The Hundred per cent. Australian Radio Journal.

THE WIRELESS WEEKLY

A Journal Devoted to the Interests of Wireless Enthusiasts both Amateur and Professional

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Wanted a Title (see page 9) (Carlton Studio, Darlinghurst)

A TALK WITH "WIRELESS WEEKLY."

Why is it that Australia is content to follow other countries in matters pertaining to the development of comparatively recent inventions?

We refer particularly to wireless and aviation. The Federal Government of course, is to blame. There is no encouragement by the Authorities for anybody to explore the unknown fields of these and other sciences; the whole thing is left to individual enterprise. Consequently Australia lags behind other countries.

That wonderful American Department, the Bureau of Standards, is doing splendid work for the advancement of wireless. Exhaustive tests are made there, and the Public is given the advantage of the results through the medium of papers and booklets.

Surely our Federal Government knows this and realises the value of such work. But, of course, there is the parrot cry of "no funds," and there you are.

The American Authorities have long been alive to the value of broadcasting. Health lectures, educational talks and weather and market and crop reports are all sent out by official radiophone and the community benefits.

Here is Australia the Authorities not only decline to use the ether for this purpose themselves, but apparently, discourage those who are willing to go to the expense from doing so. It is a dog-in-the manger policy to say the least.

The next Government will have to give the whole question of Wireless in Australia its measure of attention. The present Government seems to have failed to get to the heart of the question, though there has been much play to the gallery.

MUSIC IN THE AIR

MR. MACLURCAN'S CONCERT.

SUNDAY NIGHT'S CONCERT

Mr. Maclurcan, of Strathfield, will send out his usual concert on Sunday night at 7.30. Listen for him on a wave-length 1400 metres.

ETHER WAVES.

ARE THERE ANY?

INVENTOR'S THEORY.

A special correspondent of "Wireless Weekly," writing from San Francisco tells of a new circuit in which no aerial is needed.

The inventor of the circuit advances the theory that there are no other ether waves.

Mr. W. O. Arzinges, who has devised a circuit using three valves for receiving, uses no aerial. In fact he claims that his receiver works as well without an aerial, but with one, he says, a good earth is essential.

The circuit, which has not been divulged, owing to pending patent application, is claimed to be revolutionary, and is worked out under the rather startling theory that "there are no ether waves!"

The inventor states: "What we do constantly get in through the air, are hydrogenions. They bring the messages to us, and the reason we have more trouble in the warm weather than during the cool, is on account of the fact that these elements gradually decrease, until, when the thermometer stands at about 95 degrees Fahrenheit, they are decreased to about one-third of their concentration, as compared with a temperature around 50 degrees.

Conditions for receiving are splendid when the thermometer is about 50 degrees, while at 32 degrees, or freezing point, conditions are superfine.

Then, as the temperature goes down, the conditions improve with each downward step for the hydrogen ions or positive elements, are in the air.

Although Mr. Arzinges preaches the advantages of a good ground, he admits that the secret of his apparatus lies in the circuit.

The inventor uses two stages of audio frequency amplification in his sets. Loading coils can be cut in or out, and the set is shielded with aluminium. He employs special tube sockets and no grid leak, or grid condensers. The range of wave-length covered by the receiver is extensive.

Several wireless experts have inspected the set without discovering the inventor's secret of eliminating the aerial.

As soon as a patent is received the inventor intends entering the manufacturing field. He states that his receivers will be cheaper than present day three-valve receivers.

THOSE REGULATIONS.

On every morn at the break of dawn,
My heart fills with palpitations.
As I search for a line and long for a sign,
Of the new Wireless Regulations.

If the Government Printer were only a sprinter,
We might get some news, so they say,
So let's form a band to give him a hand,
And end this distressing delay.

TRAFFIC INCREASE.

A new record has been attained by the radio service of the Drahtlose Uebersee-Verkehr, A.G. (Overseas Wireless Company) of Germany.

On a recent day, last, a total of 50,000 words were exchanged via radio at the radio station of this company at Nauen and Ellvese. Since the reconstruction of commercial relations the traffic through these radio stations has been steadily increasing. In August, 1919, the entire business for the month only amounted to about 100,000 words. It increased to 550,000 words in June 1921, and in February, 1922 rose to 1,000,000 words.

CREWLESS SHIPS.

CONTROLLED BY RADIO.

How It Is Done.

The manner in which the old battleship Agamemnon was manoeuvred, steered and worked by wireless at speeds which at times reached 15 knots during the air bombing tests off the Isle of Wight has attracted wide interest. For a long summer's day she cruised about the Channel with no human being on board, entirely directed and controlled by wireless from the destroyer Truant, which followed nearly two miles astern.

She was burning oil, and the smoke of it at times poured densely from her fore funnel, showing that the mechanical stoker was not quite so expert as the human article.

The sight of this 17,000-ton battleship slowly circling the centre of a flotilla which took their movements from her was curiously impressive; it suggested immense possibilities to the imaginative. For example, if a new Zeebrugge had to be blocked, a ship with no one on board but wireless controlled from some distance away could be employed to do the work. Or, again, a ship laden with high explosives might be sent into a hostile anchorage and there blown up. An attack of this kind might prove distinctly trying to an enemy's nerves.

The exact nature of the devices employed is naturally a secret, but, simply stated, the system consists in wireless currents which are generated at the control station (that may be either on board ship or on shore) being transmitted "wirelessly" to the object being "controlled." There they are "received" by valves and made to operate magnets. Of the latter a series is installed in the ship—if it is a ship that is under control. Each magnet has a particular job to do. One puts the rudder to port, another turns it to starboard, and so on through the whole range of actions incidental to "running" the ship.

Each magnet does its special job and that job alone—and it works only when current is directed upon it. Communication is made or broken instantly. If the operator at the control station wants a given number of degrees of starboard helm "put on" the "controlled" vessel, he energises the magnet installed for the purpose of starboarding the helm and cuts it out again immediately the helm is in the position required. Instantaneous response to the "signals" from the control station is an essential feature of radio control.

Although he may be 20 miles away from her, the man who handles a ship by this system occupies exactly the same position in relation to navigating her as he would if he were captain giving his orders from her bridge. In the latter case he tells various sailors what he wishes them to do. But by "control," instead of giving verbal orders to men, he transmits "wireleased" orders to mechanical appliances, and they do exactly what he wants them.

Theoretically, the use of different wavelengths for operating different "control" instruments is satisfactory. In practice there are objections to it on the grounds of multiplicity of plant. The better method is to operate the relay switches, which do whatever is required aboard the "controlled" vessel by impulses—or "punches." One wireless "punch" sets a specific switch (or magnet) in action; two "punches" start up another—and so on through the whole gamut of activities that are subject to the will of the man at the control station.

RADIO "HOOK-UP."

June being the month for beautiful, blushing brides, Miss Mabel Brady and John H. Stone, of Dallas, Texas, decided to celebrate.

They did the same old thing that has been done in June for centuries—they got married—but not in the same old way. To relieve themselves of the long, nervous walk down the centre aisle to the waiting minister, they tuned in on their radio instruments with the Rev. Thomas H. Harper, repeated the marriage vows and capped the ceremony with a radio kiss.

This was probably the world's first radio wedding.

ART OF TUNING.

THE RADIO RECEIVER.

By O. P. MINGAY (Member of the Wireless Institute of Australia)

(Concluded).

Whenever you hear on your set some whistling sounds which come and go, varying in pitch, you may know that receiving stations near you are radiating in this way because their ticklers are tuned up too close. This is an excellent opportunity for practicing the Golden Rule—remember that whenever your tickler is increased too far, you are causing to the other stations the same interference which they might cause you.

The single-circuit receiver with its few controls is quite simple to operate, and a little experience enables one to get results easily. This type of receiver is sensitive but is not as selective as the two-circuit type, that is, it is more likely to let through undesired signals, with the desired ones, thereby interfering. On the other hand, the two-circuit receiver, especially if provided with regeneration, is much more difficult to adjust.

The major controls on a two-circuit receiver, are the aerial circuit —called primary tuning; secondary circuit tuning—the coupling between these two—the tickler and the filament making five controls to adjust.

The most important and most critical of these is the secondary tuning. To pick up signals, set the coupling at or near maximum, the detector at proper brilliancy, the primary tuning control at or near its lowest value, and the tickler also at or near its lowest value. Then very slowly carry the secondary wave-length control from zero to maximum. If signals are not heard, change the primary setting five or ten degrees, and vary the secondary through it entire range again. This should be continued until signals are heard. If they are not heard, increase the tickler a little and repeat—"Patience is a virtue" being very necessary with the radio enthusiast.

After a signal is once located, adjust all controls to best results, remembering that if it is desired to obtain selectivity, this is, freedom from interference, the coupling must be decreased toward zero considerably. Do it in small steps so as not to lose the signal at any time. The tickler must be increased to best position, but not as far as to oscillate the tube, since this spoils the signals, and causes the same trouble to other receiving stations, that it does on the single circuit receiver as mentioned above. The decrease in coupling will decrease the strength of the desired signals too, but not as much as the undesired ones.

MAKE YOUR OWN.

ADJUSTABLE GRID LEAK.

The addition of a grid leak, connected across the grid condenser, is often a great improvement in a circuit, and is well worth trying..

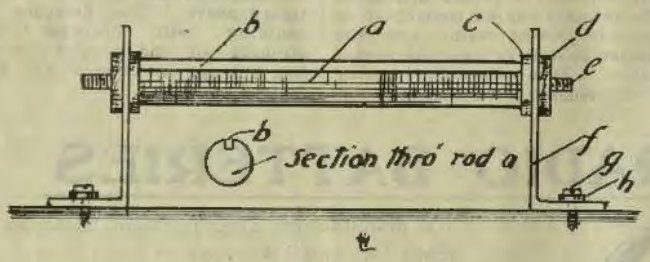
A simple and effective grid leak, which can be varied to suit the particular valve it is being used with, is illustrated here. It only costs a few pence to make, and the experiment may improve signals immensely. All you need is a small piece of ebonite or fibre rod about the thickness of an ordinary lead pencil, and a few scraps of brass. Take the piece of rod "a" (about 1 inch is a suitable length)—the illustration is not to scale—and make a small groove "b" in it as shown, about 1/16 inch wide and 1/16 inch deep.

Drill and tap each end of the rod and screw in about ½ inch of threaded rod "e" each end. Place a washer "c" at each end of the rod, and a nut "d" will also be needed to screw up tightly and hold the washer in position.

The grid leak is now ready for mounting. You could take a small piece of ebonite for a base and mount the leak, or else mount it directly on your panel in any suitable place.

The easiest way to mount it is to have two small strips of brass "f" bent at right angles as shown, with holes punched in them to support the threaded rods. The whole is clamped together by the nuts "d" and screwed down to the panel or base by the screws shown "g," with washers "h" to make the connections.

When this is complete, all you have to do, is to put some pencil lines along the groove "b," as these form the leak. Experiment with this, until you get the correct amount of leak across these pencil lines, and the results will repay you.

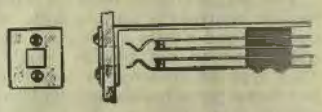


JACKS AND PLUGS.

The advantages of jacks and plugs in a radio set are many, but the disadvantage is that they are too costly for most of us to buy and too hard to make. This article tells how a different kind of plug and jack may be constructed. They work well and look as good as the expensive ones.

The plug is made by first obtaining a piece of bakelite, or fibre, ¼ x ⅜ x 2½ inches long. One sixteenth of an inch is cut off both sides for a distance of 1½ inches so that one end is ¼ x ⅜ inches. The end is then rounded and a small notch cut near each side.

Pieces of brass 3/16 inches wide are then bent to catch in this notch and run nearly the length of the bakelite on both sides. The other ends are held by drilling a hole through the brass and bakelite and putting in small bolts so that they will make threads in the bakelite. The holes are drilled at different places on the two sides so that the bolts will not touch. The bolts must be so short that they will not go all the way through the bakelite and short against the brass on the other side. The connections are then fastened under the small bolts on each side and a piece of fibre tube 1 inch long and ⅜ inch inside diameter is slipped over them. A tiny bolt may be put through this tube to hold it on. The plug is now completed.



The jack is made like the commercial ones. A heavy piece of brass ½ inch wide and 3 inches long is used for the base. The contact strips can be made out of thin springy brass, but phosphor bronze strip is better. Fibre makes good insulation. From the drawing it can be seen how these are cut and mounted. The brass has larger holes cut in the end of it than the fibre has so the bolt will hold them without making contact. The end of the base is bent in a right angle and the jack is fastened to the panel. Three or four wire jacks and plugs may be made by using the other sides of the bakelite plug and putting contact strips on the sides of the jacks.

WHAT ABOUT THIS SET?

A splendid set is possessed by Mr. L. R. Hewett, of Railway arade, Kogarah. The apparatus is seen in the photograph, and he describes it as follows:—

At back of large panel is a 300-1800 metres loose coupler,

which, by means of a double throw, is immediately made conductively coupled, using secondary as tickler, and which I use for telephony over 600 metres. On front of panel is control 600-1800 metres, long-wave set, and audio-frequency amplification, and contains valve ('Audiotron'), variable grid condenser, phones and condenser, and short-wave tuning switches, change-over switch, etc.

The long-wave set (on left) is brought into action by means of a double switch, and is conductively coupled. This tunes from 5000 to 23,000 metres, the primary being tapped every 150 turns, with a dead-end switch at 9000 metres, and is shunted with a .0005 condenser. This tapping gives a good conductive tuning with a small amount of capacity, and using one valve brings in all Continental High-Power stations, including Lyons, Nauen, Bordeaux, etc.

NSS time signals can be heard daily at 1 p.m., and San Francisco is very loud and clear. Above this may be seen amplifying valve and audio-transformer. B battery in box with 3-point switch varying 1½ volts per point, accumulator for amplifying valve and safety gap. A 6-volt 60-amp. accumulator for first valve is under cabinet and leads to filament switch in centre of table.

On 600 metres spark, using 1 valve, I can copy Hong Kong, Singapore and Honolulu nicely, and wiht 2 valves Cavite can be heard 60ft. from phones (Baldwin's), and music from Mr. Macfurcan can be heard upstairs.

Aerial consists of 3 wires on 5ft. spreaders supported by 50ft. and 30ft. masts, 75ft. apart with 30ft. lead-in. The whole of this set is home-made.

Our Radio Yarn

A Village Murder.

By O.E.M.

"I don't half like it," said old Mary Dawson, as she sat with her husband on the verandah seat waiting for a cool breeze to come along and make the sultry evening more bearable.

"You can never get to the bottom of these city fellows," said Bill Dawson, "I am sorry that we let this chap Fletcher have our balcony room for the summer."

"But he seemed such a nice quiet young chap, wearing glasses and all," ventured Mary.

"Anyhow, this wireless stuff he is experimenting with, is a lot of tomfoolery, Mary, and I am afraid that it is a blind for something worse. I did not like to mention it to you before, but I have several times heard men's voices, yes, and a woman's voice, too, during the evening, and I have never seen a living soul come down the stairs."

"Do you think it could have been anything to do with the wireless that you heard, Bill?"

"Wireless be blowed," said Bill with emphasis, "a lot of tap-tap-tapping with no sense at all in it. He got me to put those telephone things on my head one day, and how anyone could listen for hours to stuff that sounded worse to me than the verandah blind tapping on a windy night—well, there must be something wrong with them."

Bill and Mary turned in that night, both feeling that things were not as they ought to be, but as they were simple old souls, they determined to think the best of their lodger, and wait to see what would happen.

It was in the very early hours, next morning, when a strong southerly breeze sprang up, and sweeping down the village street, expended its force on the exposed house in which Bill and Mary were uneasily sleeping.

It was Mary who woke first. She started violently, and lay staring at the ceiling, wondering what could have happened. The house creaked and groaned, but her blood almost seemed to freeze in her veins as a mournful wail, which gradually rose to a shriek, sounded down the stairs, and seemed to come from the lodger's room above. With trembling hand she woke Bill, and in a moment the heartrending wail was repeated, this time with even more intensity.

"A woman's voice, and her death-cry," whispered Bill hoarsely. "Lock the door, Mary, for I am too old to struggle with a madman, and that is what must have happened. Fletcher must have got some poor woman up there, and is murdering her."

"Oh, Bill, we must do something," said Mary. "Let us slip out the front door, and in a few moments we could rouse the constable, and perhaps save the woman, or at least prevent any further crime being committed."

Shivering and trembling, the couple made their way out into the street, and hurried to the village lock-up. The constable, hearing the words "madman and "murder," did not feel like going single-handed to the scene of the tragedy.

He roused up several of his neighbours, and armed with all kinds of weapons, they gathered in front of the lock-up, and discussed what to do.

The little band stopped in front of Bill's house, and listened intently. There was silence save for the racket caused by the wind, but they turned to each other fearfully, as a faint almost undistinguishable moan floated down from the balcony room.

"There is no time to be lost," whispered the constable; "let us all rush in together and up the stairs."

The men nodded, and with a few half-fearful backward glances they opened the door, and scrambled in a bunch up the stairs. The constable turned the handle of the door at the top, and, as expected, found it locked.

"Open, in the King's name," he shouted, feeling that he was indeed in a position at last, where he could display that valour which so often coloured his dreams.

Fletcher, the mild youth with the spectacles, was considerably astonished at the sudden onslaught then made on the door, and hastily stepping out to the balcony, he climbed over the rail, and slid down to the street. There, he was espied by the women folk, who immediately started to shriek "murder!" He did not wait for more, but took to his heels, and ran at a pace that would not have discredited any sprinter.

The constable and his followers broke the door down, and as it fell with a crash, they gazed into the room, looking first, instinctively, at the floor, where they expected a gruesome sight, but the room seemed to be in order.

The constable stepped quickly out to the balcony, and was then informed by the women below that the bird had flown, and alone.

The men decided to search the room carefully, and they gazed with awe at the wireless gear which occupied the whole of a large table on one side of the room. "I wonder what this gramaphone horn arrangement is" said one of them, and at that moment they were all startled violently by hearing a voice ask them loudly, in tones that filled the room: "Did you get me, that time? I will now send you a flute solo."

The voice, of course, proceeded from the loud speaker attached to the wireless set, and as the strains of music from a flute filled the room, the men looked at each other and began to realise what had aroused the suspicions of a murder having been committed. The constable gingerly turned one of the knobs on a panel beside the loud speaker, and instantly howls and shrieks issued from the instrument, and Bill was the first to lead the hearty laugh which went around.

It was dawn before the village

(Continued from Page 8)

settled down again to rest, and Mary, peering out into the street, her heart full of sympathy for the booger who had been so rudely scared away from his home, descried a lonely figure in spectacles looking cautiously around a corner. She beckoned to him, and finally induced him to return and listen to the explanation of the strange proceedings of the night.

The village, however, would not be appeased until Fletcher gave them all a demonstration of his machine in the local hall, and not being able to boast of a murder, they were content to boast that they had heard "Melbourne Radio" speaking.

FOOD FOR THOUGHT.

In a recent issue of The Electrician there appears the following editorial comment, which offers sound food for thought:—

"Apart from the press stunts, of which wireless has been the victim (or conspirator), the thing that most strikes the observer of progress in this branch of electrical service is the enormous disproportion between the hundreds of kilowatts utilized at the transmitting end and the few microwatts picked up at the receiver. No doubt this apparently inevitable state of affairs has had its influence upon those who have been engaged in the practical development of wireless, for it is only within recent years that any progress has been made in the rounding up and extermination of the losses which take place within the transmitting plant itself.

The old spark transmitter had an efficiency in the neighborhood of 15 per cent., but it is only necessary to inspect the oil-cooling system of the high-frequency alternator, the water jacketing of the arc, or the red-hot anodes of the very latest transmitter, the 3-electrode valve, to realise that even present day apparatus has far to go before it aproaches the efficiencies now commonplace in low-frequency and direct-current work."

AMPLIFIER NOISES.

By "STATIC."

One of the difficulties in amplifier design is the elimination of various sizzling, crackling, or howling noises, which are frequently heard in amplifiers when several valves are used. The noises are due largely to the following causes:—

(a) Faulty insulation of the amplifier.
(b) Transformer leakages.
(c) Eddy currents in iron cores.
(d) Uneven discharge of A and B batteries.
(e) Faulty plate battery.
(f) Microphonic noises due to vibration.
(g) Undesirable capacity effects.
(h) Leakage of current through the person operating the instrument; faulty insulated 'phones.
(i) Self oscillation of the valves.
(j) Defective valves such as those having grids or plates which are not rigid.

The noises may sometimes drown the signals. They can usually be cut out by decreasing the filament current, but at the same time the signals are also weakened. The greatest care should be taken to insulate all parts of the amplifier,, more especially the transformers, which usually give most trouble.

Noises can often be decreased by connecting the iron cores of the transformers by a wire to the positive side of the plate battery. Microphonic noises are those heard in the 'phones when the valves in an amplifier vibrate. Undesirable capacity effects, which frequently produce singing noises, may usually be prevented by separating the various leads and parts of the amplifier, as much as possible.

A TITLE WANTED.

We are offering a prize of 5/- for the best title for our front page pictures this issue. The two photographs should be covered by the one title.

Entries should reach the Editor, Box 678, G.P.O., not later than November 20th.

Envelopes should be marked Picture Title.

SUPER-REGENERATIVE.

ARMSTRONG'S FAMOUS RECEIVER.

We have come to another milestone in radio progress. This time it is the super-regenerative receiver invented by Major Edwin H. Armstrong who, as the inventor of the regenerative circuit, the feed-back, and other improvements in vacuum tube receivers and transmitters, is one of the outstanding figures in radio history.

The potentialities of the super-regenerative receiver are enormous, and, indeed, threaten to revolutionise present radio practice. The fact that the new super-regenerative receiver, is 100,000 times more sensitive than the regenerative receiver, means a good deal in radio. Furthermore, it must be remembered that Armstrong's regenerative receiver, now so widely employed, is ever so much more sensitive than the ordinary vacuum tube receiver. The receiver can be worked on very short waves, well below 200 meters, thus opening up a new field of wave lengths for radio-phone broadcasting. It makes indoor loop antennae practical, so that the outdoor antennae must soon disappear.

The general principle of the super-regenerative receiver may be readily explained as follows:

Consider the usual regenerative receiving set. Incoming signals are applied between the grid and the filament of the tube, and the oscillations are amplified in the tube as a result, so that we obtain very much greater variations in the plate circuit. Now, if the plate circuit is coupled back to the grid circuit, the reinforced oscillations are fed back to the grid, and, in turn, once more go through the amplifying process and cause still greater variations in the plate circuit, and so on, over and over again.

The regenerative process increases the sensitiveness of a single vacuum tube detector enormously, making it possible for the well-equipped radio amateur to pick up radio-phone stations at hundreds of miles and even thousands of miles distant.

The regenerative process, however, can be brought up just so far and no further. As the regenerative action or feed-back action is increased, the sounds in the telephone receivers or loud-speaking device become louder and louder, but suddenly the arrangement breaks down and the sounds while still louder, become mushy and distorted. The radio-phone speaker's voice, so clear and loud up to this point, now becomes a mere gibberish. The reason is that the detector tube has begun oscillating and is putting out its own oscillations which interfere with and break up the received radio-phone waves. If the oscillating conditions could be overcome, the regenerative or feed-back action could be still further increased, with a very great gain in sound strength.

It has remained for Major Armstrong to get around the usual oscillating point of the tube. As the regenerative action takes place in the usual tube, the resistance of the circuit, as far as the radio frequency current is concerned, approaches zero. If the tube can be kept from oscillating, the effective resistance gets down to absolute zero and even less than zero, and takes on a negative resistance. In his super-regenerative receiver Major Armstrong increases the coupling between the grid and plate circuits so that the tube is far beyond the oscillating point and the effective resistance of the circuit is less than zero, having a negative resistance. He puts a stop to the oscillations so that he can take advantage of the negative resistance and in this manner obtains signals or sounds of heretofore undreamt-of strength.

A set employed by Major Armstrong in demonstrating his new receiver before the Institute of Radio Engineers in New York City, makes use of a vario-coupler, a duo-lateral coil, two Seibt type variable condensers, three Western Electric type vacuum tubes, fixed condensers, "B" batteries, filament battery, loud-speaker, and various accessories.

At Honolulu, the Radio Corporation of America is introducing remote control in connection with their Koko Head Station (KIE). This station works direct with both Japan, Funabashi JJC, and Bolinas, California (San Francisco) KET. The station will be operated from a central office in Honolulu, a distance of about 60 miles from the station.

ILLAWARRA RADIO CLUB.

The fortnightly meeting of the Illawarra Radio Club was held at the Club room, No. 75 Montgomery Street, Kogarah, on Thursday 26th October.

Mr. Hewett reported the result of the last meeting of the new Radio Association, and pointed out that as the present Delegates (he and Mr. Atkinson) held Office in the new Association it was necessary that the Club appoint a new Delegate. Mr. C. A. Gorman was accordingly appointed.

Mr. Gorman continued his lectures on "Constructional Details."

METROPOLITAN CLUB.

Members of the Metropolitan Radio Club have expressed complete confidence in their officers, and at the last meeting re-elected them.

It will be remembered that the president, Mr. R. C. Marsden, Miss J. V. Wallace (treasurer), and Mr. Mitchell resigned recently. Mr. Marsden's and Miss Wallace's reasons were that they were connected with the selling of radio apparatus, and, therefore, did not think it was right that they should hold office in an amateur's club. At the meeting Mr. Marsden spoke straight and to the point. Several members contended that the officers were mistaken in their views, and mentioned that members were quite satisfied.

The officers allowed their names to be submitted for re-election, and following was the result:—President, Mr. Marsden; hon. treasurer, Miss Wallace; hon. secretary, Mr. Mitchell; committee, Messrs. W. Best, F. Swinburne, W. Bird, S. Atkinson, and W. Cotterill. Mr. Marsden and Miss Wallace were also elected delegates to the Radio Association.

LEICHHARDT AND DISTRICT RADIO SOCIETY.

The fourth general meeting of members of the above society was held at the Club Room, No. 3, Annesley Street, Leichhardt, on Tuesday, October 31st, when three short papers by Mr. W. J. Zech were read by the author. The subjects dealt with were, Crystal Detectors and Their Action, The Telephone Receiver and Its Construction, and A Few Points on Magnetism.

At the conclusion of the lecture a discussion on the subjects dealt with followed, and many interesting points were raised by members.

Later, Morse practice was carried on, as it is the desire of the council to raise members to the "12 words per minute" standard as early as possible.

The next meeting is to be held on Tuesday, November 14th, at 8 p.m., and all interested are invited to attend. The membership of the society is steadily increasing, and any information desired will be gladly supplied by the hon. secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.

WAVERLEY AMATEUR RADIO CLUB.

At the last meeting of the W.A.-R.C. a vote of confidence was passed in its delegates to the recent conference of the Radio Association of Australia upholding their action in opposing the election to executive office of any person commercially interested in radio. For the present we have decided to remain in the association to watch our own interests.

Mr. Lawrence has resigned as trustee of the club's license, and Mr. N. S. H. Rubie has resigned as treasurer. Mr. G. Thompson was elected trustee, and Mr. E. Lavington has been appointed treasurer.

The club has been asked to organise for the reception of the trans-Pacific radio tests in this State, and a committee, consisting of Messrs. E. Bowman,, C. Doyle, G. Thompson, E. Lavington and F. H. Harvey, has been appointed. A meeting of all clubs and persons interested in this matter will shortly be called.

The club's call sign has been altered from N249 to 2BV.

Any person wishing to become a member of this club should write to the hon. sec. Mr. F. H. Harvey, "Lourdes," Nelson Bay Road, Bronte.

STATION CALLS.

SHIPS STATIONS. GREAT BRITAIN

Ormara MVD; Orlock Head GFDC; Ormonde BNC; Orna GNY; Orantes MOZ; Oropesa GDLP; Orotava GDJM; Orotava GUD; Orowaiti GFMP; Orsova MOF; Ortega MJK; Orteric GBJW; Orthia YYT; Ortinashell YLB; Oruba MGJ; Oruba GUE; Osiris GAQ; Orvieto MOJ; Osterley MOY; Otaki GCLN; Oswestry GDYK; Otarama GTI; Othello YNT; Otira XFD; Ottawa MIV; Otterburn YBH; Otto Kalthoff GBYV; Overdale BUY; Oxfordshire MYE; Ovid GBTQ; Oxonian MHR; Oyleric YPE; Ozarda GNZ.

Pacific Transport ZED; Pacuare MLY; Padua GCVZ; Pakena GLG; Pak Ling ZJN; Palermo MIL; Palitana ZSQ; Palma MKD; Palma YMG; Palmella GDNZ, Palm Branch EWG; Paludina GFLM; Panama MWB; Panama Transport ZDV; Pancras MDI; Pangani GBZN; Pangbourne OGL; Pardo GLL; Pannonia MNA, Paparoa MHY; Paraguayo GCSP; Parana GLK; Paris GLC; Paris City GDRP; Patani ZIL; Parktown ZYF; Parthenia ZXJ; Partridge GDTS; Pasha MZZ; Partella MZO; Pathan MPV; Patia GDCY; Patricia GBZP; Patrician BDI.

Patriotic, LSM; Patrol, MEM; Pavia, ZZV; Patuca, GDB; Paul Paix, YGP; Pary (La), GDLQ; Pays de Waes, GDXR; Pear Branch, GDZJ; Pearleaf, ZZO; Pearlmead, YIM; Peebles, ODB; Peel Castle, MVB; Peleus, YFO; Pembroke, BDT; Pembrokeshire, MUT; Penare, YFM; Pencarrow, GFQJ; Pencisely, BNY; Pendarves, YHB; Pendeen, XFI; Pendennis, GBLB; Pendragon Castle, ZZF; Pengelly, YLX; Pengreep, EWR; Penmowah, ZXN; Penmount, XFH; Pennard, ZZC; Pennyworth, ZPL; Penolver, YXT; Penpol, GBLT; Penrhos, YKW; Penrhydd, EXY; Penrhys, MHX; Penrose, ZWU; Pensacola, OED; Pensilva, YMZ; Pentaff, GBYM; Pentakota, ZSN; Pentaur, GOV; Penteifi, GBXM; Perez, BQZ; Perim, GBKD; Persian Prince, XIZ; Persic, MQC; Perth, EWC; Perthshire, GQB; Peru, GLN; Peshawur, GCBS; Peter Killen, GDRJ; Petersham, ETZ; Peterton, YGV; Petingaudet, BFW; Petricola, GFLN; Petrograd, BUF; Petroleine, ZYK; Petworth, XIH; Peveril, XKK; Phidias, YOT; Phoebe, OCN; Philadelphian, GCMJ; Phorus, YCY; Phrygia, EST; Physa, EVW; Piako, GBYP; Pikepool, XLV; Pilar de Larrinaga, BHF; Pilton, GDBP; Pinar del Rio, GCNJ; Pinemoor, ZJO; Pinewin, GBX; Pinot, GBTV; Pittsburgh, GFJS; Pladda, GFMB; Planorbis, GFLP; Plassy, MNJ; Plata, GBKF; Plumleaf, ZZM; Plerodon, GFLQ; Plum Branch, GBJL; Plutarch, ZIB; Pointer, GDTR; Poland, ZWZ; Polbain, BLH; Polcrest, BOH; Poldennis, FBY; Poleric, GCY; Polo, GBNJ; Polglass, Castle, ZTA; Polgowan, ZIZ; Polish Monarch, EJC; Politician, MVZ; Polladern, ZMH; Pollensa, XHS; Polperro, BFZ; Polshannon, XUK; Poltolia, ZWA; Polycarp, XIE; Polyphemus, YSZ; Pomaron, OEI; Poona, MSO; Poplar Branch, YPF; Porsanga, YBW; Port Adelaide, GCNR; Port Albany, CWI; Port Alma, EQB; Port Augusta, EPN; Port Bowen, XHP; Port Caroline, XHQ; Port Chalmers, EJW; Port Curtis, GCFJ; Port Darwin, YGL; Port Denison, YGM; Port Elliot, ZLT; Portfield, GCBF; Portgwarra, BLP; Port Hacking, EIP; Porthia, GDLM; Portinglis, MXN; Port Kembla, GCNQ; Port Lincoln, GTZ; Portloe, EKN; Port Lyttleton, ZPD; Port Macquarie GSB; Port Melbourne, ZSW; Port Napier, ZNZ; Port Nicholson XHO; Port Pirie, ZSV; Portreath MXX; Portrushton, YPW; Portsea, YQH; Port Stephens, ZSU; Port Sydney, ZLU; Port Victor EQD; Portuguese Prince, GHS Portwood, GFCK; Potomac, GLC Potosi, MII; Prah, ERW; Prahs ZMB; Prairial, BAM; Pretoria GCYB; Pretorian, MFN; Prian YTO; Prince George, GLR; Prin Rupert, GLS; Princesa, ZQ Princess, BJX; Princess Er GDQX; Princess Maud, YX

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