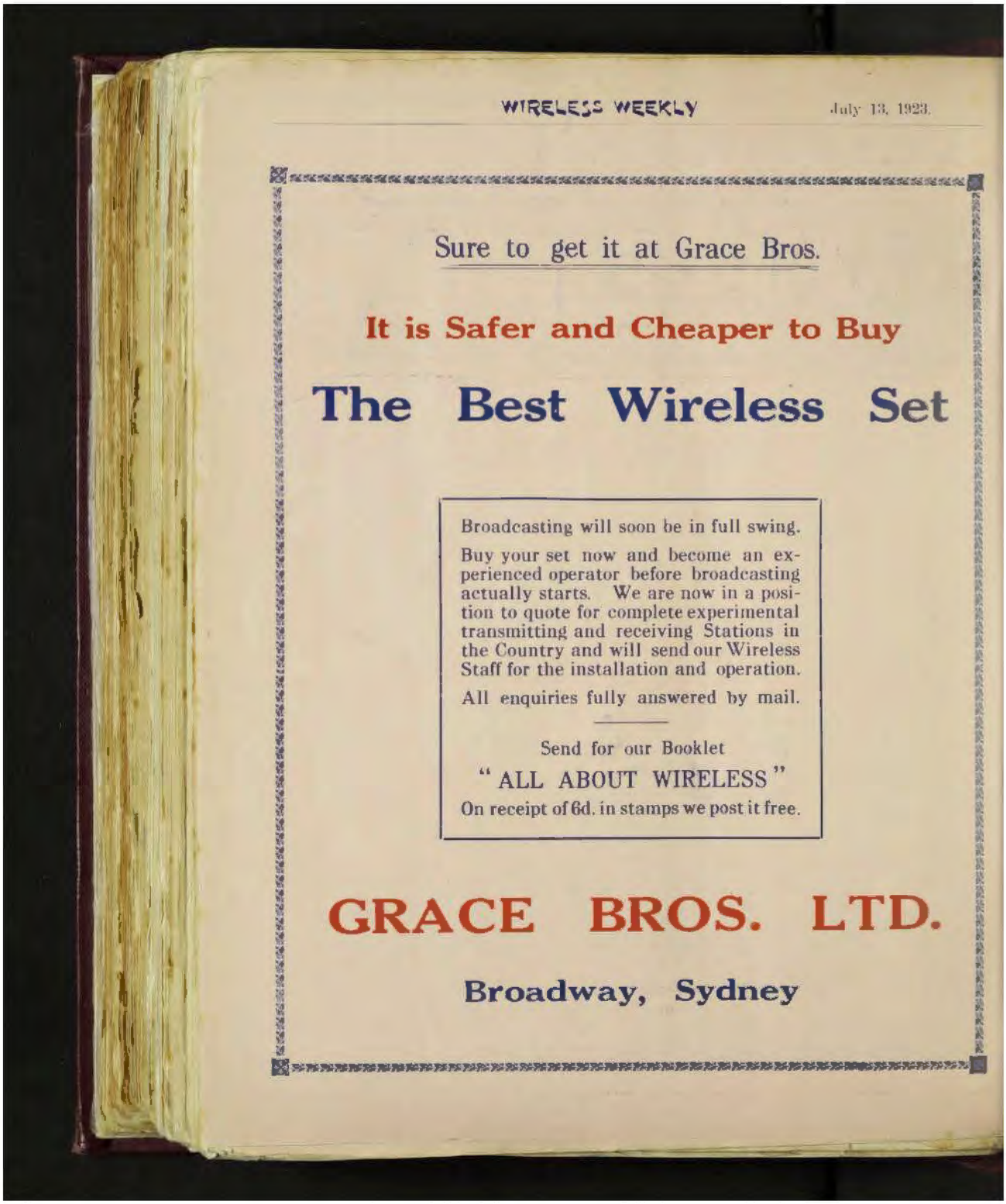
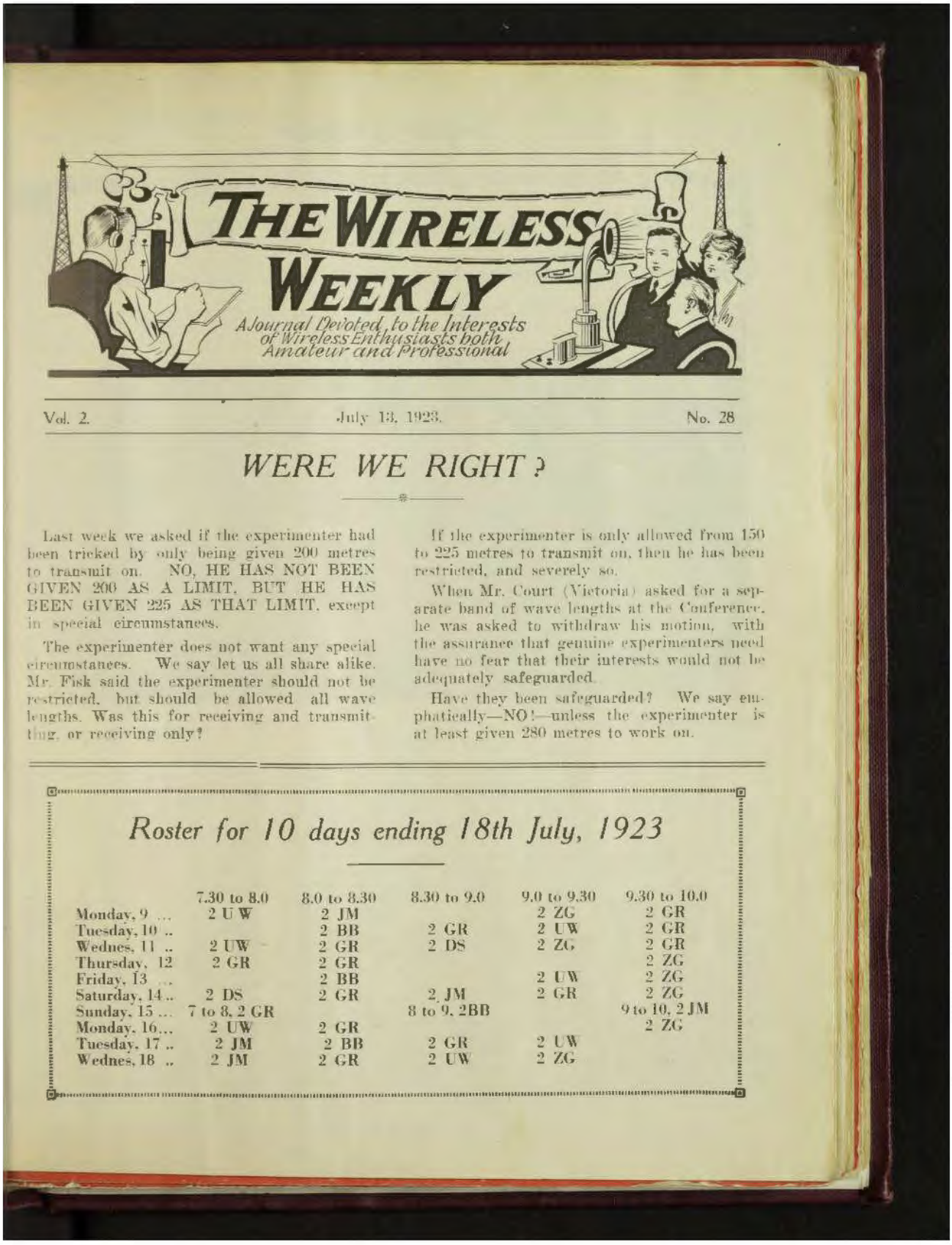




THE WIRELESS WEEKLY

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

Vol. 2. July 13, 1923. No. 28

WERE WE RIGHT?

Last week we asked if the experimenter had been tricked by only being given 200 metres to transmit on. NO, HE HAS NOT BEEN GIVEN 200 AS A LIMIT, BUT HE HAS BEEN GIVEN 225 AS THAT LIMIT, except in special circumstances.

The experimenter does not want any special circumstances. We say let us all share alike. Mr. Fisk said the experimenter should not be restricted, but should be allowed all wave lengths. Was this for receiving and transmitting, or receiving only?

If the experimenter is only allowed from 150 to 225 metres to transmit on, then he has been restricted, and severely so.

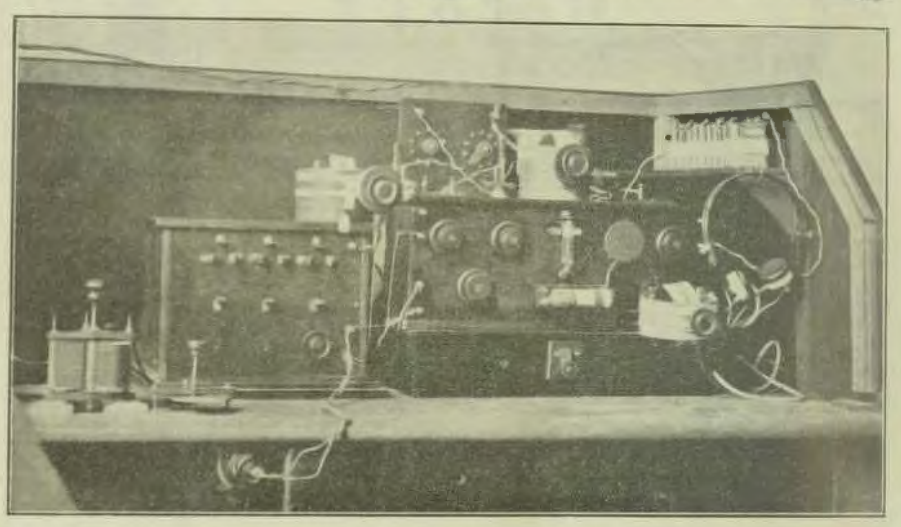
When Mr. Court (Victoria) asked for a separate band of wave lengths at the Conference, he was asked to withdraw his motion, with the assurance that genuine experimenters need have no fear that their interests would not be adequately safeguarded.

Have they been safeguarded? We say emphatically—NO!—unless the experimenter is at least given 280 metres to work on.

Roster for 10 days ending 18th July, 1923

	7.30 to 8.0	8.0 to 8.30	8.30 to 9.0	9.0 to 9.30	9.30 to 10.0
Monday, 9 ...	2 UW	2 JM		2 ZG	2 GR
Tuesday, 10 ..		2 BB	2 GR	2 UW	2 GR
Wednes, 11 ..	2 UW	2 GR	2 DS	2 ZG	2 GR
Thursday, 12	2 GR	2 GR			2 ZG
Friday, 13 ...		2 BB		2 UW	2 ZG
Saturday, 14 ..	2 DS	2 GR	2 JM	2 GR	2 ZG
Sunday, 15 ...	7 to 8, 2 GR		8 to 9, 2BB		9 to 10, 2 JM
Monday, 16...	2 UW	2 GR			2 ZG
Tuesday, 17 ..	2 JM	2 BB	2 GR	2 UW	
Wednes, 18 ..	2 JM	2 GR	2 UW	2 ZG	

THE TRANS-PACIFIC TESTS



2 EC, which was the only station to log official signals during the tests in N.S.W. It has not yet been presented with the prizes it won.

Some months ago tests were conducted between America and Australia. American amateurs transmitted and Australian experimenters endeavored to log them.

In New South Wales the test took the form of a competition, and certain firms offered prizes for the most successful.

A committee, under the chairmanship of Mr. Malcolm Perry (late Australelectric) took the matter up, but owing to the lack of publicity, etc., very few experimenters entered for the competition.

The Trans-Pacific tests started on 1st May and ended on the 31st May.

On the 6th June a meeting of the Trans-Pacific Test committee was held at the Royal Society's Rooms, Elizabeth Street.

Mr. W. J. Maclurdy, Editor of Wireless Weekly, was requested to open the logs—11 in all—9 or 10 which had been sent in by Mr. Gorman.

At this meeting the Secretary handed the Chairman a report, but for some reason this report was not read. Some time after this meeting, Mr. G. A. Gorman was rung up on the telephone and told that he had been awarded the 1st prize only.

Mr. Gorman, after due consideration, wrote the following letter to the Trans-Pacific Committee:

31 Segenhoe St.,
Arncliffe.

The Hon. Secretary, T.P. Tests,

Dear Sir,—I have been notified that Station 2EC officially won the tests, and that your Committee has decided to grant the first prize in the first section only, and let all the other prizes lapse. In my opinion this is not a fair course to take. The schedule of prizes posted to entrants clearly shows six sections under different headings. No mention has at any time been made about any prizes lapsing through any cause whatsoever, or is any mention made to the effect that only one prize shall be awarded to any station. As station 2EC happens to be in the unfortunate position of being the only one whose logs have been marked officially correct, why has the right to win under more than one section been taken away from it? This matter was discussed at the prize committee meeting, held at the shop of Messrs. Colville & Moore, when it was decided that more than one section could be won by any station. Station 2EC clearly wins section 1 (most complete log) and

in my opinion also clearly wins section 2 (most complete log of signals on least valves). Section 3 (greatest number of stations). As soft valves and a standard circuit was used, the remaining sections must lapse, but Station 2EC clearly had the most complete log, the greatest number of stations, and as only 2 valves were used, the greatest number on the least valves. It must be kept in mind that these tests were a competition pure and

Mr. C. A. GORMAN

simple, prizes clearly won should in all fairness be awarded to 2EC, irrespective of how many received signals. Trusting this will receive your earnest consideration.

I remain,
Yours faithfully,
(Signed) C. A. GORMAN

Over 2½ months have elapsed since the tests commenced, and Mr. Gorman has not had a reply to his letter nor has he received the prizes due to him.

The Following are the Prizes we Consider Mr. C. A. Gorman is Entitled to.

1st prize for most complete log of signals, £10/10/-.
1 prize for the most complete log of signals on the least number of valves, £5/5/-.
1 prize for using a soft valve as a detector, 10/-.
1 prize for the most original circuit, £3/3/-.
1 prize for the greatest number of stations logged, £2/2/-.
Making a total of £21/10/-

This list of prizes is compiled from the official list, and was published in Wireless Weekly, Vol 2, No. 18, 4/5/23.

If Mr. Gorman won the 1st prize then the others mentioned above both justly and legally belong to him.

A number of the firms who donated prizes, when interviewed by the writer (though their prizes had not been won by Mr. Gorman) suggested that they would not object to their prizes also being handed to Mr. Gorman for his splendid achievement.

Mr. Gorman is the only N.S.W. experimenter who officially logged American amateur stations during the test, and it must be remembered that N.S.W. had just double the number of experimenters as compared with any other State.

It is to be hoped that Mr. Gorman will be handed his prizes immediately. It will soon be impossible to get up competitive tests if after they are over the winners have difficulty in obtaining the prizes they had won.

The Story of the Tests.

During the Easter vacation, 1922, Mr. H. K. Love (President of the Victorian Division of the Wireless Institute) conceived the idea of conducting an organised test to ascertain whether the signals of the American Pacific Coast amateurs were audible in Melbourne, and this idea was further encouraged by reports appearing in the radio press of the successful reception of many American experimental stations in the United Kingdom. Mr. Love, with characteristic energy, set about the organisation of a combined test, and to this end wrote to four leading radio clubs on the American Pacific Coast. The only reply received was from the Longbeach Radio Association (President Robert J. Portis), who welcomed the idea with great enthusiasm. The outline of the scheme was then put before the Victorian Division of the Institute, and Mr. Love was appointed President of a special committee, whose work was to organise the working details of the test. There was also appointed a committee to handle the technical side. The experiment was to consist of a sustained attempt to receive the signals of the Pacific Coast amateurs on wavelengths approximating 200 metres, with a power limitation of 1000 watts.

After consideration it was decided to make the test a Commonwealth matter, and accordingly all Divisions of the Wireless Institute were invited to participate, and to organise each particular State. To the first letter sent out to the Divisions, South Australia was the only State to reply, and this State unfortunately could not see their way clear to join in the experiment. After a lapse of three months, and in the absence of any communication from the New South Wales Division of the Institute, the advice of several leading Sydney experimenters was sought, and this course resulted in Waverley Club taking over the organisation of New South Wales The N.S.W. Institute then complained they had been overlooked, but were informed that matters had gone too far to alter the organisation; it was also pointed out that Mr. Love's original circular letter had been ignored. Queensland was then organised, the three eastern States working in conjunction. Much trouble was experienced in arranging the American end of the test, owing to the delay between mails and the many misunderstandings which arose. A schedule was sent to Mr. Portis by Mr. Love, which was approved, conditionally upon further details being sent over from America. These "further details" never came to hand, and final arrangements had to be completed by cable at the last moment, which nearly upset the whole of the carefully arranged schedule. Copies of correspondence sent by the Wireless Institute to the Longbeach Radio Club show clearly that the mistakes were made at the American end. At this particular time the American paper, "Radio Journal," took over control from Mr. Portis, and over 500 entries were received for the test from all over America. "Radio Journal" prepared an adequate list of code words which were allotted to competitors, a copy of which was to be sent to the Controller of Wire- that very more startling results Mr. Love's request to the contrary.

a copy of this code was sent him, and he was thus barred from competing in the test. A sorry reward for his months of work! Owing to misunderstandings, which were finally cleared up by somewhat expensive cablegrams, the test officially commenced on the 20th May, and lasted until the 31st May.

Very generous prizes were offered in connection with the contest, and it was decided to allot the first prize to the competitor presenting the most complete log.

The original dates were from 17th May to 31st May. In fact,

Mr. J. W. ROBINSON.
Hon. Radio Inspector, Western Suburbs (N.S.W.)

listening-in was being carried on by many competitors from the 1st May, but owing to the fearful atmospheric conditions in Victoria, little could be done in the nature of logging signals.

The six months drought broke on the 10th May, and the accompanying weather conditions were extremely unfavourable for reception. These conditions, however, settled down gradually into normal winter weather. The first signals to be logged were those emanating from Major Mott's station, which were received in several places, both in New South Wales and Victoria. 6CGW was another American station heard both in Sydney and New South Wales. However, the most complete log, and undoubtedly the most consistent record was presented by Mr. M. Howden, of Box Hill, Victoria (3BQ). This gentleman's record was truly magnificent, for he logged perfectly no fewer than twenty American stations, and practically all his work has been simply confirmed. 3BQ's win was through sheer merit and dogged persistence. His apparatus was of a fairly simple character—two stages of tuned radio frequency, with one stage of reflex audio-frequency. His tuner was of the spider web coil variety, and the aerial was inductively coupled. 3BQ is rather favourably situated, being over 350 feet above sea level and his earth system includes a deep well. His log shows that much interference was experienced throughout the test, and the excellent results obtained are nothing short of miraculous. Mr. Howden has been the recipient of many congratulations from experimenters all over the State, and is being tendered a dinner by the Box Hill section of the Victorian Division of the Institute shortly.

The next best log received was presented by Messrs. C. Ham and R. A. Hull. The efforts of these gentlemen were greatly hampered by local induction from a nearby power station, and electric trains and trams. Nevertheless, their results are very good, seven stations being logged, and a complete message being received from station 6JD. Three stages of radio frequency were used by this station.

Mr. H. K. Love, with four stations, comes next on the Victorian list. Mr. Love, of course, was disqualified from formally contesting, owing to his knowledge of the code, but his work stood out by reason of his reception of a station which was not logged anywhere else, 3KK, and if this is confirmed it will prove a record as the third American District is around New York!

Mr. Gorman, of New South Wales, logged six stations, but some of the "5" call signals are open to doubt, as "5" belongs also to Western Australia, where amateurs are working on 200 metres.

Mr. C. Maclurcan reports having logged one station, but it is understood this gentleman did not actively participate.

Though the final allotment of prizes has not yet been made, there appears little doubt that Mr. Max Howden, Victoria, has come an easy first.

Mr. Love expressed much satisfaction at the success attained in the tests. In comparison with the work done last year across the Atlantic, the Pacific Test is of far greater importance. The distances are upwards of 8000 miles, and in Victoria the signals have to come over mountains and very dry country. Notwithstanding the drought and bad weather conditions, reception was quite consistent, thus proving that the logs were not of a "freak" character. Much success has been gained in New Zealand, but the writer's experience tells him that atmospheric conditions are far superior in that country to those obtaining in Australia, and the additional distance—about 1400 miles—has to be considered.

Mr. CHAS. MACLURCAN.
Hon. Radio Inspector, Transmitting Stations (N.S.W.)

The test has provided that Australian radio enthusiasts are well up in the front in their hobby, and it is to be hoped that when the tests are renewed in October next, that even more startling results will be obtained. It has been re-

ported on excellent authority that an American station, 6JD, who was by far the loudest station logged in Victoria, has been read in South Australia on a single valve receiver. Let us hope that this fact will induce many more contestants to join in the test, as only 15 were entered in Victoria, 15 in New South Wales, and 5 from Queensland. The fact that the Pacific can be bridged by such short waves and by so small a power is highly important. The Trans Pacific Test is making wireless history, and this has been done by pure "amateurs." Long live the Australian "amateur"!

DIAL MOUNTED SERIES PARALLEL SWITCH.

(By J. BALSLEY.)

Following is a description of an arrangement for operating a variable condenser in series or parellel with an inductance by merely revolving the dial through 180 degrees. For the first 90 degrees, the capacity is in series and diminishes up to the point where it changes to a parallel connection after which it increases for 90 degrees more. Using it in this manner, only one-half of the brass strips on each side are brought into play. If so desired, the condenser may be used in series through the entire 180 degrees, and in parallel for the next 180 degrees, as may easily be seen by studying A of Fig. 1. This switch requires the use of a flat back 4 inch dial, of which there are many on the market, four switch points and a piece of brass or copper sheet 3½ inches in diameter, together with a few inches of fine wire to make four light springs. The brass strips, when cut to size, can be glued to the back of the dial more easily than fastening by countersunk screws. This is very easily made and eliminates the necessity of using the usual unsightly series parallel switch.

SHIPS YOU SHOULD HEAR, NEARING AND DEPARTING FROM OUR COAST.

CAPEMAY	WDOI
DIOGENES	GCSV
HOLLYWOOD	KDCS
HUNTINGDON	GJFZ
HYMETHUS	GCPL
MAUNGANUI	GFYB
ORCADES	GBKL
PORT ALBURY	GWI
SURREY	GCBJ

Miss Lee White, who has won her way into the hearts of the Australian public, was the first person to make an appeal by wireless. By the courtesy of Paling's, and with the co-operation of the New Systems Telephones, she broadcasted an appeal on Sunday night in her effort to raise 10,000 shillings to commemorate the fact that 10,000 babies have been born at St. Margaret's Hospital for Women at Darlinghurst, where 1/- keeps one baby for one day. The appeal was signally successful, and Miss Lee White is still receiving money as a result. Readers of the Wireless Weekly are invited to send her any number of shillings to the Hotel Australia, which she will be glad to acknowledge personally.

MAKE YOUR OWN

How to Determine the Constants of your Antenna.

By MORRIS S. STOCK.

Whether an antenna is a poor or a good receiver of radio waves depends to a great extent upon its constants (electrical properties which can be determined by measurements or sometimes estimated or computed) and by another property of the antenna, "effective height."

The term "constant" is somewhat misleading because some of these electrical properties of antenna vary greatly with the length of radio waves to which the antenna is tuned. But at a particular wavelength the constants of an antenna when used with a ground do remain much the same for a considerable period.

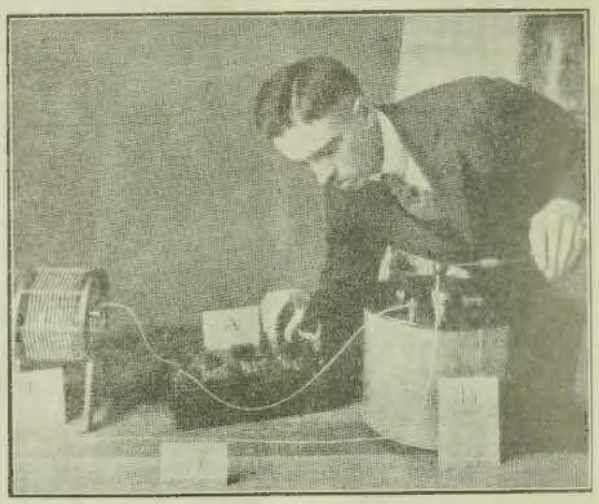
What are the constants of an antenna?

(1) Resistance;
(2) Capacity;
(3) Fundamental wavelength, and
(4) Inductance.

The resistance of an antenna is the opposition which it offers to the flow of the high-frequency (rapidly reversing) currents induced in it by the radio wave. High-frequency or radio frequency currents flow only on the surface of a conductor. Therefore if the surface area is increased the resistance will be reduced. Antenna resistance is a complex quantity, but it may easily be expressed in ohms.

The capacity of an antenna is a property which enables it to hold a certain electrical charge, and then to discharge this in the form of electrical energy through the receiving set to earth. Capacity is expressed in microfarads.

The fundamental wavelength of an antenna is the length of the wave to which it will respond when it is connected directly to earth. Thus if an antenna had a fundamental wavelength of 200 metres, electrical vibrations or oscillations will be set up in the receiving antenna by a transmitting station that is sending out signals of this wavelength.



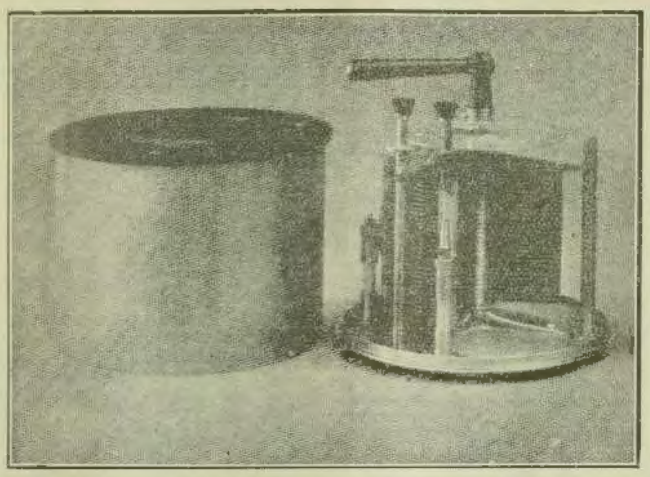
THE "PHANTOM ANTENNA," USED FOR LABORATORY TESTS.

The author demonstrates the resistance box, A, which can be set at any value of resistance to be substituted for the resistance of the antenna; B, the variable condenser, which substitutes the capacity; D, the wire substituted for the ground, and C, the coil which furnishes the inductance which would be found in the real antenna. Mr. Stock is connected with the Bureau of Standards, and the following article was prepared by permission of the Director.

The inductance of an antenna is a sort of electrical inertia which retards the changes in the rapidly reversing current induced in the antenna by the incoming radio wave.

In figure "a" is shown an artificial antenna in which the required value of resistance is obtained by adjusting the box A and the required value of capacity by adjusting the condenser B; while a fixed value of inductance is obtained in the coil C. The wire D represents the conducting earth under the antenna. The condenser B consists of two sets of overlapping plates which are at all times insulated from each other.

The interior of the condenser is shown in figure 1. An antenna is a condenser in which the wires and the earth take the place of the two sets of overlapping plates. The coil C has about the same inductance as the average simple receiving antenna. If the wire in the coil is



A DELICATELY CALIBRATED VARIABLE CONDENSER.

Figure 1: Here is shown a standard varinble condenser which has been taken out of its protective casing. By rotating the black lever the rotary plates telescope inside of the stationary plates and the capacity of this instrument is varied. This instrument is used in the phantom antenna which is shown at B in Figure 1.

unwound and pulled out straight, its inductance is much less. This explains why the long wire in an antenna has so small an inductance value. In practice no attempt is made to secure a certain value of antenna inductance. The constants in the artificial antenna are "lumped"; in a real antenna they are "distributed."

If the inductance and capacity of an antenna (artificial or real) are increased, its fundamental wavelength is increased. (The capacity is more easily changed than the inductance.) The resistance has no effect on the fundamental wavelength, but if the resistance is increased the current induced by the radio wave is decreased.

Imagine that the inductance of the artificial antenna is "distributed," and that the coil C is the tuning coil of the receiving set. Then we may connect a variable condenser across the terminals of the coil, and thereby increase the wavelength to which the complete antenna system will respond. To decrease the wavelength of the system, we may insert the condenser in the wire leading from the right hand terminal of the coil to the box A.

The artificial antenna in figure "a" is a poor receiver of radio waves because its dimensions are so small that it cannot pick up much energy.

Resistance can only be measured with special apparatus which is elaborate and expensive. It can not be computed. The other constants can be measured with less elaborate and, consequently, less expensive apparatus. It is also possible for one who owns a receiving set to measure these other constants with fair accuracy by adding a few simple pieces of apparatus. This method can not be described here, owing to lack of space.

Capacity can be computed, although in many cases it is necessary to make allowances for intervening objects, and other factors. On some antennas the computed capacity will check closely with that measured. In other cases the accuracy is not so good. In the formula

$$C = \frac{12.2h\sqrt{A} + 2.7A}{1{,}000{,}000 \times h} \quad (1)$$

C equals capacity in microfarads.
h equals height of antenna above ground in feet.
A equals area of horizontal portion of antenna in square feet.

To apply this formula to a single-wire antenna, A is obtained by multiplying the length of the nearly horizontal portion of the antenna by 2.5. The result obtained for C must be multiplied by a factor as follows:

Length of Antenna (in Feet).	Factor.
30	1.12
40	1.16
50	1.2
60	1.24
70	1.28
80	1.32
90	1.36
100	1.4

Owing to conditions about the average receiving antenna, this result should now be increased by about 20 per cent. The factor is not used when the antenna has more than one wire and in addition has a length less than eight times its width.

Fundamental wavelength in metres may often be accurately computed for a single-wire antenna by multiplying the total length of wire in feet by 1.57. Practical allowances can be made for an antenna of several wires close to obstructions, although the result will not be so reliable.

The inductance (L) of an antenna can not be accurately computed by a theoretical formula. It can be computed after one knows the fundamental wavelength (λ_o) and capacity (C), from the formula

$$L = \frac{\lambda_o^2}{3,550,000 \times C} \quad \ldots\ldots (2)$$

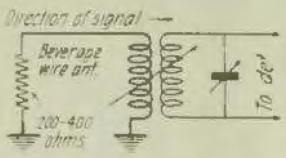
If the reader has not the facilities for measuring antenna constants, he may determine them by applying the formulas just given.

To illustrate the method some typical antennas will be considered. The preceding formulas and the following examples apply to "L" antennas—the type used in the majority of cases. If the lead-in is taken from the centre, the capacity remains about the same, but the fundamental wavelength is decreased.

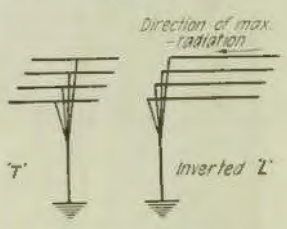
Example 1:

A single wire 80 feet long and 40 feet high; lead-in wire is brought down vertically from one end. The antenna and lead-in are clear of obstructions. If the ground connection is good, the resistance of this antenna at 360 metres should not be more than 15 ohms.

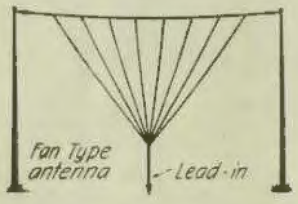
TYPES OF AERIALS.



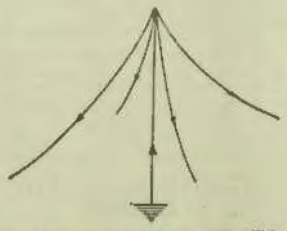
A Modified Form of the Beverage Antenna. It Consists of a Single Wire, One Wave-Length in Length, and Grounded at its Free End Through a Resistance.



Antennae of the Inverted "T" and "L" Types. They Are Both Good Radiators



A Fan Type Antenna. These Are Very Good Radiators, If They Are Designed Correctly. They Have the Advantage of a Comparatively Low Resistance.



An Antenna of the Umbrella Type. It Has a High Capacity, Therefore Good Radiation Qualities.

To compute the capacity use formula (1) and let h equal 40 and A equal 80 multiplied by 2.5 equal 200. Substituting these values in formula (1)

$$C = \frac{12.2 \times 40 \sqrt{200} + 2.7 \times 200}{1,000,000 \times 40}$$

Equals 0.000186.

This value is multiplied by the factor 1.32, giving

C equals 0.000245.

increasing the value 20 per cent. gives

C equals 0.000294 microfarads.

If the antenna is close to trees or obstructions, or if the lead-in is closer than one foot from the building the capacity will be increased still more.

The total length of wire (vertical and horizontal) in this antenna is 120 feet. Multiplying this by 1.37 gives 165 metres as the fundamental wavelength. Add 10 per cent. to this value if the antenna or lead-in is close to obstructions.

Inductance is computed from formula (2) and is:

$$L = \frac{(165)^2}{3,550,000 \times 0.000294}$$

Equals 26 microhenries.

The same method of computation may be applied to single-wire antennas of various heights and lengths.

Example 2:

A two-wire antenna 40 feet long and 50 feet high with the wires three feet apart; the lead-in wire is brought down vertically from one end. With a good ground connection the resistance of this antenna, if it hangs clear in space, should not be more than 10 ohms at 360 metres. Because of its comparatively short length this type of antenna is likely to be erected in a restricted space. In this case its resistance may be increased two or three times. The capacity is computed as before, using A equals 40 multiplied by 3, and is found to be 0.000192 microfarads. (If the wires are closer than 3 feet, the value of A is the same). Although the antenna has more than one wire, its length is greater than eight times its width; a factor of 1.16 is therefore used in obtaining the result. As before,

buildings or obstructions which are very close will increase this capacity.

Multiplying the total length of wire (90 feet) by 1.37 gives 125 metres as the fundamental wavelength. This antenna has a capacity somewhat higher than if a single wire were used. The fundamental wavelength is thereby increased. To allow for this, increase 125 by 15 per cent. This gives 145 metres for the fundamental wavelength. Again increase this value by 10 per cent. if obstructions are near. Inductance computed as before is 23 microhenries.

What is the best receiving antenna?

This is not an easy question to answer; in fact, it can not be answered at all unless one knows the location of the antenna and the type of receiving set.

If you have a receiving set with a regenerative tuner or one that employs some kind of radio frequency amplification it is not necessary to have a very high antenna; in some cases a high antenna may be a disadvantage. If you live in a part of the country where static is bad, a high vertical antenna (especially one of several wires) is undesirable. Instead, a single horizontal wire should be used. But if you have a receiving set with a simple (non-regenerative) detector and not more than one step of radio frequency amplification, it is well to have the antenna as high as possible, and also to keep it away from all obstructions. A receiving set connected in the ground lead close to the ground increases the effective height of the antenna and improves reception.

The following points apply irrespective of the kind of receiving set:

(1) Unless you are using an antenna near its fundamental wavelength or one which is exceptionally long compared to its height its directional effect will be slight and not worth considering.

(2) The antenna and lead-in should be kept as free as possible from swaying. The lead-in should be kept as far from obstructions as possible. The vertical part of an antenna is as important as the horizontal part. After the wire has entered the building, it must not be tacked to the wall.

(3) No. 14 copper wire is large enough for any ordinary receiving antenna and ground connection. Larger wire or stranded wire is better because it is mechanically stronger. Of course the greater the surface area, the lower the resistance, but in practice there are so many other features of resistance involved that a larger conductor than No. 14 is not necessary. It makes no difference whether the wire is bare or insulated.

(4) All connections, especially those made outdoors, should be soldered; this insures permanently low resistance. Ground connections to a pipe can best be made with a clamp; a clean surface for contact should be secured. It sometimes happens that a receiving station is situated where the soil is dry and where there is no natural ground connection; in this case a counterpoise (which is nothing but another antenna suspended near the surface of the ground, under the regular antenna) should be substituted. The counterpoise should consist of several parallel wires.

(5) Unless a high antenna is used, natural supports can usually be found. The ropes that support the antenna should have insulators inserted in them. Glazed porcelain is best, but oak blocks boiled in paraffin can be used.

(6) If the fundamental wavelength of antenna is above 250 metres, a condenser connected in series with the wire leading to the receiving set should be used. If a fixed condenser is used its capacity should be about 0.0003 microfarad. To allow tuning to a wider range of wavelengths a special switch may be used in such a way that a variable condenser may be connected in series with the coil or shunted across the terminals.

(7) It is a good plan to take the lead-in from the centre of the antenna instead of the end when by so doing extra bends can be eliminated.

(8) A water pipe is a better ground connection than a radiator or gas pipe. An iron pipe driven several feet in moist earth may be used.

(9) A single wire will usually give as good results as several wires in the horizontal portion of an antenna. If space is limited, two or more wires may be used.

This article concerns antennas most effective in the reception of wavelengths between 200 to 450 metres.

VICTORIAN NOTES.

By our Special Representative

On the 26th June a meeting of delegates from all Clubs in Victoria was held under the auspices of the Victorian Division of the Wireless Institute, with a view to affecting an affiliation. It was explained that the present Victorian Division was fully prepared to cease its present organisation and allot its members to whatever sections they desired. A constitution was presented to the meeting, and after discussion several clauses were amended or altered and the final result was that nine delegates agreed to accept same subject to ratifications by their Sections. The names of the various Sections will be "such and such" a Section, Wireless Institute of Australia, and all the Sections will constitute the Victorian Division. Two delegates from each Section will be appointed biannually to sit on the Council for Victoria, which in future will consist entirely of these delegates. Leading experimenters in Victoria have expressed great pleasure at the successful results of the various meetings of Clubs and it is expected that in future every Club in Victoria will be affiliated. The districts represented at the above meeting were as follows:—Malvern, Brighton, St. Kilda, Box Hill, Canterbury, Geelong, Ballarat, Warrnambool and Bendigo. It is sincerely hoped by Victorians that New South Wales will in time be able to organise its many Clubs into one State body. It is pointed out that the Clubs absolutely retain their entirety under the Victorian scheme, and each Club has equal representation on the State Council.

At a meeting of the Malvern Section a constitution was adopted and the following gentlemen were elected as officers for the ensuing six months: President, Mr. Golding; Vice President, Mr. T. P. Court; Hon. Secretary-Treasurer, Mr. E. J. Masters (who organised the Malvern Section); Asst. Hon. Secretary Mr. Brown, and Committee, Messrs. Conry, Love and Duff. This meeting was held in the Malvern Town Hall, and was well attended, much enthusiasm being displayed. Malvern is a prosperous and go-ahead suburb, and is the home of many of Victoria's leading experimenters, and it is expected that this Club will be one of the foremost in the State. At the next meeting (July 10th) a lecture on "Aerials and Earths" will be delivered by Mr. T. P. Court.

Malicious rumours are being bruited abroad by mischievous persons to the effect that the broadcast regulations state that all experimenters' apparatus has to be sealed to one wave length. Despite many public contradictions by the Institute Delegate to the Conference (Mr. T. P. Court) the rumours persist. The Postmaster-General (Mr. Gibson) in speaking about the regulations recently, said: "Some experimenters were anxious with regard to their position, but I can assure them that they will have more privileges than they have had in the past. It would be wise for those contemplating purchasing receivers to exercise care until the regulations are available so that they will make no mistake in buying receivers which have been set for certain wave lengths." In view of this statement it is difficult to understand where the rumours had their origin, but it may be confidently asserted that they are absolutely false.

On the 26th June, a meeting was held to consider the formation of a Relay League similar to that in America. It was proposed that a Roster System similar to that in vogue in New South Wales be adopted. A leading article in this paper was commented on, and a Committee was appointed to devise means of controlling all transmitters effectively. It was suggested that a member of the League be on duty nightly, and that he be given power to direct experimenting, all members agreeing to obey his instructions.

Letters are frequently being received from New Zealand, stating that Melbourne experimenters are being heard in that country. 3AM (Mr. Dohrmann), 3JJ (Mr. Hull), 3BY (Mr. Holst) and 3BD (Mr. Cox) have recently been heard well at Gisborne and other places, and the recent tests have been very successful. The number of transmitters is steadily increasing around Melbourne and the Hon. Radio Inspectors have a fairly busy time.

The Brighton City Council are giving a helping hand to the Brighton Section of the Wireless Institute in proving accommodation for the Club. This is a very public

spirited action on the part of the Council, and it is to be hoped that other Councils will follow suit. The recent "amateur" successes in long distance transmission and reception proves definitely that the experimenter is a valuable asset to any community and the movement is deserving of every support. With Captain Whalley as President of this Section, it should go a long way, as he has proved very energetic in organising various affairs in Brighton, not the least of which was a wireless demonstration in connection with a carnival in aid of wounded soldiers.

Hunting Trouble in the Radio Set.

By H. Winfield Secor.

"Trouble shooting" on radio sets a few years ago was relatively a simple matter. If trouble was experienced in the operation of the simple crystal detector receiving sets of that period, the difficulty was usually found by examining the slider or switch connections to the tuning coil or loose coupler, or possibly the detector crystal was a poor one, or again some poor joints in the aerial or ground circuit were the cause behind the effect. But today the trials and tribulations of the radio trouble hunter have multiplied many fold, due to the advent of multiple stage vacuum tube amplifiers of both radio and audio-frequency types.

Some of the faults with which the writer has come in contact in operating multiple stage V.T. receiving sets are discussed here, and it is difficult to tell just where to begin, as many of the different troubles may happen at any time, or in conjunction with "one or more complications," as the doctor would say.

VACUUM TUBE TROUBLES.

One of the most persistent troubles which was hard to locate in one case which the writer recollects, was that where the voice came in all broken up. Of course, faulty connections were looked for as one of the ostensible reasons for this trouble. New grid leaks and grid condensers in various sizes were tried, as these were suspected of possibly having become defective, but the voice still came in unintelligible. The transformers were tested by means of a galvanometer and battery through both primary and secondary windings to see that the fine wire coils were continuous and not open circuited, and the B batteries were very strongly suspected as a possible cause of this trouble. Complaints are heard every now and then concerning them, a poorly soldered connection having suddenly developed into a high resistance or loose joint, which would be very difficult to locate, except by placing a voltmeter across the battery and

watching it for some time to see if any fluctuations occurred. To make this test effective, the meter must be very sensitive, and the battery must be shaken up a little now and then, so as to vibrate the loose connection if present.

After hunting over the whole set, and having no other detector tube, one of the amplifier tubes was placed in the detector socket. The phones were switched into the detector circuit, and with the amplifier tube of the U. V. 201 type, perfect reception was had at once, thus proving that it was the detector tube which had started to leak air, or for some other reason had proclaimed itself ready for the scrap pile or repair shop, several companies now repairing and re-exhausting vacuum tubes. The next day a new U.V. 200 detector tube was purchased and the set worked fine.

GRID LEAKS AND GRID CONDENSERS.

Cheap grid condensers and grid leaks are a frequent source of trouble. A set may work for months in good shape; grid condenser and grid leak may not be suspected, but my advice to any radio enthusiast to-day is to use nothing but mica insulated grid condensers. One of the best grid leaks is of the type which is sealed in a glass tube with a bakelite or other suitable insulating base and spring clips to hold it. These parts cost but a very small sum and it pays to purchase two or three of them in different sizes and try them on your set, and in some cases increased efficiency will be found by changing them when the detector bulb becomes aged, or when a new detector bulb is placed in the set, as the characteristics change and vary for different bulbs.

The grid condenser is, of course, of very small capacity, and if a pair of headphones and a battery are connected across the condenser to test it, a slight click only will be heard as the contact is completed; if the condenser is short-circuited, a loud click will be heard in the phones the same as if no condenser were in circuit at all. In testing a grid leak, the phones and battery connected in series across the leak will give a slight click each time the circuit is closed and opened, depending upon the resistance of the device. If no click at all is heard, or an extremely faint one, it is possible that one of the connections of the grid leak is not properly made, and it is better to try a new one in its place. A pencil line drawn on a piece of paper is a very changeable quantity as a grid leak, for paper is hygroscopic, and unless the grid leak has been thoroughly paraffined, it will change with the weather.

TRANSFORMERS.

Transformers are now and then the cause of trouble in multiple stage V. T. receiving sets, whether they happen to be of the radio or audio frequency type. Either type of transformer may be tested in the same way as shown in the diagram, by means of a galvanometer, millivoltmeter, or milliammeter, and a battery of a few cells connected across first the primary and then secondary terminals. If the winding in either case is contin-

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Experimental Transmitting Stations.

New South Wales

2 A A	Radio Inspector	Macdonald House, Pitt St., Sydney. T.
2 A G	Grace Bros. (W. G. Keogh)	Broadway. T.
2 A R	W. H. Hudson	1 Terrace Rd., Dulwich Hill. T.
2 B B	E. B. Crocker	14 Roseberry St., Marrickville. T.
2 B M	E. T. Vears	"Pipitea," Grove St., Leura. T.
2 B V	Waverley Amateur Radio Club	42 Evans St., Waverley. T.
2 C A	E. W. Bonwell	Cowra. T.
2 C Q	E. Barlow	Faulkner St., Armidale. T.
2 H Y	G. S. Bongers	"Mararra," Rawson St., Rockdale. T.
2 K C	Capt. R. H. Fry	Brighton St., Croydon. T.
2 M J	W. H. Newman	Cooney Rd., Artarmon. T.
2 M R	J. E. Stewart	Gorrick St., Mayfield, Newcastle. T.
2 B Y	E. C. Arnold	Cartake St., Tamworth. T.
2 C J	F. L. H. Saywell	12 Dillam St., Paddington. T.
2 L C	G. Caletti	King St., Newtown. T.
2 L I	F. B. Cooke	The Manor, Clifton Gardens. T.
2 G D	Croydon Radio Club	"Quandong," La Mascotte Ave., Concord. T.
2 F F	Western Suburbs Wireless Assen.	77 Park Rd., Auburn. T.
2 G Y	North Sydney Radio Club	Cnr. High & Alfred St., North Sydney. T.
2 H H	Wireless Institute, N.S.W. Division	
2 U R	A. A. Creamer	10 Hereford St., Glebe Point. T.
2 U U	R. G. C. Roberts	9 Church St., Ashfield. T.
2 U W	O. Sandel	14 James St., Manly. T.
2 W V	Burgin Electric Co. (O. F. Mingay)	352 Kent St., Sydney. T.
2 X X	O. F. Mingay	Kuring-gai Chase Rd., Turramurra. T.
2 D K	R. P. Whitburn	7 Rathern St., Leichhardt. T.
2 I J	A. H. Gray	Florence St., Killara. T.
2 C I	R. Charlsworth	173 Parramatta Rd., Haberfield. T.
2 C S	L. T. Swain	49 Everton St., Hamilton. T.
2 D S	R. Davis	Fisher Ave., Vaucluse. T.
2 G R	J. S. Marks	Ritz Flats, Salisbury Rd., Rose Bay. T.
2 F A	S. V. Colville	10 Rowe St., Sydney. T.
2 J M	R. C. Marsden	Victoria Rd., Edgecliffe. T.
2 S O	Newcastle Radio Club (A. V. Zoppi)	25 Winship St., Hamilton. T.
2 S P	R. Evans	"Garth-Craig," 6 Flood St., Clovelly. T.
2 S X	H. C. Slade	"Rockleigh," Lang St., Croydon. T.
2 U I	Illawarra Radio Club (C. A. Gorman)	75 Montgomerie St., Kogarah. T.
2 C R	L. V. G. Todd	Dennison St., West Tamworth. T.
2 C M	C. D. Maclurcan	Agnes St., Strathfield. T.
2 C Z	O. W. Exton	Lismore. T.
2 D H	E. R. Mawson	"Daisydale," Wonga St., Campsie. T.
2 D N	G. H. E. Blanchard	60 Blight St., Newtown. T.
2 I X	Burwood Radio Club	203 Burwood Rd., Burwood. T.
2 A L	A. E. C. Cooper	"Edale," Cecil St., Ashfield. T.
2 E C	C. A. Gorman	31 Segenhoe St., Arncliffe. T.
2 Z A	W. G. Keogh	11 Victoria Square, Summer Hill. T.
2 Z B	Balmain District Radio Association (P. G. Stephen)	9 Nicholson St., Balmain. T.
2 Z C	F. M. E. Larington	7 Blanford Ave., Waverley. T.
2 Z D	S. F. Brain	85 Bland St., Ashfield. T.
2 Z E	F. J. F. Laker	Harfleur St., Deniliquin. T.

WIRELESS INSTITUTE OF AUSTRALIA — N.S.W. DIVISION.

The next general meeting has been definitely fixed for Tuesday, 17th July, at 7.45 p.m., at Royal Society's Hall, 5 Elizabeth St., Sydney, when a special lecture of a technical nature will be delivered by Mr. Apperley.

Mr. Apperley is a technician of great standing, and a good attendance is expected as a suitable compliment on such an occasion.

Matters in connection with the big Radio Exhibition are well in hand, and the date will be announced in a few days' time.

ILLAWARRA RADIO CLUB

The Club concluded the first year of its operations with the 20th meeting, which was held on the 3rd inst., with a good attendance, and quite fittingly brought the membership up to the half century mark by the election of another new member.

After minutes had been disposed of, nominations were received for office-bearers for the ensuing year. Auditors were also appointed (under the Club rules) to audit the year's accounts and verify the balance sheet for presentation to the annual general meeting.

The President spoke with regard to the very satisfactory progress made by the Club during the year, and wished it every success and prosperity in the future.

Mr. Hewett (delegate) and Mr. Atkinson then spoke with reference to recent activities of the Radio Association, particularly in regard to the mass meeting of experimenters to be held at the Education Building on Thursday, 12th inst., when Mr. G. A. Taylor would give an address on broadcasting and the regulations, which all members were urged to attend: the proposal as to the formation of a Local Board in Sydney (to be composed of representatives of the Wireless Institute

and the Radio Association) to deal with future applications for experimental licenses, was also explained.

Mr. S. Atkinson explained to the members the arrangements which were being carried out by the Metropolitan Club for the tests between N.S.W. and New Zealand, and the Secretary also read a letter from the Organising Secretary of the tests asking the Club's co-operation and support by the entry of members in these tests. Discussion ensued and some members expressed the opinion that they would like to see all the conditions published before entering, but the idea appealed to the Club, and it is thought that the Tests will receive a fair measure of support from this quarter.

Mr. F. Strom then gave an interesting lecture on "Storage Batteries," which he said were things which required a deep study to properly understand. He described the construction of the positive and negative plates in accumulators, and the composition of the electrolyte used therein, and the action of same on the plates. What happened on the charging and discharging of these batteries was also explained, and how the flow of current was caused by the action of the acid on the plates. The reason for sulphating and how to avoid it, was also shown. Many useful hints and tips were given on the care of accumulators, and how to avoid or rectify any of the usual battery troubles, all of which was appreciated and should prove of great help to members. A hearty vote of thanks was accorded Mr. Strom, who responded, and offered to help any member who should experience "A" battery trouble at any time. Mr. Smith also gave some very useful hints on how to make your own accumulator plates.

The next meeting of the Club, which will be the first annual general meeting, will be held at the Club-room, 75 Montgomery St., Kogarah, on Tuesday, July 17, at 8 p.m. All members are particularly requested to attend in view of the special nature of the business.

KILLARA RADIO CLUB.

The fourth general meeting of the Killara Radio Club was held on June 29th. After 15 minutes' buzzer practice, the meeting was called to order, Mr. Hurll taking the chair by request of Dr. Greenwell, who was absent.

The minutes of the previous meeting were then read and confirmed. In view of the fact that the Vice-President (Dr. Greenwell) would be unable to be present, it was decided to alter the night of meeting to the Friday on which the Club does not at present meet; this means that the next meeting will be held on 6th July.

Mr. Gray then gave a lecturette on Elementary Electricity, this was followed by a talk on Aerials and Earths, by Mr. Hurll.

The question of extending the time of the buzzer practice was discussed and it was decided to start them at 7.30 and continue till 8. The meeting then adjourned.

Please address communications to the Hon. Secretary, "Moylough," Florence St., Killara, 'phone J9681

MR. HECTOR'S LECTURES.

On the evening of May 10th last experimenters will remember Mr. Hector addressed the "All Clubs' Night" meeting of the Wireless Institute. On that occasion Mr. Hector expressed the desire to have each Club individually to visit his laboratory at Greenwich on separate Saturday evenings, for the purpose of a "colour music" demonstration. He asked Mr. Phil Renshaw to take charge of the arrangements in this connection. The first visit, at Mr. Hector's expressed wish, is to consist of two delegates from each club, and is to be held on 14th July (next Saturday evening). Delegates are to meet in front of Lane Cove Wharf, Circular Quay at 7 p.m., but the party must not consist of more than 40 in number.

Those Clubs who have not already communicated with Mr. Renshaw (or Mr. Atkinson, Hon. Sec., Radio Association) are requested to immediately do so if they desire their two delegates to be present.

Mr. Renshaw has matters in hand for a roster of visits, so Clubs should get in early to secure a place on the roster.

To the Editor

Sir,—In regard to your leader entitled "That Herring—Have the Experimenters been Tricked?" in your issue of the 6th July, I wish to emphasise the fact that in all meetings both in Committee and in Conference of all the broadcasting interests held for the past few months, there has never been any statement or indication that such interests wish to limit the experimenter in regard to his wave length. I was elected by the Conference to represent the N.S.W. Division of the Wireless Institute on the Committee, and as such I attended all the Committee meetings and in addition, visited Melbourne along with the other members of the Committee about a fortnight after the main Conference, and it has been at all times emphatically announced that the broadcasting interests did not wish to place any restriction on the genuine experimenter.

Although I am interested in wireless from a commercial aspect, I nevertheless claim to understand and appreciate the position of the genuine experimenter, and along with all the other representatives on the Broadcasting Committee and Conference, I contend that the matter of limitation of wave length is one between the Government and the experimenters themselves, and further I would advise all the official organisations representing the experimenters, to ask for no limitation, but rather that they be given any wave length which is not being used for any other service. I entirely disagree with you that the experimenter is due for anything less than 280 metres. According to American information most excellent work has been carried out on about 200 metres, but I say that even if 2000 metres was available and not being used by either a broadcasting, commercial, naval or military service, that the experimenters should be allowed to have this wave length if they so desire. Once the experimenters place a limit on themselves, then I venture to express the opinion that they are going to be handicapped.

Your etc.,

O. F. MINGAY

DEMONSTRATION AT THE PRESS CLUB.

An interesting demonstration was given at the Press Club last Thursday evening by Mr. Swinbourne, who had a 2 valve set working, with loud speaker, kindly lent by Messrs. H. Wiles, and 3 stage power amplifier. Music was received from stations 2ER, 2GR, and 2JM, and quite filled the large billiard room at the Club.

Mr. Swinbourne explained to his audience in small groups the workings of his set.

CROYDON RADIO CLUB.

The last meeting of the Club was held at the Club Rooms, "Rockleigh," Lang Street, Croydon, on Saturday, June 30th, at 7.30 p.m., when there was a large attendance of members.

Instead of the usual lecture the evening was devoted to questions, when the Technical Committee answered any question which was put forward by various members, and some interesting discussion resulted.

Mr. Fry's (2KC) buzzer messages to the club were received.

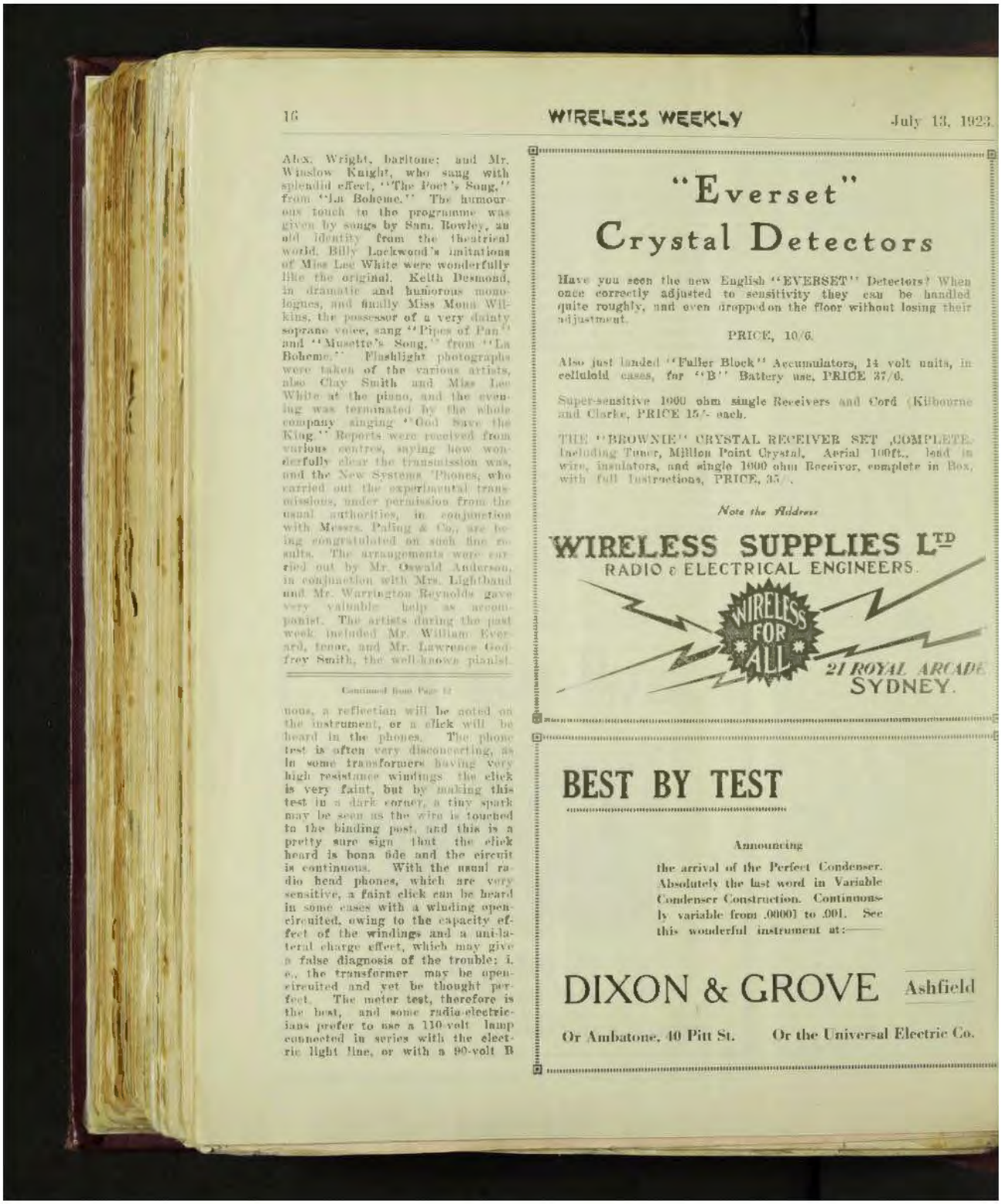
Next Saturday, July 14th, Mr. Malcolm Perry will lecture to members.

Intending members please communicate with the Secretary, G. Maxwell Cutts, "Carwell," Highbury Street, Croydon.

The officers for the ensuing year are as follows: Patron, Major Marr, M.H.R.; President, Rev. W. Maltley; Vice-Presidents, Messrs. C. W. Slade and A. L. Dixon; Secretary and Publicity Officer, G. Maxwell Cutts; Treasurer and Assistant Secretary, Mr. A. R. Burton; Librarian, Mr. W. Craig; Auditor, Mr. H. Lees.

WIRELESS CONCERT FROM PALING'S.

The most complete transmission that has been held in Australia took place recently at Paling's Concert Hall, when an array of well-known theatrical and concert artists gathered there for the purpose of giving a concert to the many thousands of listeners in. Miss Lee White and Clay Smith gave a number of items at the piano, in addition to Miss Lee White's appeal for subscriptions for the St. Margaret's Hospital for Babies. The main items for the evening were arranged by Mrs. Lightband, and the following artists appeared: Miss Gertrude Palmer, piano solos; Mr. Harold Bloomfield, operatic tenor; Westell Gordon, whose songs at the piano were a feature of the evening; Mr.



Alex. Wright, baritone; and Mr. Winslow Knight, who sang with splendid effect, "The Poet's Song," from "La Boheme." The humourous touch to the programme was given by songs by Sam. Rowley, an old identity from the theatrical world. Billy Lockwood's imitations of Miss Lee White were wonderfully like the original. Keith Desmond, in dramatic and humorous monologues, and finally Miss Mona Wilkins, the possessor of a very dainty soprano voice, sang "Pipes of Pan" and "Musette's Song," from "La Boheme." Flashlight photographs were taken of the various artists, also Clay Smith and Miss Lee White at the piano, and the evening was terminated by the whole company singing "God Save the King." Reports were received from various centres, saying how wonderfully clear the transmission was, and the New Systems 'Phones, who carried out the experimental transmissions, under permission from the usual authorities, in conjunction with Messrs. Paling & Co., are being congratulated on such fine results. The arrangements were carried out by Mr. Oswald Anderson, in conjunction with Mrs. Lightband and Mr. Warrington Reynolds gave very valuable help as accompanist. The artists during the past week included Mr. William Everard, tenor, and Mr. Lawrence Godfrey Smith, the well-known pianist.

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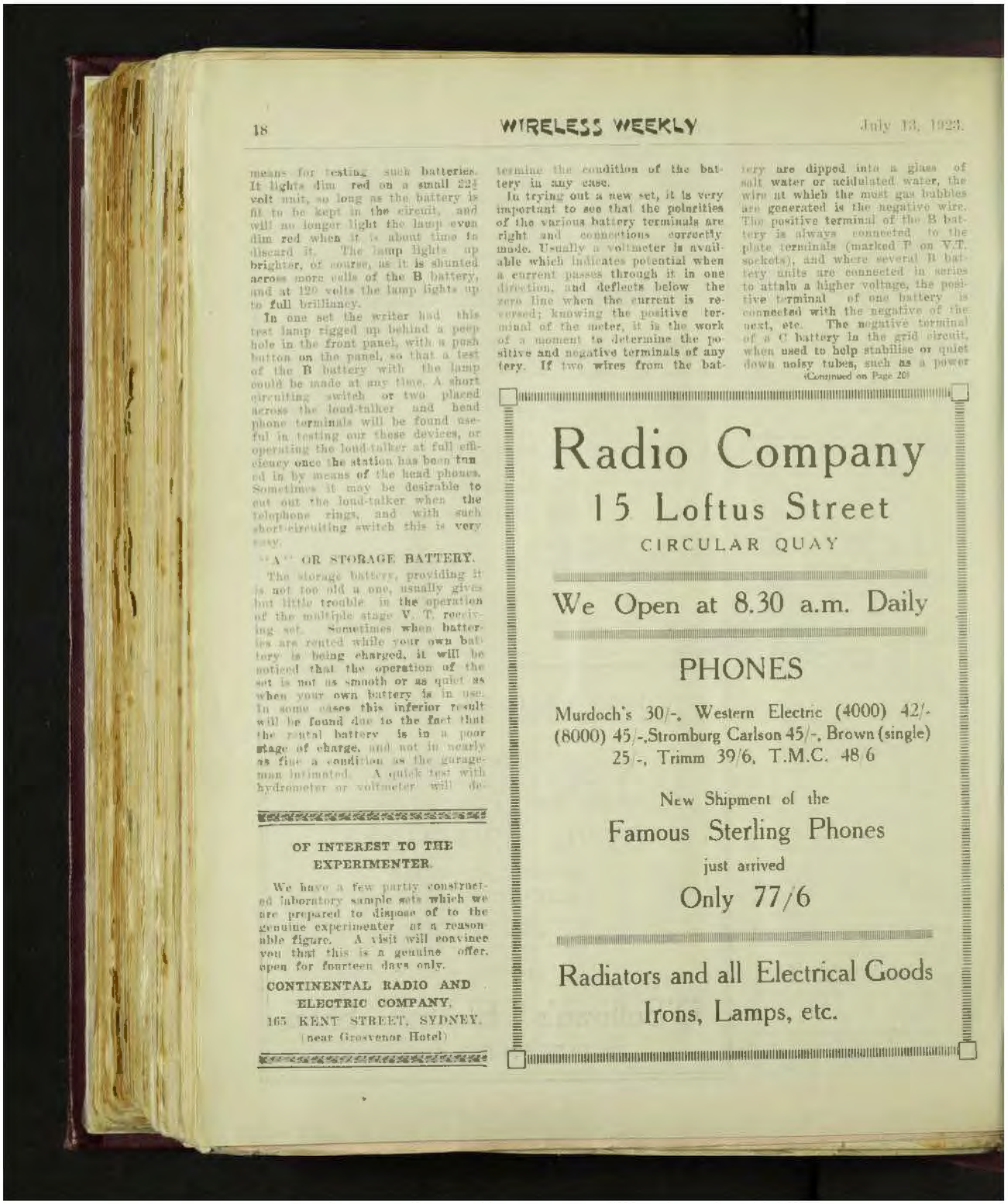
nous, a reflection will be noted on the instrument, or a click will be heard in the phones. The phone test is often very disconcerting, as in some transformers having very high resistance windings the click is very faint, but by making this test in a dark corner, a tiny spark may be seen as the wire is touched to the binding post, and this is a pretty sure sign that the click heard is bona fide and the circuit is continuous. With the usual radio head phones, which are very sensitive, a faint click can be heard in some cases with a winding open-circuited, owing to the capacity effect of the windings and a unilateral charge effect, which may give a false diagnosis of the trouble; i. e., the transformer may be open-circuited and yet be thought perfect. The meter test, therefore is the best, and some radio-electricians prefer to use a 110-volt lamp connected in series with the electric light line, or with a 90-volt B

battery, and then make a lamp test across the terminals of each transformer winding.

In testing transformers, it is always a good plan to see that the windings are not grounded to the iron core; do this by connecting one of the test wires to the core and touching the other wire to both primary and secondary terminals. The windings should not be grounded to the core, and if such a condition is found to be present, the transformer should be disassembled and the trouble remedied, as this may be the cause of endless trouble in the operation of the set and it is better to buy a new transformer if the trouble cannot be cleared up. Usually it can be cured, even if the transformer has to be disassembled in order to find whether the wire of the windings is touching the iron core. This would be the cause of serious trouble, particularly in the case where the iron cores are grounded to earth as practiced by some designers and builders of large radio sets, in order to reduce squealing and howling to a minimum.

DEFECTIVE OR WEAK "B" BATTERIES.

Either by opening one of the main connections to the B battery or batteries, these units can be tested by means of a milliammeter placed in series with the circuit, which tests are made more convenient by means of a plug and flexible cord connected to the meter, and self-closing jacks connected in the main B battery feed wires. It is a very good investment to have a milliammeter on the panel of the receiving set, which will show the plate current passing at all times. If a defective B battery should be at fault at any time and be the cause of trouble, this fact will be noted instantly by connecting up the milliammeter in the plate circuit of the vacuum tubes, as the usual current value will not be indicated. Again, the needle may rest at the zero point on the scale, as it did in one case with the writer a short time ago, one of the small units in a four B battery set having gone completely dead in one day; it was working well the night before and by the next noon-time when the set was started up, it had developed such a high resistance joint or defect in the connections somewhere, that it would not pass a fraction of a milliampere when 120 volts was applied to it from another set of B batteries. This is almost unbelievable, yet it actually happened. If a milliammeter or other testing appliance had been available and had been used at once, a lot of endless hunting for poor joints in the set or other suspected weak spots might have been saved. It is well to make a test about once a week to see what kind of condition B batteries are in; the writer finds a 110 volt, thirty to forty watt lamp one of the best



means for testing such batteries. It lights dim red on a small 2½ volt unit, so long as the battery is fit to be kept in the circuit, and will no longer light the lamp even dim red when it is about time to discard it. The lamp lights up brighter, of course, as it is shunted across more cells of the B battery, and at 120 volts the lamp lights up to full brilliancy.

In one set the writer had this test lamp rigged up behind a peep hole in the front panel, with a push button on the panel, so that a test of the B battery with the lamp could be made at any time. A short circuiting switch or two placed across the loud-talker and head phone terminals will be found useful in testing our these devices, or operating the loud-talker at full efficiency once the station has been tuned in by means of the head phones. Sometimes it may be desirable to cut out the loud-talker when the telephone rings, and with such short-circuiting switch this is very easy.

"A" OR STORAGE BATTERY.

The storage battery, providing it is not too old a one, usually gives but little trouble in the operation of the multiple stage V. T. receiving set. Sometimes when batteries are rented while your own battery is being charged, it will be noticed that the operation of the set is not as smooth or as quiet as when your own battery is in use. In some cases this inferior result will be found due to the fact that the rental battery is in a poor stage of charge, and not in nearly as fine a condition as the garageman intimated. A quick test with hydrometer or voltmeter will determine the condition of the battery in any case.

In trying out a new set, it is very important to see that the polarities of the various battery terminals are right and connections correctly made. Usually a voltmeter is available which indicates potential when a current passes through it in one direction, and deflects below the zero line when the current is reversed; knowing the positive terminal of the meter, it is the work of a moment to determine the positive and negative terminals of any tery. If two wires from the battery are dipped into a glass of salt water or acidulated water, the wire at which the most gas bubbles are generated is the negative wire. The positive terminal of the B battery is always connected to the plate terminals (marked P on V.T. sockets), and where several B battery units are connected in series to attain a higher voltage, the positive terminal of one battery is connected with the negative of the next, etc. The negative terminal of a C battery in the grid circuit, when used to help stabilise or quiet down noisy tubes, such as a power

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The Australasian Radio Relay League

By J. W. Robinson, Publicity Officer, Australian Radio Relay League

The recently formed Australasian Radio Relay League promises to become one of the most important bodies in connection with the amateur wireless movement in Australasia. Not only will it bring together the leading amateurs, but it will create an organisation which will be of the utmost value to the nation in time of danger or necessity. This object will be accomplished by enthusiastic amateurs in their own time and at their own expense, and it is to be hoped that the value of this work will be fully recognised by the Federal authorities.

As was briefly explained in last week's issue of "Wireless Weekly" the objects of the Radio Relay League, are to associate all persons, bona fide experimenters, directly interested in the transmission and reception, and reception only of wireless signals for the purpose of establishing a chain of stations for the effective relaying of experimental messages between members. To provide a centre for the distribution of information, instruction and advice on all matters relating to wireless telegraphy for the purpose of encouraging the correct procedure in transmission and reception and the handling of experimental test traffic. The third object of the League is to establish and maintain a body of trained wireless operators this body to be at all times of national service.

The objects of the League are so worthy that they immediately commend themselves to any amateur or experimenter. A successfully conducted League will doubtless result in the establishment of a chain of stations throughout the entire length and breadth of Australia, and by constant practise the working of traffic on a relay system by these stations should become highly efficient.

The result which will be achieved by the establishment of such a chain of stations is not difficult to grasp. The splendid use to which wireless was put during the war and the valuable services which were rendered the army and navy by the Australian wireless operators can not be over estimated and can not be forgotten. Should there come a time of national danger when our own shores are threatened with invasion the defence authorities will, at a moment's notice, be in possession of a complete relay system, each unit of which will be staffed and worked by men whose knowledge of their respective stations is thorough and whose experience will ensure smooth working. The conditions under which licenses are granted provide for the requisitioning of any private station should necessity demand it, and the enthusiastic experimenters who have worked hard to form the Radio Relay League have borne this fact in mind.

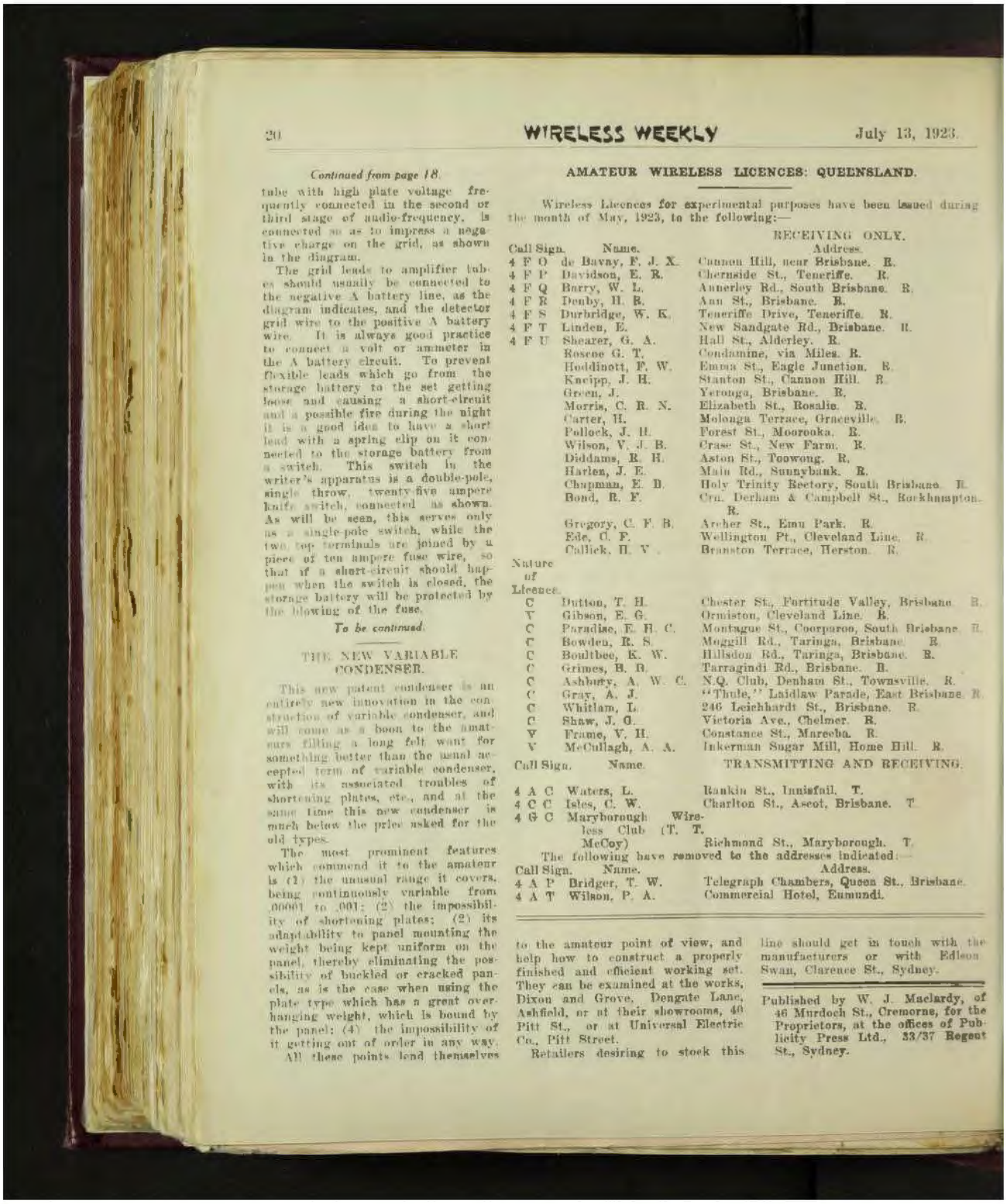
When the League was first discussed at what might almost be termed an informal meeting in the Royal Society's Rooms, Elizabeth St., some five or six weeks ago, one of the first matters which was mentioned was the fact that the successful formation of the then proposed League would result in the amateurs building up an organisation which would prove itself to be a national asset.

In America a Radio League has been working and has received some very successful results. In Australia many conditions render the task of floating and carrying on a League a much more difficult proposition than that tackled by our fellow amateurs overseas. However, this fact has not for one moment deterred Australian experimenters, and an organisation is already at work which will doubtless spell success to the League.

Still, another matter which is an important factor to be considered in connection with the League is the fact that it will provide valuable practise and valuable experience for the amateur in regard to the handling of traffic. As is generally known wireless traffic is handled in a manner peculiar to wireless itself and up to the present beyond the listening-in to commercial stations the experimenter has not had any great amount of experience in the regular handling of traffic. The Radio Relay League should meet his wants in this direction and should give him the training which will result in his being a fully trained man ready for any emergency.

Many people will remember the trouble which was experienced during the early days of the war when it was exceedingly difficult to secure the services of men fit to operate the services which were installed in ships of the mercantile marine. Such a state of affairs should not exist in the future because the Radio Relay League will in times of calm, be busily engaged in providing the training which in the past was of necessity a matter for hasty action.

It matters not in what manner the Radio Relay League is viewed, its importance to both the nation and the experimenters themselves can not be overlooked, and its value to the country should in itself ensure it the support of all within the movement.



Continued from page 18.

tube with high plate voltage frequently connected in the second or third stage of audio-frequency, is connected so as to impress a negative charge on the grid, as shown in the diagram.

The grid leads to amplifier tubes should usually be connected to the negative A battery line, as the diagram indicates, and the detector grid wire to the positive A battery wire. It is always good practice to connect a volt or ammeter in the A battery circuit. To prevent flexible leads which go from the storage battery to the set getting loose and causing a short-circuit and a possible fire during the night it is a good idea to have a short lead with a spring clip on it connected to the storage battery from a switch. This switch in the writer's apparatus is a double-pole, single throw, twenty-five ampere knife switch, connected as shown. As will be seen, this serves only as a single-pole switch, while the two top terminals are joined by a piece of ten ampere fuse wire, so that if a short-circuit should happen when the switch is closed, the storage battery will be protected by the blowing of the fuse.

To be continued.

THE NEW VARIABLE CONDENSER.

This new patent condenser is an entirely new innovation in the construction of variable condenser, and will come as a boon to the amateurs filling a long felt want for something better than the usual accepted form of variable condenser, with its associated troubles of shortening plates, etc., and at the same time this new condenser is much below the price asked for the old types.

The most prominent features which commend it to the amateur is (1) the unusual range it covers, being continuously variable from .00001 to .001; (2) the impossibility of shortening plates; (2) its adaptability to panel mounting the weight being kept uniform on the panel, thereby eliminating the possibility of buckled or cracked panels, as is the case when using the plate type which has a great overhanging weight, which is bound by the panel; (4) the impossibility of it getting out of order in any way.

All these points lend themselves to the amateur point of view, and help how to construct a properly finished and efficient working set. They can be examined at the works, Dixon and Grove, Dengate Lane, Ashfield, or at their showrooms, 40 Pitt St., or at Universal Electric Co., Pitt Street.

Retailers desiring to stock this line should get in touch with the manufacturers or with Edison Swan, Clarence St., Sydney.

AMATEUR WIRELESS LICENCES: QUEENSLAND.

Wireless Licences for experimental purposes have been issued during the month of May, 1923, to the following:—

RECEIVING ONLY.

Call Sign.	Name.	Address.
4 F O	de Bavay, F. J. X.	Cannon Hill, near Brisbane. R.
4 F P	Davidson, E. R.	Cherniside St., Teneriffe. R.
4 F Q	Barry, W. L.	Annerley Rd., South Brisbane. R.
4 F R	Denby, H. R.	Ann St., Brisbane. R.
4 F S	Durbridge, W. K.	Teneriffe Drive, Teneriffe. R.
4 F T	Linden, E.	New Sandgate Rd., Brisbane. R.
4 F U	Shearer, G. A.	Hall St., Alderley. R.
	Roscoe G. T.	Condamine, via Miles. R.
	Hoddinott, F. W.	Emma St., Eagle Junction. R.
	Knapp, J. H.	Stanton St., Cannon Hill. R.
	Green, J.	Yeronga, Brisbane. R.
	Morris, C. R. N.	Elizabeth St., Rosalie. R.
	Carter, H.	Molonga Terrace, Graceville. R.
	Pollock, J. H.	Forest St., Moorooka. R.
	Wilson, V. J. B.	Crase St., New Farm. R.
	Diddams, R. H.	Aston St., Toowong. R.
	Harlen, J. E.	Main Rd., Sunnybank. R.
	Chapman, E. D.	Holy Trinity Rectory, South Brisbane. R.
	Bond, R. F.	Cnr. Derham & Campbell St., Rockhampton. R.
	Gregory, C. F. B.	Archer St., Emu Park. R.
	Ede, C. F.	Wellington Pt., Cleveland Line. R.
	Callick, H. V.	Branston Terrace, Herston. R.

Nature of Licence.		
C	Dutton, T. H.	Chester St., Fortitude Valley, Brisbane. R.
V	Gibson, E. G.	Ormiston, Cleveland Line. R.
C	Paradise, E. H. C.	Montague St., Coorparoo, South Brisbane. R.
C	Bowden, R. S.	Moggill Rd., Taringa, Brisbane. R.
C	Boultbee, K. W.	Hillsdon Rd., Taringa, Brisbane. R.
C	Grimes, B. D.	Tarragindi Rd., Brisbane. R.
C	Ashbury, A. W. C.	N.Q. Club, Denham St., Townsville. R.
C	Gray, A. J.	"Thule," Laidlaw Parade, East Brisbane. R.
C	Whitlam, L.	246 Leichhardt St., Brisbane. R.
C	Shaw, J. O.	Victoria Ave., Chelmer. R.
V	Frame, V. H.	Constance St., Mareeba. R.
V	McCullagh, A. A.	Inkerman Sugar Mill, Home Hill. R.

Call Sign.	Name.	TRANSMITTING AND RECEIVING.
4 A C	Waters, L.	Rankin St., Innisfail. T.
4 C C	Isles, C. W.	Charlton St., Ascot, Brisbane. T.
4 G C	Maryborough Wireless Club (T. T. McCoy)	Richmond St., Maryborough. T.

The following have removed to the addresses indicated:—

Call Sign.	Name.	Address.
4 A P	Bridger, T. W.	Telegraph Chambers, Queen St., Brisbane.
4 A T	Wilson, P. A.	Commercial Hotel, Eumundi.

Published by W. J. Maclardy, of 46 Murdoch St., Cremorne, for the Proprietors, at the offices of Publicity Press Ltd., 33/37 Regent St., Sydney.