to wire will be required to wind this coil? (3) Could double rectification be utilised with a vario-meter and crystal detector?

Answer: (1) For best results, tune both primary and secondary. The simplest way would be to use a single circuit. To tune to 1200 metres, use a 150 turn honeycomb coil in series with a variable condenser. (2) About two ounces of No. 26 d.c.c. wire. (3) You would be unable to accomplish double rectification with the apparatus available. Thanks for complimentary remarks re *Radio*.—Ed.

G. R. (Wycheproof) submits particulars and diagram of receiver and asks: (1) Range for Telegraphy and Telephony? (2) Would larger condensers increase range? (3) Cause of noises in 'phones? (4) Is the circuit in accordance with the regulations? (5) How can weak telephony be made audible? (6) Is there a quicker way of tuning-in? (7) Is it necessary to obtain permission before altering circuit? (8) Is earth lead too long? (9) What is the best time to listen in for experimenting purposes.

Answer: (1) and (2) No definite information can be given regarding the range of radio apparatus, owing to the many factors involved. (3) The noise you experience is caused by the absence of a grid leak. All hard valves are liable to behave in this fashion owing to the accumulation of a negative charge on the grid. (4) The circuit you describe is not permitted by the Radio Department. (5) Use additional amplification, preferably high frequency to bring in the weak stations. (6) The circuit you are at present using is the simplest possible consistent with selectivity.

(7) Special permission must be obtained for the use of circuits likely to energise the aerial. (8) Your earth lead is quite satisfactory. (9) Most experimental work is done between the hours of 7 and 11 p.m.

C. C. (Diggers' Rest): We are unable to give the data you require. Only by actual experiments is it possible to construct a transformer capable of operating from interrupted direct current. Should you require the data for a transformer to operate from an alternating current source, we will be only too pleased to supply it.

W. G. T. (East Coburg) asks for further data regarding his previous query in issue *Radio* No. 18.

Answer: Transformer cores are built up so that the ends of each limb inter-leave in a manner somewhat similar to the mitred edge of a box. Laminations of about sixteen mils thickness are suitable. The formers described in issue *Radio* No. 15 will do if the necessary corrections are made as regards core dimensions. The secondary wire must be of large enough gauge to carry the heavy currents which are liable to be drawn off. Use at least No. 18 for a small transformer. The turns in the windings are directly proportional to the voltage, therefore the number required for four volts will be two-thirds of that required for six volts. For the transformer previously described a pound of wire for each winding will be required. Enamel wire may be used if care is taken not to damage the insulation.

B. E. (Newcastle) asks: (1) Is it

necessary to pass an examination to obtain an experimental licence? (2) Will the fee be raised in 1924? (3) Would it be advisable to erect aerial after application has been forwarded, or wait for reply? (4) Would using different gauge wire for connections make any difference?

Answer: (1) You must satisfy the Radio Department you are possessed of the necessary qualifications to carry on experiments. (2) We can express no opinion regarding the future policy of the Government. (3) You must not erect your aerial until permission has been obtained. (4) No appreciable difference will be noticed.

A. S. (Marrickville) asks for windings of variocoupler to tune to 1150 metres. (Particulars of aerial submitted).

Answer: A vario-coupler suitable for tuning to 1150 metres with variable condensers of 0.001 microfarads capacity in both primary and secondary circuits, should have 100 turns of No. 26 d.s.c. on the stator, and 120 turns of No. 36 d.s.c. on the rotor. This will enable you to cover a range between approximately 800 and 1500 metres.

J. K. J. (Berri, S.A.) submits diagram and particulars of receiver and aerial and asks how many and what type of valves would be required to receive the broadcasting concerts shortly to be transmitted from Adelaide on 800 metres.

Answer: To cover any appreciable distance with the circuit you submit, you should use a soft valve such as the UV 200 or Expanse B. A very efficient and sensitive one valve reflex

circuit was described on page 302, issue *Radio* No. 13. We suggest you wire up your apparatus in accordance with the details given therein.

W. L. B. (Randwick) submits diagram and particulars of receiver and asks if it complies with the Regulations.

Answer: If the apparatus is so disposed that there is no magnetic coupling between the plate and grid circuits there will be little trouble as regards self oscillation. To make doubly sure, the grid circuit of the radio-amplifier can be damped by the insertion of a variable resistance of about 250 ohms.

C. B. (Armidale) referring to article on "Radiotron Valves," published in issue *Radio* No. 8, asks for particulars for adding two stages of audio, and also another stage of radio amplification.

Answer: Additional audio amplification is possible with the circuit you submit by connecting, in place of the telephone receivers, an inter-valve transformer, which couples to the audio amplifier. Regarding the use of another stage of Radio amplification see article on "Radio and Reflex Amplification," published in issue *Radio* No. 5.

A. J. H. (Essendon): We are very interested in the graph submitted by you showing the electron emission of a D.E.R. Valve at 1.4 volts. To make these valves function equivalent to the standard "R" in amplifier and kindred circuits, they have to be operated at a higher temperature than the normal detecting value. This shortens the life of the valve considerably.

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