

RADIO

IN AUSTRALIA
& NEW ZEALAND

Incorporating "Sea Land and Air"

VOL. I.

OCTOBER 31, 1923

No. 16

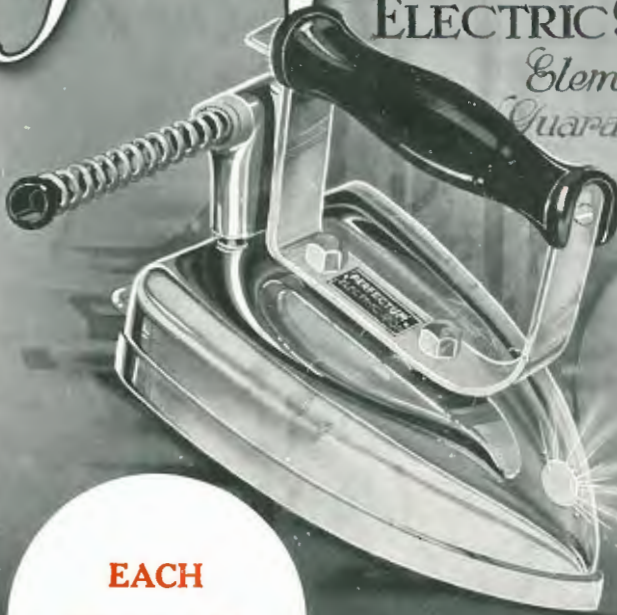


Mr. R. C. Marsden, owner and operator of experimental station, 2JM. A full description of the station appears in this issue.

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

Managing Editor:
 S. E. TATHAM.

Associate Editor:
 M. DIXON.

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Published by
THE WIRELESS PRESS

422-24 Lt. Collins St.,
 Melbourne.

97 CLARENCE ST.,
 SYDNEY.

Australasia Chambers,
 Wellington.

PRICE, 6d. per Copy.

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

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

Wholesale Distributing Agents:

GORDON & GOTCH (AUSTRALASIA), LTD.,
 Sydney, Melbourne, Adelaide, Brisbane, Launceston, Perth,
 Auckland, Wellington, Christchurch, and Dunedin, N.Z.

Great Britain:

The Wireless Press Ltd.
 12-13 Henrietta St.,
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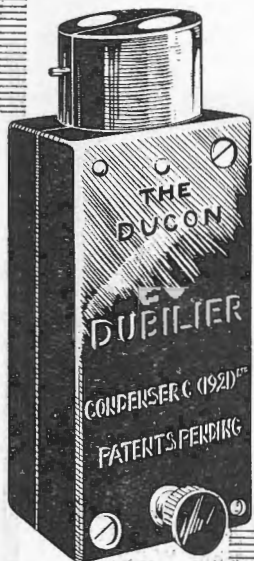
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Why Broadcasting Will Succeed

A REVIEW of the circumstances relating to Broadcasting and its near beginning in Australia cannot have other than a heartening effect on all who are anxious to see it a success.

WHEN the Federal Government sensed a public agitation for the commencement of broadcasting it very wisely decided to call a conference of representatives of the interests concerned in order that the scheme devised might be the best possible.

THE holding of that Conference in Melbourne in May last, its representative character, and the enthusiasm and unanimity with which the delegates subsequently recommended a scheme to the Postmaster-General for approval are all matters of history.

MR. GIBSON lost no time in giving practical effect to the proposals put before him by Conference, and on August 1 the regulations were gazetted.

THE next act was an announcement by firms of high standing in the various States of their intention to erect and operate broadcasting stations in accordance with the Government regulations.

COULD any more striking endorsement of the excellence of these regulations possibly be forthcoming?

THE complaint is frequently and justifiably made that legislation has a strangulating effect on business

enterprise in Australia, particularly when it insists that business firms must operate in conformity with certain regulations.

NO such complaint in regard to broadcasting has been made by the big business houses here, who are expending much money and energy in organising high-class entertainment services which the public wants, and the Government insists it shall have.

THUS we find enthusiasm and unanimity on matters on which differences would certainly have arisen had the regulations been other than broad and encouraging, and, above all, framed in the letter and spirit which mean success and service to all concerned.

THESE facts are so obvious that to reiterate them is quite unnecessary.

WITHIN the next few months Australia will have the finest broadcast services of any country in the world, and the public will be able to enjoy a continuity of high-class entertainments over the radiophone which would be impossible if a sound and progressive policy had not been provided for in our regulations.

THE obvious course for all who wish the venture to succeed is to throw their influence and enthusiasm behind it.

THAT is the royal road to success!

Australia Has Not Lagged Behind

THE well-worn truism that if a statement is made often enough those responsible will come to believe it, no matter how groundless it may be, holds good to-day.

THIS is painfully true of those who persist in repeating, in season and out of season, that Australia, of all countries in the world, is hopelessly behind in the matter of wireless telegraphy and telephony.

EVEN the most casual examination of the position discloses that, all things considered, Australia has no need to feel ashamed of where she stands, or of what her wireless men have done in the field of radio research.

OUR apparent backwardness is actually due to modesty, or in other words, to a disinclination to boast of our accomplishments.

TRUE, we are not so far advanced as countries like America and England, but that is no reflection on our ideas of progress.

WE are on the eve of broadcasting—to be conducted on the most advanced system in the world; the erection of a high-power Wireless station to communicate direct with England is within measurable distance, and our wireless men have demonstrated by actual experiment that they are no less efficient than those in any other part of the world.

FURTHERMORE, the Commonwealth Government has announced that it is prepared to afford the benefits of wireless communication to settlers in isolated parts of the Continent.

THESE facts reveal that whatever we have done, or are doing, bears the hall-mark of excellence, and conjointly provides an effective reply to those who are forever deploring what they term, our lack of progress in wireless work.

Radio Telephony

Modern Development

IN

Duplex Working

BY

GEORGE APPERLEY

(Radio Engineer)

ANOTHER link has been put into the chain of progress in Radio Telephony by the production in commercial form of a system by which conversation between two points may be carried on in exactly the same manner as over an ordinary wired telephone system.

Many investigators have suggested methods for achieving this end, but the apparatus necessary has been either too costly or too complicated for unskilled persons to successfully operate. One system hitherto generally used involves the operation by each party of a switch which connects the transmitter or receiver to the aerial system as may be required. The endless confusion and annoyance which usually attends the use of such a system particularly by unskilled persons is only too well known, but when the switching is once mastered rapid exchange of messages becomes a simple matter.

The new installation which has been commercially developed by Marconi's Wireless Telegraph Co., Ltd., of London, incorporates as its fundamental feature an invention due to C. S. Franklin, Commonwealth Patent Specification No. 2956/21, which utilises the effects of beat phenomena.

As will be gathered from the following brief description the new ap-

paratus offers the same simplicity and ease of operation as the ordinary landline telephone and shows a marked improvement in economy over other wireless telephone methods.

It is well known that by superimposing oscillations of a given constant frequency upon oscillations of a different constant frequency a result-

regulated to bring it within the acoustic gamut.

It is also well known that the amplitude of the beat oscillations is controlled by the amplitude of the weaker oscillations a fact which renders duplex telephony by this method possible. If then the incoming continuous wave energy is acoustically

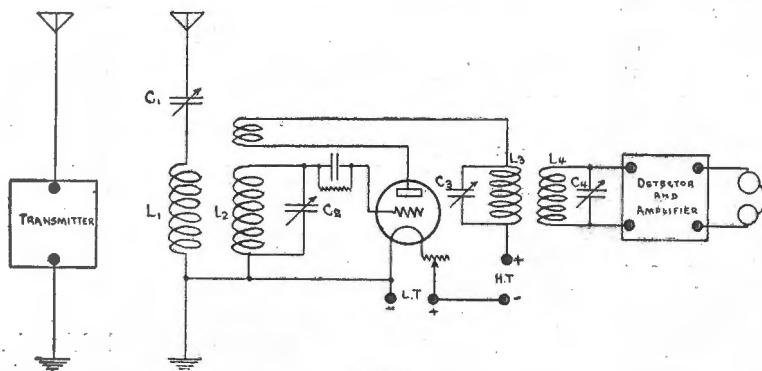


FIG. 1.

Circuit arrangement of "Beat" Duplex receiver.

ant complex wave is obtained which when rectified sets up a frequency corresponding to the difference between the first two frequencies.

This is called the "Beat" frequency and when utilised for aural reception of continuous wave telegraph signals the superimposed or heterodyning frequency is necessarily

modulated in amplitude, the "Beat" energy is similarly varied in amplitude and if its frequency is within the gamut of audibility the only effect is a variation of intensity in the strength of the signals in the telephone receivers. If, however, the heterodyne oscillations are adjusted in frequency so as to produce a supersonic beat frequency the signals obtained by rectifying the latter will be a reproduction of the sounds used to modulate the incoming energy.

This is the principle upon which the new duplex installation operates and will be better understood by referring to Figure 1, which is a skeleton diagram of the circuits utilised in the receiving section. The local transmitter "T" which obviously

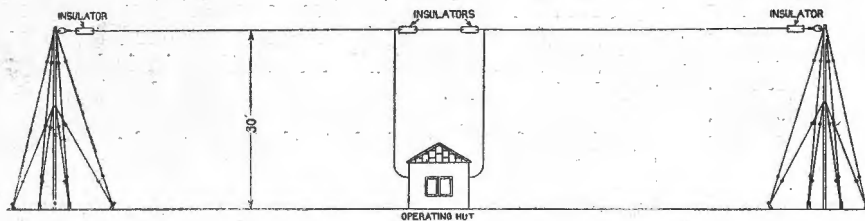


FIG. 2.

Showing aerial arrangement for "Beat" Duplex working.

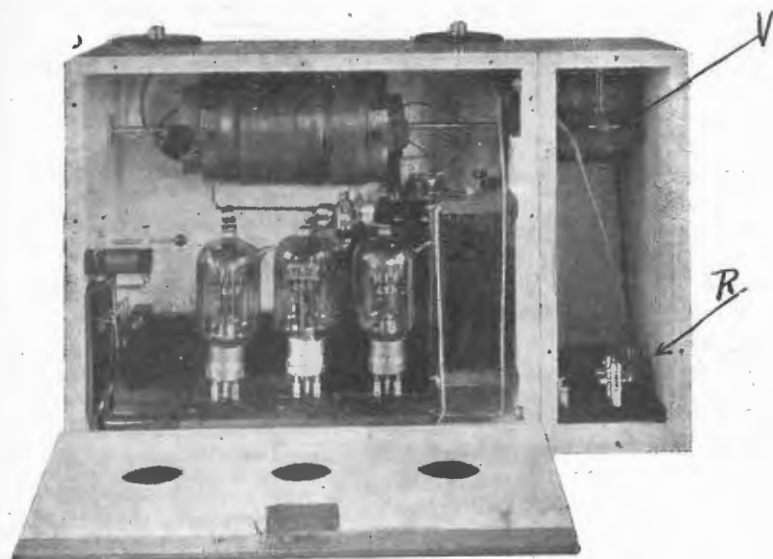


FIG. 3.

Transmitter Unit—showing interior.

must be in operation for duplex working provides in the adjacent receiver aerial circuit a definite constant frequency which beats with the incoming waves from the distant station. The receiver aerial circuit $L_1 C_1$ and also the coupled closed circuit $L_2 C_2$ is adjusted to be resonant with the incoming waves and the local transmitter is arranged to transmit a wave differing in frequency so as to produce beats above audibility in the circuit $L_3 C_3$ by the rectifying action of the Valve V1. The circuit $L_4 C_4$ loosely coupled to $L_3 C_3$ is tuned to this new frequency which after suitable High Frequency amplification is rectified, this giving signals in the telephone receivers corresponding to variations in the amplitude of the incoming energy. Regeneration may be employed in the amplifier as well as in the circuit of V1. The use of such circuits at the distant station will thus enable duplex conversation to be carried on in exactly the same manner as over the ordinary landline telephone no switching whatever being necessary.

In practice each station is provided with two aerials Fig. 2 adjacent to one another in the form of a single wire supported between two masts and electrically divided by insulators into two distinct parts, one being connected to the transmitter and the other to the receiver.

For two-way communication, i.e., between two stations only each trans-

mitter is adjusted to transmit a wavelength of 350 and 400 metres respectively, whilst each receiver aerial circuit is tuned to the distant transmitter. As already explained these two waves create in each receiver circuit a supersonic frequency corresponding to a wavelength of 2800 metres which when rectified reproduces the speech from the distant station.

For “party line” working or group communication each installation is provided with a “Stand-by—Listen,” “Talk” Switch, which through suitable relays enables the wave-length of the Transmitter to be changed from 350 to 400 metres and the receiver aerial and coupled circuit $L_2 C_2$ from 400 to 350 metres. Thus all stations normally radiate a wave of 350 metres with the receivers tuned to receive 400 metres. A station wishing to call another places his switch in the “Talk” position and indicates on his 400 metre wave the station he desires to communicate with. The reply is heard only by the calling station whose receiver is now on the 350 metres adjustment and the conversation is carried on without further switching. When communication is finished the calling station restores his switch to its original position. Figure 3 is an illustration of the transmitter unit of a duplex installation having a range for reliable communication at all times of 45 miles over reasonably flat country. R is the relay which is operated from the “Stand-by—Listen,” “Talk” Switch and brings into circuit the variometer V when it is required to transmit on the “Talk” wave of 400 metres. The valves are rated at 20 watts each two being oscillators supplying energy to the aerial and one a

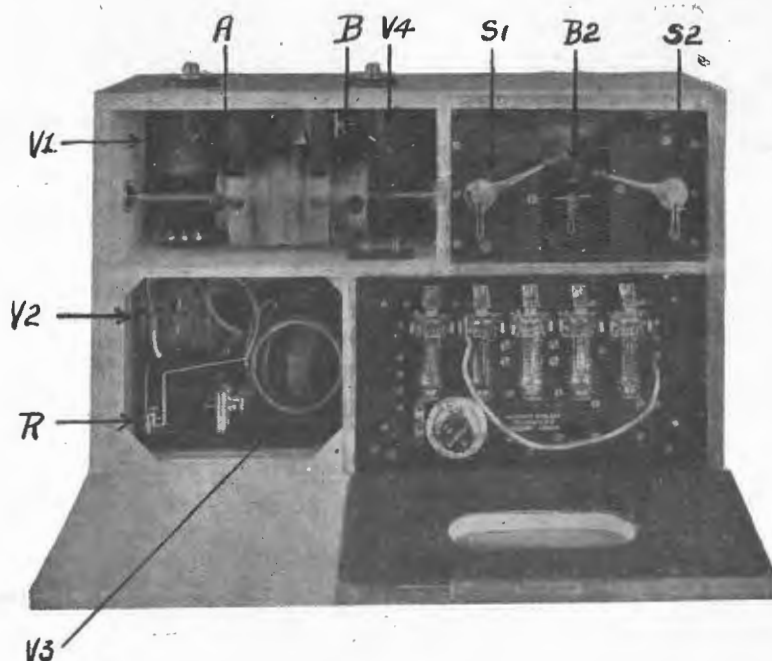


FIG. 4.

Receiver Unit—showing interior.

modulator. Either one or both of the oscillator valves may be used. Modulation is effected by a combination of the "Choke" and "Grid" control methods.

Fig. 4 shows an interior view of the receiver unit. R is the relay operated from the "Stand-by—Listen," "Talk" Switch as already explained, V1 V2 the Variometers included the aerial circuit, and V3 V4 similar instruments in the aerial secondary circuits, V2 and V4 being short-circuited by the relay when the switch is in the "Talk" position. A is the aerial coupling coil and B the regeneration coil of the "Beat" Valve, which is the first on the left-

tion starts the small dynamotor D through the relay R on the switch-board. A small pilot lamp P on the strip behind the transmitter unit indicates when the set is ready for use. The "Stand-by—Listen," "Talk" Switch is mounted on the same strip but is hidden from view in the illustration. Normally the transmitter and receiver units are enclosed the valves alone being visible. High tension supply for both transmitter and receiver is supplied from a 1500 volt continuous current winding on the dynamotor this supply being suitably smoothed out and reduced in pressure through a potentiometer for the receiving valves. Complete control of the set is effected from any rea-

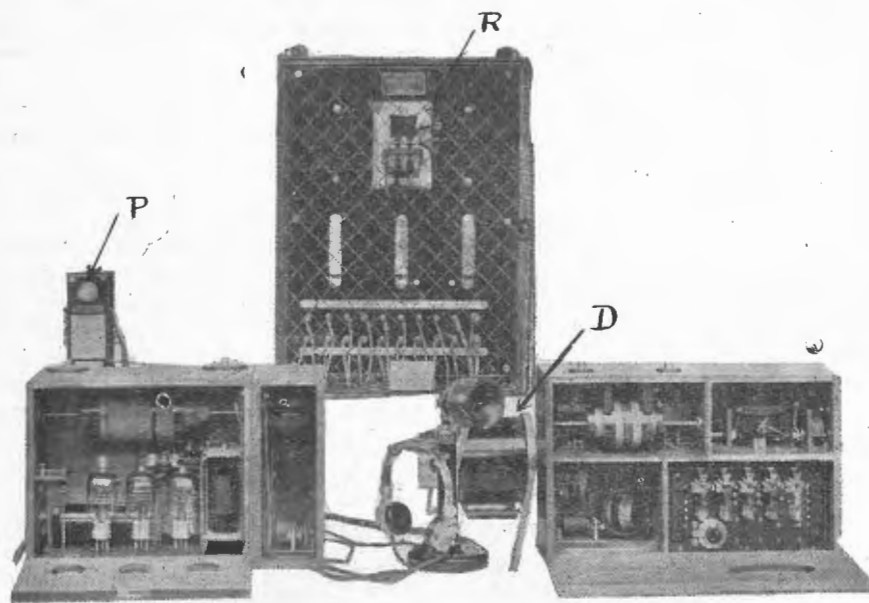


FIG. 5.

General assembly of "Beat" Duplex Station.

hand side of the series. S1 and S2 are the variable condensers for tuning the "Supersonic" circuits, and B2 the regenerative coupling in the amplifier. The second and third valves of the series are high-frequency amplifiers the fourth a rectifier and the last a low frequency amplifier.

Fig. 5 shows the installation complete, excepting the 18-volt accumulator which supplies all necessary energy for its working. All that is necessary for communicating is to remove the receiver from the hook on the microphone pedestal. This opera-

tion starts the small dynamotor D through the relay R on the switch-board. A small pilot lamp P on the strip behind the transmitter unit indicates when the set is ready for use. The remainder of the apparatus may therefore be placed wherever convenient. The set requires no skilled attention and no adjustments are necessary when it is once properly installed.

Although up to the present this class of installation is made only for comparatively short ranges, it is the forerunner of more powerful radio telephone installations characterising the same simplicity of operation to cover far greater distances.

LETTER TO THE EDITOR.

The Editor,
"Radio."

Sir,

Being a subscriber to your excellent magazine and a keen radio enthusiast, I take the liberty of writing you in reference to the forthcoming Wireless display to be held in Sydney Town Hall in December next.

To the average countryman it is regrettable that the display is not to be held towards the end of February, as this is usually the time that most country people spend their holidays in the city.

Might I request that in future consideration be given this matter of dates, for the benefit of the country people who are interested in Wireless.

Even January may be a better time for the majority of country folk.

The matter of dates is of no great importance to the City people who have the advantage of always being in touch with expert wireless advice at no cost.

Trusting that I have not usurped too much of your valuable space.

I am, etc.,

"STATIC."

Trundle. 14/10/23.

Wireless Equipped Motor

Adelaide Man Scores

To Mr. L. A. Harper, managing director of the Millswood Auto and Radio Company belongs the distinction of equipping the first motor car in South Australia with a wireless receiving set.

The set is a powerful seven-valve one; the aerial being installed under the hood in the form of a loop. Wireless signals have been picked up with this set with remarkable clearness and strength.

At a recent trial the Morse code was audible several hundred yards from the set. The car which is a sports model "Courier," is being sent into the country, where demonstrations will be given.

How Radio Serves Mankind

Life Saver and Home Entertainer

A Future That Staggers the Imagination

EVERY century seems to bring its wonders, as well as its disappointments. If the latter appear to dwarf those of previous times, how much greater are the scientific achievements of the present compared to those which compelled world admiration in the years that are still fresh in memory!

He would be a brave man indeed who would prophesy, with any pretensions to accuracy, what the next fifty years will bring forth. A survey of the past affords a truly staggering outlook. The wonders of one age have been the commonplace of the next, and perhaps the most extraordinary feature is that the greatest progress has been made along lines which to the lay mind, at least, offered a baffling prospect. The scientist is no longer looked upon as an individual apart from the rest of the world. His activities play a great and useful part in the everyday affairs of life, and in all worth-while progress of the present and future, science is playing, and will play, an outstanding part.

We are too near to our own years to see them in true perspective. We can, however, realise sufficiently the progress that has been made to banish any fear that posterity will reproach us for our lack of enterprise.

Bearing in mind its comparative youth and the fact that the great mass of people are only just realising its value, wireless has made astounding progress. It is rapidly becoming incorporated with our daily life. It is proving ever more fascinating by reason of its seemingly limitless potentialities. Radio is only twenty-five years old, but already man can make it do his bidding in ways no mortal twenty-five years ago could have dreamt of. It is only twenty-one years since Marconi made the first successful attempt at long-distance telegraphy in a message between Cornwall and America. This year

there will be in operation a scheme which will connect England and India by one wireless step. A central station will maintain continuous direct communication. Wayside villages possessed of cheap sets will tap the news all along the line without detracting from the original strength of the signals. Two weather signal stations have been erected on the Thames. By means of reports passed from ship to ship, these stations will be in constant touch with the weather of the world. As ships leave the river they will be able to learn what to expect in the matter of weather wherever their route. Through the agency of wireless a ship can now be taken out of dock, manoeuvred in deep water, and brought back without a single person being at any moment on board. Every action can be controlled by a wireless operator on shore.

During the recent manoeuvres of the United States Navy at the entrance to the Panama Canal the fire of the battleship Mississippi was turned on the battleship Iowa, which steamed out at full speed without a crew, and simulated an enemy trying to escape. The Iowa was steered by wireless from a point several thousand yards away, and was under perfect control throughout the practice. Any ship's captain, finding himself befogged, can ascertain the exact position of his ship to within a few yards, and within three minutes of the time when he sends out his message to the land stations. The dangers and terrors of the sea are being steadily diminished by the aid of wireless. The Bergen and Gothenburg wireless stations give medical advice in response to inquiries at sea. If a doctorless ship has a troublesome case, an account of the symptoms may be transmitted to these stations, and the medical men of these towns will supply advice without fee. The extent to which correctness may be attained in such long-distance diagnosis is indi-

cated by the fact that a physician stationed several hundred miles inland heard the heart beats of a man lying unconscious on a ship three miles out at sea. Every beat was clearly transmitted. Wireless greatly aided the American airplanes and the British dirigible in their trans-Atlantic flights. Messages can now be flashed to airplanes aloft, and these messages appear in plain English on a tape in the airplane. While in the air the plane can be entirely controlled from the earth. Through the medium of radio an airplane could be sent over an enemy's lines and made to drop bombs at the radio operator's will. The uses of wireless, however, are not always dramatic and tragic. Far more frequently its services are homely and useful socially. Germany is within sight of a combination of wireless, bioscope and gramophone which will result in a synchronised talking film. In America the projection of photographs by wireless is practically perfected. Pictures can be sent across the Atlantic in a few minutes. In America over 600 broadcasting stations are sending out regular schedules. Every night subscribers may listen to scholarly addresses or to jazz music; the financier may learn the latest fluctuations on the Exchange; the farmer the prospects of the market. For three years Buenos Ayres has had a regular service of operas broadcasted straight from the stage. Into one of the English concert series a five-minute talk on music is sandwiched; the talks are part of a course designed to develop musical appreciation in the listeners. Research and invention are proceeding apace. The day is approaching when wireless will be an adjunct of the average house. Through the medium of a tiny elegant piece of furniture, called the receiver, the householder will be able to sit in comfort at his own fireside and bid the world minister to his pleasure.

Radio "2JM"

R. C. Marsden's Fine Station

SITUATED at Victoria Road, Edgecliffe, Sydney, is the well-known 10-watt radio experimental station 2JM, owned and operated by Mr. R. C. Marsden, whose photograph appears on the front cover of this issue of *Radio*.

Thousands of experimenters in New South Wales, Victoria, Queensland, Tasmania, South Australia and New Zealand regularly hear the genial voice of 2JM testing "on the air."

The aerial at this station is a "T" type, one hundred feet long and an average height of forty feet. It consists of four wires, each $\frac{3}{20}$ copper and is of the sausage variety on 2 1/2 in. wooden hoops. Insulated by three porcelain insulators at each end, it is suspended between a 40ft. mast and a tree.

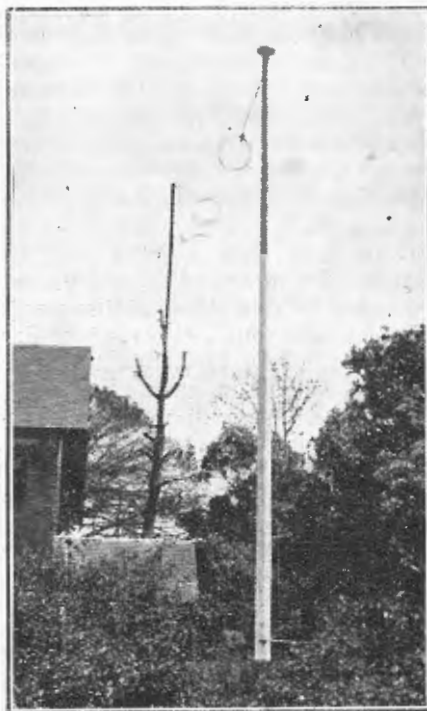
The operating room is well lighted by electric light at night and natural light through large glass windows during daylight. There are two entrances one from the outside and the other from the lounge in his residence.

Owing to the sandy nature of the ground Mr. Marsden finds a counterpoise absolutely essential for efficient radiation. Without a counterpoise his radiation is only 400 milli-amps, but with a tuned counterpoise it jumps up to 1700 milli-amps.

To secure the best earthing arrangements possible, in addition to the "popular" water mains metal plates are buried underground.

The circuit used by "2JM," which is published herewith, is of the three-coil variety with a few slight variations.

The various inductances employed consist of the following: Plate coil is 5in. in diameter and 5in. long, and is wound with 38 turns of No. 12 D.C.C. wire. Rotating in one end of this coil is a rotor approximately 4in. diameter wound in 40 turns of No. 20 D.C.C. wire. In the opposite end of



The Aerial at "2JM."

the Plate Coil the Aerial Tuning Inductance Coil slides in and out similar to a loose coupler. The A.T.I. has 27 turns of No. 12 D.C.C. copper wire tapped at every second turn.

The Plate Coil is shunted with a .0003 mfd. variable condenser, but only about half the capacity is employed.

The Grid Leak consists of graphite and chalk over which a graphite contact travels thus, giving a resistance range from zero to 40,000 ohms.

The modulation transformer consists of a Ford car spark coil with the make and break screwed down hard. It functions perfectly and therefore answers the purpose very well.

The number of variable controls is reduced to a minimum consistent with efficiency. No variable grid con-

denser is found necessary, as the variation of the grid coupling is sufficient to serve the purpose.

The radiation meter is a Weston Thermo coupled type. With the shunt in circuit this meter will read up to 500 milli-amps.

The oscillating valves are two Cunningham 5-watt tubes connected in parallel. The system of modulation is the grid control method and it has two very good features, Cheapness and Efficiency at least up to 10 watts.

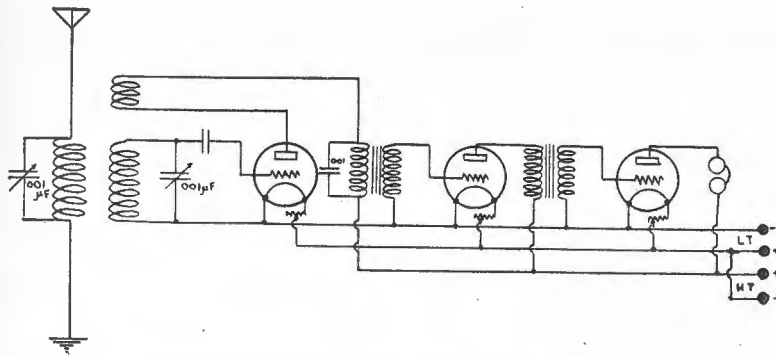
The microphone is a Stromberg-Carlson and being of the desk type is very handy for sustained conversation.

Methods of signalling with this set are: (1) Buzzer in the microphone circuit; (2) key in the aerial circuit, and (3) speech.

For power supply a transformer is used with an output of 480 volts each side of the middle leg. In addition there are two filament windings of 10 volts each, with a middle tap, one for the filaments of the oscillating valves and the other for the Kenatrons. The High Tension supply is also controlled by a variation of H.T. voltages by means of a double pole five throw switch which enables the supply to be varied. The whole of the transformer is encased in a perforated zinc case and the panel accommodates terminals, fuses, etc.

For the smoothing out choke 4 lbs. of No. 30 D.C.C. wire was wound on a tube, 6in. long and 1in. diameter, filled with soft iron wire. The smoothing out condensers consist of eighteen two microfarad paper condensers in banks of three in series; nine before the choke and nine after.

Mr. Marsden recommends those experimenters who may be installing transmitting apparatus to secure and use the best measuring meters procurable. It is well worth the extra outlay and it is only by having such instruments that accurate work can be done.



Receiving Circuit employed by Mr. Marsden.

The Receiver at "2JM" is of the three-coil variety using Paramount coils for short wave owing to their great advantage over the Honeycomb coils for loose coupling on short wave reception. The rectifying valve is an Oscillaudion, years old, and two V24 valves, also of respectable age, are used as amplifiers. The condensers employed are .001 Murdochs with pigtail attachment. The Audio Frequency Transformers are General Radio products, the filament controls being a Bradleystat and Cutler Hammer rheostats.

This particular receiver was primarily designed for the N.S.W.-N.Z. tests. Its wave length range is limited to a maximum of approximately 350 metres.

Another receiver uses four valves and employs one stage of radio frequency amplification, detector and two stages of audio frequency amplification. The circuit used is novel being an adaptation of three circuits. At present it is in the experimental stage. The volume of sound that it will "push through" a Brown Loud Speaker is phenomenal.

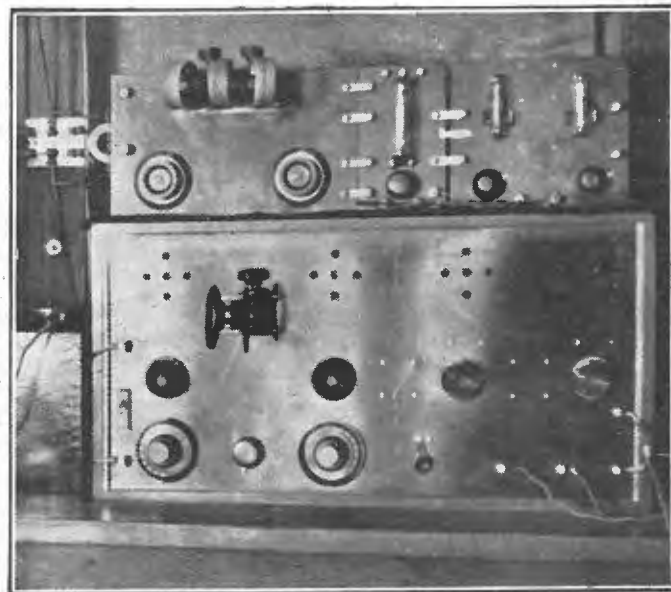
Another favourite receiver of "2JM's" is the Neutrodyne with slight alterations from that of the

standard circuit, and Mr. Marsden has achieved some very wonderful and remarkable results with this receiver.

Additional to the transmitting and receiving apparatus described above there is the usual "spare" apparatus lying round. The "spare" gear includes a wave meter, a Tungar rectifier, H.T. Transformers, 'phones, Loud Speakers, batteries and valves of many sizes and shapes.

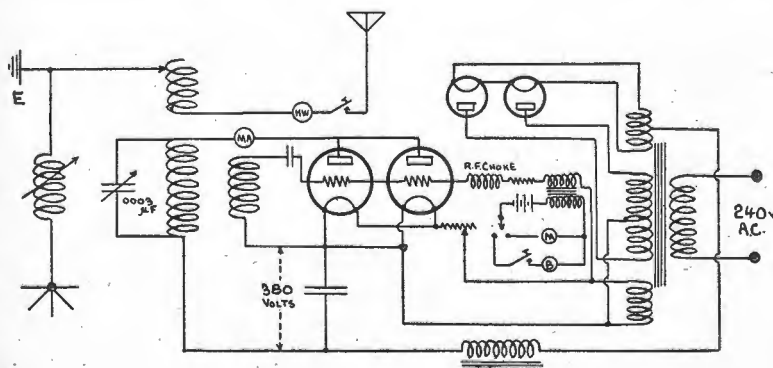
"2JM" can be honestly classed as a real experimental station and Mr. Marsden in conversation with the Editor of *Radio*, said, "Like most wireless enthusiasts I soon tire of the same thing and experiment with many weird and wonderful contraptions."

Mr. Marsden is well-known throughout Australia and New Zea-



RECEIVING EQUIPMENT AT 2JM.

The Receiver on the top is the one used for the recent N.S.W.-N.Z. Tests. Underneath is a Receiver with which Mr. Marsden has been experimenting for some time.



Circuit of 2JM's Transmitter.

land and is President of the Metropolitan Radio Club and Vice-President of the Wentworth Radio Club, two very active amateur organisations.

It is men of Mr. Marsden's type that keep the experimenter going. He is always willing to conduct transmitting or receiving tests for other amateurs and his co-operation is heartily appreciated. Everyone who has heard "the voice" at "2JM" has the idea that the owner is a genial, happy-go-lucky individual. They are quite right!!

2CM Establishes New Record

Truly Amazing Performance

Congratulations to Charles Maclurcan

The frequency with which Mr. Chas. Maclurcan (2CM), of Sydney, establishes new records in the transmission of low-power wireless signals has linked his name enduringly with this class of experimenting.

The particulars of his latest test with Mr. Frank Bell (4AA), of N.Z., published herewith, afford interesting reading to all experimenters, and almost prompts one to ask "Where is it all going to end?"

LOWER POWER TEST. 2CM (N.S.W.) TO 4AA (N.Z.). OCTOBER 3 AT 9.30 P.M.

After half an hour's traffic had been carried on with full power (about 7 watts) power was reduced as follows:—

Plate input Volts 175, Current M.A. 4, Power 7 watts.

4AA replied: "QSA QRP and give plate voltage and current."

Power reduced to:—

Volts 40, Current 1 M.A., Power .04 watts.

Bell replied: "QSA QRP on .04 watts."

Reduced to:—

Volts 20, Current .5 M.A., Power .01 watts.

Bell replied: "QSA QRP on .01 watts."

Reduced to:—

Volts 15, .25 M.A., Power .0037 watts.

Bell replied: "O.K. QSA. Sigs. strong and steady throughout. Another world's record gone west. MIM. Congratulations. O.M. G.M. 4AA."

I was present during this entire test and took the above readings.—Signed G. S. Gow, 5 Moore Street, Strathfield.

Log vised by Phil Renshaw, 4.10.23, and W. J. Maclardy, editor *Wireless Weekly*.

Oct. 4: Telegram received from Odgers, Charters Towers, Queensland: "Heard you lowest power last night. Writing."

Mr. Maclurcan's measuring instruments certified correct within one per cent. Signed E. Joseph.

LOW POWER DAYLIGHT TEST BETWEEN 2CM AND 3JU.

Monday, September 24.

Powers used: (Not checked).

Plate Input.

Volts.	Cur- rent M.A.	Watts.	Code Letter
390	20	7.8	F
270	16	4.32	K
220	10	2.2	R
122	4	.48	V
80	3	.24	L
52	1.5	.078	X

Hull reported receiving F, K, V, L, X. Sigs. on last power still QSA and could be read about two feet

from 'phones. Requested to reduce much further.

Tuesday, September 25. (Same time.)

Powers used:—Checked by J. S. Barling.

Plate Input.

Volts.	Cur- rent M.A.	Watts.	Code Letter.
380	18	6.8	F
192	5	.96	K
120	3	.36	R
60	2	.12	U
44	1	.044	L

Hull reported receiving H, K, R, U. Then jammed by V I M, X's bad last letter U could be read through V I M.

Friday, September 28. (Same time.)

Powers used:—Taken and checked J. P. Cureton.

Plate Input.

Volts.	Cur- rent M.A.	Watts.	Code Letter.
380	16	6.08	X
212	8	1.6	K
172	4	.688	J
60	2	.12	P
40	1	.04	Y
24	.5	.012	Z

Hull reported: All jammed after K conditions very bad X's strong and induction bad.

Mr. Maclurcan's measuring instruments certified correct within one per cent. Signed E. Joseph.

Wireless Telephony

Good Work in S.A.

On Monday evening, October 8, an uninterrupted wireless telephone conversation was carried out between Mr. H. Lloyd (5A1) and St. Peter's College Wireless Club (5DO). The power used was very low—less than is ordinarily employed in receiving—and each operator heard the speech clearly. The distance between the two aerials is only a few hundred

yards, but the successful "tuning in," which enabled an uninterrupted conversation to be held, is applicable to any two stations which can be made to oscillate in sympathy.

It is the intention of the two parties to continue experimenting to ascertain the maximum range that can be covered and there seems every pos-

sibility that the attempt will be successful even up to ten miles.

The transmission and reception on October 8 were carried out on two valves using four volts and half an ampere on the filament, and about 60 volts on the plate. The volume of speech was ample, and when another stage of amplification was put on one set to listen to music, incoming signals were heard throughout the room.

Activities in N.Z. Radio Concert in Queensland

(By Our Special Correspondent.)

THE present is an age of records! A commercial wireless operator claims that while at Westport recently using only a crystal for a detector he established what is believed to be a record for long-distance reception. Speeches and music broadcast from IYA (Auckland) were received clearly, he states. This is a creditable performance as the air line distance between the two places is somewhere about 350 to 400 miles.

One is often asked who holds the New Zealand reception record and what the actual line of such record is? As far as I can learn most New Zealand stations can read all the chief European stations, the maximum distance being upwards of twelve thousand miles. A number of Dominion amateurs have been able to pick up the American experimenters' messages as far afield as New York, whilst many have enjoyed the broadcast programmes from the States.

The increased interest in broadcasting in Australia under the new regulations has had an awakening effect on radio circles throughout the Dominion. This is largely due to the announcement by Farmer & Company, Ltd., and many enquiries are being made as to the most suitable type of receiver to purchase. There are rumours that one or two Auckland and Wellington commercial firms will follow the excellent example set by the Australian houses, but so far no definite announcement has been made. Dominion "listeners-in" will have an advantage over their Australian brethren in the matter of the overseas programme, inasmuch as they will have no license fee to pay for the pleasure of hearing the matter broadcasted.

The Dominion Farmers' Institute of Wellington has commenced broadcasting, using a power of one kilowatt.

Weather reports for shipping are broadcasted on 600 metres by the following New Zealand Commercial stations:—

Radio. Chatham Islands. VLC. 4 p.m.

Radio. Wellington. VLW. 9 p.m.

Radio. Awanui, VLA, 10-12 p.m.

Splendid Demonstration

WHAT was undoubtedly one of the finest open-air radio demonstrations yet given in Queensland was successfully carried out on Saturday evening, October 13, by several members of the Queensland Institute of Radio Engineers in the bandstand of the New Farm Park reserve, in conjunction with the Henley-on-Brisbane celebrations.

A three-valve receiving set was installed, with a straight out detector, and three stages of low frequency

and D. W. Chandler, who were in charge of the mechanism, tuned in shortly before 9 p.m., and within a very short space of time the area immediately surrounding the bandstand was crowded with interested listeners. Until the termination of the programme—about 10.30 p.m.—the concert held the undivided attention of a huge audience, and many interested people sought further information on radio matters, evidently well satisfied with their intro-



Adelaide children listening to a Bed-time story broadcasted while local amateurs were testing recently.

amplification, connected with a Western Electric Power Amplifier. When the set was complete it was tried out on the fourth stage, and magnificent results were achieved. A resident on the far side of the River claimed to have heard the experimental record at a distance of nearly a mile, but eventually it was decided to use the first stage only, that being considered of sufficient power to meet the requirements of the demonstration.

Messrs. C. L. McLaughlin, A. E. Dillon, S. Winton, C. E. Sandercock,

duction to the science. Such demonstrations can do nothing but good for radio activities in general, and the members of Institute of Engineers are to be congratulated upon their achievement.

It is worthy of note that the arrangements at 4CM—which broadcasted the programme—were in the capable hands of a lady, Mrs. McIlwraith. The aerial, about 30ft. in length, of No. 18 gauge V.I.R. wire, was simply held to the posts of the bandstand, around which it was twined.



The Radio King



Published by special arrangement with Universal Films. Adapted from the Universal Chapter Play, "The Radio King."

Synopsis of Previous Chapters.

Marnee, an Electrical Wizard, fostering a feeling of anarchy has imprisoned Jimmy, an orphan boy, to help him in his nefarious schemes. Jimmy having learnt the code and signals of Marnee's super wireless plant sends out a message for help to Bradley Lane, a wealthy scientist and detective. He is interrupted by Marnee, who takes in Bradley Lane's reply that he is coming to Jimmy's assistance. Leaving his instruments Marnee goes upstairs and informs the revolutionaries that Bradley Lane is coming; telling them to send him below and he, Marnee, will deal with him. John Leyden, is another scientist who is working for the Government, endeavouring to perfect a scheme by which he can recall all messages from the air. Almost every experiment in this direction is frustrated by Marnee. Jimmy, left alone in the laboratory, sends out a call for help, which is picked up by Bradley Lane on his experimental set. Lane hurries to the house indicated by the call, but is entrapped by Marnee. The Wizard of electrics throws in a switch, causing a static discharge of thousands of volts to envelop Lane, who slowly collapses beneath the terrible strain. Whilst Lane is lying insensible on the floor the house is raided by the authorities and Marnee and his confederates effect a hurried escape.

JOHAN LEYDEN, disheartened by the results of his experiments, is almost on the point of admitting failure when Ruth, his daughter, who has been his sole assistant and inspiration, prevails on him to continue, feeling sure that such endeavour and tireless tenacity must soon meet with success.

"Father, I cannot feel as you do, that it is just fate that is baulking you. I am sure it is the work of some person who is wilfully trying to dishearten you and prevent your experiment."

With such a noble spirit to stimulate his thoughts Leyden had no

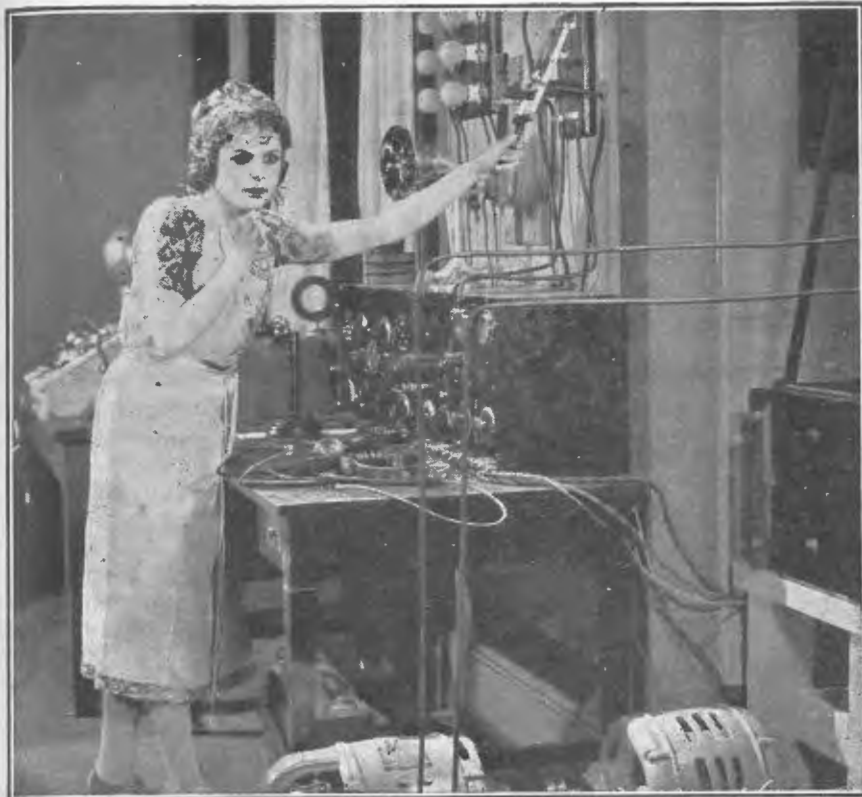
course open to him but to continue. The thought of constructing apparatus that would effectively recall messages from the air was so gigantic, so colossal, that it would revolutionise wireless telegraphy the world over.

Feeling that success was almost within his grasp, Leyden started up his generator and commenced to manipulate his valve controls. So much of his work was visible, but the super-sensitive instruments of his own invention, secured in a sealed case, were of such delicate construction that, should any attempt be made to open the case, the result would be an immediate shattering of its contents. After an interval of hours, the silence of the laboratory was suddenly broken by the exclamation of Leyden, "I've won! I've won!"

Quivering with excitement, his voice hoarse with emotion, he collapsed in a chair; the shock of success had been almost too much for his overworked constitution. Ruth, entering at her father's cry, picked up the 'phones, just in time to intercept a message. The physician who attended Lane was advising Lane's valet of the mishap that had occurred to the detective. At the doctor's estimate, no man could absorb such an amount of electric current and survive longer than six months. Then came another voice, that of Lane himself, calling to Ruth, endeavouring to allay her fears and telling her that his misadventure was not serious and would pass away in a few days. This he knew to be untrue yet there was a small hope of his being able to outlive the terrible ordeal, and while this hope existed he had no wish to un-

duly alarm Ruth, for whom he held more than an ordinary regard.

Leyden, now recovered from his excitement, set about recording his secret process in such a manner that, should anything unforeseen happen to him, the world would benefit by his invention. Science demanded something better than the usual note in book or on paper, so Leyden started the cylinder on his dictaphone and recited the formula into the recording funnel: but not a moment too soon, as Marnee, learning of the success of his rival took steps to enlighten himself of the efficacy of the invention. He knew that it would be useless to attempt to persuade Leyden to divulge his secret, so the house was surrounded by members of the Brotherhood and Leyden seized. To Marnee it seemed quite an easy matter to take the cylinder and reproduce the spoken words at his leisure; but the super-intellect of Leyden has been prepared for such an emergency. He had not used the usual method of cutting his speech into the record, but devised a crystal of peculiar shape that produced recording lines altogether different to those produced by any other recorder, and would not reproduce a sound until fitted with a reproducing crystal of exactly the same shape. The sudden disappearance of Leyden from the laboratory did not allow further interrogation by Marnee, who was compelled to content himself with taking the cylinder away with him. Once in his new laboratory; his former rendezvous being destroyed by the police authorities, Marnee called a consultation of the foremost members of the Brotherhood to determine the best plan to



Ruth, John Leyden's daughter, intercepts a message stating that Bradley Lane will be unable to live longer than six months owing to the electricity absorbed by his body in Marnee's laboratory, where Lane was almost electrocuted.

secure the secret recorded on the cylinder. When all suggestions proved fruitless Ivan Renally, the right-hand man of Marnee suggested that, as Ruth was her father's associate in his experiments, she doubtless would know the secret of reproduction of the message. After a considerable amount of enquiry it was discovered that Ruth, accompanied by Bradley Lane, was at a nearby residence enjoying the pleasures of a social evening. This residence, in keeping with

most modern homes of the times, was installed with a Radiophone receiving set. The only way Marnee could hope to interrogate Ruth was to first decoy her back to her home and to this end he spoke into his transmitter. "Bradley Lane! Bradley Lane! We've got Leyden and we've got his secret. Now come and get us!" Through the crowded assembly of the social gathering the words reached Lane and Ruth, instilling a feeling of apprehension and calling for immedi-

ate action. Lane left Ruth to return home and set off to discover the whereabouts of her father, promising to join her as soon as he had some news of the mysterious happening. That is just what Marnee desired, and he and his confederates surrounded the Leyden home. Ruth, not suspecting any foul play, had hardly entered the house, when, in response to a ring at the front door, she admitted a messenger from Marnee. This man brought a faked message to Ruth to the effect that Lane had been seriously injured and had sent a car along so that she could be hurried to the hospital. Not hesitating to question the validity of the message, Ruth entered the car, and after driving over a circuitous route, reached the place at which Lane was said to have been taken. This house was none other than the waterfront headquarters of Marnee. Too late to return—this startling discovery dawned on Ruth.

(Another instalment of this exciting story will appear in the next issue.)

A Remarkable Experiment

Mr. F. D. Bell, of Otago (N.Z.) is credited with a remarkable achievement in hearing messages passing between two experimental stations in Melbourne.

Using an indoor aerial only 3ft. square and no outdoor wires whatever, Mr. Bell succeeded in hearing messages sent by Mr. M. Howden, of Box Hill, to another Melbourne experimenter. A number of American experimental transmitting stations, using very low power, have also been heard on this small aerial. Mr. Bell has frequently transmitted messages to Australia, and has succeeded in communicating with Australian experimenters by wireless telephone.

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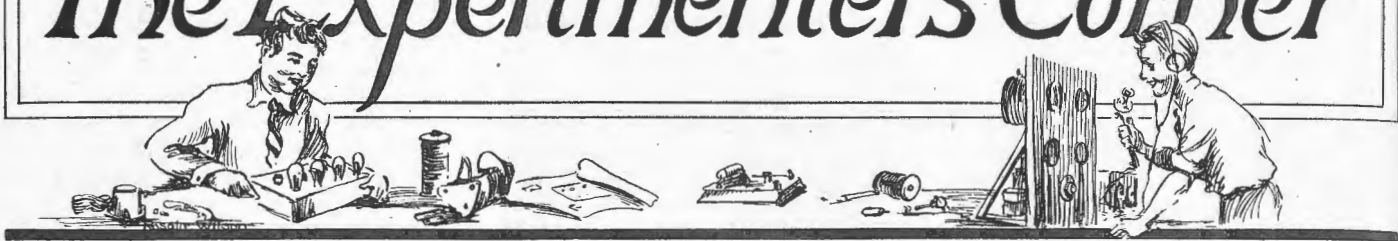
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The Experimenters' Corner



IMPROVING THE AUDIO AMPLIFIER.

WHEN using a valve as an amplifier the loudest signals will be obtained when a high plate voltage is used. This extra potential is liable to introduce distortion unless a biasing voltage is applied to the grid of the valve. It would appear at first sight that a third battery must be included with the amplifier to apply the necessary negative potential to the grid, but by

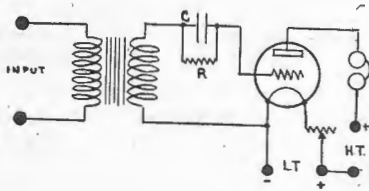


Fig. A."

using the connection shown in Fig. A the extra battery can be dispensed with. The condenser "C" must be of fairly high capacity and offer very little impedance to the audio frequency currents which are to be impressed on the valve. A suitable value is between 0.1 and 0.5 microfarads, and an ordinary paper dielectric telephone condenser will suit ad-

mirably. Across the terminals of this condenser is shunted a high resistance "R." The exact value of this part depends upon the valve used and the plate voltage applied. By mounting a piece of sandpapered ebonite or bakelite about half an inch wide and two inches long between two terminals, as shown in the figure a variable resistance can be obtained by rubbing on a graphite coating with an HB pencil. Before screwing down the terminals cover a half-inch strip at each end with a thick coating of graphite and insert a tinfoil washer to ensure good contact. To adjust this resistance to optimum value commence with it at open circuit and gradually apply the graphite by rubbing with the point of the pencil until signals reach a maximum and then just commence to fade,

A QUICK CHANGE CRYSTAL-VALVE RECEIVER.

A great saving in battery power will result if a crystal detector is used in place of the valve for the reception of local signals. In addition to this saving it will act as a stand by during the time that the storage battery is absent being charged. Obtain an old "R" type valve and re-

move the composition base which holds the four terminal pins. This is now screwed to the bottom of a crystal detector stand as shown in Fig. B, and the two terminals connected to the grid and plate pins respectively. A double pole switch is now wired up to the circuit, and by removing the valve from its socket and throwing this switch to the left the connection is changed from valve to crystal reception. One arm of the

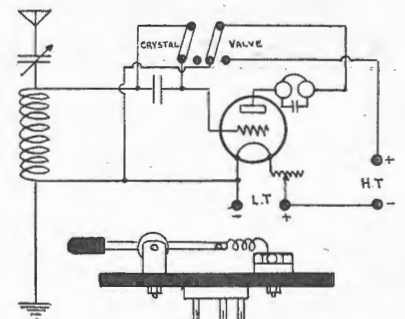


Fig. "B."

switch short circuits the grid condenser and leak resistance, and the other disconnects the high tension battery and connects the telephones to the low potential terminal. The crystal detector is now inserted in the valve socket and the circuit is completed.

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A New Neutrodyne Circuit

In accordance with the new Government Radio Regulations receiving apparatus must be so wired up and operated that it will be incapable of generating oscillations in the aerial circuit and thereby interfere with the reception being carried on by other stations. The insertion of a valve acting as a radio frequency amplifier between the aerial and that portion of the receiver where regeneration is employed is a very effective barrier against what is known as re-radiation. Radio frequency amplifiers employing resistance coupling have scarcely any tendency to generate self oscillations, but those in which the coupling circuit consists of a tuned combination of inductance and capacity are very prone to this defect owing to the inter-electrode capacity, and stray magnetic couplings which assume far from negligible values at high frequencies.

Professor Hazeltine, of U.S.A., has developed a receiver known as the Neutrodyne, which by means of specially constructed adjustable condensers and connections to the intervalve radio frequency transformer, is capable of neutralising these undesirable capacity effects. Experimenters who have succeeded in striking the happy combination of these values speak highly of this receiver and find it to operate successfully over a wide band of wave-lengths.

In Figure C is given a circuit for a single wave radio frequency amplifier

in which the internal capacity effect is neutralised by means of a high frequency bridge connection. If the terminal B—as regards high frequency currents—happens to be at a higher potential than the grid there will be a transference of energy through the small condenser effect between P and G, and regeneration will take place. The intervalve trans-

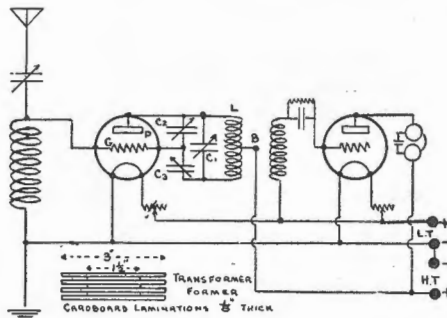


Fig. "C."

former must be provided with a centre tap on its primary winding, and this may be accomplished either by winding it on the special three section former shown in Fig. C, or taking three honeycomb coils, using the centre one for the secondary and the two outers joined in series for the primary. The two latter coils must each have half the number of turns which are on the secondary to preserve the one to one ratio. Make sure that the primary coils are connected so that their magnetic fields

do not oppose. Condenser C1 is used to tune the primary winding to the desired wave-length, and from practical tests it should not exceed 0.0005 microfarads. In parallel with this condenser are two smaller condensers C2 and C3 which are connected in series. These condensers need only be of small value such as two or three plate verniers with a capacity of about 0.0001 microfarads. The centre terminal of these condensers is connected to the grid, and by varying their relative capacities the high frequency potential of this point can be made to either lag or lead relative to the point B. Assuming the centre tap to be accurately located on the inductance L, it will be at the same high frequency potential as the point G when the capacities on either side are equal. In parallel with condenser C2 is the internal capacity of the valve, and to bring about a state of balance between it and condenser C3, the latter must be increased above the former by an amount equal to that due to the valve. If the relative adjustment of these condensers is reversed the valve will oscillate owing to the increased capacity coupling between the grid and the plate elements. With the exception of the centre tap on the primary the values for the different windings are the same as those given in the article on Radio Amplification in No. 5 issue of *Radio*.



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Club Notes & News



WIRELESS INSTITUTE OF S.A.

At the monthly general meeting on October 3 a letter was received from Amalgamated Wireless (Aust.) Ltd., stating the Company was prepared to grant a license for the free use of its patent rights for scientific experiments, provided such was not used for commercial work.

It was resolved to thank the Company for its offer.

The Victorian Division of the W.I.A. wrote supplying certain particulars in regard to the trans-Pacific amateur tests. The transmission from America will cease on November 3 and between November 4 and 13 inclusive Australian experimenters will transmit.

The meeting decided to distribute the information supplied from Victoria amongst electrical dealers for the benefit of all concerned.

Later in the evening Mr. Bland gave an interesting lecture on Circuits, and at its close was accorded a hearty vote of thanks.

A presentation to Mr. Edgar, late assistant secretary of the Division, was made by the President who wished him every future success.

Mr. Edgar leaves shortly for America.

MANLY RADIO CLUB.

At the October 8 meeting Mr. J. G. Reed delivered an exceedingly useful lecture on the problems which frequently confront wireless experimenters.

Mr. Reed illustrated his lecture by blackboard diagrams, and afterwards an-

swered a number of questions pertaining to his lecture.

He was accorded a hearty vote of thanks on the motion of the President, Mr. F. C. Swinburne.

WAVERLEY RADIO CLUB.

After disposing of general business at the October 4 meeting a discussion was initiated on the question of eliminating static.

The chairman, Mr. Malcolm Perry, and Messrs. Bowman, Thomson and others, took part. The consensus of opinion was that whatever is done in the way of eliminating static will be after the signals have actually been received.

The club agreed with the suggestion contained in a letter from *Radio* regarding an altered system of international amateur call signs, but suggested a number of improvements.

In response to a request from the committee of the Wireless Exhibition the Club agreed to assist in the publicity work.

ESSENDON RADIO CLUB.

Mr. T. P. Court, a well-known member of the Victorian Wireless Institute, lectured to members at the October 4 meeting of the above Club. His subject was "Radio Frequency Amplification."

Mr. Court dealt exhaustively with his subject and his listeners received much useful information. At the close of the lecture a long list of questions was asked and answered.

The club secretary, Mr. J. W. Jacobs, of 40 Munro Street, Ascot Vale, will be

pleased to hear from prospective members.

ST. JOSEPH'S COLLEGE WIRELESS CLUB.

Between June and October of this year the membership of the above Club has increased from four to thirty-six.

This rapid increase has justified the club in erecting an aerial, and several sets are now being constructed.

At the election of officers on October 6, the following were elected:—President, C. Cziisz, Vice-President, Rev. Bro. Wilfred; Hon. Sec., T. Meurer; Hon. Treas., T. Cochrane; Committee, Messrs. T. Salmon, A. Gilchrist, J. Murray-Gibbes, and I. Perry.

NEUTRAL BAY RADIO CLUB.

A general meeting of this club was held on Tuesday evening, October 16, and was extremely well attended.

Mr. R. C. Marsden (2JM) addressed the members on the desirability of every club having an exhibit at the forthcoming Wireless and Electrical Exhibition to be held in the Town Hall, Sydney, in December.

Mr. George Apperley, Radio Engineer, assisted by Mr. Eric Burbury, then delivered an intensely interesting "talk" on wireless, illustrated by almost 200 lantern slides.

A hearty vote of thanks to the club's visitors was carried by acclamation.

The next meetings take place at 180 Kurraba Road, Neutral Bay, October 30 and November 13.

Wireless Link with "Outback."

Mr. W. G. Gibson (P.M.G.) made an important announcement recently regarding the establishment by the Government of a wireless station in the North of Australia.

"This station, he said, would be erected in the western portion of the Northern Territory and will probably be in touch with Darwin, Wyndham and Broome. It will bring the great pastoral properties in those parts of Australia into closer touch with the

telegraph lines and the centres of civilisation.

"This venture will mark the beginning of wireless for the pastoralists of those vast stations. The range will be between 300 and 400 miles, and feeder stations, which will be in touch with the coastal wireless stations of Australia and the main telegraph line running down to Adelaide will probably be also established.

"I am very sympathetic in the whole matter of wireless," concluded Mr. Gibson.

"It is coming into this country as a blessing to the man outback.

"I expect great things from the transmission of news, weather and market reports, sporting intelligence, etc.

"It is something the people must have, and it is going to count."

Mr. Gibson is to be congratulated on his determination to utilise this newest factor in rapid communication for the benefit of those who spend their lives in the monotonous, if useful, task of winning a livelihood in the "great outback."

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THE WIRELESS PRESS,
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Movements of Wireless Officers

Mr. A. J. Costa signed off s.s. *Victoria*, at Sydney, on September 24.

Mr. R. G. Wright signed off s.s. *Tarcoola*, at Sydney, on September 20, and signed on s.s. *Boren* on September 27.

Mr. R. L. Beatty signed on s.s. *Iron Chief*, at Brisbane, on September 25.

Mr. R. C. Christie signed off s.s. *Bulla*, as 3rd Operator, at Sydney, on September 28, and relieved Mr. J. H. Surplice on s.s. *Makura* as 3rd Operator, on October 2.

Mr. C. C. Ullman, who was relieved on s.s. *Saros* by Mr. J. H. Surplice, at Sydney, on October 2, signed on s.s. *Tintenbar*, at Sydney, on the same date.

Mr. T. Exon was relieved by Mr. T. Bannister on s.s. *Eastern*, at Sydney, on September 25 and proceeded on Home Port leave.

Mr. H. Kirk was relieved by Mr. A. Webster on s.s. *Koromiko*, at Nelson, on September 27.

Mr. H. K. Wadsworth signed off s.s. *Carina*, at Melbourne, on October 2, and proceeded on Home Port leave.

Mr. O. S. Kelly signed off s.s. *Wodonga*, at Brisbane, on October 4, and signed on s.s. *Aramac* on October 5.

Mr. G. Pow signed off s.s. *Esperance Bay*, at Sydney, on October 9 and relieved Mr. F. L. Scott on s.s. *Arawatta* on the same date.

Mr. F. L. Scott signed on s.s. *Eugowra*, at Sydney, on October 9.

Mr. L. G. Graham relieved Mr. S. J. McVeigh on s.s. *Mackarra*, at Sydney, on October 10.

Mr. T. Bannister signed off s.s. *Eastern*, at Sydney, on October 9 and relieved Mr. H. E. Young on s.s. *Dimboola*, at Sydney, on the same date.

Mr. H. E. Young signed on s.s. *Esperance Bay*, at Sydney, on October 9.

Coastal Radio Service

STAFF CHANGES.

Mr. L. Mowlem, Radiotelegraphist, Thursday Island Radio, has been transferred to Brisbane Radio.

Mr. A. Harrower, Radiotelegraphist, Brisbane Radio, has been transferred to Thursday Island Radio.

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Doings in W.A.

A general discussion on the desirability of affiliation with the W.A. branch of the Wireless Institute of Australia took place at the third general meeting of the Mount Lawley Radio Club. The President of the Club, Mr. B. M. Cavanagh, and Hon. Secretary, Mr. C. H. Snowden, addressed the members on the benefits to be derived from such affiliation. It was then decided that a copy of the Institute's rules of affiliation should be applied for and discussed at the next general meeting.

At a recent gathering of local experimenters, Mr. J. A. Wishaw, of the Wireless Supplies Company, delivered an address on Capacity and

intention of the Institute to instal a Receiving and Transmitting set for the benefit of its members at an early date. According to the Secretary, Mr. A. E. Stevens, the aerial will be suspended from the Fire Brigade's look-out tower, which is approximately 66 feet in height.

Newcastle Notes

The Newcastle District Radio Club has now lowered its wave-length to 220 metres, and has been carrying out some transmitting tests with music, speech and C.W. with very satisfactory results. On October 11 a special test was carried out, which resulted in a QSA report from Mr. Burehill, of Western Suburbs Club.

hall, and was loudly applauded by the audience. Mr. Olsen, also Mr. Stewart (Radio Inspector) would be pleased to have any information concerning the Spark Transmitter who sat on his key all through the demonstration.

2ZX (Olsen, Waratah) may be heard on Saturday and Sunday nights, and almost every night through the week, between 7.30 and 9 p.m., and will be pleased to receive reports from any amateurs receiving his transmission.

Appeal by Wireless

On Saturday, October 6, the electors of Queensland gave an overwhelming vote against Prohibition, but it is distinctly within the realms of possibility that some few of the anti-Prohibition votes were secured by wireless. The science has been put to many uses, but when Rev. Wyndham Heathcote delivered his final anti-Prohibition speech from the Observatory station, under the auspices and direction of the Queensland Institute of Radio Engineers, an innovation must surely have been accomplished, for his audience was seated in the South Brisbane hall—distant a couple of miles. The novelty attracted a large attendance, and the hall was taxed to its utmost capacity when the first words came through. The aerial had been constructed inside the walls, and fairly good results were obtained.

New Relay League

Formed in Queensland

At the meeting called to decide the allotment of transmitting times for experimental purposes, it was unanimously decided to form the Relay League of Queensland, as distinct from the Queensland branch of the Australian Radio Relay League.

In the new organisation Dr. Val. McDowall was appointed Patron; Mr. A. B. Corbett, President; Mr. C. Isles and Mr. E. M. Gibson, Vice-Presidents; Mr. W. Finney, Hon. Sec.; Mr. A. E. Dillon, Hon. Treasurer. Two of the members of the committee were elected, and it was left to the Queensland Institute of Radio Engineers and the Queensland Wireless Institute to each nominate another committeeman.



THE STUDIO AT THE NORTHERN ELECTRIC CO'S. BROADCASTING STATION (CHYC) IN MONTREAL.

The walls are draped with heavy cloth, the floor carpeted, and a cloth ceiling placed beneath the regular ceiling, leaving an air space between the two, to secure best acoustical results. The microphone for collection is seen on a stand in front of the piano, and at back, extreme left, is the panel containing the "input" amplifying equipment.

Inductance, and Capacity-Reaction.

A radio club has been formed in Kalgoorlie by a number of enthusiasts. It is understood that the membership at present totals about 20. The Fremantle Wireless Club, a branch of the Arts and Science League, is also in full swing, with a membership of something like 30.

Members of the Perth branch of the Wireless Institute of Australia, have taken up new quarters in the Gymnasium room of the Central Fire Station, Murray Street. It is the

On Wednesday October 10, Mr. N. P. Olsen (2ZX) gave a special demonstration (transmitting) in connection with a Lecture Concert held in the Tyrell Hall, Newcastle, under the auspices of the Workers' Educational Association. The demonstration was given by permission of the Postmaster-General. There were over 400 people in the Hall and the receiving station was operated by Mr. A. Metham, with his valve receiver and magnavox. The music and speech was distinctly audible all over the

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- the proper proportion of grid and plate currents in a transmitting tube?
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- how to eliminate excessive plate current when no adjustment of the circuits will do it?
- the percentage of increase in output to be expected by the addition of one or more tubes to a transmitter?
- the advantages and disadvantages of transmitting circuits employing direct current on the plates; A. C., with half-wave rectification; A. C. with full-wave rectification, kenotron-rectified A. C.; and which type of circuit is the most economical and at the same time most efficient?

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7. Operating Characteristics of Vacuum Tubes.
8. Methods of Obtaining Plate Potentials and Types of Continuous Wave Transmitters.
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**Efficient Crystal
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N. Z. Amateurs' Success

IN *Radio* No. 13 (page 310) we recorded an account of some excellent reception work on a crystal receiver by Mr. Frank C. Reardon, of Auckland, New Zealand. We have now received from Mr. Reardon particulars of stations heard on his crystal receiver during the months of August and September.

COAST STATIONS.

VLA, VLB, VLC, VLD, VLW, VMR, VMG, VPD, VSB, VIA, VIB, VID, VIH, VIM, VIO, VIP, VIS, VIT, VIW, VIY, VIL, VKT.

SHIP STATIONS.

Niagara followed for six days from Auckland, approximately 1800 miles.

Tofua followed for seven days from Auckland, approximately 2000 miles.

Tofua also heard on ninth day out, approximately 2700 miles.

Westmoreland, working VLD, approximately 1700 miles distant.

Makura, working VIS and VLD, seven days out.

Makura copied all way between Sydney and Auckland, approximately 1200 miles.

Marama copied all way between Sydney and Auckland, approximately 1200 miles.

Tofua heard working VPD tenth and twelfth days out from Auckland. *West Islip*, three days out, about 900 miles.

Iris, three days out, working VLW, approximately 900 miles.

Manuka copied all voyage Sydney-Auckland, approximately 1200 miles.

Ulmaroa, working VIS 3½ days from Auckland, approximately 950 miles.

Mr. Reardon is using only a plain single circuit crystal receiver and he is to be congratulated on the excellent results he is getting. It proves that a good crystal is both efficient and reliable.

It is not unusual for Mr. Reardon to follow vessels of the Canadian-Australian line consistently up to 1800 miles.

Make sure of regularly receiving *Radio* by placing a standing order with your newsagent, or send 10/- for year's subscription (26 issues) to The Wireless Press, 97 Clarence Street, Sydney.

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Queensland Transmitting Roster

Programmes Arranged

As the outcome of a certain amount of friction which has existed for some time between various groups of experimenters in Brisbane relative to priority in the choice of times for transmission, a meeting was recently summoned by the wireless officials at

4CG (Mr. A. N. Stephens), 7—8 p.m.; 4CM (Dr. Val McDowall), 8—10 p.m.; Monday, 4FI (Y.M.C.A.), 7.30 p.m.—9 p.m.; Tuesday, 4AE (Queensland Wireless Institute), 7.30 p.m.—9 p.m.; Wednesday, 4EI (Engineers' Branch, G.P.O.), 7 p.m.—9

Radiophone Demonstration

On the evening of September 27, a highly successful demonstration was given to a select party of Squatters, who were entertained by Messrs. Bartram & Co., Melbourne. This was given with a view to showing what Broadcasting will mean in the near future to those who are, at present, isolated.

A resume of a Broadcasting Service was transmitted as follows:—A Morning News Service, Weather Reports, Market Reports and Stock Quotations, Time Signals, Afternoon Entertainments for Ladies, Bedtime Stories for Kiddies, etc.

A little later on a novel feature was introduced into the demonstration by Mr. Phillips, Champion Bird Whistler of Australia, who gave a wireless demonstration of his faithful imitation of our various feathered friends. Mr. Phillips afterwards gave a similar demonstration from the stage and it was generally agreed that the reproduction by wireless was clearer at the back of the hall than the demonstration actually given on the stage.

The next item was a violin solo by Mr. Lorrigan, a noted violinist, who played his violin near the microphone of the Collins House Transmitter and the strains were reproduced with wonderful clearness by means of a Loud Speaker at Messrs. Bartram & Co.

The appreciation of the audience, numbering some 500, was apparent by the loud applause given at the end of the entertainment, and a vote of thanks was accorded Amalgamated Wireless (A/sia.) Ltd. for the very successful entertainment.



BROADCASTING EQUIPMENT AT THE NORTHERN ELECTRIC CO'S. BROADCASTING STATION IN MONTREAL.

The two panels on the right form the 500-watt set and the two on the left the 100-watt set. This station has only been operating since the beginning of this year but has already established long distance records having been heard at most points in Canada and the U.S.A.

which representatives of each of the transmitting stations were present. Keen debate ensued anent the respective claims of the members, but eventually a roster was drawn up on the following lines:—Weekly allotment of transmitting periods—Sunday,

p.m.; Thursday, 4EZ (Queensland Institute of Radio Engineers); Friday, 4AM (Mr. E. M. Gibson), 6 p.m.—7 p.m.; 4CC (Mr. Clifford Isles), 8 p.m.—9 p.m.; Saturday, 4AK (Mr. J. Milner) and 4AU (Mr. W. Finney), working conjointly, 7 p.m.—9 p.m.

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Race Timed by Radio

The Tamworth and District Motor Cycle Club recently conducted a mile race in which the ten competitors were timed by wireless. The arrangements were in charge of Messrs. Todd, Arnold and Peppel, and the innovation was a success, perfect results being obtained.

This is the second occasion on which motor events in Australia have been timed by wireless, and from the success achieved it is easy to foresee its almost universal adoption for such work.

Good Work in W.A.

It is safe to assume that all amateurs in W.A. have heard of Mr. A. E. Stevens, a well-known local experimenter, at present attached to the staff of the Radio Inspector, Fremantle.

Mr. Stevens has been transmitting for about 4 months, and so far results obtained have been very satisfactory. About six weeks ago, he carried out an experiment with Mr. Fontaine, an officer of Amalgamated Wireless Ltd. who was journeying North on the s.s. *Bambrah*. At a distance of 460 miles Mr. Fontaine, using one Expanse "B" valve, received CW signals very clearly (1½ watts) from 6 BN (Mr. Stevens' station). Speech has also been heard very distinctly at 300 miles.

The Transmitter is of the loose coupled 3-coil type, using an "R" valve with Grid modulation, whilst the Receiver consists mainly of three Expanse "A" valves, with three stages of audio frequency. Practically every station in the world has been heard—Bordeaux being readable 20 feet from the 'phones. The aerial dimensions are: length 100 feet, height 40, inverted L type.

Perth Firm's Novel Idea

Rather a novel idea has been adopted by a Perth Radio importing firm—Messrs. Ritchie & Jackman Ltd. All persons purchasing apparatus from this firm, may if they so desire, receive free instruction in the various methods of building a receiving set. This instruction is carried out by a competent man, and so far has proved very satisfactory, much benefit having been derived by many young enthusiasts.

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Victorian Notes

(By our Special Correspondent.)

THE fund for the Stafford appeal was further augmented when the Box Hill Theatre was crowded to the doors by 1500 people on October 1. Athletic displays were given and excitement ran high when the radio concert was announced. This attractive item on the programme was under the control of Messrs. Hurst and Beattie, two experimenters of Box Hill. The programme consisted of musical items and reception was excellent.

Once again the "damping" occasioned by a large concourse of people was noted, the volume of sound being considerably lower than the test given in an empty hall. Transmission was in the hands of 3DP, who has been assisting the appeal in many other directions.

The 1K.W. experimental transmitting station being erected under the direction of Mr. F. Howden, at Box

Hill, is now almost complete, and on one or two evenings local experimenters have resignedly closed down in the true spirit while 3BQ conducted a few tests.

Mr. G. W. Steane, Secretary of the Victorian Branch of the Wireless Institute, has received the following letter from Mr. A. L. Powell (3KC), Surrey Hills: "2.10.23. Heard 3UX. Can you beat this? Last evening I received yourself, 3DP, and 3JU, on a 'loud speaker' hearing telephony perfectly all over the house. No aerial loop or radio frequency was used, simply a detector and two-stage

Audio Amplifier. On using a 3ft. loop it came in so solidly that I could not wear the 'phones. I think this is the limit. I can give a practical demonstration if any one is doubtful about it. Your modulation and strength were fine. I would like to hear if any other receiving stations are getting same results, as these experiments are very interesting."

The following is a sample of the card system adopted by Mr. K. Barbour in his reception of Interstate experimental stations. The layout is simple and is useful for back reference.

Station Logged.	Date.	Working.	System.	Strength.
2CM	23/9/23	CQ	'Phone and CW	Good.
5AG	26/9/23	3JU	CW	Excellent.
2CM	28/9/23	?	CW	Very strong.
2AD	29/9/23	3BD (N.Z.)	CW	Fair.
2AY	29/9/23	3ZI	'Phone and CW	Excellent.
2AY	29/9/23	CQ	CW	Excellent.
2AY	29/9/23	5BY	CW	Excellent.
5BY	29/9/23	2AY	CW	Excellent.
2CM	30/9/23	CQ	'Phone and CW	Weak (QRM)

Wireless Music for Newcastle Parks

Newcastle people are nothing if not progressive!

Their city may not be as up-to-date as one would expect from the above statement, but that is due to circumstances outside the control of the local governing authorities.

Newcastle business men were told of the wonders and possibilities of wireless in a lecture by Mr. E. T. Fisk some time ago, and at the following meeting of the City Council the Town Clerk (Mr. Glassop) and engineer (Mr. Shine) were instructed to inquire into methods of

popularising the parks, with particular regard to the possibilities of wireless broadcasting.

With a view to obtaining first-hand information the two officials mentioned paid a visit to the experimental transmitting station of Mr. N. P. Olsen (2ZX) at Waratah on Sunday evening, October 14.

During Mr. Olsen's transmission, Mr. Glassop spoke through the radiophone to "listeners in" and in addition to touching briefly on the Council's scheme asked all who heard him to ring up on the landline. The

response was so prompt and generous that Mr. Glassop speedily regretted his hopelessly inadequate estimate of the number who would hear him.

"Listeners in" who heard Mr. Glassop described the reception as excellent.

The move is certainly a progressive one, and the several fine parks, of which Newcastle people are so justly proud, may later on be made still more attractive through the agency of wireless concerts broadcasted from Sydney and other centres in the Commonwealth.

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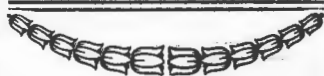
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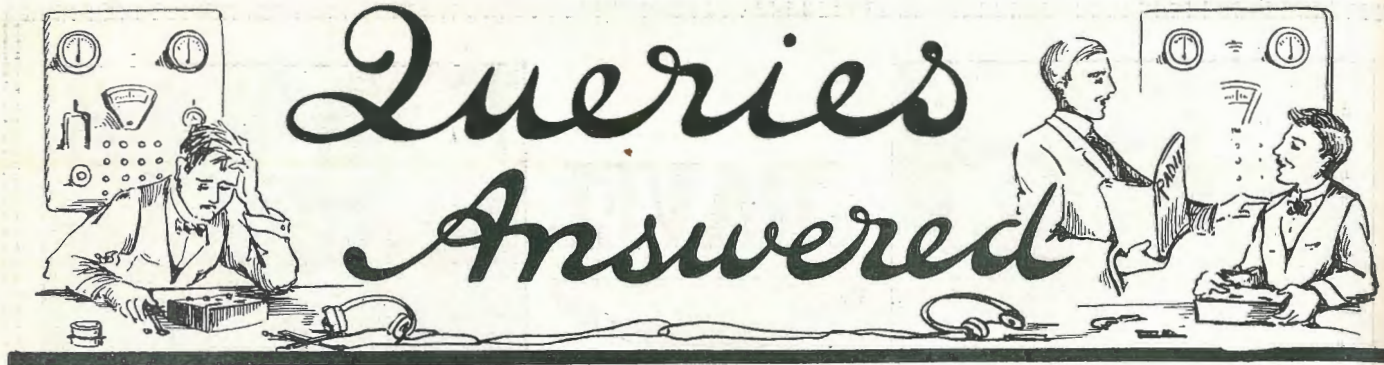
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J. S. (Hawkes Bay).—A parallel condenser will increase your tuning range.

F. W. P. (Minimi, Qld.) asks: (1) Does the rotation of the armature in an ordinary dynamo exert a pronounced tendency to turn over the whole machine, necessitating firmly fixing it to its base. (2) Is this tendency directly proportional to the strength of the magnetic field and power applied to the armature. (3) Is this in turn directly proportionate to the number of turns of the field coil windings. (4) Can a powerful field be produced by a weak current passing through a great number of turns. (5) What is the best type of motor for satisfactory automatic service under varying conditions of load, speed and current input.

Answer: (1) There is a mutual magnetic drag between the field and the armature, and if no means were taken to hold the former in place, both would rotate. If such an experiment were carried out, the speed of rotation of the field would lag behind that of the armature just sufficiently that the relative motion could generate sufficient energy to overcome the mechanical and electrical losses. A practical example of this phenomenon is the squirrel cage induction motor where the rotating magnetic field of the stator winding causes the rotor to follow it around at a similar speed, less the above mentioned slip. (2) The magnetic reaction in the case of a D.C. machine is proportional to the strengths of the magnetic fields involved. (3) Assuming a constant current and a flux density well below saturation, the magnetic pull will be proportional to the turns. (4) Yes. (5) For variable speed under heavy loads a series

motor as used for electric trams and trains is most suitable, but where the speed must be steady a level compound wound machine is best.

C. R. M. (Turrawan) asks if an iron core choke is more efficient than a grid leak in the usual circuits, employing one or two valves.

Answer: An iron core grid leak choke must possess a very high impedance, and for use in capacity coupled audio amplifiers, one wound with 25,000 turns of No. 44 enamel on a $\frac{1}{2}$ in. core would be suitable.

A. L. C. (Leeton) asks: (1) Length and gauge of wire to build an aerial for all-round purposes, i.e., receiving from both long and short wave stations, also for transmitting on about 200 metres. (2) Is the W.D. 12 valve better than the W.D. 11?

Answer: (1) The best all-round aerial is the cage type. For 200 metre work a length of about 60ft. with 4 to 6 wires of 3/20 gauge on 2ft. hoops would be suitable. (2) The only difference is the base, the W.D. 11 having a special base and the W.D. 12 the standard American base.

H. E. R. (Warren) asks: Cause of unusually heavy spark discharge experienced on connecting aerial lead to receiver.

Answer: The sparks were caused by a static charge accumulating on the aerial. During the recent cyclonic disturbance which passed over the Eastern side of the Continent it was a common occurrence for all stations, both commercial and experimental, to draw fairly strong sparks from the isolated aerial wire. The presence of electrified dust in the atmosphere is responsible for this charge when conditions are otherwise clear.

F. H. M. (Browns Plains) asks: (1) The most satisfactory of two aerials (particulars submitted). (2) Cause of trouble with 2-valve receiver.

Answer: (1) Both are good aerials, but for 200 metre work the 3-wire aerial 66ft. long will give best results. (2) Without a detailed description of the component parts of your set we are unable to advise regarding the trouble you are experiencing.

L. D. (Lindfield) referring to article on "reflex crystal-valve circuit" published in *Radio* No. 13, asks for circuit with separate oscillator for reception of continuous wave signals.

Answer: A description of an oscillator was given in the article on "Super-heterodyne Reception" in issue *Radio* No. 12.

(Please note all queries are to be signed with your full name. These are always answered under initials only, unless otherwise requested.—Ed.)

J. S. B. (Lithgow) asks if an Expanse "B" Valve would be satisfactory for the transmitter described in *Radio* No. 11 issue.

Answer: A hard valve such as an "R," "V24" or "Q" should be used. The Expanse "B" is a low vacuum valve and will ionize if a high potential is applied to the plate. (Please note answer to "L.D." regarding signature.)

W. M. (Warnambool) asks wavelength on which Sydney Radio sends press.

Answer: 1800 metres. (Please note answer to "L.D." regarding signature.)