

RADIO

IN AUSTRALIA
& NEW ZEALAND
Incorporating "Sea Land and Air"

VOL. I.

AUGUST 8, 1923

No. 10



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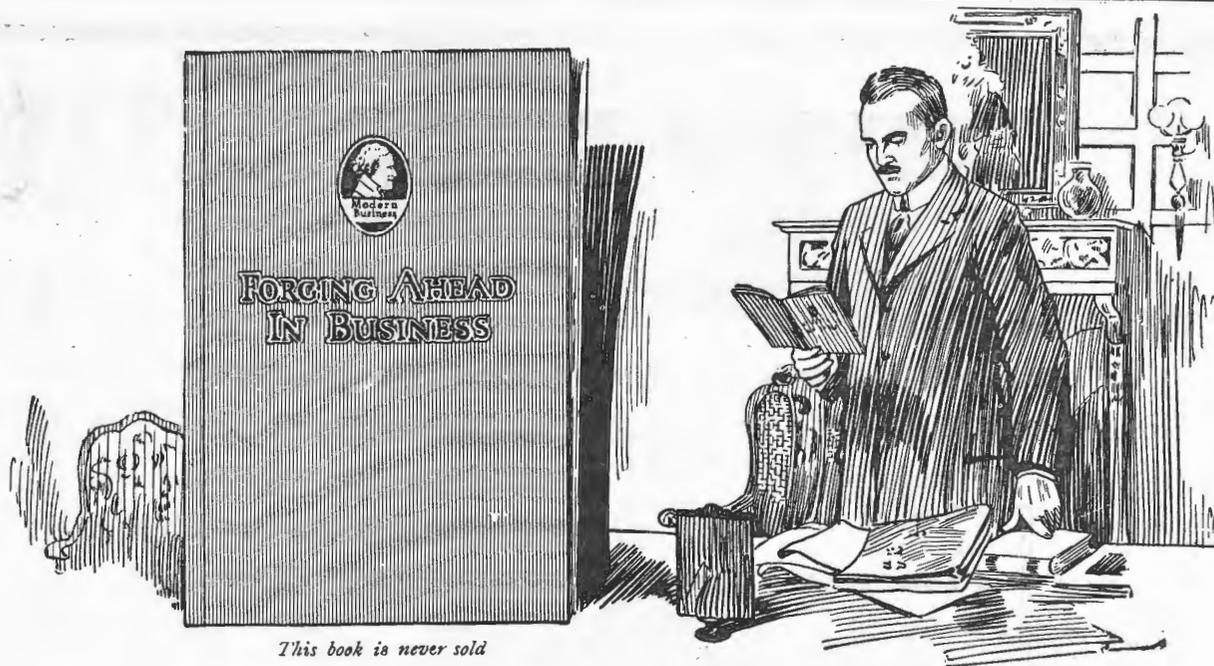
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Where Australia Will Lead

THE Commonwealth Broadcasting Regulations which became operative a few days ago, place Australia in a position unique amongst the countries where radio entertainment services are already in operation. The confusion in America and the lack of variety in England—outstanding features of the systems operating in those countries—fortunately will not spoil Australia's enjoyment of this new phase of home entertainment. The competitive element, which has been allowed to run riot in America, will be intelligently controlled here, instead of being eliminated as it has been in England. It will therefore ensure services of high quality and almost infinite variety.

The regulations have been framed with the definite object of enabling those undertaking the transmission of entertainment programmes to cater for the requirements of their subscribers in the most approved fashion. It will be a case of the "survival of the fittest." The only guarantee the public will require will be one of service—in the fullest meaning of the term. When assured of that there will be an almost immediate and overwhelming rush to subscribe.

The principle of allowing the promoters of broadcasting stations to draw up their own programmes is eminently sound. It may take some little time to discover just what the public wants, but once that has been ascertained it will be a comparatively simple matter to dispense the right kind of entertainment. The task of doing this can safely be left to the broadcasting companies, who, in addition to giving certain guarantees to the Government, will be faced with the fact that success or failure rests in their own hands. If any of them were so foolish as to persist in transmitting programmes which a majority of subscribers had intimated they did not appreciate it would spell early ruin. The public is therefore protected by the most effective of all safeguards—open competition. If, as will almost certainly happen, subscribers become so enraptured at the entertainment provided by any one station and

desire to hear a greater volume and variety it will be comparatively inexpensive to subscribe to the programmes of one or more additional stations. If any company desires to provide a service for its patrons free of cost it will be quite entitled to do so.

The regulations rightly require the person claiming to be an experimenter to produce proof that he is such, and not merely a "listener-in." This imposes no hardship on the true blue student of radio science, but it protects the broadcasting companies, who will be put to great expense to provide up-to-date programmes, from loss of revenue which would result if all applicants could procure experimental licenses, build their own sets and listen to any or all programmes without further cost.

The man who wishes to build his own set, in preference to purchasing one, will be free to do so, provided it conforms to the regulations dealing with the wavelength or lengths of the one or more stations from which he desires to receive. When assembled the set will require to be taken to a radio inspector to be tested, and if it conforms to the regulations, a certificate will be issued.

In the meantime the owner of the set will have paid his subscription fee to the station or stations to which his apparatus is tuned.

This is a wise, necessary and workable provision.

The method of securing a government license, costing 10/- per year, will be simplicity itself. All licensed wireless dealers, which includes everyone selling apparatus, will be empowered to receive both the license and broadcasting fees. This will be a very great convenience to prospective licensees, as it will enable the whole operation of securing a license, purchasing a set and subscribing to a station to be carried out at the one time and place.

There are many other points in the regulations which emphasise the careful attention given by the authorities towards ensuing maximum satisfaction and efficiency to the public of Australia.

Wireless Will Solve the Problem

A correspondent in a Sydney evening paper recently deplored the high cost of forwarding reading matter through the Post Office or railways, to settlers outback. He emphasised the national value of the work these people are performing, and the need for brightening their cheerless lives with suitable reading matter.

The correspondent was right in his contention, but not sufficiently far-seeing in his conclusions. He overlooked the fact that radio broadcast programmes, which will soon be in operation, will carry news and entertainment to the most remote homes every night. Outback isolation will soon be no more.

Broadcasting Regulations

Gazetted on August 1

Extracts from Official Copy

PART II.—LICENSES: CLASSES AND CONDITIONS.

(9) It shall be a condition of the granting of any licence that the licensee shall not—

- (a) transmit any work or part of a work in which copyright subsists except with the consent of the owner of the copyright; or
- (b) send out news or information of any kind published in any newspaper or obtained, collected, collated or co-ordinated by any newspaper, or association of newspapers or any news agency or service except with the full consent in writing, first obtained, of the owner of the copyright, and upon such payment and conditions as are mutually agreed upon by the licensee and the newspaper, association of newspapers, news agency or service.

(10) Every licensed installation shall be available to the Minister for Defence in case of national emergency.

(11) The issue of a licence by the Minister or an authorized officer under these Regulations shall not relieve the licensee of any responsibility for any infringement by the licensee of any patent for an invention.

PART IV.—BROADCASTING.

Division I.—Broadcasting Stations.

28. Except where any inconsistency exists nothing in this Part shall affect the generality of the provisions of the other Parts of these Regulations.

29. An application for a broadcasting station licence shall be in writing and shall contain the following particulars:—

- (a) Name and address of applicant;
- (b) Technical qualifications of applicant or the persons who, it is proposed, will operate the licensed installation. (Where the applicant does not possess the necessary qualifications and proposes to engage an expert to control the station after the issue of the licence, this should be stated);
- (c) Registered title of the company on behalf of which application is made or, in the case of an application from a private individual, particulars of financial stability;

The following excerpts from the official Regulations issued by the Commonwealth Government are of direct and immediate interest to all concerned in broadcasting in Australia.

- (d) Location of proposed station;
- (e) Type of transmitter and character of modulation proposed;
- (f) Maximum power of transmitter (in high frequency generator circuit);
- (g) Type of aerial and natural wave-length;
- (h) Wave-length desired for broadcasting;
- (i) Hours of service;
- (j) Class of service to be broadcasted; and
- (k) Circuit diagram of transmitter and receiver.

30. (1) A broadcasting station licence in accordance with Form 4 in the Schedule to these Regulations, may be granted in respect of a station operated for the purpose of transmitting to broadcasting (receiving) licensees.

(2) The licence shall be prepared in duplicate, one copy to be retained by the Department and the other to be issued to the licensee and to be available for inspection by authorized officers.

(3) The licence shall not be transferable, nor the location of a licensed station changed without the approval of the Minister.

31. (1) A broadcasting station licence shall continue in force for a period of five years from the date of granting and shall be renewable annually thereafter.

(2) The fee payable for such a licence shall be Fifteen pounds per annum payable in advance.

32. (1) A broadcasting station licence may be granted only to an applicant who produces evidence to the satisfaction of the Minister, of financial and technical capability to provide and maintain a reliable broadcasting service.

(2) A licensee shall within one month after the issue of the licence give an undertaking, supported by a financial guarantee of £1,000 approved by the Min-

ister, to commence the broadcasting service within six months, or such extended time, not exceeding six months, as the Minister may decide, after the date of the issue of the licence and to maintain the service to the satisfaction of the Minister for a period of five years.

(3) If the licence be renewed at the termination of that period a similar undertaking and a similar guarantee shall be required in respect of the period covered by the renewal.

33. (1) The broadcasting station shall be operated at the power and wave-length shown in the licence, subject to such alterations as the Minister directs, or the Minister or an authorized officer permits.

(2) The power shall be rated in watts measured in the high frequency generator circuit of the transmitting apparatus.

(3) The licensee may apply for the use of any power between 500 and 5,000 watts, which shall be fixed at the Minister's discretion.

(4) The power rating and the circuit arrangements indicated in the licence shall not be altered without the permission of the Minister or an authorized officer.

34. (1) The transmitting apparatus shall be equipped with a tuned circuit coupled to the aerial and shall be so designed as to maintain reasonably constant radiation during periods of operation and shall be as free as possible from injurious harmonics.

(2) It shall be controlled in such a manner as to minimize the risk of interference with other stations.

(3) A maximum variation of one per centum above or below the licensed wave-length shall be permitted.

(4) Provision shall be made at the station for a wave-length indicating instrument or the equivalent to be available.

35. (1) Each licence shall be issued for the use of a particular wave-length selected from bands available for broadcasting between 250 and 3,500 metres.

(2) The Minister shall determine the wave-length to be used, and the wave-length shall not be altered except by direction of the Minister, or except with the permission of the Minister or an authorized officer.

(3) The Minister shall determine the number of wave-lengths to be used at any centre.

(4) When the number of approved applications exceeds the number of approved wave-lengths available for a particular centre, the matter shall be determined by ballot at the discretion of the Minister as between the parties affected.

36. The Minister reserves the right to curtail the hours of broadcasting at any time if found advisable in the public interest.

37. (1) The licensee shall include in the programme to be broadcasted such items of general interest, and shall broadcast them in such manner, as the Minister stipulates from time to time.

(2) The volume of stipulated items shall not be such as to entail a period of occupation of the broadcasting station in excess of 30 minutes in each consecutive period of 12 hours.

(3) All matter broadcasted shall be subject to such censorship as the Minister determines.

38. The licensed installation shall be operated by a certificated operator who shall sign a declaration of secrecy of wireless communications.

39. The licensed installation shall include receiving apparatus of a type which will not cause the aerial to oscillate.

40. Re-broadcasting shall only be permitted with the consent of the licensee of the original broadcasting station, and then only on such conditions as are determined by the Minister or an authorized officer.

41. The licensed installation shall be open at all reasonable times to inspection by authorized officers, and every reasonable facility shall be given for ascertaining the condition of the station and whether these Regulations are being complied with.

42. (1) The broadcasting station shall be connected by telephone with the public telephone exchange system of the centre in which the broadcasting station is located.

(2) The broadcasting station licensee shall enter into the usual telephone subscribers' agreement for the establishment of the service.

43. Any licensee of a broadcasting station who is authorized to issue broadcasting receiving licences shall execute the provisions of these Regulations relating thereto.

Division 2.—Broadcasting (Receiving) Stations.

44. (1) A broadcasting (receiving) licence in accordance with Form 5 in the Schedule to these Regulations may be issued to any person on payment of the annual licence fee of 10s., together with the annual subscription payable to the broadcasting station licensee.

(2) Broadcasting (receiving) licences shall be prepared in triplicate and shall be numbered consecutively.

(3) The Department may supply books of forms to broadcasting station licensees, who shall be responsible for the issue of the licences and the collection of the licence fees, and any amounts payable in respect of the issue of the licences shall be recoverable from the broadcasting station licensee as a debt due to the Crown.

(4) A broadcasting station licensee or any agent or employee of the licensee shall issue the original copies of the licences to the licensees, retain the triplicate copies, and once a month forward the duplicate copies, together with the licence fees, to the Department.

45. (1) The broadcasting (receiving) licence will be issued for one year, and shall be renewable, on payment of the annual licence fee, from the first day of the month in the year of renewal corresponding to the month in which the licence was issued.

(2) The licence shall not be transferable.

(3) A broadcasting (receiving) licensee shall not transfer, or otherwise dispose of, the licensed installation to any person other than a person holding a broadcasting (receiving) licence.

46. (1) The receiving apparatus which may be purchased or hired for use by a broadcasting (receiving) licensee shall be of a type approved by the Minister or by an authorized officer. It shall bear a stamped indication of such approval in the following form:—

Broadcasting Receiver
Approved by P.M.G.
Type No.....
.....metres.

(2) Approved broadcasting receivers shall be so constructed as to respond to the wave-length indicated on the stamped indication or to any wave-length not differing more than ten per centum from that specified. The receivers shall not respond to wave-lengths outside the specified limits.

(3) No receiving apparatus shall contain a valve or valves so connected as to be capable of causing the aerial to oscillate.

(4) For the purpose of approving any type of receiving apparatus the Minister or authorized officer shall not have regard to the method of construction of the apparatus but shall have regard only to reaction and the wave-length to which the receiver will respond without alteration.

(5) All apparatus bearing the stamp referred to in sub-regulation (1) of regulation 46 of these Regulations shall bear a seal approved by the Minister.

(6) No person, except an authorized officer, the maker, or an accredited agent shall break or interfere with the seal.

(7) Where an authorized officer, the maker, or an accredited agent breaks or interferes with the seal, he shall re-affix it before returning the apparatus to the control of the licensee.

47. (1) Tests of sets may be made by authorized officers for the production of oscillations in the aerial and for interference properties with a factor of safety, i.e., increasing the anode battery by about 30 per centum, changing valves or other essential parts of the apparatus, but not by altering any soldered connexions.

(2) After approval of a type set the type shall be given a registered number and

makers, accredited agents, or users (in case of sets made by the users) shall see that all sets comply with the approved type before they are sold or used.

(3) The unit or set approved as a pattern instrument for an approved type shall be retained by the maker or accredited agent without alteration.

(4) No change in the design or circuit arrangements affecting wave-length and reaction characteristics of an approved type shall be made without the previous sanction of an authorized officer.

48. The approval of the Minister or an authorized officer does not carry any implied guarantee of quality, workmanship, or sensitivity of the apparatus, and shall not render the Minister or any authorized officer liable or responsible for any infringement of a patent for an invention by any licensee, or by any maker, vendor, purchaser or user of the apparatus.

49. All sets other than those assembled by their users shall bear the stamped indication referred to in regulation 46 of these Regulations, together with the type, number and wave-length.

50. (1) An authorized officer shall have the right at any time to select any apparatus available for disposal or actually disposed of to a broadcasting (receiving) licensee to determine whether it be in conformity with the approved type.

(2) In the case of sets which, as the result of tests, are found not to comply with the provisions of regulation 46 of these Regulations, the authorization of the future sale or hire of that class of set may be cancelled by the authorized officer; and any other similarly defective sets, which have been disposed of to licensees shall be modified at the vendor's expense, to conform with these Regulations.

(3) The vendor may appeal to the Minister, who may affirm or revoke the cancellation.

(4) Similar sets hired out shall be withdrawn from service, until they are altered so as to conform with these Regulations.

51. No standard aerial is prescribed, but tests, made by the officers of the Department to determine conformity with regulation 46 of these Regulations, shall be made on an elevated aerial 100 feet long.

52. (1) Licensees who propose assembling or who have assembled parts into receiving sets shall arrange their receivers in conformity with requirements of regulation 46 of these Regulations to the satisfaction of the Minister or an authorized officer.

(2) The tuning elements of the receivers shall be assembled and enclosed in a box or case suitable for effective sealing.

(3) The box or case containing the tuning elements shall be submitted to an authorized officer, who will ascertain by test whether regulation 46 of these Regulations is complied with.

(4) A charge of 2s. 6d., payable in advance, shall be made for each test.

(5) If the set complies with regulation 46 of these Regulations the box or case containing the tuning element shall then be sealed and returned to the licensee together with a certificate of such compliance.

(6) A copy of the certificate shall be forwarded by the authorized officer to the broadcasting station licensee concerned.

53. (1) A licensee who desires to receive at the same address from more than one broadcasting station may have separate receivers, or may have his receiver altered so as to respond to the wave-length of the other station, or stations.

(2) The alterations to the receiving apparatus shall be made in conformity with the requirements of regulation 46 of these Regulations.

(3) In case of any such multi wave-length reception the subscription to all the broadcasting stations concerned shall be paid to the respective broadcasting station licensees and the broadcasting receiving licence fee shall be £1 per annum, provided that the installations so licensed are operated at the same address.

54. (1) Where a broadcasting (receiving) licensee desires to remove the licensed installation to a new address which is not at a greater distance than twenty miles radially from the original address, permission shall be obtained from the broadcasting station licensee concerned for the operation of the licensed installation at the new address.

(2) The broadcasting station licensee shall notify the Department monthly of all changes of address so authorized.

(3) A temporary removal shall be dealt with in the manner indicated in sub-regulation (1) of this Regulation but notification to the Department of the change of address is not required unless the period to be covered exceeds three months.

(4) Removal of a licensed installation to any address at a distance greater than 20 miles radially shall not be made without the consent of the Minister or an authorized officer.

55. All licensees shall permit authorized officers or approved employees of the broadcasting station licensee whose programmes they receive, thereto authorized by him, to inspect, at any reasonable time in the daytime, licensed installations and shall provide all reasonable means for such inspections.

56. A broadcasting (receiving) licensee shall not operate his licensed installation, or permit it to be operated, for profit, without the consent of the broadcasting station licensee.

Division 3.—Sale of Broadcasting

(Receiving) Apparatus.

57. (1) The Minister may grant a dealer's licence, in accordance with Form 6 in the Schedule to these Regulations, permitting any person, firm or company to sell

or let on hire or otherwise dispose of complete broadcasting receivers or parts comprising the complete tuning element of those receivers.

(2) A licence shall be granted in respect of a particular address of the licensee and shall not be exercised in respect of any other address without the consent of the Minister or an authorized officer.

(3) A licence is not transferable.

(4) The licensee shall exhibit a notice on his premises as follows: "Licensed Radio Dealer."

58. The fee for the granting or renewal of a licence referred to in the last preceding regulation shall be One pound, payable in advance.

59. No person, firm or company shall sell or let on hire or otherwise dispose of any apparatus referred to in regulation 57 of these Regulations to any person unless he or it is satisfied that he holds a Broadcasting (Receiving) Licence or an Experimental Licence.

60. Any person, firm or company who deals in the apparatus referred to in regulation 57 of these Regulations shall keep a record of the sales, hirings and disposals of that apparatus and shall permit any employee of a broadcasting station licensee, thereto authorized in writing by the licensee, to inspect the record at any reasonable time.



The British Broadcasting Company's new home at Savoy Hill, London.

Photo shows a general view of the Studio. In the foreground is the microphone, and on the left are the chimes. Similar studios will soon be erected in Australia.

Patents Section

By **GEORGE APPERLEY**
RADIO ENGINEER

THE following are abridgements of complete specifications of Wireless Patents notified in the Official Journal of Patents as accepted at the Commonwealth Patents Office, Melbourne, during the month of May, 1923.

No. 7645/22.—Inventor: K. H. Kingdom, United States of America, describes an invention whereby the current carrying capacity of an electron discharge device is increased without producing deleterious effects of ionisation by accumulating the positive ions in the electrode space where their presence neutralizes the negative space charge of the electrons. One embodiment of the invention is illustrated in Fig. 1, the device comprising a cylindrical anode 6 and a cathode 7 axially located within the anode. Conductive guard plates 14 and 15 provided with apertures through which the cathode conductors pass are carried on insulating supports 16 and 17 and positioned adjacent to the ends of the cylindrical anode 6. The battery 30 provides means of impressing any desired potential between the anode and the guard rings. The accumulation of the positive ions in the region between the electrodes is caused by the guard plates or by the geometrical relation or shape of the electrodes.

Modifications employ a cylindrical anode with nearly closed ends; or a

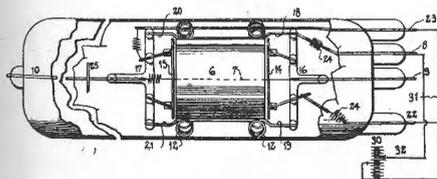


Fig. 1.

ring adjacent to the ends of the anode and carrying internally projecting conductors; or an anode having a length twelve times its diameter but without end guard plates.

No. 8950/22.—Inventor: Walter Schaffer, Germany, describes a method whereby incoming wireless signals are caused to control the generation of oscillations of a different frequency generated by a local oscillator.

Oscillations in the aerial 1 due to received signals are transformed into the tuned circuit 2. Rectifiers 3 rectify both half cycles of the oscillations thereby producing between

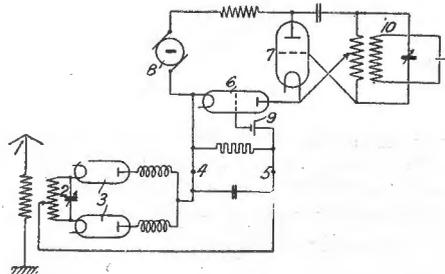


Fig. 2.

points 4 and 5, and between the grid and filament of the valve 6, a difference of potential proportional to the received energy. A battery 9 keeps the grid of this valve normally negative in respect to the filament. The valve 6 is in the high tension feed circuit of a valve generator 7, the source of high tension being shown at 8. The potential of 9 is adjusted so that when no signals are being received by the aerial 1, the valve 7 cannot generate. When signals arrive the potential of the grid of valve 6 is altered and allows the valve 7 to generate oscillations in the circuit 10, which may be tuned to an audio frequency so that the signals can be heard in a telephone 11.

In a modified arrangement the valve 6 is omitted, the incoming energy being led to the grid circuit of the valve 7 which circuit is coupled to the plate circuit 10. The oscillations generated by the valve 7 may have a high frequency and the circuit 10 may be coupled to a second

aerial system, so that the signals may be re-transmitted.

No. 10726/23.—Inventor: E. Y. Robinson, England, describes methods of constructing vacuum tubes in which ionisation is eliminated or reduced to a minimum, the tubes thereby having hard characteristics, although the residual gas pressure therein is comparatively high. The amount of ionisation in a valve is determined mainly by the length of the longest path of the electrons and, according to the invention, the space through which the space current flows is reduced to a small value by being limited to the inter-electrode space which itself is made small. Fig. 3 illustrates the application of the invention to a three electrode valve having cylindrical electrodes. A cylindrical cathode i heated by a discharge from an auxiliary filament cathode j constitutes a concentrated source of electrons. A cylindrical anode k is mounted coaxially with and at a very small distance from i. Metallic shielding screens m and n are mounted at each end of and insulated from the cathode, but are elec-

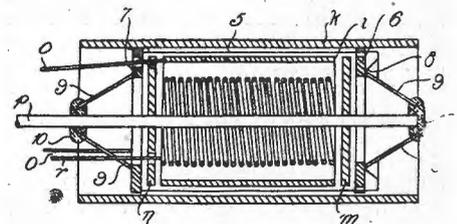


Fig. 3.

trically connected to the auxiliary cathode so that they are at a negative potential with respect to the cathode.

The grid is composed of parallel wires 5, supported by rings 6 and 7, and held taut by the springs 8. The rings 6 and 7 are supported by stems 9 fused into insulating beads 10.

In modifications, the invention is applied to a rectifier having cylindrical electrodes and to a rectifier having flat electrodes.

An Experimental Loop Aerial

By CHAS. D. MACLURCAN

A LOOP or frame aerial is a very valuable addition to an amateur wireless station with which many interesting experiments may be carried out. It is of great assistance to the operator of a transmit-

Four pieces of Bakelite or Ebonite are next required to insulate the wires from the frame. These should each be $5\frac{1}{2}$ inches long, $2\frac{1}{2}$ inches wide and $\frac{1}{4}$ or $\frac{3}{16}$ inches thick. When cut to size, the four pieces should be

on an angle as shown in Fig. 4 and 4A, so that the wire tends to pull more tightly into the slots and is thus prevented from coming off the frame when once wound. Three of the four pieces of Bakelite have two holes drilled through in order to screw them to the wooden frame (Fig. 4). The fourth piece (Fig. 4A) has two slots instead, which provides a means of taking up from time to time any looseness which may occur in the windings.

One insulating strip is screwed to each arm as shown in the sketches, the adjusting one preferably to one of the side arms for convenience.

WINDING.

The windings consist of nine turns of No. 22 D.C.C. on each side spaced $\frac{1}{2}$ in. apart. The second winding is put on in the opposite direction to the first.

The beginnings and ends of both coils are brought to four terminals mounted on a piece of Bakelite of any convenient size. The beginning

ting station as he is able to listen to his own transmission at varying distances, and the loop is very convenient when demonstrating the working of his set to visitors.

One of the disadvantages of a loop aerial made in the ordinary way is the limited range of wave-lengths that it will cover. The loop to be described in this article is furnished with double windings, which not only add mechanical strength to the frame, but by using either a single winding, or joining in series or parallel a range of approximately 250 to 1900 metres may be covered.

HOW TO CONSTRUCT THE FRAME.

This consists of two pieces of oak or similar wood $1\frac{1}{2}$ in. x $1\frac{1}{2}$ in. cross section, one piece being seven feet and the other six feet long. In the short piece a slot is cut out in the middle (see Fig. 1) $\frac{3}{4}$ in. deep by $1\frac{1}{4}$ in. wide. A similar slot is cut in the long piece, but not in the middle. It must be three feet from one end and four feet from the other. This enables the two pieces to be dove-tailed at right angles (see Fig. 1A), leaving one long arm to be fitted into some kind of base to support the loop. This base may conveniently be made as in Fig. 2 and 2A, showing plan and elevation.

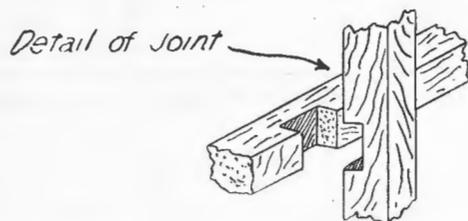
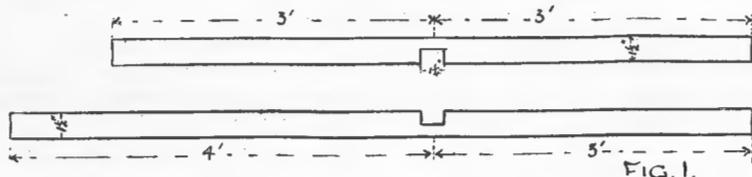


FIG. 1 A

clamped together and nine slots to hold the wire cut in each side with a hack saw. These slots should be half an inch apart and half inch deep, cut

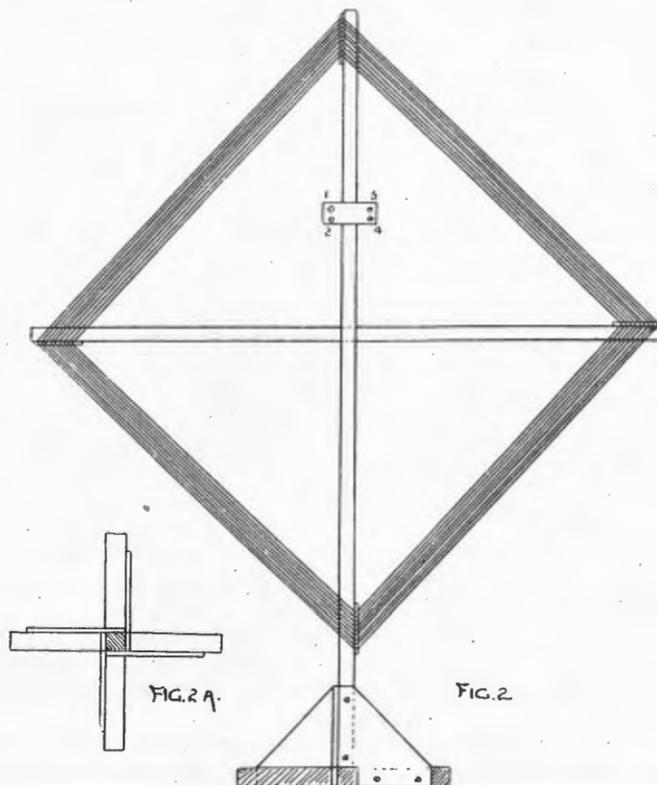
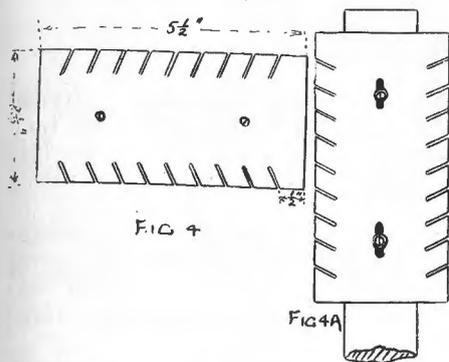


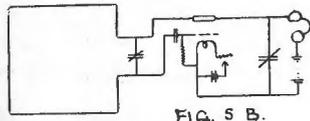
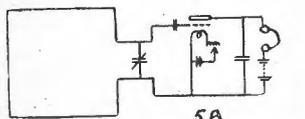
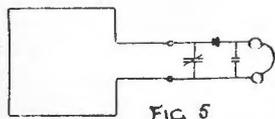
FIG. 2 A

FIG. 2

and end of the first coil go to terminals marked 1 and 2, while those of the second coil go to 3 and 4 respectively.



The following approximate wavelength ranges may then be obtained, using a shunting condenser of .001 M.F.



250—480 metres. Coils in parallel, join 1 to 3 and 2 to 4. Connect receiving circuit to 1 and 2.

360—950 metres. Coils in parallel, join 1 to 4 and 2 to 3. Connect to 1 and 2.

680—1900 metres. Coils in series, join 1 and 3. Connect to 2 and 4. Each coil singly will cover from 360 to 1000 metres.

Victorian Notes

(By Our Special Correspondent.)

Next October will see further activity between Australian and American experimenters. A further series of tests will be held, differing from the last successful attempt only in that the schedule times of transmission will not be kept secret, and no prizes will be offered. The test is open to all, and arrangements are in

the hands of the Victorian Division of the Wireless Institute of Australia.

Not outside the realms of practicability is the suggestion that a high-power experimental transmitting station should be established in or near Melbourne for the purpose of replying to American amateurs. Using very low power, Melbourne has had no trouble in reaching New Zealand, and Victorian experimenters can see no difficulty in doing the same with America. It would unquestionably open up a prolific field for research, and with, say, a two-months' license, great things might be discovered for the benefit of radio.

Victorian experimenters, notably

Mr. Howden, 3BQ, are keen on conducting tests with N.S.W. experimenters. Mr. Howden will welcome calls from New South Wales, and does not mind if he is kept busy every night for a week.

Crystal sets are often relegated to the experimenters' museum now that valves are so popular. When a "valve" man takes up the almost forgotten love of coherers and the like his efforts are worthy of note, especially when he designs a circuit of his own and receives such distant stations as Broome, W.A. (VIR). This was accomplished by Mr. H. K. Hirst using an inductively coupled set and a crystal detector.

Super-Regeneration A Simplified Method

By S. L. LANE

THE Armstrong Super-regenerative circuit, of which such great things were expected, has failed in the hands of the average experimenter to give satisfaction, mainly on account of the multiplicity of controls required, and skilful manipulation demanded to obtain the desired results.

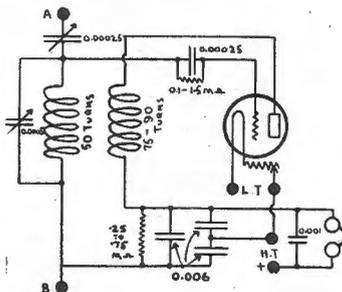
An American, E. T. Flewelling, described in an American Radio Jour-

The chief innovation of this circuit is the bank of three small fixed condensers, .006 microfarads capacity each. It is essential that these condensers are of identical capacity, and the insulation used in their construction should be good, especially if it is desired to use "five watt" tubes with their high-plate voltage of 350 to 500. For ordinary people the UV201 Radiotron with 100 volt plate protection will be found to give excellent results.

The construction is fairly simple, and should give no trouble to the average experimenter. In operating this set for the first time, try it out with both "A" and "B" terminals disconnected from the loop or aerial. Light the valve with the high tension, adjust the coupling of coils rather closely, and a whistle should be heard in the telephone receivers. If this does not occur there is probably a wrong connection in the set or the values given have been departed from, or the two "leaks" wrongly adjusted.

An aerial or ground may be used, but not both; this is connected to the "A" terminal, "B" only being used with a "loop."

The values given cover the experimenter's band of wave lengths between 150 and 600 metres.



nal a means, well within the capabilities of most amateurs, whereby the results obtained by Armstrong can be approached, if not duplicated. The circuit reproduced has all the characteristics of the Super-regenerative circuit of Armstrong when in operation, such as the whistle, which has to be tuned out, and the tight coupling of the regenerator coil.

Radio Telephony to Give Warning of Forest Fires

Projected Action in West Australia

THE Minister for Forests, Mr. Scaddan, made an important announcement when addressing the audience at a wireless concert in Perth recently. The Forestry Department, he said, was seriously considering the use of wireless telephony for giving warning of forest fires, and also as a means of communication in connection with breakdowns in the electrical power system.

Mr. Scaddan informed his audience, as a depressing illustration of our archaism, that transport was the only means now available for communicating with the gangs that were protecting the forests from fire.

Such means are, of course, inadequate, particularly at the present day when in so many other directions the fullest possible use is being made of wireless telegraphy and telephony to bridge hitherto isolated points.

Wireless telephony has already proved of great practical value in America, England, and other coun-

tries. Spurred on by the successes it achieved during the war, it has been applied to many uses which were unthought of ten years ago. Its earliest use during the war was confined almost exclusively to aircraft; telephonic as against telegraphic connection had the advantage that it could be managed by the pilot himself without the aid of a skilled operator; and it gave more speedy communication. In 1916 a successful demonstration was given in the transmission of speech from an aeroplane to a ground station over 100 miles distant, and it was also found possible for aircraft to communicate with each other while in flight. Since the termination of the war the development of radio telephony has been very rapid, and it proved of great practical utility during the emergency caused by the great railway strike in England in 1919. The linking up of the radio-phone with ordinary telephone instruments has been successfully accomplished,

and in this way telephonic conversations have taken place between London and Amsterdam, the radio link bridging the 115 miles gap separating England from Holland. Within the last few weeks a telephonic message was transmitted from America across the 3,000 miles of ocean and was audible and intelligible to a large audience in London.

In the face of these achievements, the move projected by the Forestry and Electric Power Departments in Western Australia is exceedingly modest. Though the track has been but recently blazed it is already well trodden. The scientific obstacles have already been removed, and, if the estimates furnished to Mr. Scaddan are reliable, the financial outlay is not prohibitive. Further investigation may show that the expenditure necessary will be a reasonable premium to pay for the insurance against loss which such an installation would provide.

Why the Country Will Welcome Broadcasting

"Let not the man be trusted that hath no music in his soul," wrote Shakespeare at a time when the very impossibility of more than a small percentage of mankind being able to indulge its musical taste must have been strikingly apparent. But the adage holds good to-day. Music has always exercised a great and beneficial influence over the human race, and if there are any in Australia whose souls have not yet awakened, it is largely because they have been denied the opportunity of drinking at its sacred shrine. This particularly applies to people who live in the remote districts of Australia. Their isolation and comparative small number render it almost impossible, or at least a very doubtful financial proposition to take musical entertainments amongst them. Therefore settlers outback and dwellers in the great majority of country towns are obliged to plod along, living a life of comparative monotony, but great usefulness. A regular programme of en-

tertainment would be welcomed by them to a degree known only to themselves. As water is to a thirsty man, so is entertainment to those who are cut off from amusement centres. Happily the time is at hand when home entertainment in Australia is to undergo a revolutionary change. No longer will distance debar the residents of outback from participating, to a very great extent, in the pleasures now available to dwellers in and around the big cities.

Experience has proved that, as a class, country folk are extraordinarily fond of musical entertainments. Ask the proprietor of any Sydney amusement house which is his best season, and he will unhesitatingly answer, "Easter, when the country people come to town." It is easy to realise, therefore, the open-hearted welcome which broadcasting will meet in the country. The fabulous sum now spent on amusement each year in the city is proof that people are always prepared to pay for the

right kind of entertainment. Broadcasting stations will be in a unique position to cater for the public taste. "Variety," we are told, "is the spice of life," and a programme which combines news of the day with market and weather reports and a liberal sprinkling of vocal and instrumental items will soon become an essential part of the everyday life of country people.

The devotion of the "movie fiend," who simply cannot exist without seeing a performance of his or her screen favourite a number of times each week, will be second only to the enthusiasm of Squatter Jones or Farmer Brown when he tastes the delights of listening to a broadcast programme at his own fireside.

It may take some little time for those unaccustomed to such luxuries to realise that this is no fantastic dream but one of the certainties of the near future, but the awakening is close at hand.

Radio Engineers in Queensland

A Strong and Enthusiastic Body

The idea of forming the Queensland Institute of Radio Engineers originated with Mr. A. E. Dillon, a young man who has always been well in touch with wireless matters. His education in electricity and wireless telephony and telegraphy has been practically self-acquired and he has applied himself to the trade with remarkable energy. He made his scheme known to an intimate associate of his, Mr. D. W. Chandler. These two organisers then convened a meeting for November 23, 1922, with four other gentlemen, Messrs. T. W. Bridger, A.M.I.E.E., A.M.I.E. Aust., C. E. Sandercock, F. A. Engles, and Captain J. Craven—men noted for their applied interest in the science. These gentlemen immediately realised the benefits to be derived from such a society, and agreed to it entirely. Suggestions by Mr. Bridger extended the scope of the association, and it can now, besides claiming to be the first of its kind in Australia, compare favourably with many societies with similar objects in other parts of the world.

At the second meeting (November 29) another party of interested radio engineers was admitted and the memorandum and articles of association of the Queensland Institute of Radio Engineers were finalised. The objects of the association, as stated in the memorandum, will be to promote the general advancement of radio science and its application, and to facilitate the exchange of information and ideas on these subjects amongst the members of the Institute and otherwise. To this end they propose to hold meetings of the Institute for reading and discussing communications bearing upon wireless and radio science and its applications. Exhibitions of instruments, apparatus, and appliances connected with radio science will also be promoted, whilst papers or any work or treatise will be encouraged.

Qualification for membership will be of a particularly high standard. Applicants must be educated in electrical science, and be engaged in one of the branches of engineering at the time of application, or have such a knowledge of radio that his admission as a member would conduce to the interests of the institution. At present the membership numbers 20.

An ideal position has been secured in the observatory tower in Wickham-street, overlooking the whole of Brisbane. The height of the tower is a decided advantage, as "screening" from surrounding buildings, trees, or other obstruction is nil. Electric light and the necessary fittings have been installed in the building.

The main aerial, which is 80ft. long, stretches from a pole 105ft. to a 12ft. high pole erected on top of the tower, which measures 80ft. This is of the cage type, comprising six 3-20 gauge stranded hard-drawn copper wire and is 2ft. 6in. in diameter, formed of cane spreaders. The "lead in" is of similar construction, with a diameter of 6in. and a length of 95ft. It is connected to the distant end of the main aerial and brought down to the window of the operating room. The approximate natural wave length of the aerial is 415 metres.

Complete transmitting and receiving sets which are under construction by the council will be available for use on any occasion. These instruments will be complete, and will remain unaltered. To facilitate the carrying out of research work, however, by way of trying out new circuits, adjustments, etc., the various component parts of instruments will be available, and by simply connecting any of the parts with flexible wires, practically any type of receiver or transmitter can be immediately tried out.

The transmitting set which will be used for both continuous wave telegraphy and telephony will have a power output of approximately 25 watts. Five 5-watt Radiotron power tubes will be used to generate the high frequency oscillations which radiate from the aerial. General transmissions will be carried out on a wavelength of 440 metres. Five valves will be used on the receiving set, two as radio frequency amplifiers, one as detector, and the remaining two as audio frequency amplifiers. This receiver will respond to wave-lengths from 200—25,000 metres, and should receive messages from any station in the world using reasonable power.

Following are the officers elected for the present year. President, Mr. T. W. Bridger; vice-president, Mr. D. W. Chandler; secretary and trea-

surer, Mr. A. E. Dillon; organiser, Captain J. Craven; council, Messrs. C. E. F. Sandercock, J. Leslie, E. H. Bourne, E. M. Douse, F. A. Engles, and Captain J. Craven. Other foundation members are: Mr. G. Cullen, Mr. C. Isles, Dr. B. S. Butler-Wood, Mr. E. M. Gibson, A.M.I.E.E., A.M.I.E. Aust., and Mr. F. W. Bestmann.

VOICES FROM AMERICA

In the course of the voyage of the Canadian-Australian R.M.S. *Makura*, Vancouver to Auckland, a demonstration of the possibilities of wireless telephony was made in a very striking manner. When the vessel was near the Great Barrier, the chief wireless operator, Mr. H. F. Hartley, heard quite distinctly, voices transmitted on a wave of 450 metres from the radiophone station at Avalon, which is situated 50 miles from Los Angeles. The vessel was thus receiving audible messages at a distance of 5630 miles. The Avalon station mentioned is on Catalina Island, and embodies a new system of wireless telephony which enables a person in his private residence to speak by radio through the ordinary land telephone system without the necessity of using the radiophone direct. A wireless link is used between the two bureaux, and the voice is then transmitted by ordinary telephone to its destination in another residence or elsewhere. Mr. Hartley also heard radio music from San Francisco while the vessel was in mid-Pacific.

N.S.W.—N.Z. TEST

Mr. D. G. McIntyre, Hon. Secretary of the New South Wales—New Zealand Tests, in a letter written to the editor of "Radio," states:—

"Should the New Zealand transmitter be received by the New South Wales transmitter and report his signals QSA then the New South Wales transmitter should, after the New Zealander is finished, call him up and carry out definite two-way communication."

Australian Wireless Experimenters

Unlimited Opportunities Offering

"THE wireless field offers remarkable possibilities for development. Already in the older world, particularly America, great strides have been made. Unfortunately, the prospect there was so bewildering that proper care was not exercised and chaos and confusion resulted. A repetition of this in Australia must be avoided at all costs.

"In no other country can wireless be of such utility. With systematic and widespread broadcasting much can be done to brighten the home-life of our out-back pioneers, who are building up this great nation. In the cities broadcasting can give an added sweetness to home-life; it will strengthen the family ties that mean so much to the future of our young Commonwealth.

"Before discussing the regulations, it would be well to look over the field of previous operations and note therefrom how Australia can profit by the mistakes of older lands, and start out with the scheme that has been designed to best help what we all have at heart—the proper development of Wireless.

"When it was ascertained that wireless telephony was possible, the world looked on with wonder-open eyes, and America rushed into the new field with wild enthusiasm. The United States Government, in its desire to please the populace, hurriedly arranged for the issue of licenses, both for receiving and transmitting; manufacturers flooded the market with sets; in fact, as a correspondent in the Sydney 'Daily Telegraph' of February 3, 1922, wrote, 'the various electrical manufacturing companies are making hay while the sun shines, selling apparatus and setting up radio-phone broadcasting stations, whilst amateur wireless telephone tinkering has become quite a craze.' In fact, up to that month over 1,000,000 amateurs' licenses had been issued.

"One can therefore understand the jamming of waves and the consequent aerial pandemonium that existed in America.

"Great Britain, however, did not rush matters. I happened to be in England at this period of indecision. I later saw the English scheme begin to develop when the British Postmaster-General announced that he would divide the country into eight or ten areas and give the same number of the most responsible manufacturers the right to work those stations. Some 30 or 40 applied for the rights, but when the cost of erecting the stations and the expense of good programmes came to be considered, the majority of the applicants for broadcasting rights declined to go further, and joined with the six of the leading firms which formed one Broadcasting Company, with a nominal capital of £100,000; the revenue of this company to be a half share of the license fees the Postmaster-General collected

The following extracts from an important lecture delivered by Mr. G. A. Taylo, before a gathering of radio enthusiasts at a Wireless Institute meeting in Sydney on July 12 will be read with interest throughout Australia.

from the public, and a fee of 10 per cent. on the selling price of each apparatus sold by the various manufacturers; the Post Office license being 10/- per set per year, and the manufacturers' license only a royalty fee for each set, no set being installed without a license, and each set to be approved by the Postmaster-General.

"All manufacturers had to join the Broadcasting Company. The shares being £1 each with £50 deposit, if necessary.

"The Company pointed out that as there was a possibility of installing a minimum of 500,000 sets within a few years, which would represent work to the extent of five or six million pounds, most of which would go in wages and so help to relieve unemployment, that labour had to be specially trained, whilst there was a risk in erecting the Broadcasting Stations amounting to about £120,000 and supplying programmes that would cost anything from £150,000 to £200,000 per year; and as there was a serious danger of foreign competition from countries with collapsed exchanges, the Postmaster-General was asked for at least two years' protection from importation.

"So Broadcasting began in Great Britain. Amongst the conditions under which licenses were issued was one that all types of receivers should be constructed for the reception of signals of any wave-length, but must not contain a valve or valves so connected as to be capable of causing the aerial to oscillate; in fact, every possible precaution was taken to prevent interference.

"There was a great rush for licenses, but it was not long before there were complaints. Many alleged experimenters who made their own sets were suspended from having experimenters' licenses because there was no 10% on the cost of the apparatus coming to the Broadcasting Company who thus lost a definite amount of revenue.

"In fact, the Company complained that thousands of people were utilising sets for which they paid the Postmaster-General no license fees, but which sets being capable of picking up any wave-lengths gave the owners the free use of the expensive programmes provided by the Broadcasting Company, so that the revenue of the latter was considerably less than what was expected.

"Its general manager stated they could only keep going by having the best artists available, and the best artists could only be available if there be a sufficient revenue which was not coming forward.

"It should, however, be mentioned that the genuine experimenter is not in any way objected to by the Company which mentioned that it desired to encourage him in every way, as the General Manager said 'without the experimenters we would not be in the position we are in to-day.'

"The experimenter, therefore, is an important factor in Great Britain, but he is a very small party compared to the vast numbers of amateurs who make their own sets and apply for experimenters' licenses. but if refused do not bother about licenses but enjoy 'listening-in' without paying any fee whatever.

"The British system therefore had definite faults. It could in a sense be called a monopoly because it could give whatever programmes it liked—though in justice to it, it had always given the best; and there was no check on the amateurs that could fix up their own sets and 'listen-in' or jam.

"On my return to Australia I immediately got in touch with the principal representatives of wireless interests. The Association for the Development of Wireless was soon formed and the Postmaster-General was approached for a conference of wireless experts in order that suitable Broadcasting Regulations be devised in order to avoid the difficulties and mistakes of older worlds. That conference was arranged to take place in April, but as Mr. Fisk, who had taken a prominent part in recent Australian wireless matters, was on the way to Australia from England, it was considered advisable to wait his return to hear his views considering he was the last to leave the older world conditions. The conference opened in Melbourne on Empire Day. It was attended by 58 delegates, and I was elected Chairman.

"The business opened with the request as to whether anyone present had any clear cut scheme they desired to submit, Mr. Fisk pointing out he did not desire to be the only one, as it was open for anyone to submit propositions.

"I put that request to the meeting so that whatever decision might be arrived at, there could not be any after-remark that no one had the opportunity.

"The Conference, however, desired to hear Mr. Fisk's scheme and to utilise it as a base upon which to build the proposed Regulations. Accordingly, it was discussed, amended and rebuilt; a committee being appointed to draft the Regulations for submission to the Government, which committee after several hours kept discussion drew up a set of Regulations, which were handed to the Postmaster-General so that the Regulations could be framed upon them for gazettal.

"Some days after, the committee that drew up the Regulations was invited to Melbourne by the Postmaster-General to consider the manner in which the Regulations had been framed for gazettal and these regulations were thoroughly discussed and twenty amendments made.

"I may point out when the result was handed to the Postmaster-General he was generous enough to agree to all with one exception—the range of wave-lengths—the Government proposing a certain limitation. The committee, however, desired a wider extension of that limitation to almost ten times the length they were asked to agree to. The Postmaster-General generously met our amendment by extending the range of wave-lengths about seven times.

"There is, therefore, no reason for any statement that every opportunity was not given for the widest consideration of all interested in wireless development; although certain traders evidently had second thoughts with regard to what they approved of at the meeting and have since met and protested.

"The Postmaster-General has, however, given his assurance that in the event of the regulations being found unfair to anyone, steps would immediately be taken to have them altered. Hence I trust that the traders who may be at present dissatisfied will link together with the Association formed throughout Australia for Developing Wireless, so that all can work together with the one great object.

"Now we come to the Regulations as arranged; they are divided into two divisions and cover 62 Regulations embracing all Broadcasting conditions where they affect the experimenter, the Government, the public, and wireless generally.

"The concern that desires to broadcast must show location, type of transmitter and character of modulation proposed, power of transmitter (in high frequency generator circuit), the range to be stated; also the type of aerial and natural wave-length, and wave-length desired for broadcasting, circuit diagram of transmitter and receiver, and hours of service. The station license will continue in force for five years and be renewable; the yearly license fee to be £15, but there must be a financial guarantee of £1000 approved by the Minister that broadcasting will commence within six months after the commencement of the license, and a further six months may be granted, the £1000 also standing as guarantee that the service will be satisfactory for five years.

"The latter is an important point. It is not desirable to see wireless companies being formed and shares being sold as has been done in other spheres, when after a short period through mismanagement or other reasons the company fails and the money subscribed by shareholders has been lost. In such cases, the blame would not be placed upon the company's mismanagement, but in an indirect way unfairly placed against wireless.

"Another protection that the Regulations will ensure is that transmitting companies will only be licensed provided expert operators are engaged for controlling the transmission gear.

"Power to be applied for may cover between 500 and 5000 watts, and the wave-lengths may be selected from 200 to 3500 metres provided they are not required for other purposes. The receiving station licenses are proposed to be 10/- per year, together with an annual subscription payable to the transmitter. Tests of sets will be made by authorised officers for the prevention of oscillations, also interference with the apparatus such as increasing the anode battery by changing the valves or other essentials. After approval the type will be given a registered number and the manufacturers or users, in the case of sets made up by users, will see that all sets comply with the approved type before they are sold or used.

"In the case of standard aerials tests will be made by the officers of the Government on an elevated aerial 100 ft. long.

"A person who desires to receive from more than one station may have his receiver altered so as to respond to the wave-lengths of other stations. The receivers' license may be removed from his address shown on the license to any other address not exceeding 20 miles distant radially; if desired to be removed beyond 50 miles, the consent of the Minister and the Broadcasting Company concerned must be obtained.

"That briefly covers the most important points regarding the Broadcasting conditions generally and should bring order into the administration of wireless in Australia and prevent the jamming that was common in America and the monopoly that existed in England. It should give widest opportunity for healthy competition so that as much pleasure as possible may be provided for the public, as well as giving a definite and clear field for genuine experimenters.

"I must emphasise the fact that in the whole of the proceedings the experimenter was kept in mind, a special resolution being passed that:

"This committee recognises the right of fully qualified persons indulging in bona fide experimental work to be without any hindrance, except as prescribed in Statutory Declaration No. 169 of 1922, such right to be kept in mind in the allotment to wave lengths, subject to the experimenter giving an undertaking that he will not poach on Broadcasting services.

"It will be understood that qualifications for experimenters must necessarily be high, and though the wave-lengths upon which they will be granted permission to operate will probably be between 100 and 250 metres, I have been assured that in any special cases a longer wave-length will be allotted. In fact, an experimenter who can prove that a very long wave-length is necessary will have that wave-length allotted to him without any hesitation. If long distance relay work is being considered by the experimenter and the short wave is unsuitable for the work I am sure there would be little difficulty in obtaining permission to utilise the longer wave-length.

"I am also informed that the present holders of licenses will not be interfered with, as they are looked upon as experimenters, though future applicants for experimenters' licenses will have to convince the authorities that their desire is genuine, and not for casual listening-in to broadcasting programmes.

"The experimenter, therefore, has nothing to fear, and everything to expect to assist him in the new arrangements that are to be issued regarding the development of wireless.

"The reason why the restricting of wave-lengths is necessary is that there must be a fair field given to transmitters and it must be borne in mind that certain wave-lengths have also to be used for commercial, shipping, naval, and military uses.

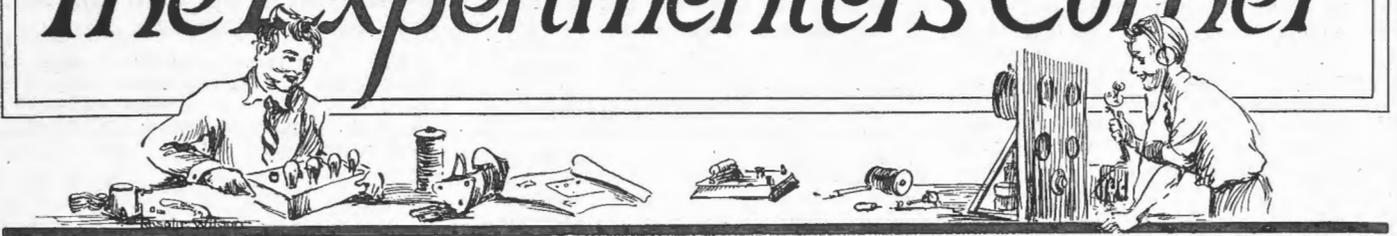
"In this respect Australia is treating the experimenter much better than Great Britain, for in the latter country he is barred between the hours of 5 p.m. and 11 p.m., whilst in Australia there is to be no time limit for him.

"In my personal discussion since with the authorities to give widest consideration to the experimenter, I have been influenced by the feeling that the development of wireless with which I am deeply concerned depends on the experimenter, and it will be the fault of the experimenter if his standing is not kept at the high recognition it holds to-day.

"I am, however, particularly anxious regarding the average experimenter at the present time, because some displays I have been to, particularly of receiving, have been very bad. The experimenter, as well as the trader, should keep in mind that a poor display does great harm to wireless, for bad advertisements travel quickly. A Sydney pressman told me recently that he had a poor opinion of wireless, as a display he had been to had been a failure. I had great trouble to convince him that that was not the fault of wireless, but of the operator, the apparatus or both. Indiscriminate displays should therefore be carefully checked, whilst interruptions should be avoided at all costs. In some cases in which delightful music was being happily listened to, a shrieking discordant note cruelly interrupted, and jarred upon one's nerves. The operator put the blame on trams and lift motors, but the audience considered that the lecturer was trying to find an excuse in order to save the reputation of wireless.

"One important point that experimenters should consider is that they should not waste energy in transmitting worthless matter. Chesterton has said that 'what the people most need is not a new means of saying things, but brains enough to say things worth saying'; and that should be applied to wireless messages. The transmitter should have as much respect for the ether as if he were entering a cathedral; in fact, wireless has been aptly designated a divine spark.

The Experimenters' Corner



SHELLAC VARNISH.

SHELLAC varnish when properly used is a very useful insulating compound to have around the experimental station. To ensure that the article will be pure, it should be prepared by the experimenter personally. Many insulating varnishes sold ready prepared contain ingredients which render their use unsuitable for radio work. Purchase the shellac in flake form and dissolve it in methylated spirit. It takes some time to completely dissolve, but it can be considerably shortened by stirring. When using the varnish, it should be remembered that it is only a good insulator when perfectly dry, and if a thick coat is desired it is better to apply several thin coats instead of one heavy one. All traces of methylated spirit can be removed from the varnish by baking the coil or other apparatus in an oven for about half an hour. This precaution is especially necessary in the case of multi layer coils where the ventilation to the inner layers is practically nil. During the slow evaporation of alcohol—methylated spirit being a denatured form of this chemical—acetic acid is generated, which, in addition to lowering the insulation resistance between the turns, causes a slight corrosion to the wire. Heating to a temperature above 100 degrees Centigrade will drive the methylated spirit off in the form of vapor.

HOW TO LETTER A BAKELITE PANEL.

Bakelite panels do not lend themselves very easily to marking by means of the ordinary steel letter stamps. Most of the lettering necessary on a panel comes close to the edges, and any sudden blow from the letter stamp is liable to fracture the surface or chip a piece off the side. A

very neat method of lettering can be carried out as follows. Clean the surface with methylated spirit to remove the film of dust and grease which is apt to accumulate while the panel is laying around the workshop. Now obtain some white ink or Windsor and Newton's Chinese White water colour paint, and with a stiff, steel pen write the desired information on the panel. As soon as the writing is perfectly dry, take a soft camel-hair brush and give the lettering a single coat of transparent varnish to protect it. If there is any occasion to alter the inscription, the whole can be quickly removed by wiping over with a cloth dipped in methylated spirit.

JOINTS IN AERIAL WIRES.

It is most important that all joints made in the outside portion of the aerial system should be properly made, owing to the corrosive effects due to exposure to the elements. The correct splice for any outside solid conductor is known as the Britannia Joint, and if the reader does not know its exact appearance, an inspection of the joints used in telegraph and telephone wires will clear matters up. Clean the surface thoroughly with sandpaper before twisting the wire, and apply a few drops of killed spirit. This can be prepared by dissolving as much zinc from an old battery element as possible in a small quantity of Hydrochloric or Muriatic acid. In a small ladle or a two-ounce tobacco tin, melt a quantity of solder sufficient to cover the splice. Take the wire and dip the joint into the solder, and hold it there until it gets as hot as the surrounding material. If taken out before it reaches this temperature, the solder will not have had time to penetrate right through the joint and a short time of exposure to sun and rain will result in a high

resistance contact known to wiremen as a "dry joint." Clean any excess of the acid flux from the wire with a piece of rag to guard against corrosion.

A "B" BATTERY FILTER CONDENSER.

Experimenters often experience frying and scratching noises in the telephones, and when the source of trouble is traced it often proves to be a faulty high tension battery, in which possibly one of the cells has become discharged, and the resultant erratic chemical actions give rise to small voltage fluctuations. Procure a telephone condenser of about two microfarads capacity and shunt it across the terminals of the battery. The insulation of this condenser must be fairly high, because it will be permanently in this position and any slight leakage will discharge the battery. A good way to test it is to connect it across the terminals of a battery with a voltage slightly in excess of that it will be required to carry in actual operation. Remove it and allow it to stand for about thirty seconds. Now connect the two terminals with a piece of copper wire and a short, snappy spark should take place if the dielectric is in good order. Only condensers which stand up to this should be used. The efficiency of this simple little method of curing parasitic noises in the high tension battery can be demonstrated in the following manner. With the large capacity condenser removed from the circuit take one of the battery wires and draw it along the surface of a coarse file. A terrific scratching and rattling noise will be immediately heard in the telephones which will completely drown out even the loudest signals. Now shunt the special condenser across the high tension terminals of the receiver and

again interrupt the lead from the battery as before. Practically no noise will be heard in the receivers now, and if a faulty battery is able to behave any way near this drastic test it well deserves to be pensioned off. The smoothing out effect of this condenser is so great that the battery lead can be entirely disconnected and the signals will persist for nearly a second after the removal, with a gradual fading away until nothing is heard.

HIGH FREQUENCY TRANSFORMERS FOR SHORT WAVE-LENGTHS.

The excellent results achieved by the experimenters who undertook the reception of short wave signals from the United States and New Zealand has no doubt stirred many others with the desire to do likewise. With exceptional conditions prevailing it was found possible to receive these signals with only one valve, but for serious work radio frequency amplification should be employed in at least one stage prior to rectification. Tuned anode and condenser coupling is slightly more efficient than transformer coupling using the ordinary method of construction of these coils, but where several valves are to be used it will be found best to use the latter type of winding. The main trouble with the transformers as usually constructed with the windings in narrow slots, is the high distributed capacity and resistance caused by the concentrated winding. These objectionable defects are overcome to a large extent by winding the coils in

single layers. The transformers described in the following text are wound on cardboard tubes 2 1/4 in. in diameter, varying from one to two inches long. These tubes should be cut to a suitable size and mounted either on the four pin sockets from old valves or provided with terminals for independent connection. For the windings use No. 36 double cotton-covered wire. Wind on the primary first, and over it place several layers of stout paper to thickness of at least 1/32 in. This precaution is necessary to keep the capacity between the windings to a minimum consistent with close magnetic coupling. The secondary consisting of an equal number of turns is now wound on, and for mechanical protection of the windings a layer of Empire cloth or paper should be wound on. Immerse the whole in wax after this is done. Although this treatment increases the distributed capacity and its attendant losses slightly, it more than compensates for this by the better insulation provided. The data as regards turns, inductance, and approximate tuning range are given below.

Turns.	Inductance.	Tuning Range with 0.00025 Condenser.
40	150 m.h.	160 to 330 metres.
70	450 m.h.	230 to 550 "
100	900 m.h.	300 to 750 "
130	1400 m.h.	400 to 1000 "

When connecting in the circuit, the correct direction of the plate current through the primary must be determined by experiment. By means of a potentiometer shunted across the

filament of each valve it is possible to control the self oscillating property of the amplifier.

RADIO ASSISTS COMMERCE.

Each week adduces fresh evidence of the commercial value of wireless telegraphy and telephony. Just how far radio will go in its application to the commercial needs of the world it is impossible, at the present moment to say, but there is no question that it will play a big part. The following serves to illustrate one of its many present-day uses:

On February 12 there was a disastrous fire at Suva, the capital of Fiji, involving damage to the extent of £50,000, and this item of news was circulated by one of the British broadcasting stations on Sunday, February 13. One of the engineers of Messrs. Dennis Brothers, Ltd., the well-known motor lorry and fire engine manufacturers, of Guildford, Surrey, is in possession of a receiving set, and he picked up the message. Within a few hours a telegraphic communication was on the way from Messrs. Dennis Bros., Ltd., to the Town Clerk of Suva, offering to ship one of their 60-70 h.p. 500-600 gallon turbine fire engines, and, after an interchange of telegrams the offer was accepted, the order booked, and the fire engine was shipped and actually on the way to Fiji within four weeks of the fire, that is, before a letter could have reached England if posted after February 13.

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Wireless and Electrical Exhibition

In Sydney Town Hall

The N.S.W. Division of the Wireless Institute of Australia is throwing plenty of energy into the task of organising the wireless and electrical exhibition to be held in the Sydney Town Hall in the near future. This will be the first exhibition of its kind in Australia, and as befits its importance, generous offers of support have been received from the various radio and electrical interests in and around Sydney.

In his office on the 5th floor of the Metropolitan Building, corner of Hunter and Bligh Streets, Sydney, Mr. Frank Daniell, the organising secretary appointed by the Council of the Wireless Institute, is busily engaged in laying his plans. "Everything is going swimmingly," said Mr. Daniell, when asked how the work was progressing. "We intend to stage an exhibition that will open the eyes of the Sydney people. There is a great deal of misconception regarding the practical application of radio and electricity generally, and we are

out to dissipate that. Every individual or firm interested who can do anything to help us achieve that aim is cordially invited to co-operate.

"We intend doing things well," continued Mr. Daniell "and hope to wind up with a huge radio ball in the Town Hall."

A glance at rules and regulations governing the exhibition discloses the thoroughness with which the organising work has been undertaken.

The official opening, the exact date of which is not yet known, will, in all probability, be performed by His Excellency the Governor-General. The sessions will extend from 10 a.m. to 10 p.m. daily, and the exhibits will consist primarily of wireless and electrical apparatus and raw materials. Demonstrations under the control of members of the Institute Council will be given at regular intervals, and no effort will be spared to interest and educate the general public who it is expected will attend in large numbers.

Mr. Daniell will be glad to receive offers of help from members of the Institute who are prepared to assist during the exhibition.

Wireless in the West

(By Our Special Correspondent.)

Wireless activities in the West are, at the moment of writing, very much in the position of a ship awaiting a storm. Broadcasting is now a topic of public discussion and, although the volume of buying is not very great at present, dealers are not at all perturbed. They recognise in the temporary slackness a determination on the part of the public to buy only the most up-to-date equipment, at a time when there will be regular, high-class programmes to listen to. Correspondence in the press has helped to swell public interest, and there is every indication that when broadcasting commences the public will need very little to convince them of the value of radio entertainment services.

Several prominent firms have taken an active interest in radio during the past few weeks, amongst them being Messrs. Harris, Scarfe and Sandover,

Ltd., and Messrs. Nicholson's. Of course, quite a number of houses have gone into the line from a more or less business point of view, and from these we have interesting window displays of wireless apparatus generally. It is expected that the two firms mentioned will take an active interest in broadcasting when they are free to go ahead.

The number of School and College youths interested in radio in the West is a healthy sign. Their optimism is unlimited, and by the time they reach manhood they should certainly have a wide and deep knowledge of radio science.

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Victorian Experimenter Honored

Presentation to Mr. W. F. M. Howden

An enthusiastic gathering of experimenters assembled at the Club Rooms of the Box Hill Radio Club, Melbourne, on Monday, July 2, to express appreciation of the wonderful success of Mr. W. F. M.

The function was attended by Mr. Malone, Commonwealth Controller of Wireless; Mr. E. W. Greenwood, M.L.A., and Mr. W. Young, Shire President. The Wireless Institute was represented by Mr.

Mr. H. K. Love, organiser of the tests, said Mr. Howden's log was far more complete than any other submitted. It was a creditable performance indeed to log 22 stations out of 23.

The Commonwealth Controller of Wireless in speaking of the work done by experimenters emphasised that the new regulations would not hinder the legitimate experimenter. Those regulations had been causing amateurs considerable anxiety. The experimenters should, and would not, be hampered. Their endeavours should be encouraged in every possible way. Such performances as that of Mr. Howden substantiated this contention. The endeavours put forward in this test had yielded a result of considerable commercial interest, and one felt like labelling Mr. Howden's receiving set as the most efficient in the world. He then presented Mr. Howden with a salad bowl on behalf of the Club, at the same time expressing the pleasure he felt at meeting members under such happy auspices.

Councillor W. Young (President, Nunawading Shire) referred to the honour Mr. Howden had brought to Box Hill, and predicted that in the near future this centre would be the recipient of further radio honours.

Mr. E. W. Greenwood, M.L.A., declared his intention of considering the question of presenting to every one in his constituency a receiving set so as to be in touch with them right to the polling booth. Mr. Howden's success was certainly grand, and he would ask the experts present if there were any important bearing in the fact that the tests were conducted between the "dry" area of Box Hill and a similar arid region in America.

Musical items were then given by Mrs. H. Beattie and friends, also a wireless concert by Mr. H. Beattie and the efficient station of Mr. N. Culliver (3DP) at East Melbourne. When the experimenters are in need of "material" to work on 3DP can be relied upon to cheerfully assist.



VICTORIAN ENTHUSIASTS HONOUR MR. HOWDEN.

Group at the Box Hill Radio Club on the occasion of a presentation to Mr. W. F. M. Howden. Standing (back row): Messrs. Lusty, Robinson, Cr. W. Young (Shire President), E. W. Greenwood, M.L.A., Elsum, Beattie and Steen (Secretary Wireless Institute). Sitting (left): Mr. H. K. Hirst (Secretary Box Hill Radio Club); (right): Mr. Boyd. The centre figures standing are: Left, Mr. Howden receiving the presentation bowl from Mr. J. Malone (Controller of Wireless) on the right.

Howden in the recent Trans-Pacific Tests. The residents of the district combined with the Club in presenting Mr. Howden with a handsome salad bowl.

H. K. Love, President, and Mr. G. W. Steen, Secretary, who were ably supported by an attendance of all the members of the Box Hill Radio Club.

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Royal Ediswan ..	1 10 0
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Radiofun

At considerable expense we have made exclusive arrangements for the publication of "Radio Ralf's" adventures, which is one of our regular features. Hereunder is one of Ralf's adventures, and in subsequent issues of "Radio" his many thrilling experiences will be recorded, which we believe our readers will enjoy.—Ed.

RADIO RALF AND HIS FRIENDS---

By Jack Wilson

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TO THE RADIO CAFÉ.

I know now what Miss Fila-ment, When "Listen here," said she, "Those other girls away I sent, You autodyne with me."

* * *

HIGH CAPACITY.

Customer: "Have you any of Swallow and Ariel's?"

Assistant (slightly deaf): "Have I ever swallowed an aerial? Good Lor', man, what do you take me for?"

* * *

MORE SONGS, PLEASE!

Fair One: "Have you any of the latest Radio songs?"

Music Seller: "Sorry, Miss, I've only one left—'Rheo Nights.'"

* * *

HOW ZIS, HUH?

Me was spilt mine valve on floor,
Me can't never buy some more,
I be clumsy, make I weep,
Can no never get more sleep;
Be it always must!

* * *

HAVE YOU?

Willie Knut entered a Radio dealers to spring a huge joke: "Say, guy, have you ever seen a Grid leak?"

The Dealer: "Yes, and I've also seen a Cell charge and a Bell push and a Sine curve and an Aerial lead and a Baker light and a Wire reel and a Bye pass and a—" But Willie bolted. He returned presently and, not to be beaten, exclaimed: "I know one you haven't mentioned. Have you ever seen a Valve sock it?"

* * *

DRAW THE BLIND, PLEASE!

A Carrier Wave came in one night,
To see the Vacuum Tubes alight.
It circled round in widening rings
And almost singed its flutt'ring wings.
It whistled round with shrieks and groans,
And played "Old Harry" with the 'phones
Then down it flew without a sound,
And buried itself deep in the ground.

* * *

"You can see that Mr. Bakelite has been well brought up."
"Why do you say that?"
"Well, he seems so well-polished."
"Ah, but only on the surface, my dear"

—Contributed by R. H. E. CHANNON.

OLD BROADCASTS REWIRED.

"When You and I Tuned-in, Maggie."

"Silver Wires Among the Copper."

"By the Glad Ether Waves."

"Aunt Dinah's Radio Party."

"Call Me by Radio To-night, Love."

"Wireless Back to Old Virginia."



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—The Passing Show. (London)

South Australian Notes

(By a Correspondent.)

Mr. Harry Kauper, 5BG, sailed for England by the s.s. *Orsova*. South Australian experimenters wish him a good trip.

The latest experimenter to start transmitting here, is Mr. V. Cook, of Prospect, 5AC. Amateurs in the northern suburbs should now hear something more than whistling valves.

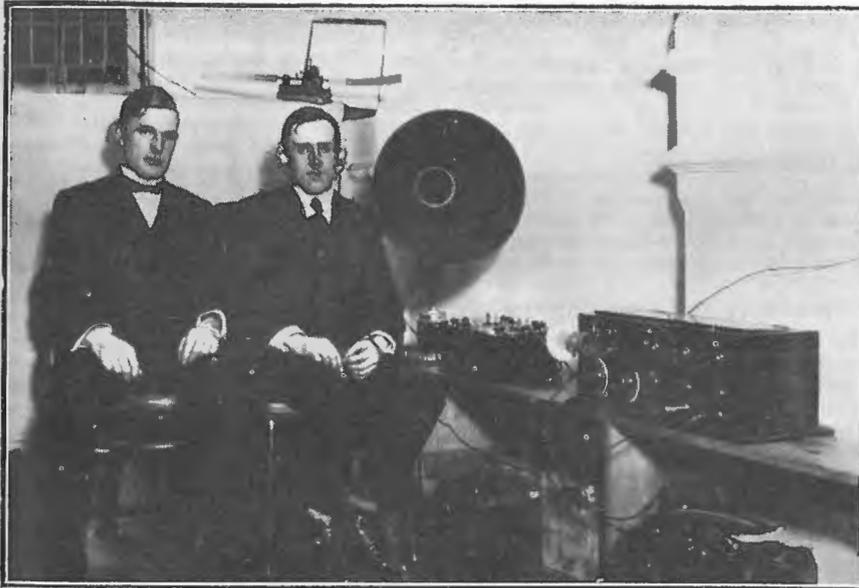
Mr. W. Bland, of Alberton, 5AG, has improved his modulation considerably; but still seems to vary his wave-length a little.

Heard on spark the other night, 5AV, Mr. C. E. Ames, of Hindmarsh.

Mr. R. T. Edgar states that he has been getting very good results on his two-valve set.

Much surprise has been evinced by some of Adelaide's leading transmitting amateurs when informed that they had been logged by VIA on 600-metres, and that they were interfering with commercial traffic. Steps are being taken by all to prevent this.

Nothing has been done in South Australia yet with regard to the Australian Radio Relay League, but it is to be hoped a move will be made soon by the amateurs here.



Messrs. H. A. Kauper and L. Jones, who had charge of the receiving set at the first dance to radio music ever held in Adelaide.

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Club Notes & News



WIRELESS INSTITUTE OF AUSTRALIA

N.S.W. DIVISION.

A GENERAL MEETING of this Division was held at the Royal Society's Hall, Sydney, on Thursday evening, July 17.

After the general business was disposed of, Mr. George Apperley, Radio Engineer, delivered a most illuminating and instructive lecture on "Duplex Radio Telephony." Mr. Apperley was accorded a very cordial vote of thanks by all present.

Mr. George A. Taylor then addressed the gathering on the question of affiliation of the N.S.W. Division of the Wireless Institute of Australia with the British Science Guild. After discussion and a motion being moved and seconded and put to the vote, it was decided that the N.S.W. Division should affiliate.

QUEENSLAND WIRELESS INSTITUTE.

At a general meeting of the Queensland Wireless Institute on July 13, various changes were effected in the list of officers. Mr. A. N. Stephens (formerly of Pinkenba Radio) was elected as Hon. Secretary, Mr. H. Maddick (Manager for Edison-Swan) Hon. Treasurer, and various other members were elected to committees. All communications should now be addressed to the Hon. Secretary, Radio House, Adelaide Street, Brisbane.

Both Mr. Stephens and Mr. Maddick are well-known in Wireless circles in Brisbane, and it is considered that, with the assistance of the President (Mr. A. G. Jackson, who is well-known throughout Australia as a Scientist of a high order) and a committee of experts, there soon should be considerable improvement in Wireless matters as far as the Institute is concerned. Members in the city, and country, may look forward to receiving every consideration and assistance in conducting radio experiments. The Institute is out to assist members in every possible way, and when funds are available, it is intended to instal more modern equipment for the convenience of Institute members. It is anticipated that this will make the Club much more popular, and assist materially in furthering the committee's aim to do everything possible to further the interests of radio generally.

MANLY RADIO CLUB.

There was an encouraging attendance at the fortnightly meeting of the above Club on July 23.

The President, Mr. F. C. Swinburne, explained various matters in regard to the Club's activities, and mentioned that at the next committee meeting a syllabus would be drawn up to provide for some considerable time ahead.

The conditions governing the competition for a crystal set capable of receiving signals over the greatest distance were explained to junior members who are taking a keen interest in it. A prize of 10/6 has been offered by Mr. Phil Renshaw to the successful competitor.

After the general business the chairman invited technical questions and, after satisfying those who required information, delivered an interesting lecture on "Waves and Wave Motion."

WENTWORTH RADIO CLUB.

The Club is now in its new premises situated at "Monesk," the residence of Mr. Spencer Nolan, president of the Club, who has very kindly donated the use of a room for club purposes. Every Monday night will be buzzer practice, and the Club is looking for men who can send and receive at 30 words per minute. It is hoped that members will take advantage of this to improve their Morse.

It is proposed in the near future that this Club will hold a dance at the Masonic Hall, Double Bay. Tickets can be obtained from the Hon. Secretary, Mr. W. Best, Carlisle Street, Rose Bay, or from the President, Mr. Spencer Nolan, at the Club address.

METROPOLITAN RADIO CLUB.

At a meeting held recently, the policy of the Metropolitan Radio Club was vigorously discussed by several members present. After about two hours debating it was decided that the Club should cater for the social side as well as the technical. It is realised that when broadcasting commences there will be a great number of "listeners-in" who will, no doubt, get sufficiently interested in the science to later on become experimenters.

At the same meeting it was decided that on September 10 the Club will hold an all clubs meeting, and invite members of outside clubs and societies to attend the presentation of prizes to successful competitors in the New South Wales-

New Zealand Radio Test. An attractive programme will be arranged, and a bumper attendance is hoped for.

N.S.W. RADIO ASSOCIATION.

It is gratifying to the pioneers of the Radio Association to see that Clubs are beginning to come under its wing. The Association is doing a lot of good work. It is primarily concerned with keeping the clubs together, and giving advice and assistance wherever possible. The Association is a purely non-technical body and is composed of members of different Clubs who are anxious to assist the authorities in carrying out the Wireless Telegraph Act, and in other ways to secure greater progress amongst amateur bodies.

ILLAWARRA RADIO CLUB.

The first annual general meeting of the Illawarra Radio Club was held at the Club-room, 75 Montgomery Street, Kogarah, on Tuesday, July 17. There was a fair attendance, and much important business was transacted.

The Secretary's Annual Report was unavoidably not available, and was deferred till next meeting.

The Treasurer's financial statement disclosed a very satisfactory state of affairs on the year's working. Although expenses had been somewhat heavy, a fair credit balance was shown, and this, together with the annual subscriptions which will now be coming in will soon put the Club in a very comfortable financial position.

Mr. A. Atkinson moved a motion for the rescission of Rule 24 and the substitution of a new Rule, the effect of which would be to bring all members on to the same financial footing on July 1 every year, by payment of the whole or a proportional part of the annual subscription (according to date of joining). This would effect a very desirable squaring of accounts at the beginning of each financial year. The new Rule was carried unanimously.

Mr. S. Atkinson then spoke to his motion, proposing the elimination of the Technical Committee and the placing of the whole of the Club's affairs, business and technical, in the hand of the Business Committee, with the Club's Licence holder as Technical Adviser. The proposal provoked a lively discussion. The consensus of opinion did not favour the proposal, and, on being put to a vote, it was decided by 16 to 1 that the present Rule should stand.



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The election of officers for the new year resulted in the following gentlemen being re-elected unopposed:—President, Mr. C. D. Cuthbert; Vice-presidents, Messrs. L. R. Hewett and A. E. Atkinson; Hon. Secretary, Mr. W. D. Graham; Hon. Treasurer, Mr. J. W. Mann.

There were four candidates for the three positions on the Business Committee, and on a ballot being taken one was elected, and the other three ran a dead heat. To get over the deadlock, it was decided to appoint one of these gentlemen to the Technical Committee, for which there were only two nominations. Mr. S. Atkinson was then offered and accepted this position.

WESTERN SUBURBS AMATEUR WIRELESS ASSOCIATION.

At a meeting of the W.S.A.W.A. on July 18, Mr. Burman lectured on "Electricity and Magnetism."

At the next meeting, Mr. Rawlinson will lecture on "Primary Batteries," and Mr. Hoile on "Valve Theory." During the past fortnight the Association has been entertaining by wireless music. Many prominent citizens have been agreeably surprised when they realised the possibilities of radio telephony. It was by courtesy of Mr. Raymond Evans, of Wireless Supplies Ltd., that a Brown's "loud speaker" was available to the Association during these entertainments.

It is hoped to again entertain the Auburn public with a wireless concert to be held shortly. The arrangements are now well in hand and success is practically assured. The Association has now entered its third year, and it is proposed to have the second annual function in the Auburn Town Hall. All interested are invited to attend next meeting, and any information regarding wireless will be given if correspondence be addressed to the Hon. Secretary.

CAMPsie AND DISTRICT RADIO CLUB.

The 26th general and business meeting of the Campsie and District Radio Club was held in the Club Room, Gravier's Hall, Beamish Street, Campsie, on Wednesday, July 18. There was a good attendance. Mr. Mawson gave an interesting lecture on Valves, with particular reference to the discovery of the Flemming Valve.

Mr. Mawson (2DH) intends transmitting signals for buzzer practice for the next meeting. Members who have head 'phones are requested to bring them along.

The election of officers for the ensuing half year resulted as follows:—

President: Mr. R. Shelton; Vice-presidents: Messrs. R. Hobbs and A. Keep; Secretary, Mr. W. Hughes; Assistant Secretary: Mr. E. R. Mawson; Treasurer: Mr. W. Hughes.

Technical Committee: Messrs. Mawson, Keep, Shelton, Hobbs and Hughes.

Club Council: Messrs. Keep, Weinert, Henry, Mawson, Hobbs, Hughes and Shelton.

Social Committee: Messrs. Jones, Steel, Hobbs, Shelton and Hughes.

Auditors: Mr. Mawson and Mr. Hampton.

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Across the Tasman Sea

Australian and New Zealand Experimenters Join Hands

THE experimental tests between Australian and New Zealand amateurs which are now proceeding, mark an important step in the progress of radio in the two countries.

The organising body, the Metropolitan Radio Club of N.S.W., deserves every credit for its very laudable aim to demonstrate just what measure of success can be attained in the transmission of signals and speech between Australia and the Dominion. Attempts like this deserve every encouragement at the hands of both experimenters and the general public. Very frequently successes won in pioneering efforts prove the foundation for achievements of world-wide interest in later years.

Very few experimenters in Australia or New Zealand to-day are interested in radio science for reasons outside the appeal it makes to their ambition and inventive genius. This in itself constitutes the surest guarantee that radio experimentation will never fail because of lack of enthusiasm.

Where financial considerations form the impelling motive, as they do in many other enterprises, this assertion cannot be so confidently made.

It is time that greater public interest was taken in the activities of radio experimenters than has been the case up to the present. When wireless was an undertaking of problematical success the man in the street evinced but little interest. Science had promised and failed in so many other apparently less difficult matters that the layman refused to become hopeful, let alone enthusiastic until there was something to enthuse over. That time is now.

At the earliest possible moment, the results of the tests at present being conducted will be announced. It is almost safe to predict beforehand that they will disclose a very great measure of success. The programme to be observed is as follows:—

The transmission will extend until August 18, thus allowing a full fourteen days for experimenters to work.

One N.S.W. and one New Zealand transmitter will work each night. Each will work for twenty minutes, during which C.W. alone, or ten minutes C.W. and ten minutes telephony may be transmitted.

Each transmitting station will be given two secret calls, one for C.W. and one for telephony. During transmission each station must send his ordinary call and secret call at least eight times at a speed of eight words per minute. Between 5 a.m. and 7 p.m. on both Sundays during the test will be a "free for all" period. Before commencing to transmit, operators should make certain they are not going to jam other experimenters.

Prizes will be awarded to the transmitting station heard strongest in New Zealand using the least power, and to the receiving station recording the most complete log on the least number of valves.

The results of the test will be officially announced at a special meeting to be held on September 3.

Personal

Mr. Marks (2GR), of Rose Bay, has his aerial in working order again, after having had it blown down in two storms.

Mr. Charles Maclurcan, 2CM, of Strathfield, has resumed his popular Sunday night concerts. He has been away for over a month and amateurs at a distance will be very glad to hear 2CM's signals coming over.

2LI has not been heard much of late in the ether. It is hoped that it will not be long before he starts again.

After a silence of nearly four months 2FA was heard in the ether the other night.

Mr. Marks (2GR), of Rose Bay, has of late been entertaining "listeners-in" to some jazz band music transmitted from his station. On Sunday, July 29, he had Miss Ethel Campbell—The Angel of Durban—at his station to address those people who have not had the pleasure of meeting her.

One Sunday evening recently, 2BB had a Scotch evening. He had the bagpipes playing over his Radiophone, and the novelty was enjoyed by a large number of "listeners-in."

Jack Davis (2DS), Vaucluse, has been doing some very good long distance work on a detector tube and on one stage of audio frequency. He could hear the amateurs working in New Zealand on speech. Standard long distance work has been one of 2DS's trump cards.



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G. E. (Sydney) asks: (1) How many basket coils, with reaction coil, would be required to tune from 200 to 1000 metres? How many turns for each coil? (2) What gauge and quantity of wire would be required for windings? (3) How many fixed and movable plates are required to construct 0.001 variable condenser?

Answer: (1) See answer to *E. S. Mincha West* in last issue. Use a reaction coil a size larger than the secondary for short waves. The values will have to be determined by yourself as they vary in individual cases. (2) Use No. 30 D.C.C. wire, of which about half a pound will be required. (3) A .001 condenser usually has about 43 plates with a proportionate number for other capacities. This assumes air dielectric and a spacing of about one millimetre for average size plates.

2 VI. (Gladesville), intending to alter his aerial system (particulars submitted), asks: (1) Would alteration increase receiving range? (2) What would be approximate natural wave-length? (3) Is the 33 KW transmitter at Sydney Radio (VIS) ever used?

Answer: (1) Yes. (2) About 240 metres, according to dimensions stated. (3) Yes, on long wave transmission.

"Calls" (Waratah) asks: (1) Names and addresses of stations he hears transmitting telephony. (2) Number of turns on high frequency transformer having tapped winding, etc. (sketch submitted).

Answer: (1) The stations you hear are as follows:—3TZ, R. W. Were, 15 Martin Street, South Melbourne; 3BC, E. A. Mustard, "Surrey," Taylor Street, Oakleigh; 3JU, R. A. Hull, 38 Charnwood Road, St. Kilda. (2)

See issue "Radio," May 30, on "Radio Frequency Transformers."

Thomas (Sydney) submits particulars and diagram of his crystal receiving set and asks why he cannot receive concerts.

Answer: The tuning for spark reception is not very critical and can be easily tuned in with your coupler, but to pick up telephony a variable condenser will have to be used across the secondary. The tuning range of the aerial with an average antenna of 0.0003 microfarads capacity is approximately from 300 to 1,600 metres, and the secondary with a 0.0005 variable 600 to 2,500 metres. You should construct a short wave receiver according to the descriptions given in recent issues of "Radio."

H. J. F. (Canterbury asks dimensions of a transformer for converting 200 volts A.C. to a current giving about $\frac{1}{2}$ in. spark, also from 8 volts A.C. to a similar spark.

Answer: Core $1\frac{1}{2}$ in. cross section, 8 in. x 5 in. outside dimension, primary 660 turns No. 24 D.C.C., secondary 40,000 turns No. 40 D.S.C. For the 8-volt A.C. use a primary of 30 turns of No. 16 D.C.C. Be sure and provide sufficient insulation between the high and low voltage windings, which are former wound and placed on the same leg of the core.

Telephony (Gippsland): If condenser is in short wave coil circuit .0005 is O.K., but if for tuning the long wave generator coils 0.005.

READERS!

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Movements of Wireless Officers

Mr. G. W. Rowland signed off s.s. *Australport*, at Sydney on July 4, and returned to Melbourne.

Mr. C. R. Waite signed on s.s. *War Spray*, at Newcastle, on July 9.

Mr. J. W. Fairley signed off s.s. *Eudunda*, at Melbourne, on July 5, and proceeded on Home Port leave.

Mr. P. J. Manley signed on s.s. *Corio*, at Melbourne, on July 5.

Mr. F. C. Smith signed on s.s. *Echuca*, at Sydney, on July 10.

Mr. K. H. McSwan relieved Mr. E. D. Nicholl on s.s. *Kaikorai*, at Sydney, on July 10.

Mr. N. W. Marshall, who was relieved by Mr. E. J. Giles on s.s. *Waikouaiti*, at Sydney, on July 7, terminated service.

Mr. P. Whelan relieved Mr. W. C. Lucas on s.s. *Kadina*, at Sydney, on July 11.

Mr. J. R. Gilligan was relieved by Mr. W. C. Lucas on s.s. *Mallina*, at Sydney on July 11, and proceeded on Home Port leave.

Mr. S. L. Filer signed on s.s. *Baldina*, at Sydney, on July 11.

Mr. E. D. Nicholl signed on s.s. *Eastern* as 3rd Operator, at Sydney, on July 13.

Mr. A. D. Gratton, who was relieved by Mr. E. Furness on s.s. *Wanaka*, at Wellington, on July 3, terminated service.

Mr. F. C. Smith signed off s.s. *Echuca*, at Sydney, on July 12.

Mr. A. G. Shepherd signed off s.s. *Eromanga*, at Sydney, on June 26.

Mr. V. E. Stanley signed off s.s. *Iron Monarch*, at Sydney, on July 12.

Mr. H. Kirk, who signed off s.s. *Kaituna*, at Lyttelton, on July 11, relieved Mr. G. M. Power on s.s. *Koromiko* on the same date.

Mr. Power signed on s.s. *Kaituna*, at Lyttelton, on July 11.

Mr. H. Taylor signed on s.s. *Changsha*, as 2nd Operator, at Sydney, on July 18.

Mr. J. Carty signed on s.s. *Saros*, at Melbourne, on July 14.

Mr. H. W. Warner, who signed off s.s. *Coolana*, at Melbourne, relieved Mr. R. J. Webb on s.s. *Hobart*, at Melbourne, on July 17.

Mr. R. J. Webb signed on s.s. *Coolana*, at Melbourne, on July 17.

Mr. T. A. Jones relieved Mr. W. Hill on s.s. *Katoomba*, at Melbourne, on July 18.

Coastal Radio Service

STAFF CHANGES.

Mr. C. M. Urquhart, Radio Telegraphist, Broome Radio Station, transferred to Wyndham Radio as Radio Telegraphist in Charge.

Mr. R. C. Anderson, Radio Telegraphist, Wyndham, transferred to Perth Radio.

Mr. E. J. Roberts, Radio Mechanic, Wyndham Radio, transferred to Perth Radio on completion of Tropical Service.

Mr. D. Bowles, Radio Mechanic, Brisbane Radio, transferred to Sydney Radio.

Mr. A. P. Hosking, Radio Telegraphist, Melbourne Radio, to Broadcasting Department at Melbourne.

Mr. J. M. Johnson, Radio Telegraphist, Adelaide Radio to Engineering Department at Sydney.

Mr. J. G. Cookson, Radio Mechanic, Sydney Radio to Broadcasting Department at Sydney.

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