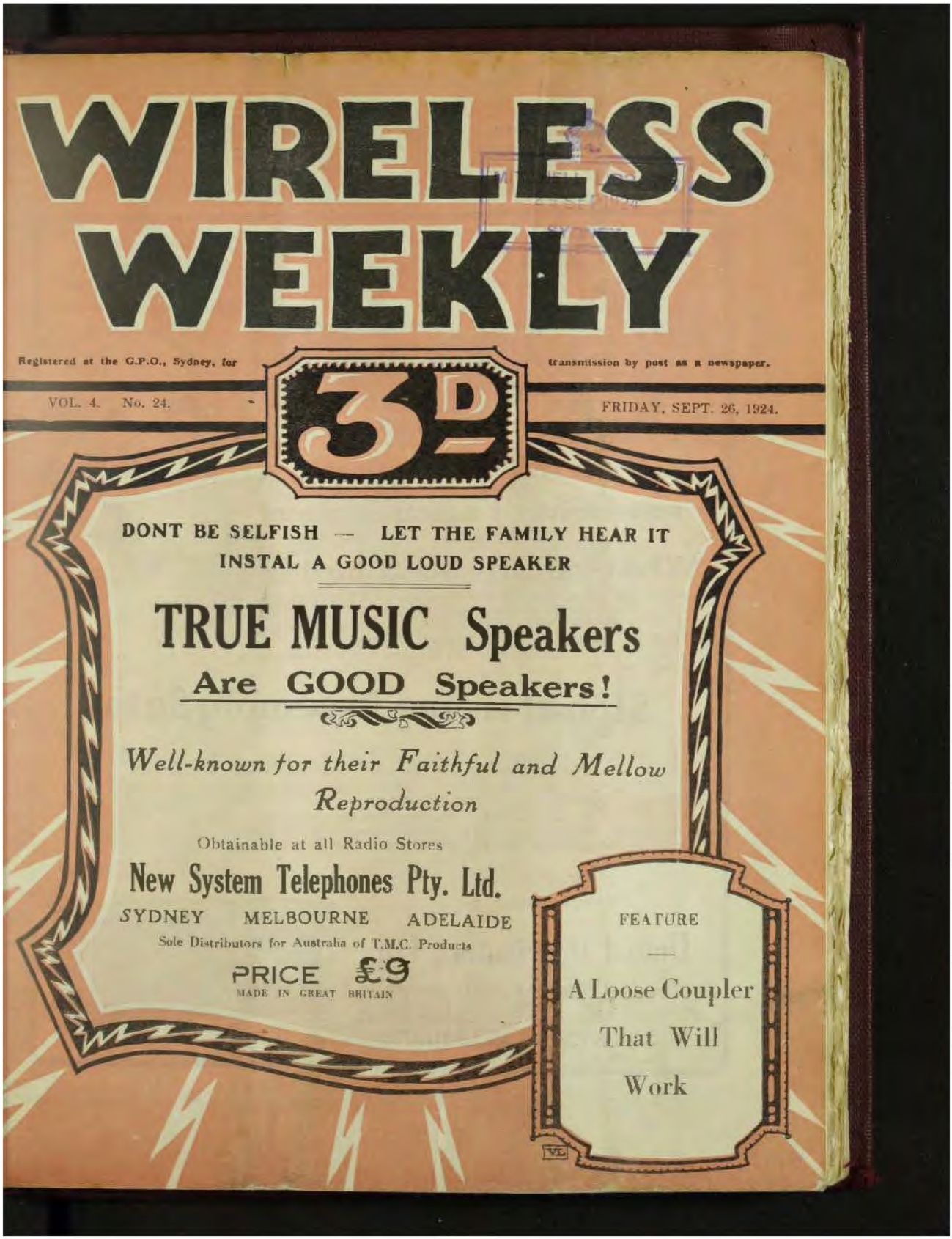

HERE THEY ARE?

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Official Organ of the New South Wales Division of the Wireless Institute of Australia, with which is incorporated the Affiliated Radio Societies and the Australian Radio Relay League.

Vol. 4. No. 24. Friday, September 26, 1924

CONTENTS:

EDITOR: A. W. WATT — The Editor will be glad to consider Technical and Topical Articles of interest to Australian Experimenters. All Manuscripts and Illustrations are sent at the Author's risk, and although the greatest care will be taken to return unsuitable matter (if accompanied by stamps), the Editor cannot accept responsibility for its safe return. Contributions should be addressed to the Editor, "Wireless Weekly," 33/37 Regent Street, Sydney, N.S.W.

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EDITORIAL

THE dramatic christening of the Wireless Motor Car attached to the Police Department at Sydney, brings home very forcibly the fact that probably no other branch of science has so consistently demonstrated its value as that of wireless. Years ago the part played by wireless in the tragic burning of the Trans-Atlantic liner "Volturno," in mid-ocean, electrified the world, and there followed the saving of thousands of lives by wireless from the wrecks of the "Empress of Ireland" and several other large passenger vessels.

Wireless was responsible for the destruction of the "Emden" and was one of the most vital factors in the successful transportation of many thousands of troops from Australia; the crews of hundreds of torpedoed vessels owe their lives to the fact that wireless operators were aboard the vessels.

In America, wireless is used extensively in the fighting of forest fires, and light vessels around the coast of England now automatically transmit wireless signals which enable the fog enveloped merchant ships to keep an unerring and safe course.

If Bill Skyes had been told that one day the nocturnal operations of his kind would be seriously restricted by the aid of wireless, he would probably have regarded his informant as a harmless lunatic. Yet to-day, we find the science of wireless linked up with the prevention or detection of crime, a new departure for New South Wales, but one that has already amply justified its installation.

Wireless Weekly Transmitting Tests.

Messrs. E. B. Crocker (2BB) and R. P. Whitburn (2DK) have intimated that they intend to take part in the tests. Particulars of their stations, together with the other N.S.W. transmitters, are shown elsewhere in this issue, so that readers will know just how to adjust their tuners for maximum results. The total number of transmitters to date who have expressed a desire to co-operate, is eight. They are 2JM, 2YI, 2CM, 2DS, 2GR, 2BC, 2BB, and 2DK. We proposed to carry on with the above transmitters with whom we shall finalise arrangements as to actual dates, times and method of transmission. Full details will be announced next week. Data forms are now in hand with our printers and as soon as they are ready, one will be sent direct by us to each of those who have kindly arranged to listen in on the tests.

Assurances of support have reached us from every State in the Commonwealth, and from New Zealand, so that these tests should be in every way successful.

BEAMING.

Mr. Gibson, fresh from weighty conferences abroad (and the Wembly Exhibition), has returned to Australia, full of punch and information upon Wireless problems. Amongst other things, he assures the world that Wireless will never be a serious competitor of the existing cable services. Perhaps not. On the other hand, if this is so, it seems hard to understand why huge sums of money are being expended on the erection of high power wireless stations to conduct commercial services between North and South America, and why the Central and South American Cable Company and the Commercial Cable Co. (both engaged in cable working between the United States and the South American Republics) have, according to a leading American journal, both sunk money in the enterprise.

No doubt, Mr. Gibson's remarks are based upon the authoritative opinions of those who should be able to pass them but the whole history of Wireless itself, offers a complete denial of the statement. Its progress, its rapid development from one stage to another, from the days of the fixed spark dischargers to the present highly efficient valves, has been altogther too wonderful to allow us to admit that it will never develop any further —and that is really what Mr. Gibson's statement amounts to.

The two main obstacles in the path of long distance commercial wireless working appear to be atmospherics and non-secrecy of messages. The former, a problem engaging the attention of the finest scientific brains in the world, must inevitably be overcome. Strange to say those scientists who have so far been unsuccessful in their experiments for the elimination of atmospherics are the most optimistic, and no one who has made a study of the development of wireless, and is aware of the aparently insurmountable obstacles which

WHAT ARE FROST LINES? SEE PAGES 2 and 3.

have already been overcome, can do otherwise than feel certain that science will conquer atmospherics.

The question of Secrecy is a somewhat different problem. A French Scientist, according to a London paper, has announced that he has almost perfected a system of transmission by which he claims that, unless the operator at the distant receiver were in possesson of the "Key", reception would be impossible. In any case the Beam system undoubtedly represents a partial solution of the problem and one that will eventually be considerably enlarged upon.

Although Mr Gibson states that the Beam method of transmission is possible only over certain hours of the day, he advocates the installation of such a station in Australia, and in this he is undoubtedly adopting the correct attitude. The possibility of war is ever with us; cables can be cut, and a Beam wireless station, even if its sphere of activities were restricted, would ensure that for a portion of the time at least, our communication with the outside world would be preserved. Better to Beam a little than never to Beam at all.

To the Editor, "Wireless Weekly."

Dear Sir,—Would you oblige me by printing in the "Wireless Weekly" all the amateur transmitting stations in New South Wales, including the call sign? I am a regular buyer of your "Wireless Weekly."

Hoping that you will oblige.—Yours faithfully,

W. THOMAS.

68 Oxford St., Paddington, N.S.W.

(Friend, we are only too happy to oblige. Please see elsewhere in this issue.—Editor.)

The Editor, "Wireless Weekly."

Dear Sir,—The reading of your editorial last week afforded me great pleasure. As you mention, there was nothing in your remarks that could possibly offend the genuine experimenter, but, on the other hand, they must cause the non-genuine experimenter to think furiously. You certainly second my own thoughts when you advocate a live experimenters' organisation in Australia. We can do it in Australia, but only after it is definitely known who are and who are not genuine experimenters. Could you not take the lead by asking all those who wish to be actively concerned with the experimental movement to forward their names to you, so that, when a complete list was available, you could publish it? This would have the effect of showing us just who could be relied upon to support any movement for the good of the experimenters, and of weeding out the undesirables.

I have every copy of "Wireless Weekly" since the first issue, and must congratulate you upon your consistency, unbiassed policy, and upon the straightforward manner in which you have tackled this particular matter.—Sincerely yours,

H. W. BEAMISH.

Parramatta, Sunday.

—::—

QUEENSLAND NOTES.

A good performance was recently put up by a set made solely of Gilfillan parts. At an airline distance of 550 miles from Sydney both the Sydney concerts were worked on a three-valve "Harrington" set and a temporary aerial with good loud speaker strength. Sydney was also worked in Brisbane on an indoor aerial, with the same set, with sufficient volume to fill a room.

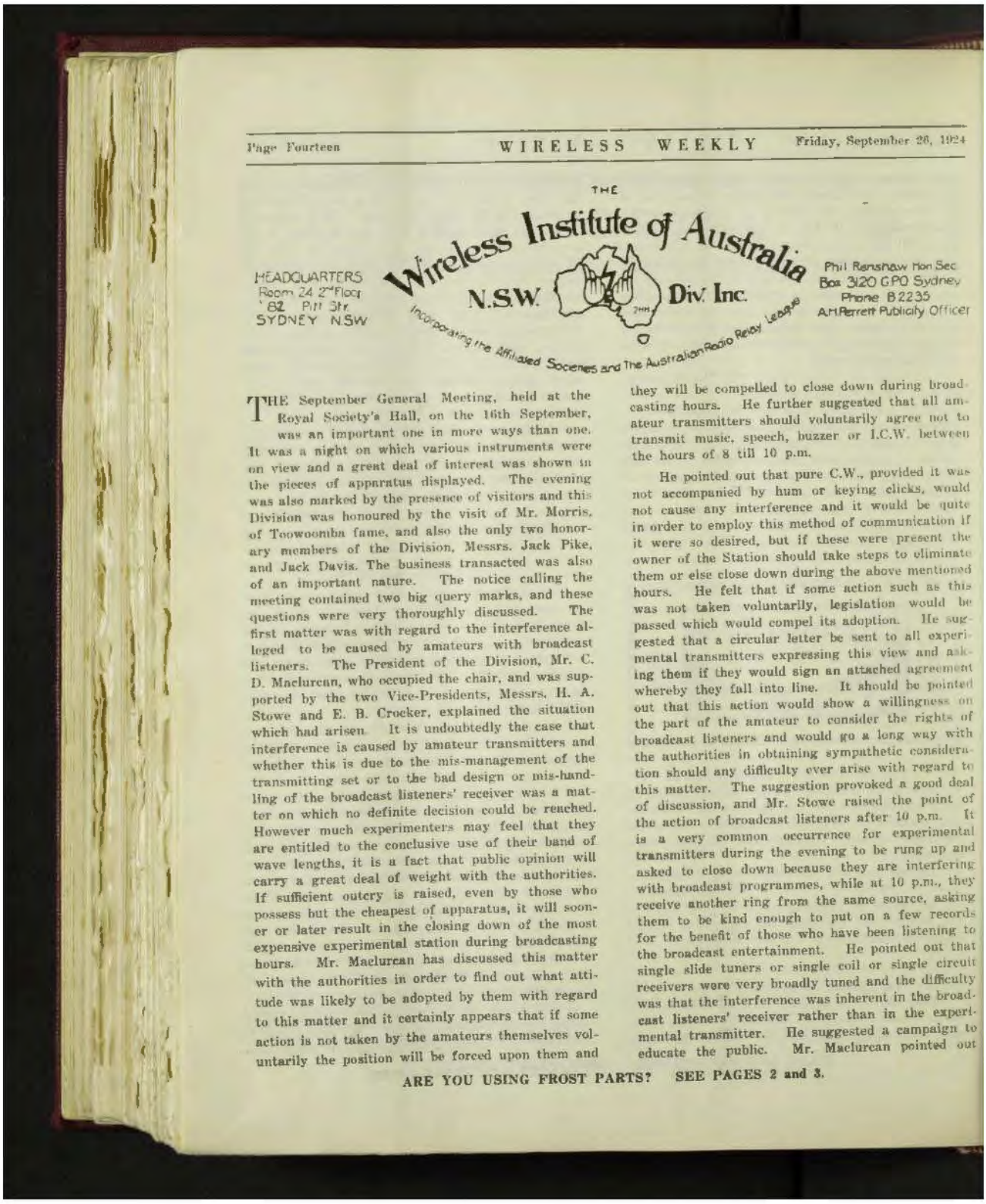
General satisfaction is expressed that Brisbane is at last to have an "A" broadcasting station, the Queensland Government having decided to apply for the necessary license. This will mean a tremendous boom in wireless throughout Queensland, as the listener-in has been up against big difficulties here.

Static is again starting its pranks up this way, a recent Sunday evening being exceptionally bad, although it was a lovely clear moonlight night. No one will be more pleased than the tropical listener-in when a good eliminator is placed on the market.

We note that Mr. N. Harper has resigned his position as secretary of the Radio Society of Queensland, through business reasons. Mr. Runge has taken up the work. He is a live wire member, as well as an enthusiastic experimenter, and we know this important position is in goood hands.

Queensland wireless clubs are invited to send along reports of their meetings to the editor, also DX reports from amateurs will be welcomed.

WHAT ARE FROST LINES? **SEE PAGES 2 and 3.**



THE

Wireless Institute of Australia

N.S.W. Div. Inc.

Incorporating the Affiliated Societies and The Australian Radio Relay League

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A.H.Perrett Publicity Officer

THE September General Meeting, held at the Royal Society's Hall, on the 16th September, was an important one in more ways than one. It was a night on which various instruments were on view and a great deal of interest was shown in the pieces of apparatus displayed. The evening was also marked by the presence of visitors and this Division was honoured by the visit of Mr. Morris, of Toowoomba fame, and also the only two honorary members of the Division, Messrs. Jack Pike, and Jack Davis. The business transacted was also of an important nature. The notice calling the meeting contained two big query marks, and these questions were very thoroughly discussed. The first matter was with regard to the interference alleged to be caused by amateurs with broadcast listeners. The President of the Division, Mr. C. D. Maclurcan, who occupied the chair, and was supported by the two Vice-Presidents, Messrs. H. A. Stowe and E. B. Crocker, explained the situation which had arisen. It is undoubtedly the case that interference is caused by amateur transmitters and whether this is due to the mis-management of the transmitting set or to the bad design or mis-handling of the broadcast listeners' receiver was a matter on which no definite decision could be reached. However much experimenters may feel that they are entitled to the conclusive use of their band of wave lengths, it is a fact that public opinion will carry a great deal of weight with the authorities. If sufficient outcry is raised, even by those who possess but the cheapest of apparatus, it will sooner or later result in the closing down of the most expensive experimental station during broadcasting hours. Mr. Maclurcan has discussed this matter with the authorities in order to find out what attitude was likely to be adopted by them with regard to this matter and it certainly appears that if some action is not taken by the amateurs themselves voluntarily the position will be forced upon them and they will be compelled to close down during broadcasting hours. He further suggested that all amateur transmitters should voluntarily agree not to transmit music, speech, buzzer or I.C.W. between the hours of 8 till 10 p.m.

He pointed out that pure C.W., provided it was not accompanied by hum or keying clicks, would not cause any interference and it would be quite in order to employ this method of communication if it were so desired, but if these were present the owner of the Station should take steps to eliminate them or else close down during the above mentioned hours. He felt that if some action such as this was not taken voluntarily, legislation would be passed which would compel its adoption. He suggested that a circular letter be sent to all experimental transmitters expressing this view and asking them if they would sign an attached agreement whereby they fall into line. It should be pointed out that this action would show a willingness on the part of the amateur to consider the rights of broadcast listeners and would go a long way with the authorities in obtaining sympathetic consideration should any difficulty ever arise with regard to this matter. The suggestion provoked a good deal of discussion, and Mr. Stowe raised the point of the action of broadcast listeners after 10 p.m. It is a very common occurrence for experimental transmitters during the evening to be rung up and asked to close down because they are interfering with broadcast programmes, while at 10 p.m., they receive another ring from the same source, asking them to be kind enough to put on a few records for the benefit of those who have been listening to the broadcast entertainment. He pointed out that single slide tuners or single coil or single circuit receivers were very broadly tuned and the difficulty was that the interference was inherent in the broadcast listeners' receiver rather than in the experimental transmitter. He suggested a campaign to educate the public. Mr. Maclurcan pointed out

ARE YOU USING FROST PARTS? SEE PAGES 2 and 3.

that if the experimenters waited, they would be forced into action, and that it would be much better to take the step voluntarily. He also drew attention to the fact that it would be impossible to educate the public as they would insist upon buying the cheapest apparatus available and the more refined circuits and more selective apparatus would cost more to buy and instal.

Mr. Gregory drew attention to the interference caused to amateurs themselves by other amateurs who persistently transmit music for long periods, but it was felt that this point was rather beside the question. Mr. Renshaw upheld the suggestion of the President, with regard to the silent period from 8 to 10 p.m. He stated that the public would insist on cheap gear and any action taken voluntarily by experimenters would make an impression. Mr. Cutts endorsed these remarks. Mr. Crocker expressed himself as being against the suggestion if the transmitter was not causing any interference. At the same time he pointed out that as experimental transmitting licenses expire the renewal of them would be made more difficult if something was not done voluntarily. He therefore supported Mr. Maclurcan's suggestion. Mr. Renshaw here made quite an impassioned address, when he stated that the public had insisted upon having open sets so that they might receive everything, and now that they were receiving everything, they did not like the result. Mr. Crocker moved that the suggestion be adopted. This was seconded by Mr. Gregory and adopted by the meeting. Mr. Mawson suggested that experimenters should use as low power as possible for local transmission. Mr. Marsden suggested that instant action should be taken and that those present having experimental transmitting licenses should agree to the proposition. The 16 transmitters present agreed upon this course. Messrs. Grigg, Sewell, Gregory, Mawson, Blanchard, James, Schultz, Davis, Leverrier, Nolan, Cutts, Challenger, Crocker, Stowe, Renshaw and Maclurcan handed in their names on the spot.

The next query was with regard to the attendance at the Institute's general meetings, and Mr. Stowe pointed out that it would be of great assistance to the Papers and Publications' Committee if members would assist with constructive criticism on the papers presented. Any suggestions as to how meetings would be improved or made more interesting will be welcomed, but it should be here pointed out that the matter which has been presented at recent meetings has been of the most interesting and instructive type and the September meeting was indeed one which could be counted as a most successful evening.

The display of apparatus which had been collected for the evening was then thoroughly investigated. Mr. Maclurcan thoroughly discussed the merits of the Institute's apparatus. He first dealt with the precision wave meter which has a range from 75 to 30,000 metres. It contains a standard condenser accurately calibrated with a series of coils dealing with the various wave length ranges having an overlap of several metres. A thermo galvometer was included in the circuit, but no buzzers or detectors as these upset the calibration. It was pointed out that certain subsidiary apparatus would be required in connection with this wave meter and the oscillator was the most important. It was suggested that parts of this oscillator should be donated by various members, and the following gentlemen signified their willingness to supply a part:

W. L. Hamilton—bakelite and condenser.
C. D. Maclurcan—valve and holder.
G. C. Hamilton—rheostat and dial.
E. B. Crocker—coils and wire.
H. R. Gregory—necessary plugs.
P. Nolan—rubber vernier button.
J. Pike—"A" battery.
L. Schultz—"B" battery.
R. C. Marsden—cabinet and condenser dial.

Mr. H. E. Stowe undertook to supply the design and Mr. R. C. Marsden will assemble the various component parts.

The Jewel valve testing set was next displayed and it was pointed out that it could take any valve characteristic required. In adition to the valve holder it was equipped with a filament ammeter, filament voltmeter, grid biasing voltmeter, plate ammeter and plate voltmeter. Other instruments belonging to the Institute which were also displayed were A standard thermo galvometer, similar to one with which the wavemeter was equipped, a portable thermo ammeter, reading to 5 amperes, a Wheatstone bridge, and an audibility meter.

Mr. Maclurcan also exhibited the first telephony and C.W. transmitter installed in Australia. It was his original set and has done much good work.

Mr. Marsden had on exhibition a low loss tuner, which was a very fine piece of workmanship and which he explained in detail.

Mr. Crocker showed a very fine instrument embodying the S.T. 100 circuit. He stated that the clarity with which music and speech was received

PAGES 2 and 3 TELL YOU ALL ABOUT THE FROST LINES.

was remarkable while great volume could be obtained from it.

Mr. Stowe also had on view a low loss tuner, employing a similar circuit to that of Mr. Marsden, but arranged somewhat differently.

Mr. Trimmington showed a home-made loudspeaker, built on the lines of the Magnavox, which he described and which he stated was giving remarkably good results. He also showed a very fine transmitting key.

Mr. H. A. Stowe had a multi-use instrument on view which by simply turning a switch and making connections to various terminals could be used to read from 5 milli-amps up to 10 amps., and from 5 milli-volts up to 100 volts.

A protective device exhibited by Mr. A. H. Perrett, consisting of an ordinary 110 volt 25 candle-power metal filament lamp used for protecting valve filaments from "B" battery voltage, caused some comment.

The meeting was a very enthusiastic one, and the fact that coffee and biscuits were allowed to stand and get cold until after 10 o'clock, and that even then it was with the greatest difficulty that members could be dragged away from the display of apparatus, speaks for itself.

During the evening the following five gentlemen were unanimously elected as members of this Division of the Wireless Institute: Messrs. H. K. James, W. H. Hannam, C. R. McKenzie, C. P. Thomas, and C. Trimmington. It is with pleasure that we note the increasing membership of the Institute and it points to the fact that the benefits accruing from membership are being realised more and more by the experimental fraternity.

NOTES

Our old friend, George Challenger, 2GC, put up a remarkable performance the other night. He received signals on a crystal set employing a loop aerial, transmitted from his station over a distance of a quarter of a mile. When it is considered that his input was only 3.7 watts, this can be counted as a remarkable performance. The loop was 4 feet square and contained 5 turns, and it was tuned by a condenser having a value of approximately .0003 m.f.d. We do not know whether the fact that he was effectively aroused earlier in the evening by a mere trifle of 450 volts has anything to do with this feat. In any case, his experiment resulted in his suddenly shifting his position several yards. We sincerely trust that he kept his temper.

AN OLD FRIEND PASSES.

His many friends will be sincerely sorry to hear of the demise of 2JM. He met with a natural death by violence, after having a bad attack of the new disease known as "dealer's license." Although defunct, we hope that some means will be found by which he may be resurrected.

VALVES—and how to burn them out.

We understand that 2ED is contemplating writing a treatise on the above subject. We trust that the phenomenal sale which will be assured to this work will somewhat recoup the author for the various mishaps he has experienced lately.

NOTICE TO TRANSMITTERS.

Mr. Maclurcan is compiling DX reports for the benefit of other States, and invites you to send him particulars of stations you have heard or worked each month, together with details of their tone, strengths, etc. Also, any other matter of interest in connection with your stations.

We have received a letter from Mr. E. Fahey, managing director, Radio Company Limited, Sydney, stating that he is not now associated with the journalistic staff of "The Sunday Times," and was not responsible for the article which appeared in that paper on Sunday, September 14th.

I am an old-fashioned, dutiful father. I stay at home and bore my children on the Fourth of July. I help my sons set off firecrackers and show them how we did it when I was a boy. You ought to see them trying to appear interested.

I am on hand to meet my daughter's callers. No amount of polite tolerance abashes me. I make the young men feel they are welcome in my house. Somtimes they almost make me feel the same way.

There is nothing like being what I call a "pal" to your youngsters. Last year, my elder daughter slipped up to me and whispered, "Daddy, you've been wonderful all day. Will you let us go out to the Country Club and have a good time?"—McC. H. in Life.

SEE THE FROST LINES ON PAGES 2 and 3.

CONDENSERS IN WIRELESS RECEPTION

AN important part of a receiving set, which is not generally given the attention it deserves by the radio enthusiast, is the condenser. The oversight is very probably due to a lack of information upon the subject, or at least information which the set-owner who has not had a college education is able to understand, and this article will attempt to discuss some of the more important phases of this instrument in electrical work, with particular attention to the condensers used in the receiving set, and the advantages and disadvantages of several general types, in order to help readers secure the best results for the money spent.

It is necessary that we understand some of the principles involved, and a brief consideration of theory will, no doubt, help in this respect. A condenser is known technically as a "Capacity," and capacity is defined as "The property of an electrical circuit by virtue of which it is able to store electrical energy." A condenser possesses the peculiar property of preventing the flow of a direct current, while permitting an alternating current to pass freely, a property frequently made use of in wireless circuits. It is reasonable to suppose the condenser has some effect upon an alternating current, and we must be familiar with its effect before going further. The voltage and current of alternating current rise from zero to a maximum, drops to zero, and repeats in the opposite direction. Power is, theoretically, the volts multiplied by the amperes flowing in a circuit at the same instant, but if suitable instruments are used to measure these relations in an A.C. circuit the theoretical relation is usually greater—in fact, is greater under practical conditions, than the measured product, and the ratio of theoretical and actual power is known as the power factor, which may be expressed as a percentage, a decimal fraction, or as a function of an angle, the angle being known as the phase angle. Without going too far into theory, the difference as above is due to the fact that the current and voltage of the alternating current do not reach maximum at the same instant. When current reaches maximum after the voltage has begun to decrease, the power factor is said to lag, and it is said to lead when the opposite is true. Lagging power factor is caused by inductive load, such as a transformer, or, in the case of wireless apparatus, a tuning coil in the circuit, while capacity or condensers in the circuit are the cause of the opposite effect. It is evident from these considerations that a wide range of control is possible. For more detailed information the reader is referred to any good text upon alternating currents.

The phenomena above are made use of in the wireless circuit in the following manner. The inductance, which causes the power factor to lag, has the effect of a resistance, but varies with the frequency of the current, increasing with increasing frequency, and causes a loss of energy, similar to a resistance. This effect is measured or calculated in ohms, same as resistance, and is known as "inductance reactance." The effect of a condenser is the opposite to an inductance. The "capacitance reactance" decreases with increasing frequency, and has the effect of adding energy to the circuit, hence the capacitance reactance is subtracted from the inductance reactance in calculating the losses in the circuit. One more technical explanation, and we shall have a good idea of the principles of the tuner in a wireless receiving or transmitting set. The total losses in an alternating circuit are due to impedance, a factor compounded of resistance and reactance, related as the sides of a right angle triangle, impedance being the longest side. The reactance is the difference between the inductive and condensive reactance, as previously explained. Now, a tuner in a receiver which responds to the waves from a certain transmitting station is said to be in resonance with the transmitter, and the condition necessary for a circuit to become resonant is that impedance be equal to resistance, hence reactance is zero, and the necessity of being able to respond to a wide range of frequencies or wave lengths is the reason variable inductances and variable condensers are a part of the usual receiving set. Efficiency demands that the value of capacity be as small as possible in comparison with the inductance in a circuit resonant to any particular frequency, as

SEE THE FROST LINES ON PAGES 2 and 3.

high capacity renders accurate tuning impossible, and the signal energy is distributed over a rather wide band, instead of being concentrated at one point.

We now have a fairly good idea of the theory and function of the condenser in wireless communication, and are able to proceed with the discussion. A condenser consists essentially of two or more conducting surfaces separated by an insulating medium, and from this it is evident the leads of the receiving set which do not form a closed metallic circuit, such as the aerial and earth, filament and grid of the vacuum tube, and adjacent turns of the inductance, are in effect condensers and have an electrical capacity. Capacity in such cases is known as stray or distributed capacity, as distinguished from the lumped capacity of a condenser. Distributed capacity is always present to a greater or less extent, since it cannot be entirely eliminated, but good design and construction always strive to reduce it to a minimum, since it is a factor which cannot be controlled, and is, therefore liable to affect the stable operations of the receiving set.

Condensers are divided into two general classes, fixed and variable, although the types for use in transmission and reception naturally differ in construction, and the same general remarks will apply to both types. We are primarily interested in reception and will not consider the additional problems of the transmitting condenser. Probably the best method of approaching the subject from the standpoint of the reader is to answer the question, "What is a good condenser?" Since there are so many types offered on the market, it is impossible to discuss each in turn, and we shall, therefore, confine our remarks to general principles in order that the enthusiast may be able to decide which type of instrument is giving him the best service and is most efficient, in other words, which is the best value for the money. To approach the subject from this angle, we shall first consider the ideal condenser.

Electrically, the characteristics of the ideal condenser would be, no resistance; dielectric (insulation) resistance infinitely high, thus preventing any losses due to leakage; the dielectric would absorb no energy; the current would be maximum when the voltage was zero, or the phase difference would be ninety degrees, and changes of temperature, current, or voltage, etc., would not cause any change in the capacity of the instrument. Mechanically, the range of choice is wider, since the cost would also have to be considered in the ideal case, but in general the condenser would be rigidly built with no possibility, under average conditions, of the plates bending; in the case of variable condensers, there would be no play at the bearings, and no possibility of the rotor plates turning upon the shaft. Spacer washers would be machined, not punched, and the whole unit would be rigid. It is immediately evident there is a wide range of choice in design and construction, and the purchaser must decide upon the best average of electrical efficiency, mechanical strength and rigidity, in keeping with the money available.

Since the currents picked up by the aerial are necessarily feeble; they must be conserved as much as possible, and we would suggest the purchaser select low loss condensers, rather than those which are ruggedly built, but offer the possibility of greater losses. Condensers for reception are of both the fixed and variable type, and the same general remarks will apply, but we shall pay more attention to the variable type, noting any additional points applying to the fixed type as occasion arises.

The causes of greatest losses in condensers are, change of capacity, leakage, dielectric absorption, and resistance. Change of capacity is caused by imperfect dielectrics, which have different characteristics at different frequencies, and are affected by temperature. Air is considered the perfect dielectric, hence our variable condenser will have negligible losses in this respect. It should be noted here that fixed condensers are subject to these effects, however, and the preferred type is that in which mica is the dielectric, and the whole pressed into a rigid unit. The rolled paper type condenser is next to useless in radio frequency circuits.

Leakage is due to various causes, notably imperfect insulation. The condenser is in effect an electrical reservoir, or rather a spring which may be compressed until the stored energy exceeds the compressing energy, thus tending to return the compressing energy to its original state, but being unable to do so, unless special provisions are made, on account of loss of energy due to friction, and the characteristics of the material of which the spring is made. In the case of the variable condenser, it is necessary that the two sets of plates be insulated from one another, and since there is no perfect insulator, a certain amount of current will leak through, which is dissipated as heat, and is, of course, a total loss. Mica and hard rubber are the materials preferred in com-

SEE PAGES 2 and 3 FOR FROST LINES.

mercial practice as insulators to reduce these losses.

Dielectric Absorption is a loss due to imperfect insulation in bushings and between plates. Since air is the dielectric between plates of the variable receiving condenser, the loss in this particular is negligible, but is aggravated in cases where there are large volumes of insulating material within the electrostatic field, such as bakelite end plates and bushings. The loss is due to the fact that the resistance of these materials is far from infinite, hence they absorb a certain percentage of the minute particles of electricity of which a charge is composed, the energy represented being again dissipated as heat, and representing a total loss. Mica and hard rubber are again the preferred material, although the latter is in more general use on account of its superior mechanical properties.

Resistance is responsible for the greater proportion of losses in variable condensers, and to reduce such losses requires a rather detailed study of the instrument. Resistance losses increase with the frequency, and at some broadcast and amateur wave lengths are apt to be enormous in poorly designed instruments. Technically, resistance may be considered as shunt and series, but as there is a definite relation we shall consider resistance losses as the equivalent of a resistance connected in series with the condenser, as this will enable the novice to form an accurate conception of the importance of this point. As we mentioned previously, the actual current received is very minute, and for satisfactory results, very little of it can be wasted. Hence a resistance connected in series with the condenser, wastes a certain amount of the signal current as heat, reducing the current which actually reaches the condenser, and added to the losses within the condenser proper, the resulting current is apt to be very feeble indeed, and the receiver may not respond to any but most powerful signals. Examining a variable condenser for possibilities of loss in this respect, our attention is first drawn to the method of making connection to the movable plates. Friction or brush contacts offer the possibility of increased resistance due to corrosion, gathering of dust and dirt, and poor contact. A rigid soldered connection of flexible copper, will reduce loss in this respect, and hence instruments which are already provided with such a connection, or where one can be easily made, are to be preferred The next point is the plates themselves, which should be of good conducting material, and rigid. Silver is the best conductor, but cost eliminates it from consideration. Copper ranks next, but is too soft for the purpose. Aluminium is a fairly good conductor, light in weight and rigid, but is difficult to solder. Aluminium is acceptable as a material for this purpose, also brass, but zinc is not satisfactory, due to the high relative resistance. The next point is the method of assembling the fixed and rotating groups. There are several methods in general use, such as moulded columns, slotted columns, and the most general, threaded rods with plates separated by washers.

The satisfaction of the first method, moulded columns, depends upon the material of which the column is made. If this material has a negative "expansion co-efficient," it will grip the plates tightly, and make a good electrical contact. Lead is not suitable. The second method is not good, as we have there the same conditions just discussed in connection with rotor contact. The satisfaction of the third method, threaded rod, etc., depends a great deal upon the construction. Machined washers are desirable, as stated previously, since the sharp edges bites into the material of the plates and make a good electrical contact. This point is particularly important in condensers with aluminium plates, as aluminium oxidizes easily, and there is the possibility of an open circuit between adjacent plates where construction is different than that under discussion. Some makers use brass plates and solder the whole assembly, both fixed and rotating, into rigid units. The excellence of this method will be apparent after the points already mentioned have been considered.

In addition, another source of trouble, if not of loss, is due to poor bearings. The preferred type of bearing is a self-centering spring bearing or one of the conical type, of different metal than the shaft, which allows a close adjustment without the danger of sticking. Means should also be provided to prevent the rotating plates being moved from their proper positions on the shaft. Insulation between fixed and rotating plates should contain as little as possible of solid material, that preferably of hard rubber, and so located as to be outside the intense portion of the electric field about the instrument. End plates of bakelite, etc., are not desirable, and for the same reason it will be better if the screws provided for panel mounting are not in electrical contact with the fixed plates assembly, otherwise special shielding precautions are necessary. While on the subject, it is a good rule for the novice to follow to use the panel of the receiving set to support instruments, not to carry

FROST LINES ARE SHOWN ON PAGES 2 and 3

or separate radio frequency circuits. To reduce objectionable body capacity effects, the fixed plates should always be connected to the high potential side of the circuit; if used in the plate circuit, connect fixed plates to the plate of the tube and rotating plates to the B. battery. In receiving sets employing a series condenser in the aerial circuit, it is better to connect the condenser, with plates as above, between the aerial and the primary inductance, otherwise complications due to aerial capacity to earth through the A. battery are introduced. For the benefit of those unable to distinguish between high and low potential sides of a receiving circuit, the earth is the low potential portion, and circuits terminating at the earth are at a similar potential.

Regarding the sizes of condensers, there is not as yet a standard method of rating variable condensers, and the number of plates is not necessarily a measure of capacity, for as capacity depends upon the area of the opposing surfaces and the amount of dielectric between them, it is evident there is likely to be considerable error if a condenser having a certain number of plates is purchased to provide a certain capacity. It is better to inquire the capacity claimed when purchasing. No condenser has a zero capacity setting, as when the plates are entirely "out" there is still a certain area of conductors separated by air, hence there is a capacity, and if the set being constructed is desired to tune very accurately, it is well to give preference to the condenser having the lowest capacity at zero setting.

In connection with the variation of capacity according to scale setting, there is considerable doubt in the minds of some readers on this point. The usual type condenser has both the fixed and rotating plates cut in semi-circular shape, and except for slight difference near maximum and minimum, the capacity varies uniformly with the scale setting, the scale being of course the usual dial. For example, if the maximum capacity of a variable condenser is .001 mf., if the plates are semi circular, and the dial has a scale reading from 0 to 100 in a semi-circle, each division of the dial increases or decreases, as the case may be, the capacity in the circuit by approximately .001 divided by 100, or .00001 m.f. Where it is desired to calibrate the receiver according to the wave length indicated by the scale setting, either a special scale or a condenser having specially shaped plates is necessary; for, as wave length varies as the square root of the capacity, those acquainted with mathematics will realise that it is not possible to construct a uniform scale. Hence, for the sake of accuracy, the specially shaped rotary plates are most generally used, and a condenser having such plates is referred to as a decrement or decremeter type. With these condensers, the capacity does not vary uniformly with the scale reading, being the opposite to the previous case.

Attention to the points mentioned, will assist the enthusiast in constructing the most efficient receiver, and will save many shillings. Reputable makers all give the information mentioned either with the instrument or in catalogues, and where such information is not available, it is very likely the construction is equally indifferent. Receiving sets constructed with attention to such details as are mentioned in this article, using only a single vacuum tube, give louder and clearer reproduction of signals, with less interference, than indifferently built sets employing several amplifiers, and economy, if no other reason amply justifies the expenditure of a great deal of care in the selection of apparatus and the construction of the set. Price is not necessarily a judge of quality or efficiency, and it is suggested that the novice familiarise himself with the elementary principles of wireless and wireless apparatus such as we have attempted to outline, in order that he may be asured of lasting satisfaction.

For the benefit of the reader who desires to express his preferences in technical terms, we may mention that the better condensers have a known power factor, the power fact in this case being a measurement of losses. Hence the perfect condenser will have a power factor of zero, and naturally, the nearer the actual power factor approaches zero, the more efficient the condenser. It is also well to remember, in connection with insulators, that the resistance of insulators in series is the sum of their individual resistances, while the resistance of insulators in parallel is the sum of the reciprocals (1 divided by the resistance) of their separate resistances. For example, the resistance of two equal insulators in parallel is half the resistance of one of them.

Careful consideration should be given to all points of design and construction of a condenser, since it is often necessary to sacrifice electrical efficiency to secure mechanical strength, and vice versa. The purchaser being the only person knowing how the instrument is to be used, and how much may be spent upon the instrument, is obliged to make the decision as to which is the best type of instrument for his purpose.

ARE YOU USING FROST PARTS? SEE PAGES 2 and 3.

A TELEPHONE CONNECTOR PANEL

MOST terminals are quite unsuitable for holding the tags of more than one pair of telephones at one time, and if several pairs are used, some makeshift arrangement has generally to be made.

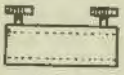


FIG. 1.

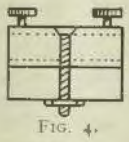


FIG. 4.

Below is shown a panel by which a number of pairs can be easily connected in series, which is the best way to connect high resistance telephones. Obtain a number of cable connectors similar to those shown in Fig. 1. The smallest size—about ⅜in. long and ¼in. in diameter—will be big enough, and one more than the number of telephones to be used will be required. The panel illustrated (Fig. 2) shows how five pairs can be utilised.

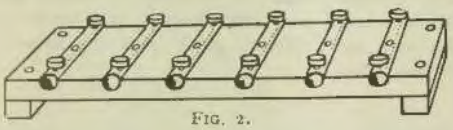


FIG. 2.

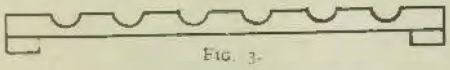


FIG. 3.

Take a piece of ebonite ⅛in. thick, ⅝in. wide, and 6¾in. long, and make on it at intervals shallow depressions with a round file (Fig. 3). Through each connector drill a small hole and fasten down to the ebonite with a bolt and nut (Fig. 4). Raise the panel with wood battens at each end, so that the nuts underneath are clear of the table.

To use, connect the telephone terminals on the receiver to the two end connectors on the panel. Then insert on tag of each pair of telephones in one connection and the other tag in the next (Fig. 5).

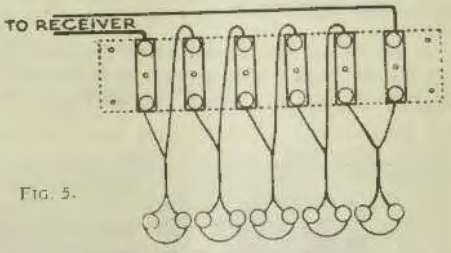


FIG. 5.

COASTAL RADIO SERVICE.

Staff Changes.

Mr. C. M. Urquhart, radiotelegraphist, has been transferred from Wyndham Radio to Perth Radio, on completion of his term of tropical service.

Mr. G. Morrison, radiotelegraphist, has been transferred from Melbourne to Sydney Radio.

Mr. M. Mortimer, radiotelegraphist, Sydney Radio, has been transferred to Darwin Radio as officer in charge.

Mr. E. H. Smellie, radiotelegraphist, Darwin Radio, has been transferred to Perth Radio.

Mr. A. R. Finch has proceeded to Papua for the overhaul of masts and aerials at Port Moresby and Samarai Radio Stations.

9/9/24.

"I stayed up until three a.m., trying to tune-in Los Angeles. Got 'em, too, all right, but couldn't hear a darned thing for that set of Bagley's next door. The howling and squealing was something terrific."

"What's he got? A single-circuit regenerative set?"

"Single-Circuit—nothing! He's got triplets!" —Life.

WHAT ARE FROST LINES? SEE PAGES 2 and 3.

A LOOSE COUPLER THAT WILL WORK

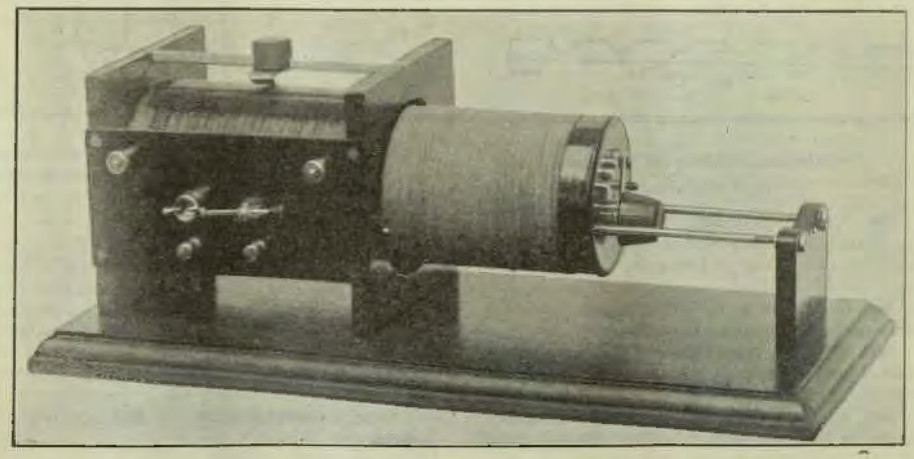
By "Insulator"

I MADE a loose coupler to-day, and I like it very well, indeed. As I was making it, my mind travelled back to the time I made my first loose coupler—many years ago. In those days it was not possible to procure the various parts, such as ends and tubes. All had to be home-made, and I smile when I think of the many peculiar articles which were pressed into service.

I hold the loose coupler in very high regard. In my opinion, it is worth while going to the trouble of making one, but make it correctly. How often have you been listening-in to a really good programme when the Morse code of Pennant Hills breaks in and completely spoils your reception? A loose coupler, properly tuned, will assist in cutting out this interference.

A glance at Fig. 2 will show you that the loose coupler is a double circuit tuner consisting of a primary coil (P) and a secondary coil (S). There is no direct electrical connection between the primary and the secondary coil, but the incoming signal from the aerial strikes the primary, which, in turn, sets up a current in the secondary coil. This method of conveying current is known as "Induction," the energy in the secondary being induced from the primary, as the secondary is situated close to the primary, and the fact that the incoming signal surges up and down between aerial and earth, perhaps two to three million times per second. This rate of "Surge" is known as "High Frequency," and high frequency currents have the happy habit of conveying some of their energy to other coils in the vicinity. It is very good of them, we know, as amongst other things it makes the loose coupler possible.

Again I'll repeat that if you want to make a loose coupler, make it properly. Follow these directions and you will have a well-made set. Purchase the necessary parts from any advertiser in this issue.



The Finished Article.

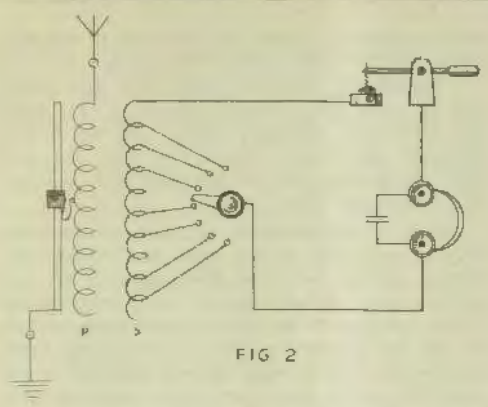


FIG 2

1 Set of Grodan Loose Coupler parts, tubes, wooden ends, baseboard, etc.
1 Slider Rod, 6⅜in. long.
2 Nickel Secondary Rods.
2 Binding Posts.
2 Telephone Terminals.
1 Crystal Detector.
1 Switch Arm.
7 Contact Studs.
2 Switch Stops.
1 Piece of N.H.M. Galena.
1 .001 Wetless 'Phone Condenser.
6 ozs. No. 22 Enam. Wire.
4 ozs. No. 26 D.C.C.C. Wire.
1 Piece of Ebonite, 6 5/8 x 3 1/4 x 1/8in.

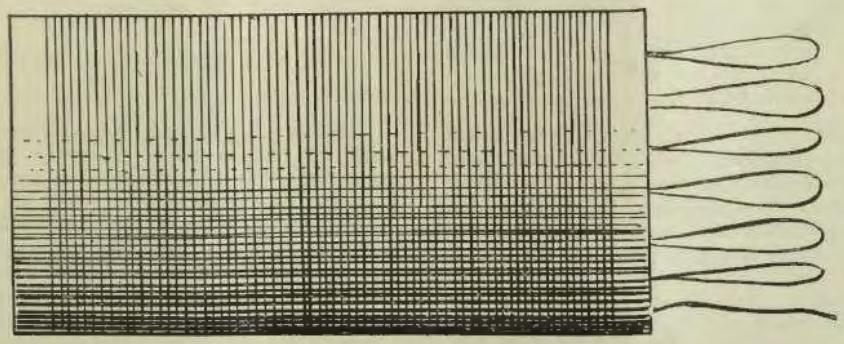
I advise Grodan tubes because they haven't got that spiral gap all round them, consequently no trouble will be experienced with the sliding contact. Bear this in mind.

Give each tube a coat of black enamel, both inside and outside. This enhances the appearance. While the tubes are drying, turn to the woodwork, and using that very fine sandpaper—00 I think is the number—sandpaper all the surfaces. I have been told to rub with the grain, and I'll pass this advice on to you. Give all these surfaces five (5) coats of shellac varnish. This dries very quickly—by the time you have the last article coated, the first one is calling for more.

Between the second and third coats give all a rub over with the sandpaper—a gentle rub will suffice. Smoothens up a lot, doesn't it?

Pick up the larger tube and wind on 150 turns of No. 22 enamel wire. Begin by piercing three holes ¼ an inch from the end. Thread the wire through these, leaving about 8 inches for connections. Proceed to wind on turn after turn closely together and evenly right to within ¼ an inch of the other end, and finish off by threading the end through three more holes. This winding is easily done by hand, but a mandril may be improvised for the purpose, if one so desires. I always wind by hand, experiencing no difficulty, as I keep one end of the tube up against my chest, leaving both hands free for guiding the wire on. Try it—it works alright.

The smaller tube has now to be wound with No. 26 DD.C.C. wire. Pierce three holes as before and wind on 25 turns; hold the wire securely while you pierce a hole in the tube. Double the wire and thread about 10 inches through to the inside of



SECONDARY 5½" x 3½"

FIG. 3

WHAT ARE FROST LINES? SEE PAGES 2 and 3.

the tube. Where the wire comes through to the inside, give it a couple of twists to hold it securely and wind on another 25 turns; tap as before, continue winding, tapping at each 25 turns until 175 turns are wound on.

Understand clearly that tappings are taken at the 25th, 50th, 75th, 100th, 125th, 150th, and—last—175th turn (seven in all), and that sufficient length of tapping should be left to allow the wire to extend about 3 inches from the inside of the tube. Got that alright? Good! Now give the wound tube a coat of shellac varnish, and while you have the brush in your hand treat the larger coil to a similar coat. So far, so good.

If you examine one of the secondary end pieces you will easily pick out the centre. Half an inch below this mark, drill a hole for wour switch. Temporarily assemble your switch and inches apart, as is also the block end of the primary through which these rods came.

Temporarily assemble both coils and insert rods to check the accuracy of your work. Make any alterations necessary now. On the drilled secondary end piece. Insert your rods and tack studs—tightening each at the back with a nut—your switch stops and switch.

Pick up the secondary coil now and bare the ends of each tap. Solder these taps to their respective studs. Keep the soldering iron hot and solder a piece of bell flex (15 inches long) to the switch spindle. Solder also another piece of bell flex to the loose end of the coil, and bring these two flexible leads through the hole provided in the secondary end piece. Insert your rods and tack the end pieces to the tube, using brass shoemakers' sprigs for the purpose.

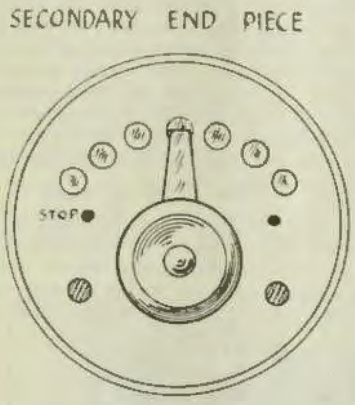


FIG. 4

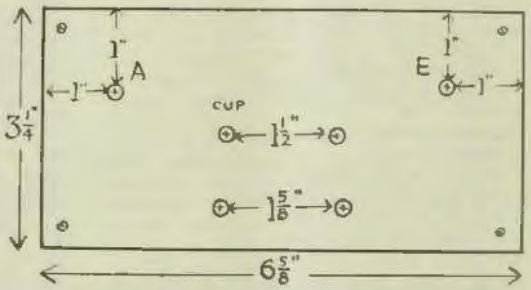


FIG. 5

scribe a semi-circle with it. Remove your switch and drill seven holes for your contact studs. Space these 3/8th of an inch apart. Make provision also for your switch stops. On the same level as the switch holes and 1 inch on each side drill two holes each 3/16th in diameter for the secondary rods.

Clamp the other secondary end piece to this one already drilled, and mark out and drill these two holes for the secondary rods. Exercise care in this operation. The secondary support has to be drilled for these secondary rods. I notice my support is drilled 2.5/16 from the bottom and 2

Declare a smoke now, and survey your handiwork. Oh, no! I haven't forgotten the ebonite panel. This has to be marked out and drilled as suggested by Fig. 5.

On this, as shown in the photograph, are the aerial earth, phone terminals, and crystal detector. At the back of the panel, and not shown in the wetless .001 condenser which fits nicely between the terminals, spaced as I have suggested.

Turn again to the primary coil. Place a ruler along its length, and with a penknife scratch a line; A quarter of an inch apart scratch another line; clean off the enamel between the lines, using

ARE YOU USING FROST PARTS? SEE PAGES 2 and 3.

the fine sandpaper for this purpose. This is the track for the slider. Now we are getting to the end of things. Assemble your primary coil between the two wooden ends and screw down the slider rod. Build in your secondary coil, piercing a hole at the end of the primary tube near the block end, and bring the two pieces of bell flex through. On the ebonite assemble your terminals, phone condenser, and crystal detector. Join the catswhisker end of the detector to the telephone terminal immediately below it. Join one end of the flex to the crystal cup, and the other end to the remaining phone terminal. This completes your secondary circuit. By connecting the beginning of the primary coil near the open end to the aerial terminal marked "A," and the slider rod to the earth terminal, you have completed the primary circuit. You will note that the end of the primary coil is left loose, and is not connected anywhere. Finish off the job by screwing the panel to the front of the primary coil and screwing the whole down to the baseboard.

You now have a really good loose coupler crystal set, which will tune from 200 to 1400 metres, the cost of which should not exceed 25/-.

In closing, let me advise you not to spoil the ship for a ha'porth of paint, as this loose coupler can be used with valve amplification, should one desire it. On the subject of valve amplification —don't expect to get loud speaker results from one stage of amplification. It simply won't do it. Cheerio till next week.

A LARGER SIZE IN HATS FOR US.

(In the following illuminating terms a correspondent who signs himself "Convert 1,000,000,000" expresses himself. Truly, the Bug bites deeply.)

To the Editor, "Wireless Weekly."

Dear Sir,—Bought a "Wireless Weekly" for the first time on the 5th inst. B-r-r, I am the joke at home ever since. Presented me with a pair of 'phones made of Capstan tobacco tins as soon as I hit the door.

Hitherto aerials represented "parking areas" for tired swallows to me, but since reading "Wireless Weekly" through about umpteen times I have become so interested that all hands are interested to know what is so interesting that I take the book to bed and dig in all over. To be candid, it is all so interesting that I cannot settle which is the most interesting; it all is. Even the "Slogan Competition" reads good; and, to swell the numbers and wax enthusiastic, I slip in, too, satisfied—if I am lacking in the essentials to land—that at least I have tried originality.

GOOD RECEPTION.

Mr. Harry Wiles has received the following letter from Mudgee:—

Dear Mr. Wiles,—I want to advise you that I have just ended a most interesting trip around the Mudgee-Coonabarabran district, having with me one of your four-valve sets, and that the results have been excellent. On Wednesday, at Binnaway, we received the "Barber of Seville" from Her Majesty's Theatre on the loud speaker, the same being perfect; in fact, prima donna Del Monte sounded as if she were in the room with us, and in this case the aerial was anything but good, being attached from a gumtree to a fence, with an average height of 15 ft. The following evening "The Tales of Hoffman" came in very well, also 2 B.L. Both worked on loud speaker. This was at Dunedoo, again on an imperfect aerial and earth. On Friday afternoon, for the grand opera matinee, I pulled up the car at the Cudgegong River between Mudgee and Dunedoo, and after hanging an aerial from the top of the bridge, then drove the car underneath, and with a motor car jack buried in the riverbank for an earth, we brought in the farewell opera perfectly. This, to my mind, was a great achievement for your set, as we were in a deep gully, badly screened by big trees, and a mountain close by, between us and Sydney.

For country reception I consider I have tested this set fully, and I really do not think the results could be improved upon.—Yours faithfully,

THOS. HOOD.

WHAT ARE FROST LINES? SEE PAGES 2 and 3.

IMPROVING THE CRYSTAL RECEIVER

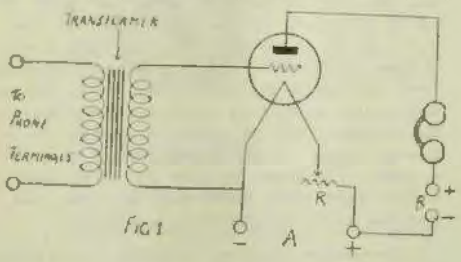
BY W. A. STEWART.

IT does not take very long for the average crystal set user to discover the limitations of his receiver, and he begins to wonder what he can do next. In some cases the received music is not quite loud enough, or possibly the amateur stations cannot be received, or lastly there is that itch for the distant stations (DX).

If loudness of music is desired, the circuit shown in Fig. 1 can be employed to advantage, and will make your present results much louder.

This is known as an audio, or low frequency amplifier, as it amplifies the low or audible frequencies. The difference between audio and radio frequency amplification has been described numbers of times, but briefly mentioned it is this: audio amplifiers amplify the signals after they have been detected, while radio frequency amplifiers amplify them before detection.

The amplifier shown in Fig. 1 is a simple audio amplifier, having no special features, and is no harder to adjust than the plain crystal circuit, the



only other control being the rheostat (R), which regulates the brilliancy of the filament of the valve. It in no way alters the tuning of the receiver, and anything once heard on the detector can be amplified by the valve. This is the circuit to employ for loud speaker operation, two stages of amplification being necessary under average conditions. This circuit is shown in Fig. 2, and is only Fig. 1 with another valve added; it is just as simple to handle.

This circuit will not bring in very much as far as distance is concerned, and if distance is needed the circuit shown in Fig. 3 willl have to be employed. This is known as a radio frequency amplifier, and although it makes little difference to the local stations it will bring in the DX stuff.

For this circuit you will require another tuner of some description, the valve, necessary batteries, socket and rheostat.

In tuning, the aerial circuit has to be adjusted to the wavelength of the transmitting station, and the plate coil, or radio frequency transformer, also adjusted to the same wavelength, when the maximum signal strength will result. The circuit is a little bit more critical to handle than the ordinary crystal receiver, but the results are well worth it.

After amplifying the signals in this fashion, they can be then amplified by means of an audio amplifier, which was shown in Fig. 1, and surprising results will be obtained.

In Fig. 4 we have combined the circuits shown in Figs. 1 and 3, and have made what is known as a reflex or dual circuit; in this circuit the valve

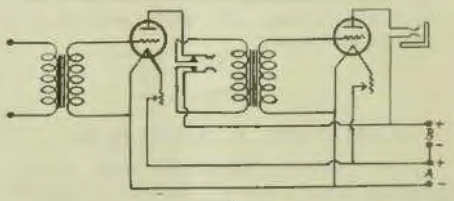


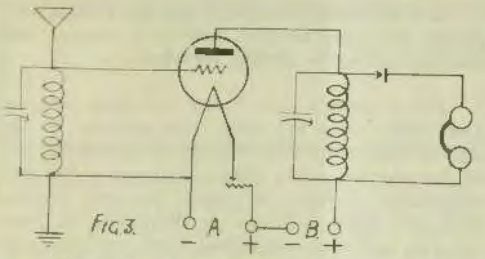
Fig. 2

acts in two capacities, both as a radio and audio frequency amplifier. This circuit gives surprising results, and a saving in valves results.

The gear required for it is—

One valve.
Batteries for same (H.T. and L.T.).
Socket.
Terminals.
Fixed condensers.
Rheostat.
Audio transformer.
Variable condenser, .0005 mfd. capacity.

SEE PAGES 2 and 3 FOR FROST LINES.



Selection of honeycomb coils for various wavelengths.

Crystal detector.

Panel.

The present tuner can be used in the aerial circuit, and the same detector can be used. The wiring of this set is quite simple, and the circuits one that I can recommend, having built and used it for some time.

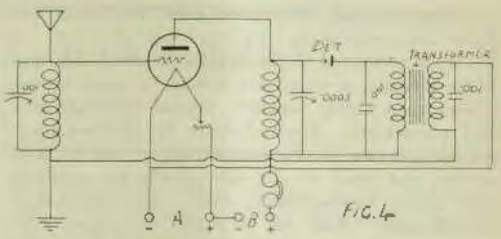
The first one was built before the days of broadcasting, and VIM (Melbourne Radio) and VIH (Hobart Radio) were easily copied, while local amateur stations came in with plenty of strength.

If the volume is not great enough, additional stages of audio amplification can be connected to the 'phone terminals in place of the 'phones. Another stage of audio will work a loud speaker off any of the local broadcast stations, while little trouble should be experienced in bringing in interstate broadcasting, when there are some more stations in other States besides N.S.W. and W.A. High-powered stations I mean.

I would again like to call your attention to the fact that a list of the conventional signs used in these diagrams can be found in the "Wireless Weekly" for Sept. 5, and it would be well to familiarise yourself with them, as, once mastered, circuits drawn this way are much easier to follow than the pictorial ones.

With reference to valves. There are so many makes of valves at present that the average person is at a loss to decide between them. For all the circuits described up to the present, what is known as a hard valve will be needed. A hard valve is one that has very little air inside it, and which will stand up to higher plate voltages than a soft detector tube, which is designed to operate on a low plate voltage.

Valves may be divided into two classes: accumulator and dry cell valves. The first type seem



to give better results than the dry cell type, as they are more stable in operation. However, for general work the dry cell valve is ideal. Although costing more than the battery valve, there is no accumulator to be bought, and the valve will soon pay for itself in the saving of battery charging.

Many and numerous are the dry cell valves, but most popular are the Weco valve, WD11, UV199 or C299, Ediswan AR .06, and Marconi DER. Any of these will give more than satisfactory results in any of the circuits previously mentioned, and are quite economical to run.

Dry cell valves are prone to microphonic noises, but sockets can be obtained to overcome this. However, they give very satisfactory service, and for the portable sets which are going to be popular this summer they are ideal, one or two dry cells being ample to operate the filament.

For the genuine experimenter who is intent on getting consistent DX results the battery valves are hard to beat, and where battery charging is not objected to, the results are well worth the extra trouble.

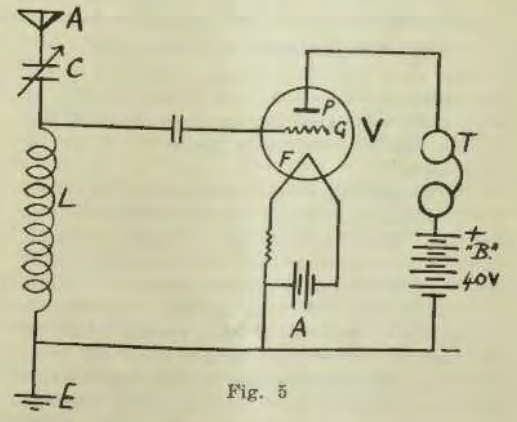


Fig. 5

ARE YOU USING FROST PARTS? SEE PAGES 2 and 3.

Remember all valves are good, but some are better than others.

With reference to the crystal detector, for use in the circuits, a stable one should be used in preference to a highly sensitive crystal requiring critical adjustment. Zincite-bornite or zincite-copper pyrites are two good combinations of the perikon variety, and good results can usually be obtained from them. Carborundum, with a steel point and potentiometer, while not so stable, is a good crystal and can be relied on to give consistent results. Molybdenite is another good crystal, which requires no adjustment, being merely clamped between two pieces of brass and left there; it is sensitive all over, and can be relied upon.

While on the subject of detectors, the Gilfillan people have brought out a detector which is ever-set, and is suited for reflex or ordinary detection, requires no adjustment, and is quite sensitive.

The detector is half the battle in reflex work, and a little experimenting will soon find the one most suited for your set.

If it is desired to dispense with the crystal altogether, the valve may be used as a detector, and the results may be greatly increased.

Fig. 5 shows a valve in use as a plain detector. The results here are very little superior to the crystal, except for the stability of the valve, but by the addition of the plate coil shown in Fig. 6 a remarkable increase in signal strength results. This coil, which is known as the tickler, or reaction coil, makes the set regenerative, and care must be exercised in handling it, or interference will be caused to nearby listeners-in.

With a circuit such as this can be used either honeycomb or straight wound coils, but the honeycomb coils will be better, as there is talk of a broadcasting service in Melbourne on 1700 metres, and it is rather hard to build an efficient varicoupler to cover wavelengths from 200 to 1700 metres. These circuits are all standard, and little trouble will be found in building any of them.

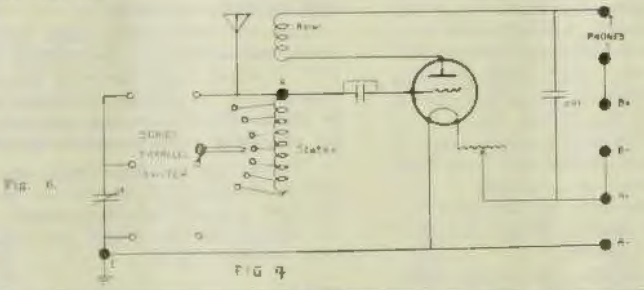


Fig. 6.

Fig 5

THE WENTWORTH RADIO CLUB.

The usual fortnightly meeting was held at the club rooms on Wednesday, 17th September, and, as usual, there was a good attendance of members, and two new experimenters were added to the list of club members.

Mr. W. Cattrell gave an interesting lecture on "Radio Frequency Amplification," illustrated by diagrams. The President, Mr. J. Spencer Nolan, showed the members his method of making dictaphone records of any telephony buzzer, etc., which the receiving set will bring in, and demonstrated the success of his idea by some records which he had made, both of amateur telephony and from the broadcasting programmes, and also showed how these records could be reproduced from the loud speaker and re-transmitted by the wireless telephone.

Efforts were made to secure a record with this machine of KGO at Mr. Allsop's receiver last Sunday, but, owing to the intense interference from oscillating valves, the experiment was not highly successful.

Arrangements are well in hand for the second annual club dance, which is to be held on Saturday, 25th October, at the White City Lawn Tennis Club Rooms. The last dance was a great success, and it is hoped that this year's function will also be well attended. Tickets are available from the club secretary, or from Mr. O. G. Peters, Carlisle Road, Rose Bay, and Mr. Skinner, "Hillcrest," New South Head Road, Rose Bay.

The next club meeting will be held on Wednesday, October 1st, at the club rooms, 152 Bellevue Road, Double Bay.

CLUBS AND THEIR MANAGEMENT

BY A. BURROWS.
No. 2.

PERHAPS the chief feature in making a club successful these days is the art of pleasing everyone. In other words, the knowledge or gift of interesting one section of the members without losing the enthusiasm of the remainder. As a rule, the members can be divided into three broad divisions—

Genuine experimenters.

Beginners.

Broadcast listeners (beginners or otherwise).

Of the three, it is unnnecessary to say that the experimenters form the most worth-while division. Unfortunately, however, they often only consist of a very small number, and no club can afford (even if it were considered wise to do so) to disregard the two remaining sections. But it will generally be found that the core of a club is made up of the more serious experimenters.

A threefold duty, therefore, devolves upon those in whose hands rests the management of a club. First, to make it a worth-while investment for the experimenters, who, as a rule, are never willing to waste an evening often. The club must be conducted, therefore, so that from their viewpoint the evening is useful. Second, to see that the meetings are attractive, and offer sufficient inducement to gain, and hold, the beginners. Third, the inclusion of those features which will interest the broadcast fan. This person, of course, will never admit that he is a broadcast listener, but he can always be found, nevertheless, and must be catered for accordingly. After all, he is a potential experimenter.

Value of the Debate.

To those responsible for the club's welfare will come many irritating experiences of more or less unprincipled beginners and broadcast enthusiasts who join merely to learn all they can, and very often to bring the club's weight at the back of an application for an experimental (and, incidentally, cheaper) license, and who never at any time have any intention of remaining members. This, while it is apt to raise the ire of the club's officers, is naturally unavoidable, and must simply be taken as a matter of course. Of any club's total numbers, it will be found a certain percentage will consist of this floating membership.

Now, the problem of arranging matters to hold the interest and make the club worth-while for all three divisions must be considered in relation to whatever form the meetings may take. If, for instance, the meeting consists principally of one or more lectures, then it is extremely unwise to hope to keep all sections interested. The only alternative, if the club is large enough, is to divide it into sections, with a lecture to each section; and be it remembered here that it is almost as big a mistake to lecture on a level with an audience's knowledge as it is to talk well above its head. The standard should always be a little higher than the listeners expect.

The same, however, doesn't apply to a debate, or anything in the nature of a "question box." All degrees of learnedness can take part in this, with edification to the beginners and satisfaction (because they have the opportunity of airing their views and opinions) to the old hands. Of all schemes for a successful club night, I think a well-conducted debate, "question box," or impromptu speeches—which must be short and concise—will be found the best. If a debate is contemplated, it is wise to arrange the subject and sides beforehand, as few can rise to their best in an extempore speech.

It is possible that to some wireless appears to offer little scope for a debate. This is entirely wrong; no single subject, perhaps, affords such a wealth of material. Here are a few examples: "Panels v. Isolated Apparatus," "General Advantages of Non-Directional Wireless v. Directional," "American Gear v. English or Continental," "High Wave Lengths v. Low for Amateur or Commercial Work." These are only a few; dozens of others will suggest themselves to the resourceful organiser. That a debate is onesided doesn't matter in the least; it is good mental exercise arguing against your convictions, and, due to the expression of many views, a subject may be found not as one-sided as was at first thought.

PAGES 2 and 3 TELL YOU ALL ABOUT THE FROST LINES.

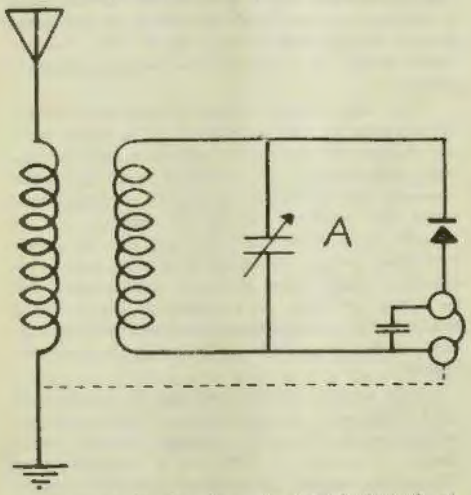
A VARIOMETER — LOOSE COUPLER

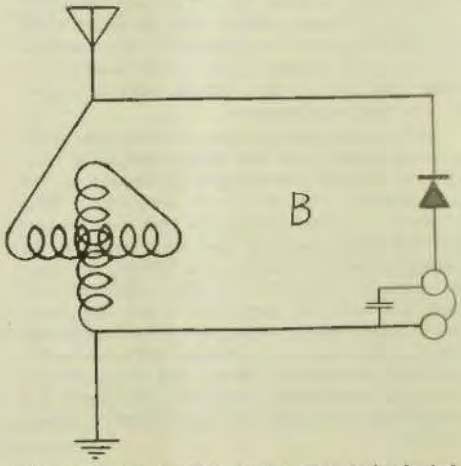
By Catswhisker

HERE is a very simple combination that will be found very easy to assemble, but very efficient in operation.

Two cardboard formers C and D, each 2in. long and 2in. and 2½in. in diameter respectively, are provided at one end with wooden discs B and E, secured to the insides with a little glue or by means of small screws. A hole is drilled through the centre of the larger disc E to accommodate the end of a 3/16in. round brass rod G, which is firmly clamped to same by means of two nuts. The small disc B is attached to an upright support A, 2½in. by 4 in. and about ¼in. in thickness. A piece of ¼in. square wood H, 3in. long, is drilled through at ¼in. from the top and bushed with a 1½in. length of brass tubing F, large enough in internal diameter to slide smoothly over the rod. This is made a "friction tight" fit in the wooden support, and, if necessary, it may be smeared with a little seccotine before placing it in position. The rod which is now attached to the disc E, carrying the former D, is pushed through the tubing and a small wooden knob or disc is fitted to the end as shown.

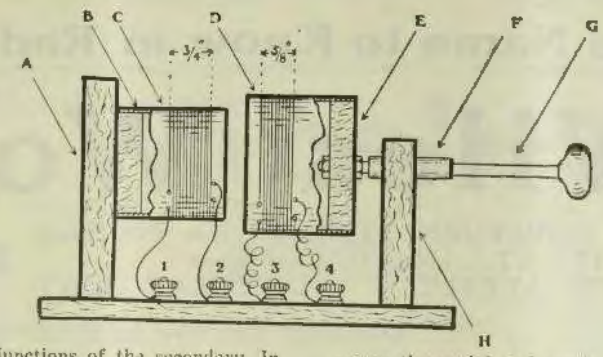
Next prepare a baseboard 7½in. long by 3½in. wide and about 3/8in. in thickness and fit four ordinary terminals along a straight line near one edge. Obtain about six ounces of No. 34 D.C.C. wire and wind on three-quarters of an inch on the former C, keeping each turn tight against the next, commencing on the left (nearest support A1, and winding in a clockwise direction. Connect the beginning of the winding to terminal No. 1 and the end to No. 2. Wind the other coil in exactly the same way, commencing at terminal No. 3 and finishing at No. 4. Five-eighths of an inch of winding is sufficient for this coil.





It will be necessary to make small spirals or solder on short lengths of soft flexible wire to permit the sliding movement of the coil. Now secure the supports A and H to the baseboard in the approximate position shown in the diagram, and the instrument is complete. Connected as shown, it may be used as a loose coupler, the terminals 1 and 2 representing the junctions of the primary

FROST LINES ARE SHOWN ON PAGES 2 and 3.OST LINES.



coil and 3 and 4 the junctions of the secondary. In this case, the aerial lead-in would be connected to No. 1, the earth lead to No. 2, the crystal cup to No. 3, and one of the 'phone terminals to No. 4, as shown in circuit diagram A. Better results are sometimes obtained by earthing this terminal as shown by the dotted lines. The variable condenser should have a capacity of .0003 mfds., and it is advisable to provide another of the same capacity across the aerial and earth.

Now, if the terminals 2 and 3 are bridged with a piece of copper wire, the instrument is instantly converted into a variometer. In this case the aerial lead-in goes to No. 1 terminal and the earth lead to No. 4, as shown in the circuit diagram B.

A small S.P.S.T. switch could conveniently be connected in series with Nos. 3 and 4 terminals.

(Continued from page 29)

Anything of this nature will be of interest to the case-hardened experimenter and the raw beginner. But with regard to lectures, buzzer practice, or technical discussion (which always confines itself to the few who know the most), it is another story. It takes an unusual speaker to hold the attention of both the man who has been years at the game and the unlearned broadcast listener, and the same applies to code and discussion. Yet, for two reasons, these must be included in any club's syllabus; the experimenters expect it, and the opportunity must be given the others of becoming proficient. If they do not avail themselves of it the club need not be concerned.

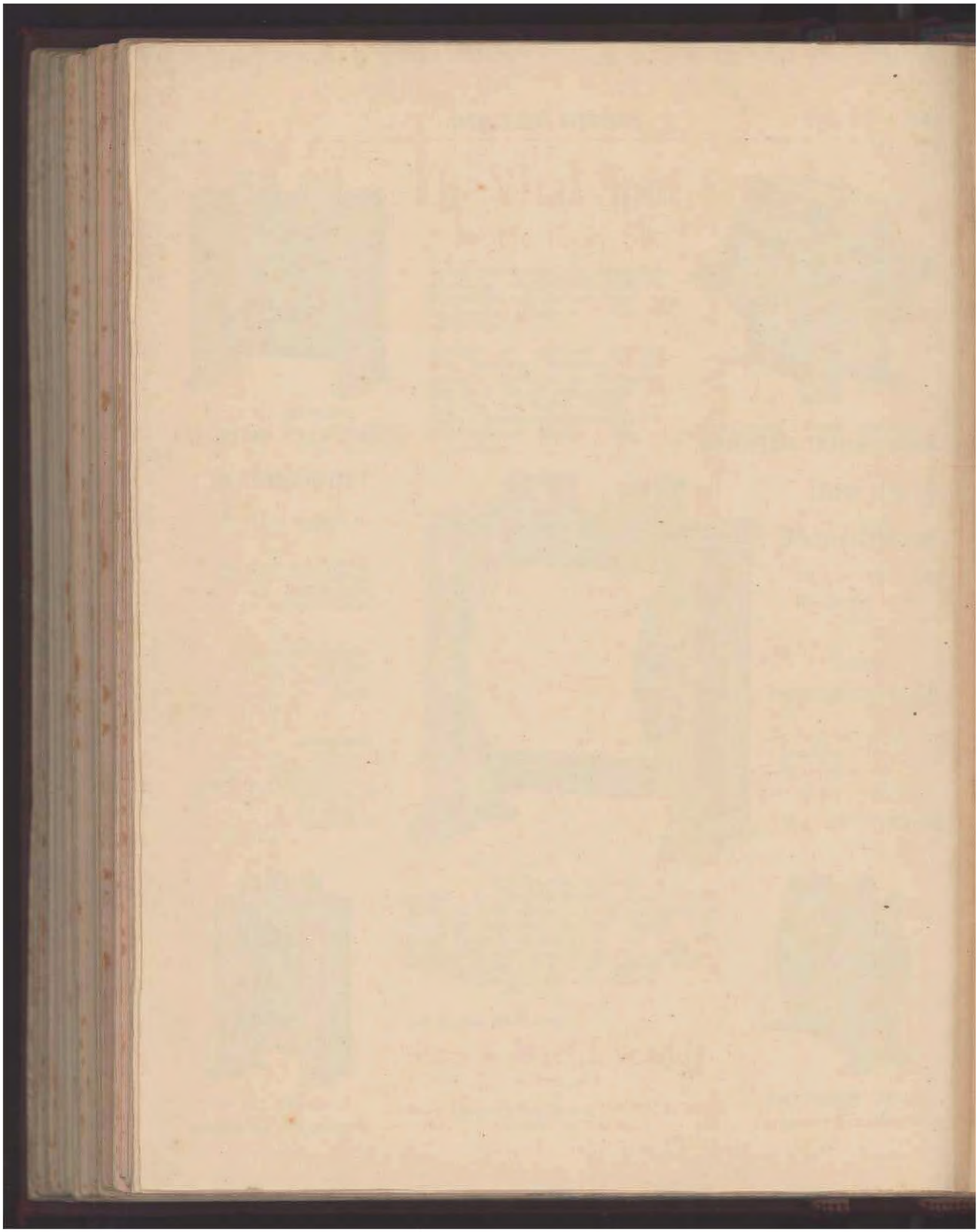
Keeping Things Moving.

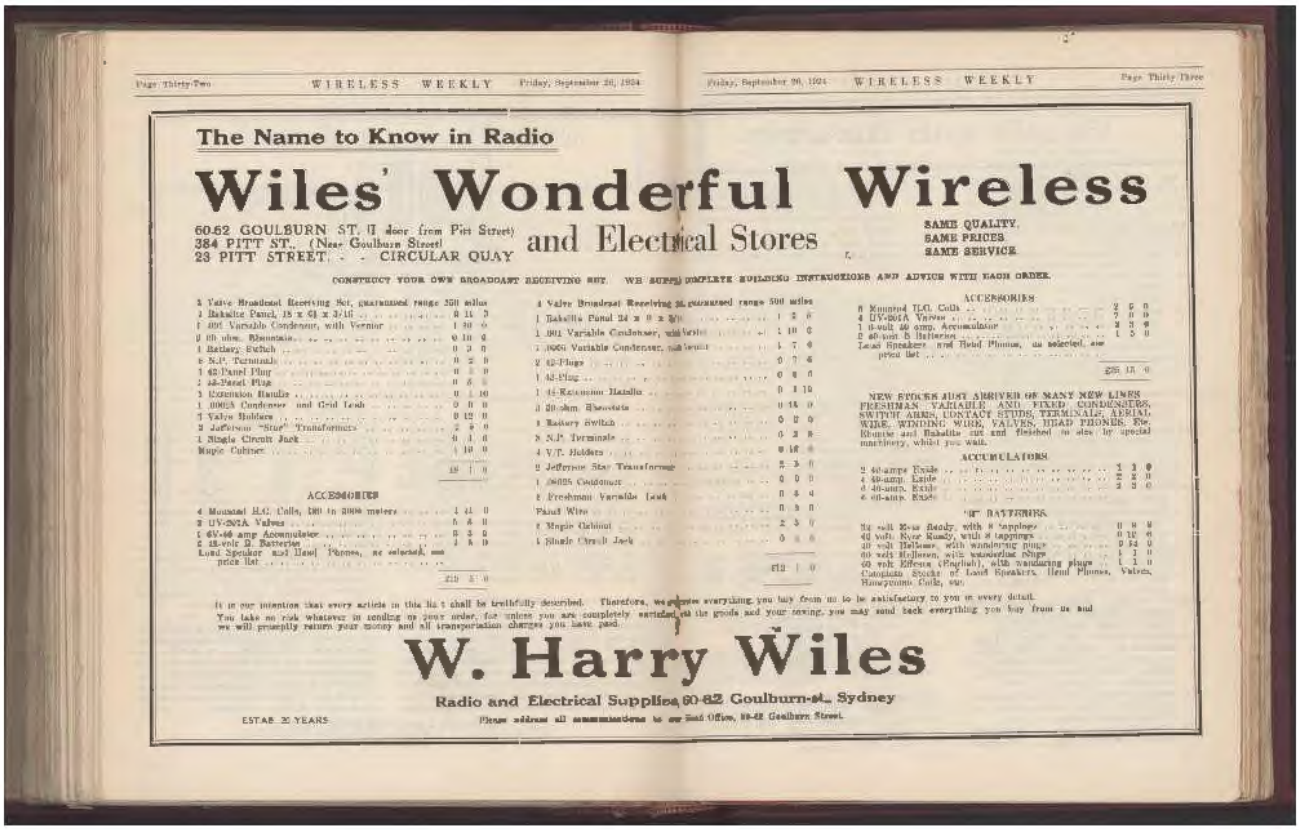
There appear to be two methods which will adjust this question. The first, as before suggested, is to divide the meetings into sections. This, however, is only possible when the club is of any size, and calls for much additional organisation. The second way is to include only a limited amount (of code, lecture, or technical matter) at each meeting, devoting the remainder to something which has a common appeal. By thus giving, say, half an hour to a highly technical lecture, or to an elementary talk, each night, or possibly both, always "making it snappy," the meeting can be kept moving. To attempt to appeal to everyone simultaneously, unless by the means suggested, is useless.

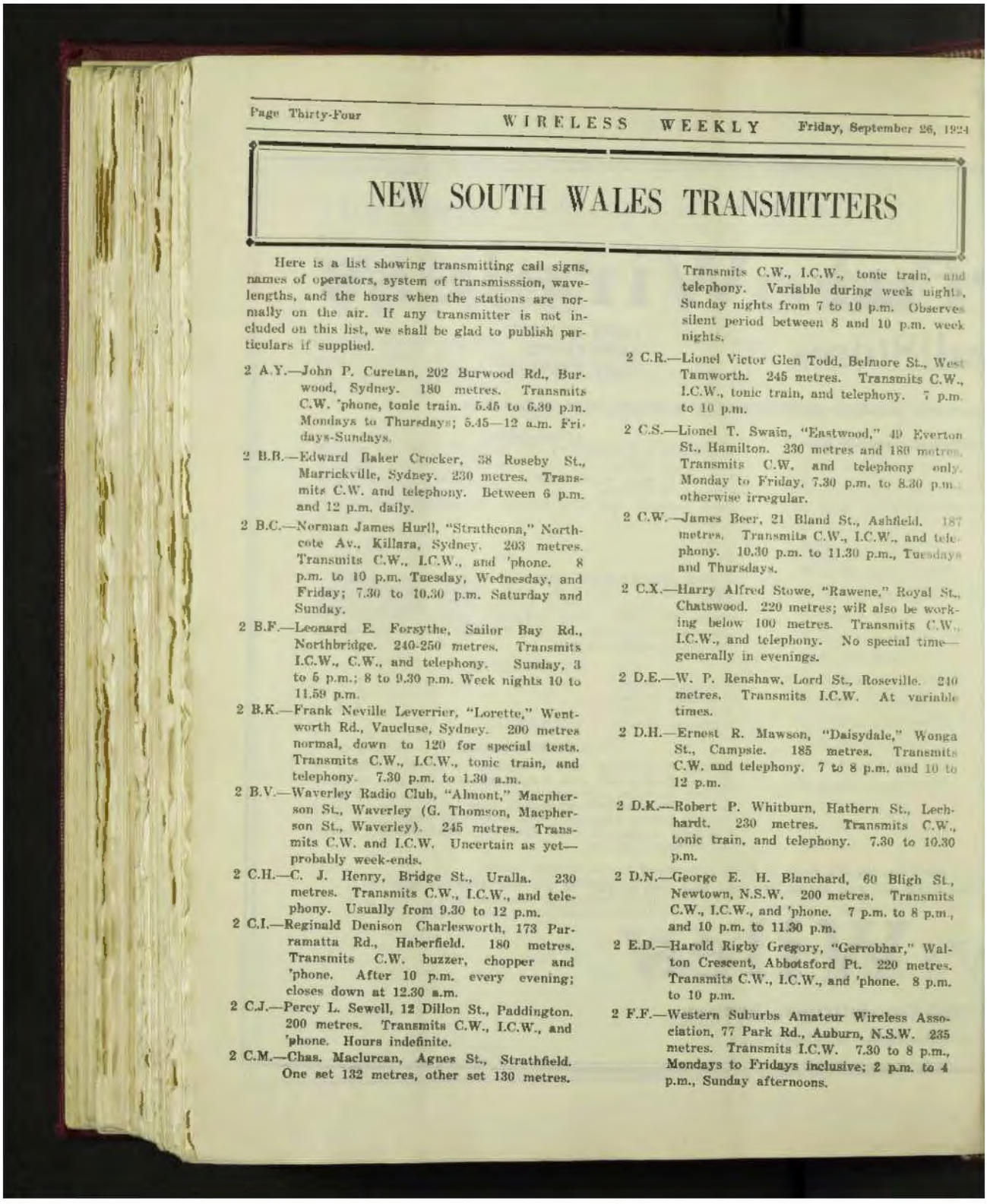
Every club, of course, should possess a receiving set, and, if possible, a transmitter. Neither, however, should be relied upon to do much in holding newcomers (it may certainly attract a few), as a receiver is no novelty nowadays, and a transmitter only offers a lasting attraction for those who actually operate it, and it is obviously impossible to allow an indiscriminate number to use a club's transmitting gear. In any case, a knowledge of Morse is essential, and it will be found that only a limited number of most clubs have this.

To correctly gauge matters in a wireless club to please everyone is a difficult matter; there is such a wide breach between those who have been experimenters for years and the beginners. By applying some of the foregoing principles, combined with the results of personal observation, however, it can be done. And a successful radio club is something of which to be proud.

SEE PAGES 2 and 3 FOR FROST LINES.







NEW SOUTH WALES TRANSMITTERS

Here is a list showing transmitting call signs, names of operators, system of transmisssion, wavelengths, and the hours when the stations are normally on the air. If any transmitter is not included on this list, we shall be glad to publish particulars if supplied.

2 A.Y.—John P. Curetan, 202 Burwood Rd., Burwood, Sydney. 180 metres. Transmits C.W. 'phone, tonic train. 5.45 to 6.30 p.m. Mondays to Thursdays; 5.45—12 a.m. Fridays-Sundays.

2 B.B.—Edward Baker Crocker, 38 Roseby St., Marrickville, Sydney. 230 metres. Transmits C.W. and telephony. Between 6 p.m. and 12 p.m. daily.

2 B.C.—Norman James Hurll, "Strathcona," Northcote Av., Killara, Sydney. 203 metres. Transmits C.W., I.C.W., and 'phone. 8 p.m. to 10 p.m. Tuesday, Wednesday, and Friday; 7.30 to 10.30 p.m. Saturday and Sunday.

2 B.F.—Leonard E. Forsythe, Sailor Bay Rd., Northbridge. 240-250 metres. Transmits I.C.W., C.W., and telephony. Sunday, 3 to 5 p.m.; 8 to 9.30 p.m. Week nights 10 to 11.59 p.m.

2 B.K.—Frank Neville Leverrier, "Lorette," Wentworth Rd., Vaucluse, Sydney. 200 metres normal, down to 120 for special tests. Transmits C.W., I.C.W., tonic train, and telephony. 7.30 p.m. to 1.30 a.m.

2 B.V.—Waverley Radio Club, "Almont," Macpherson St., Waverley (G. Thomson, Macpherson St., Waverley). 245 metres. Transmits C.W. and I.C.W. Uncertain as yet—probably week-ends.

2 C.H.—C. J. Henry, Bridge St., Uralla. 230 metres. Transmits C.W., I.C.W., and telephony. Usually from 9.30 to 12 p.m.

2 C.I.—Reginald Denison Charlesworth, 173 Parramatta Rd., Haberfield. 180 metres. Transmits C.W. buzzer, chopper and 'phone. After 10 p.m. every evening; closes down at 12.30 a.m.

2 C.J.—Percy L. Sewell, 12 Dillon St., Paddington. 200 metres. Transmits C.W., I.C.W., and 'phone. Hours indefinite.

2 C.M.—Chas. Maclurcan, Agnes St., Strathfield. One set 132 metres, other set 130 metres. Transmits C.W., I.C.W., tonic train, and telephony. Variable during week nights. Sunday nights from 7 to 10 p.m. Observes silent period between 8 and 10 p.m. week nights.

2 C.R.—Lionel Victor Glen Todd, Belmore St., West Tamworth. 245 metres. Transmits C.W., I.C.W., tonic train, and telephony. 7 p.m. to 10 p.m.

2 C.S.—Lionel T. Swain, "Eastwood," 49 Everton St., Hamilton. 230 metres and 180 metres. Transmits C.W. and telephony only. Monday to Friday, 7.30 p.m. to 8.30 p.m.; otherwise irregular.

2 C.W.—James Beer, 21 Bland St., Ashfield. 187 metres. Transmits C.W., I.C.W., and telephony. 10.30 p.m. to 11.30 p.m., Tuesdays and Thursdays.

2 C.X.—Harry Alfred Stowe, "Rawene," Royal St., Chatswood. 220 metres; will also be working below 100 metres. Transmits C.W., I.C.W., and telephony. No special time—generally in evenings.

2 D.E.—W. P. Renshaw, Lord St., Roseville. 240 metres. Transmits I.C.W. At variable times.

2 D.H.—Ernest R. Mawson, "Daisydale," Wonga St., Campsie. 185 metres. Transmits C.W. and telephony. 7 to 8 p.m. and 10 to 12 p.m.

2 D.K.—Robert P. Whitburn, Hathern St., Lechhardt. 230 metres. Transmits C.W., tonic train, and telephony. 7.30 to 10.30 p.m.

2 D.N.—George E. H. Blanchard, 60 Bligh St., Newtown, N.S.W. 200 metres. Transmits C.W., I.C.W., and 'phone. 7 p.m. to 8 p.m., and 10 p.m. to 11.30 p.m.

2 E.D.—Harold Rigby Gregory, "Gerrobhar," Walton Crescent, Abbotsford Pt. 220 metres. Transmits C.W., I.C.W., and 'phone. 8 p.m. to 10 p.m.

2 F.F.—Western Suburbs Amateur Wireless Association, 77 Park Rd., Auburn, N.S.W. 235 metres. Transmits I.C.W. 7.30 to 8 p.m., Mondays to Fridays inclusive; 2 p.m. to 4 p.m., Sunday afternoons.

2 F.P.—Ernest J. Baker, 62 Estell St., Maryville, via Newcastle. 225 metres. Transmits C.W., I.C.W., and telephony. Various hours from 7 to 11 p.m. nightly.

2 G.C.—Geo. R. Challenger, 77 Park Rd., Auburn, N.S.W. 200 metres. Transmits C.W., I.C.W., tonic train, and telephony. 7.10 to 7.30 nightly, except Sundays; Sunday mornings at 11 a.m.

2 G.M.—G. Maxwell Cutts, "Carwell," Highbury St., Croydon, N.S.W. 198 metres. Transmits C.W. After 10 p.m.

2 G.P.—Cedric Steward Mackay, Urunga, North Coast. 210 metres. Transmits C.W., I.C.W., tonic train, and telephony. 7 to 8 p.m , and 10 to 11 p.m.

2 G.Q.—Edward Barlow, 268 Beardy St., Armidale. 250 metres. Transmits C.W., I.C.W , and telephony. 10 p.m. to 1 a.m.

2 H.F.—F. Thompson, "Surbiton House," Donnelly St., Balmain. 230 metres. Transmits C.W., tonic train, and telephony. 10 p.m. to 11 p.m., Mondays, Wednesdays, and Saturdays; 10 a.m. to noon, and 8 p.m. to 11 p.m., Sundays.

2 H.M.—H. A. Marshall, Electric Supply Co., Armidale. 245 metres. Transmits C.W., I.C.W., and 'phone. 7 p.m. to midnight, daily.

2 H.Y.—G. S. Bongers, 7 Rawson St., Rockdale. 237 metres. Transmits C.W., I.C.W., tonic train, and telephony.

2 I.J.—A. H. Gray, "The Wattles," Northcote Av., Killara, Sydney. 220 metres. Transmits C.W., I.C.W., and 'phone. Every Friday, Saturday, and Sunday night.

2 J.C.—H. Fraser, Roderick St., Tamworth. 240 metres. Transmits C.W. and telephony. Sundays, 9 to 11 p.m.; occasionally through the week.

2 J.I.—Wilfred E. Wilson, "Denwood," Archbold Rd., Roseville. 220 metres. Set under construction.

2 J.M.—R. C. Marsden, "Tamavua," Victoria Rd., Edgecliffe, Sydney. 237 metres. Transmits C.W., I.C.W., tonic train, and telephony. 8 p.m. each evening.

2 J.S.—J. M. Stanley, 33 March St., Orange. 215 metres. Transmits C.W. and telephony. Hours indefinite.

2 K.C.—Reg. H. Fry, "Barretta," Brighton St., Croydon. 233 metres. Transmits C.W. generally—occasionally telephony and buzzer. 10 p.m. to midnight Tuesdays to Thursdays, and intermittently other nights from 11 p.m. onwards.

2 L.F.—U. V. Ginger, 68 Cairo St., North Sydney. 238 metres. Transmits C.W. and telephony. 12 p.m. to 1 p.m. daily, and 6 p.m. to 6.30 p.m. Sundays.

2 L.O.—L. N. Schultz, "Waraba," Burns Bay Rd., Lane Cove. 225 and 125 metres. Transmits C.W. and telephony. 8 to 10 p.m. daily; 5 p.m. to 2 a.m. Saturday.

2 M.U.—James Nangle, Tupper St., Marrickville, 200 metres. Transmits spark. Sends time signals from 6.55 p.m. to 7 p.m. Saturdays and Sundays.

2 O.I.—A. T. Whitaker, 31 Railway Crescent, Banksia. 200 metres, also 100 metres. Transmits C.W. and telephony. 7 p.m. to 7.30 p.m., 'phone and C.W.; 9 p.m to 9.15 p.m., C.W.; 10 p.m. to 10.15 p.m., C.W. Station opens at 6.30 p.m.

2 R.A.—K. J. Vickery, "Kemja," Kilbride St., Hurlstone Park. 220 metres. Transmits I.C.W. and telephony. 7.30 p.m. to 8 p.m., about three times a week

2 R.J.—R. J. Fagan, "Sunny Ridge," Mandurama, N.S.W. 220 metres. Transmits C.W. and telephony. Time uncertain.

2 S.O.—Newcastle Radio Club, 25 Winship St., Hamilton, N.S.W. 200 metres. Transmits C.W. and telephony only. 7.30 p.m. to 9 p..m., Thursday and Tuesday; 11 a.m. to 12.30 p.m., 7 p.m. to 7.30 p.m., 8.30 to 9 p.m., Sundays.

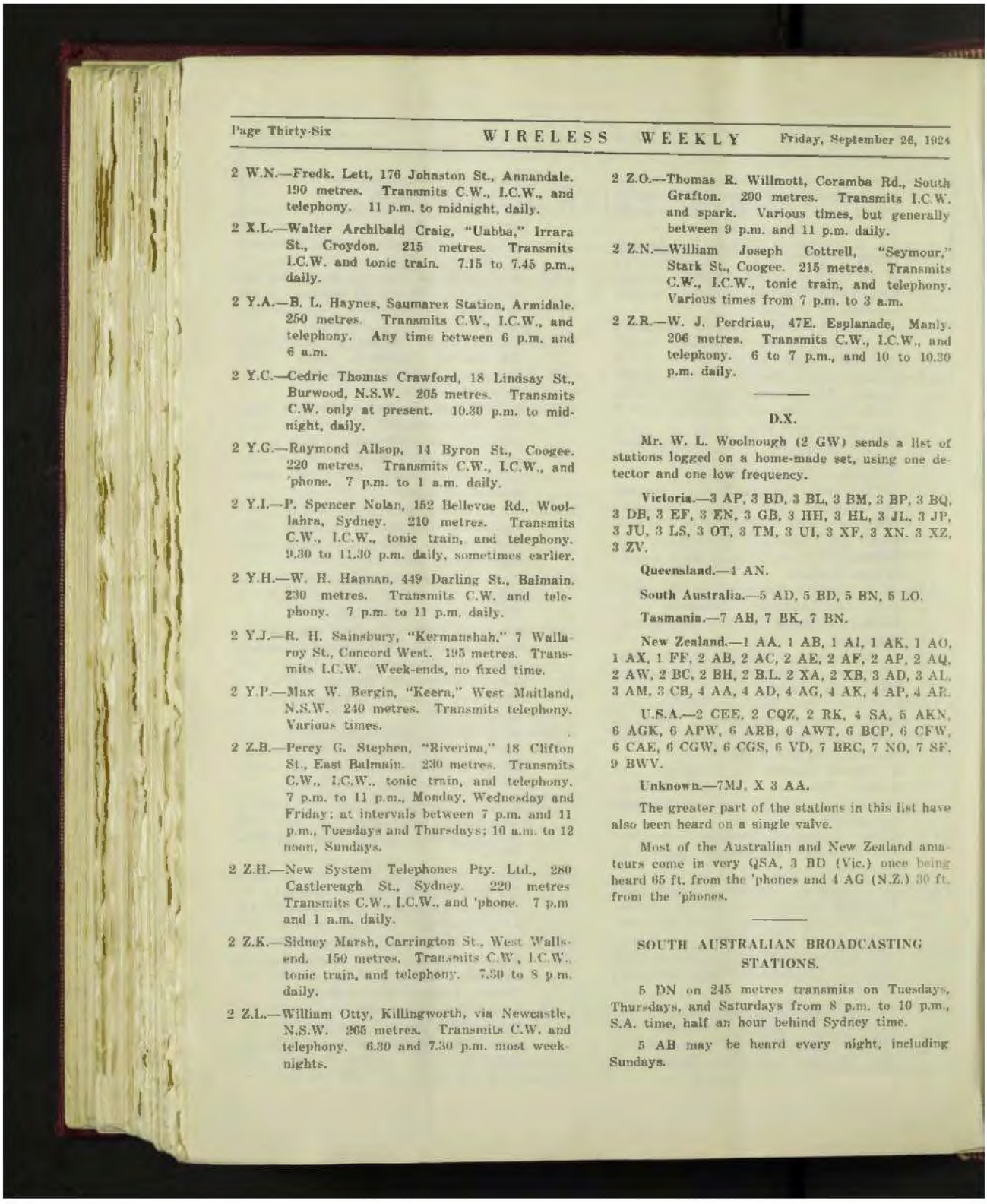
2 S.S.—A. E. Wright, Scarborough, South Coast. 240 metres. Transmits C.W. and telephony. After 7 p.m. for about half an hour, usually Wednesday, Saturday, and Sunday.

2 T.S.—Alfred Wyatt Hill, "Illaroo," Greengate Rd., Killara. 223 metres. Transmits C.W. only at present—'phone later. Irregular times.

2 U.R.—Arthur A. Creamer, 10 Hereford St., Glebe Pt., Sydney. 210 metres. Transmits C.W., I.C.W., and telephony. 9.30 a.m. to 11.30 a.m., and 10 p.m. to 12 p.m. daily.

2 U.W.—Otto Sandel, c/o J. C. Morrow, Sailor Bay Rd., Northbridge. 228 metres and 190 metres. Transmits C.W., I.C.W., and 'phone. 9 a.m. to 12 p.m. daily.

2 V.X.—Daniel George McIntyre, "Barooga," Livingstone Av., Pymble. 180 metres. Transmits C.W., I.C.W., and 'phone. Various times.



2 W.N.—Fredk. Lett, 176 Johnston St., Annandale. 190 metres. Transmits C.W., I.C.W., and telephony. 11 p.m. to midnight, daily.

2 X.L.—Walter Archibald Craig, "Uabba," Irrara St., Croydon. 215 metres. Transmits I.C.W. and tonic train. 7.15 to 7.45 p.m., daily.

2 Y.A.—B. L. Haynes, Saumarez Station, Armidale. 250 metres. Transmits C.W., I.C.W., and telephony. Any time between 6 p.m. and 6 a.m.

2 Y.C.—Cedric Thomas Crawford, 18 Lindsay St., Burwood, N.S.W. 205 metres. Transmits C.W. only at present. 10.30 p.m. to midnight, daily.

2 Y.G.—Raymond Allsop, 14 Byron St., Coogee. 220 metres. Transmits C.W., I.C.W., and 'phone. 7 p.m. to 1 a.m. daily.

2 Y.I.—P. Spencer Nolan, 152 Bellevue Rd., Woollahra, Sydney. 210 metres. Transmits C.W., I.C.W., tonic train, and telephony. 9.30 to 11.30 p.m. daily, sometimes earlier.

2 Y.H.—W. H. Hannan, 449 Darling St., Balmain. 230 metres. Transmits C.W. and telephony. 7 p.m. to 11 p.m. daily.

2 Y.J.—R. H. Sainsbury, "Kermanshah," 7 Wallaroy St., Concord West. 195 metres. Transmits I.C.W. Week-ends, no fixed time.

2 Y.P.—Max W. Bergin, "Keera," West Maitland, N.S.W. 240 metres. Transmits telephony. Various times.

2 Z.B.—Percy G. Stephen, "Riverina," 18 Clifton St., East Balmain. 230 metres. Transmits C.W., I.C.W., tonic train, and telephony. 7 p.m. to 11 p.m., Monday, Wednesday and Friday; at intervals between 7 p.m. and 11 p.m., Tuesdays and Thursdays; 10 a.m. to 12 noon, Sundays.

2 Z.H.—New System Telephones Pty. Ltd., 280 Castlereagh St., Sydney. 220 metres Transmits C.W., I.C.W., and 'phone. 7 p.m and 1 a.m. daily.

2 Z.K.—Sidney Marsh, Carrington St., West Wallsend. 150 metres. Transmits C.W., I.C.W., tonic train, and telephony. 7.30 to 8 p.m. daily.

2 Z.L.—William Otty, Killingworth, via Newcastle, N.S.W. 265 metres. Transmits C.W. and telephony. 6.30 and 7.30 p.m. most week-nights.

2 Z.O.—Thomas R. Willmott, Coramba Rd., South Grafton. 200 metres. Transmits I.C.W. and spark. Various times, but generally between 9 p.m. and 11 p.m. daily.

2 Z.N.—William Joseph Cottrell, "Seymour," Stark St., Coogee. 215 metres. Transmits C.W., I.C.W., tonic train, and telephony. Various times from 7 p.m. to 3 a.m.

2 Z.R.—W. J. Perdriau, 47E. Esplanade, Manly. 206 metres. Transmits C.W., I.C.W., and telephony. 6 to 7 p.m., and 10 to 10.30 p.m. daily.

D.X.

Mr. W. L. Woolnough (2 GW) sends a list of stations logged on a home-made set, using one detector and one low frequency.

Victoria.—3 AP, 3 BD, 3 BL, 3 BM, 3 BP, 3 BQ, 3 DB, 3 EF, 3 EN, 3 GB, 3 HH, 3 HL, 3 JL, 3 JP, 3 JU, 3 LS, 3 OT, 3 TM, 3 UI, 3 XF, 3 XN. 3 XZ, 3 ZV.

Queensland.—4 AN.

South Australia.—5 AD, 5 BD, 5 BN, 5 LO.

Tasmania.—7 AB, 7 BK, 7 BN.

New Zealand.—1 AA, 1 AB, 1 AI, 1 AK, 1 AO, 1 AX, 1 FF, 2 AB, 2 AC, 2 AE, 2 AF, 2 AP, 2 AQ, 2 AW, 2 BC, 2 BH, 2 B.L. 2 XA, 2 XB, 3 AD, 3 AL, 3 AM, 3 CB, 4 AA, 4 AD, 4 AG, 4 AK, 4 AP, 4 AR.

U.S.A.—2 CEE, 2 CQZ, 2 RK, 4 SA, 5 AKN, 6 AGK, 6 APW, 6 ARB, 6 AWT, 6 BCP, 6 CFW, 6 CAE, 6 CGW, 6 CGS, 6 VD, 7 BRC, 7 NO, 7 SF, 9 BWV.

Unknown.—7MJ, X 3 AA.

The greater part of the stations in this list have also been heard on a single valve.

Most of the Australian and New Zealand amateurs come in very QSA, 3 BD (Vic.) once being heard 65 ft. from the 'phones and 4 AG (N.Z.) 30 ft. from the 'phones.

SOUTH AUSTRALIAN BROADCASTING STATIONS.

5 DN on 245 metres transmits on Tuesdays, Thursdays, and Saturdays from 8 p.m. to 10 p.m., S.A. time, half an hour behind Sydney time.

5 AB may be heard every night, including Sundays.

THE LEICHHARDT AND DISTRICT RADIO SOCIETY.

On Tuesday, September 9th, the third lecture of the syllabus was delivered by Mr. H. F. Whitworth, before the 97th general meeting of members, held at the club room, 176 Johnston Street, Annandale.

Members rolled up in good force, and Mr. Whitworth's lecture, "Crystal Detectors and Their Action," proved very interesting and instructive to all present. The lecturer handled his subject excellently, and after a number of questions had been asked and replied to, a vote of thanks was carried by acclamation.

Members were reminded of the exhibition of members' apparatus to be conducted at the following evening, and next Tuesday night, the fourth lecture of the syllabus will be delivered by Mr. E. J. Fox, who will deal with the important subject of "Telephones."

On Tuesday, October 7th, the Society will hold its second annual meeting, when the previous year's activities will be reviewed, and, it is anticipated, splendid progress revealed.

Inquiries regarding the activities of the Society are welcomed and should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth Street, Annandale.

CONCORD AMATEUR RADIO CLUB.

The usual weekly meeting of the Concord Amateur Radio Club was held at the club rooms, Wallace St., Concord, on Thursday, 11th September, at 8.15 p.m. The Vice-President, Mr. Stephenson, occupied the chair. Attendance was very fair.

After the minutes of the previous meeting had been read and confirmed, and correspondence had been dealt with, it was decided to write to those people who had helped in the erection of the new mast, thanking them for their services. This new mast was put up under the supervision of Mr. Neal, Warilda Street, West Kogarah.

The sixth syllabus lecture was then carried on with, after which the members listened-in until 11 p.m. The meeting then adjourned.

On Thursday, the 2nd October, the fourth annual meeting of this club will take place at the above address.

All communications or inquiries re membership should be addressed to the Hon. Sec., Mr. W. H. Barker, Wallace Street, Concord.

"It is very annoying," he said to his wife when they returned from the bridge party; "you asked what was trumps at least a dozen times."

"Yes, dear, I know," she explained, "but I really didn't have to. I did it to show I was taking an interest in the game."—Boston Transcript.

PAGES 2 and 3 TELL YOU ALL ABOUT THE FROST LINES.

INTERSTATE NOTES

TASMANIA.

TASMANIAN radio men have shown keen interest in a letter recently received by a local radion from Mr. J. S. Streeter, a prominent South African experimenter. Mr. Streeter says in the course of the letter: "I am sorry to say the tests with Australia were not successful. . . . But we are willing to try again. Our first broadcasting station is now working at Johannesburg (call letters JB) on 450 metres, every evening 7.30 to 11 p.m. (5.30 to 9 p.m. G.M.T.), except Sundays, when they sometimes transmit a lecture, etc. Input 1½ Kw. Shall be interested to know if they are heard in Australia.

"Cape Town will be starting early in September, 6 Kw., 375 metres. The apparatus has already arrived."

I have received notice of a test to be carried out between Australasia and Hawaii. The programme is as follows, all times being given Australian times:—

September 14.—6.40 p.m. till 7.10 p.m., Australia calls Hawaii; 7.10 p.m. till 7.40 p.m., Hawaii replies.

September 21.—7.10 p.m. till 7.40 p.m., Australia calls Hawaii; 7.40 p.m. till 8.10 p.m., Hawaii replies.

September 28.—7.40 p.m. till 8.10 p.m., Australia calls Hawaii; 8.10 p.m. till 8.40 p.m., Hawaii replies.

Sydney's operas were listened to all over Australia, and in Tasmania there were about a thousand radio men hard at work on their sets, testing out coils, charging their batteries and wiring up new circuits. The press boomed the operas, and everyone wanted to listen-in, and there weren't enough receivers for them. The dealers did the biggest trade they've done for years. Amateur listeners sprang up everywhere, and when the big night arrived their howls rent the air like lost souls. So far as Tasmania was concerned the operas might just as well have been lightning disturbances. The amateurs spoilt their own entertainment and everybody else's.

Now that it is all over, and reports are coming in from Mainland stations to the effect that the operas was enjoyed by thousands of listeners in other parts of Australia, the need for some sort of organised instruction for the amateurs is making itself painfully evident.

The Hobart Radio Experimenters' Club now has a chance to prove its worth.

As in other parts of Australasia, the burning question in Tasmania at the moment is, "Can you get KGO?" The first Tasmanian station to pick up the American was Mr. J. Stipek, of St. Helens, East Coast, who has one of the most efficient installations in the Island. Mr. Stipek is one of those keen radions who turns in with the owls—in the early hours of the morning.

All eyes are at present turned upon our amateur broadcaster, 7AA (Mr. T. Watkins, Warwick Street, West Hobart). 7AA has been picking up strange signals from beyond the seas. Though on a similar wave, it is not KGO whom Mr. Watkins has been picking up. The call sign of this station, according to Mr. Watkins, is indistinctly heard, only the final letters being audible. Following the call, ?JX, a programme of first-class music is heard, the strength being about half that of KGO.

Mr. Watkins has now heard this mysterious station three times, each time without catching the call letters. He believes the signals to be either of American or Hawaiian origin. The wave is 325.

Bearing on the above, I came across the following paragraph the other day in a New Zealand paper:—

"The Rev. Bryan King, of Dunedin, is described as probably the most enthusiastic and successful amateur broadcast listener in that city. Mr. King says that every night between 7 and 8 he hears a station sending music and speech just about the same wavelength as KGO . . . but he cannot tune in quite clear enough to distinguish the call sign.'

Do any N.S.W. fellows know this station?

2RJ, the Sydney amateur broadcaster, is heard in Hobart as loud as 2BL. Mr. F. W. Medhurst, of Hobart, has been conducting numerous experiments with 2RJ'S transmissions with a view to eliminating the interference trouble.

Mr. Cyril Monks, of Hobart, has been carrying out some important long-distance tests with the

FROST LINES ARE SHOWN ON PAGES 2 and 3.

United Kingdom. For some reason or another the tests were not successfully worked on the Mainland, and Mr. Monks was requested to see what he could do in Tasmania. The result was the reception of long wave signals from the big Marconi station at Leafield.

Someone asked me the other day how it was that he had heard "Horsey, Keep Your Tail Up!" when listening for Mars on a very short wave. If what he heard wasn't a harmonic of Sydney Broadcasters, the popularity of our ultra-classical jazz melodies has spread to the Martians.

Considerable agitation has been shown on the part of Tasmanian listeners for a local broadcasting station. Under the new regulations Tasmania is paying for first-class broadcast—being in Zone 1—yet the nearest broadcaster is Melbourne, 350 miles distant. There is a scheme afoot in Parliamentary circles for the establishment of a wireless service for the schools, the Attorney-General (Hon. A. G. Ogilvie, M.L.C.) being a keen supporter of the idea. Such a scheme is entirely out of the question until a Tasmanian broadcaster is in full swing.

A mother-in-law was in the habit of visiting her daughter just often enough to make her daughter's husband wish he had married an orphan.

One day she arrived and found her daughter in tears.

"What has happened? Has George deserted you? Has he run away?"

"YYe-yes." (Sobbing.)

"Then there is a woman in the case; who is she?"

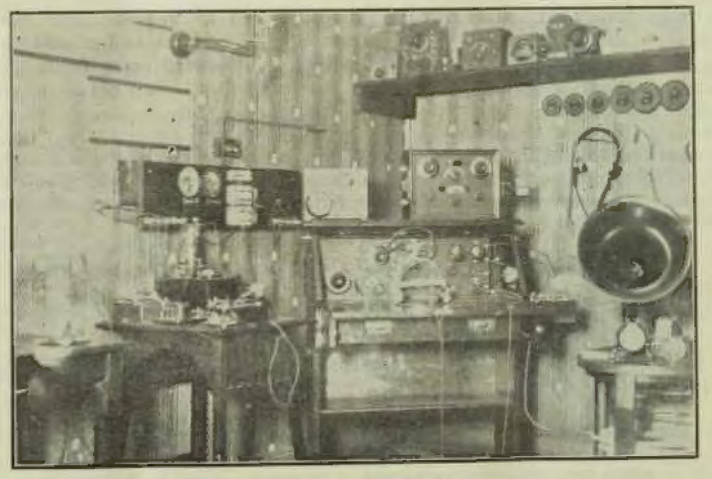
"Y-you!" (Sobbing.)

"Good heavens! And to think that I never encouraged him!"—Pasquino (Turin).

* * *

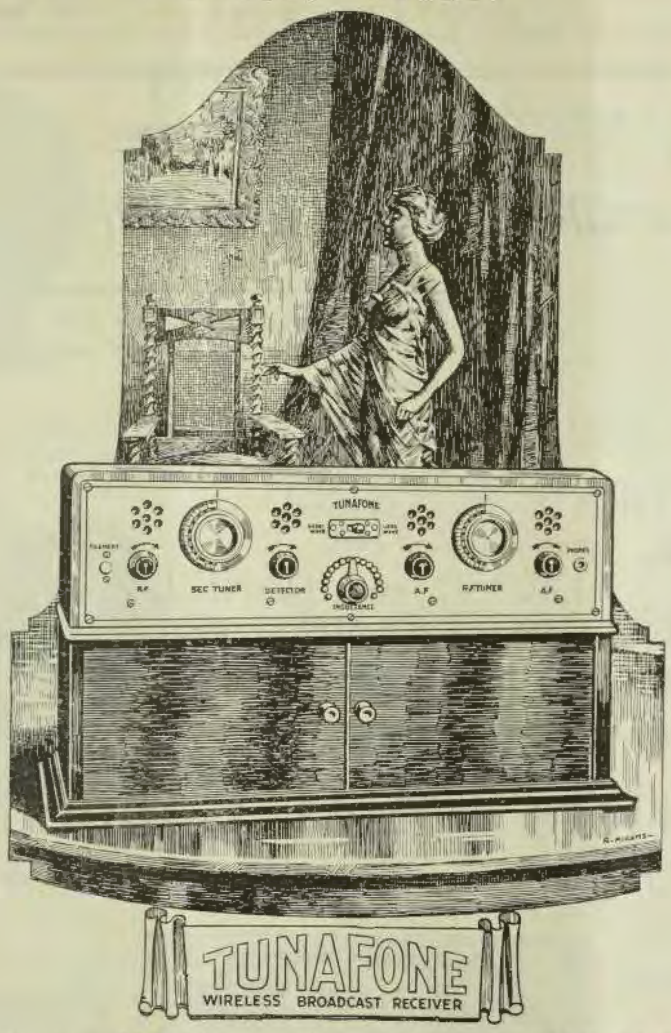
A group of big business men in Washington were talking one evening about government taxation.

'There is no telling where we will land by the time the tax bill is settled," said one. "Our status is as uncertain as that of an old Negro slave I once heard of. Somebody asked him whom he belonged to. 'I don't know, suh,' he replied. 'Old Marse, he's upstairs playin' pokah.' "—Forbes



The photograph shows portion of the station of Mr. V. Fortescue, Toowoomba.

SEE PAGES 2 and 3 FOR FROST LINES.



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The Tunafone Model X4 consists of one stage of Radio Frequency amplification Detector and two stages of Audio Frequency amplification, a combination that will bring in far away broadcasting stations with great volume, and is the ideal receiver.

This model is supplied as illustrated above, with Battery Cabinet. No provision as a rule has been made to house batteries. The A and B Batteries are usually strewn about the table with their miscellaneous assortment of wires, making an unsightly affair suitable for a radio workshop, but not pleasant for a living room or other place in the house.

The Tunafone Model X4 is supplied with a battery cabinet with ample room for A and B batteries and head phones, and also conceals all wiring.

The Tunafone Model X4 is supplied as above with four tubes, B Batteries and Head Phones, and carries with it a GUARANTEE OF SERVICE.

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WIRELESS INSTITUTE OF AUSTRALIA

SOUTH AUSTRALIAN DIVISION

THE sixth annual general meeting of the South Australian Division of the Wireless Institute of Australia, was held in the Prince of Wales Lecture Theatre, Adelaide University, on Wednesday, 3rd September. There was a large attendance of members over which Mr. R. B. Caldwell presided.

In opening the meeting, Mr. Caldwell states that he would like to address a few words to the members before vacating the chair. He said:—"During the past 12 months our membership has been well sustained, although a good many old members have dropped out, others have taken their places, and the records show a slight increase on last year, our present strength being between 90 and 100. The Treasurer will shortly tell you that financially we are sound and have a very creditable amount of money in hand. Although our membership and finances are at the present time in a satisfactory condition, we have now reached a stage where, for the future, we are going to find it difficult to sustain interest and hold the Institute together."

"With the increasing interest now manifest in wireless, numerous Clubs are springing up, and many of our old members are naturally taking an initiative in them. A suburban club offers great advantages, the members usually make headquarters at the residence of some enthusiastic radio fans and here they often meet and, in course of time, collect a valuable and instructive plant at very little cost and are able to teach each other all the practical details of construction and manipulation."

"Many of our older and more progressive members have taken to radio as a profession, of this we are proud; but in doing so they place themselves within the sphere of keen commercial competition and find time fully occupied in attending to details of business. We can hardly expect these members to attend all our meetings, or devote much time to the Institute's affairs. Now, however, as never before, it is imperative that the Institute should be held together and that all Radio Clubs and wireless enthusiasts, especially amateurs, should support it.

"You are all aware of the new regulations and how they might be interpreted to affect amateurs adversely. It appears that we are to have big broadcasting stations in each of the provincial capitals, and it should be realised by all of you that the broadcasting stations, there established, might ultimately be guided and forced by another large combine, whose name I need not mention, into a policy directly hostile to the experimenter.

"Regulations in the past have not been very liberal so far as the amateur was concerned, and I'm afraid that with the advent of the new method of broadcasting, his activities will be very closely watched, more particularly as regards transmitting. I can quite imagine the transmitter of the future being asked to pass a highly technical examination, do 30 or 40 words per minute in Morse, and work with a maximum of 5 watts, between the hours of 2 a.m. and 4 a.m. by special permission, signed by a J.P."

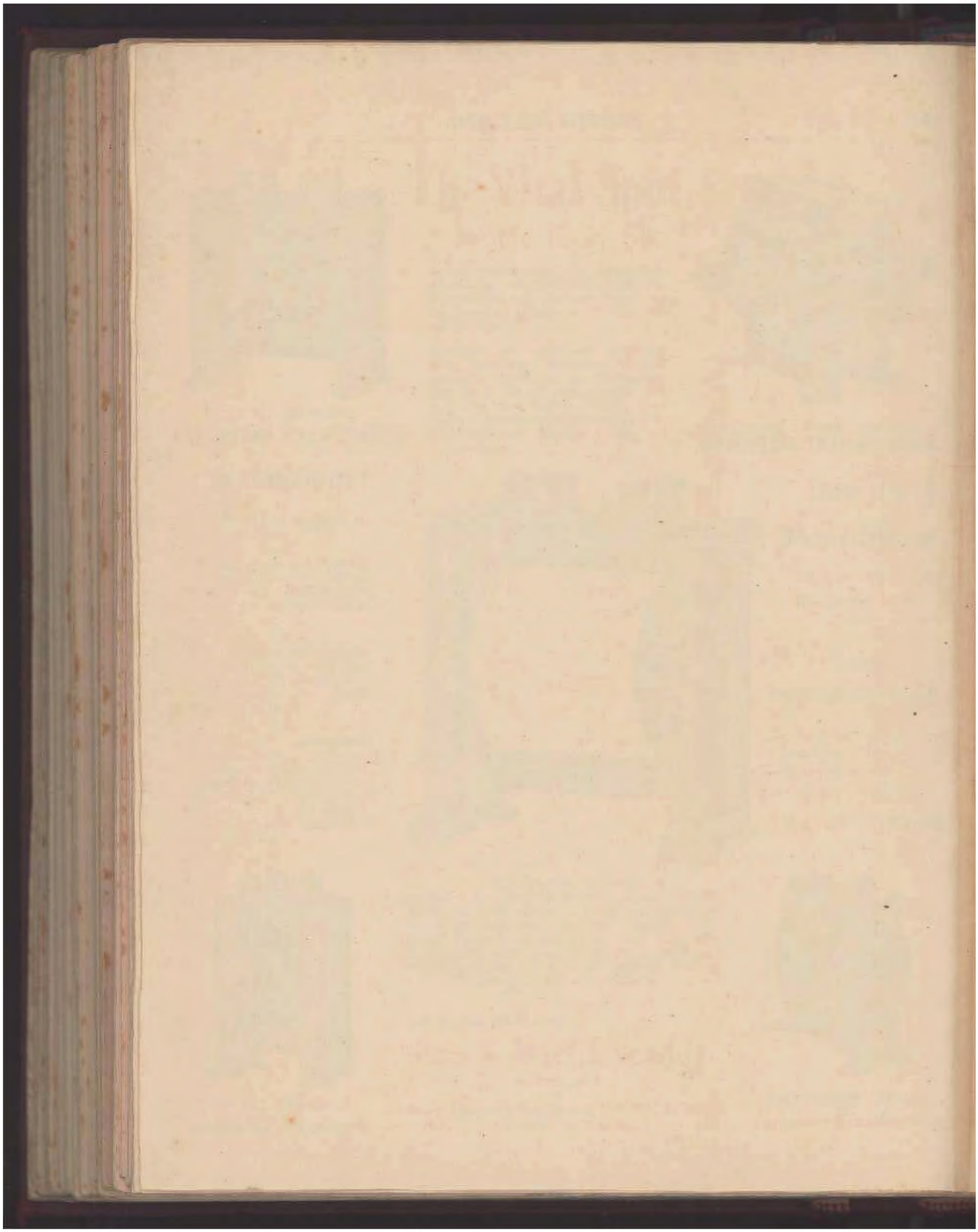
"Regarding broadcasting as at present defined I am inclined to the feeling that it is not going to be the success and revenue producing concern which some people anticipate. A broadcasting station working close handy, is going to be a useful thing to tune in a crystal set, and I have no doubt a good many people will pay for a broadcast listener's license once. If the broadcasting business does not turn out the success expected of it, the experimenter and amateur transmitter will probably be blamed and his activities still further curtailed. The future of experimenters will depend in a large measure in union amongst themselves, and it behoves us to court all wireless clubs to affiliate with the Institute, so that a united front may be presented if the rights of experimenters are assailed."

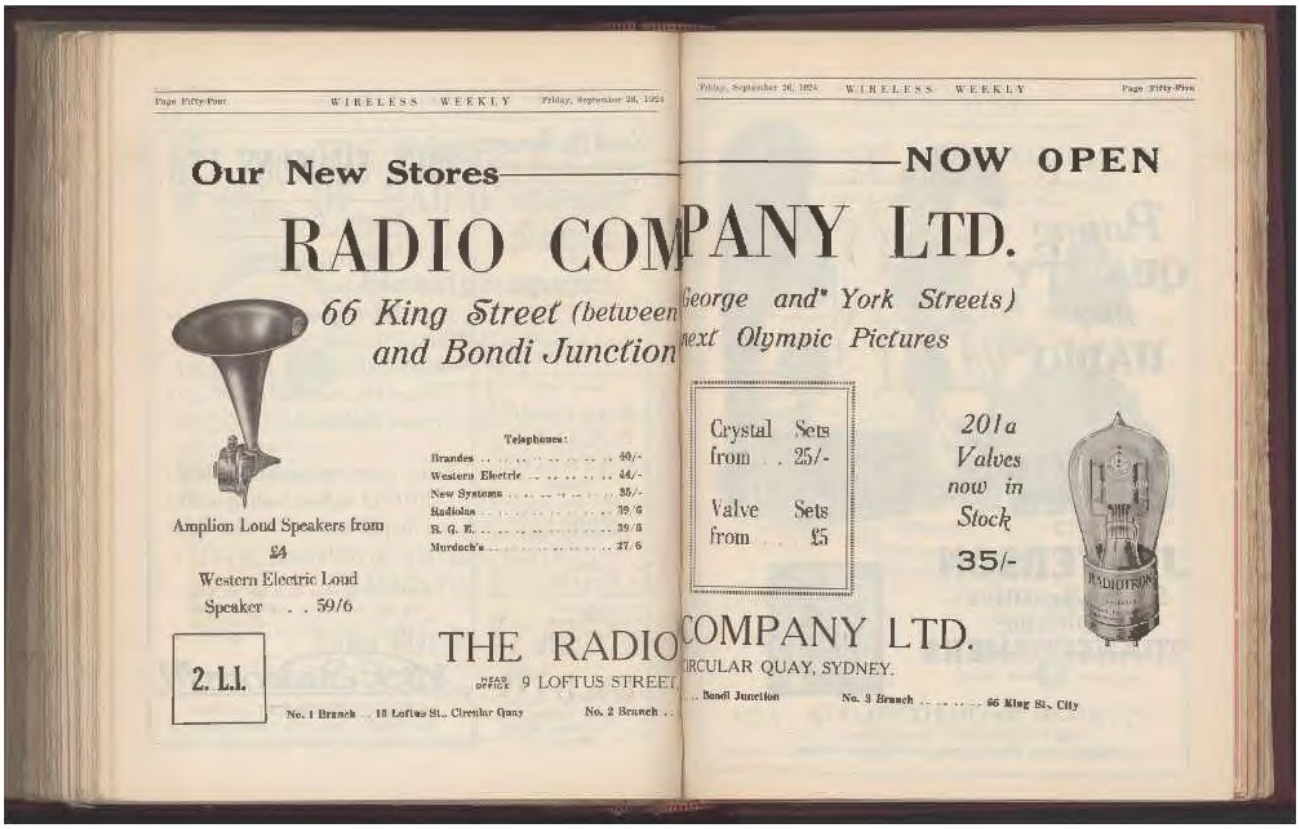
A letter was read from Mr. Stanley Ward, of Clare, expressing regret at being unable to attend the meeting. Mr. Ward further stated that he had accidentally dropped on to K.G.O's. transmission; having been previously of the opinion that the reception of that station was only freak work, he had never troubled to try for him. Mr. Ward states now that he is sorry for the time he has wasted; however, he has been able to pick him up several times since.

The election of officers for the coming year now took place, the result of the election being:

President: Mr. R. B. Caldwell.

(Continued on Page 58.)





Page Fifty-Four WIRELESS WEEKLY Friday, September 26, 1924

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Friday, September 26, 1924. WIRELESS WEEKLY Page Fifty-Five

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(Continued from Page 50.)

Vice-Presidents: Messrs. J. M. Honner and T. S. Bagshaw.

Hon. Treasurer: Mr. K. H. Milne.

Hon. Secretary: Mr. C. E. Ames.

Hon. Assistant Secretary: Mr. F. E. Earle.

Hon. Librarian: Mr. H. Hawke.

Executive Council: Messrs. H. L. Austin, W. W. Honnor, C. R. Churchward, R. M. Barker and T. Morris.

Library Committee: Messrs. H. L. Austin, J. M. Honnor, and L. C. Jones.

The report and balance sheet for the previous year was read by the Treasurer (Mr. Milne) and Mr. Churchward moved the adoption of the report which was seconded by Mr. Bagshaw.

It has been proposed that a carriage on one of the suburban trains should be hired one evening and a receiving set installed and trials be conducted during the trip. This proposal was received with enthusiasm and will most probably take please early next month.

WAVERLEY RADIO CLUB.

Waverley Radio Club held its half-yearly meeting on Tuesday, September 16th, with Mr. E. Bowman in the chair.

The delegate to the meeting of the affiliated clubs, Mr. Bunous, submitted his report of the last meeting, Mr. A. W. Stewart then moved "That the Club's delegate at the next council meeting propose that all amateur transmitters voluntarily agree to close down between the hours of 8 and 10 p.m., unless under exceptional circumstances." Mr Stewart supported his motion with the opinion that such a restriction was bound to come, and it was better that it should be done voluntarily. The motion was seconded by Mr. G. Thomson and carried. Arrangements were then made to proceed with the club's aerial and receiver.

The half-yearly elections were then held. Mr. Graham proposed Mr. Perry as President, the motion being seconded.

Hr. Howell proposed Mr. Burrows. This was also seconded.

Mr. Burrows then signified his intention of declining in favour of Mr. Perry. The meeting was then notified, however, that Mr. Perry did not wish to stand for President. The elections finally resulted as follows, all being elected unopposed, with the exception of the committee:

President: Mr. A. Burrows.

Vice-Presidents: Messrs E. Bowman and J. Miller.

Secretary: Mr. R. Howell.

Treasurer: Mr. J. Simpson.

Publicity Officer: Mr. A. Burrows.

Auditors: Messrs. W. Howell and W. Anderson.

Messrs. Stewart, Thomson, Howell and Anderson, were nominated as Committee-men, Messrs. Stewart and Thomson finally being elected.

The competition for the best and most efficient crystal set was won by Mr. J. Miller, whose set cost 1/6; Mr. M. A. Burrows (cost 15/-) ran second, and Mr. W. Stewart third, his set costing £2/10/-.

THE LEICHHARDT AND DISTRICT RADIO SOCIETY.

The Leichhardt and District Radio Society held a very successful function on Tuesday, September 16th, when an exhibition of members' apparatus was held at the club room, 176 Johnston St., Annandale.

It was the occasion of the 98th general meeting, and members rolled up in good force. The quantity of gear exhibited was considerable, and ranged from the humble single-slide crystal set of the beginner, to the multi-valve set of the more advanced experimenter. The workmanship was of a high-class order, and several novel features were incorporated in the sets on show. The exhibition was non-competitive, but had the reverse been the case the judges would have certainly found great difficulty in allotting prizes, as the gear exhibited showed such merit throughout.

Next Tuesday night the Society will hold its 100th general meeting, and will celebrate the occasion by conducting a debate, the subject to be "Honeycomb Coils v. Vario Couplers as a Method of Tuning." The last debate held on August 19th was very successful indeed, and it is anticipated that next Tuesday's function will be equally so.

On the following Tuesday—October 7th—the Society will hold its second annual general meeting, when the previous year's activities will be reviewed. There will be a considerable amount of business to transact on that occasion and a big roll-up of members is anticipated.

Inquiries relative to the work of the Society are welcomed, and should be addressed to the Hon. Secretary, Mr. W. J. Zech, 145 Booth St., Annandale.

Wireless Weekly

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All copy must be written in ink or typed, and on one side of paper only.

Advertising Rates on application.

Correspondence

Sir,—Mr. Malone's circular and your communication thereon was very much to the point. No one can grumble at the small charge of 35/- for a nightly entertainment for twelve months. The trouble is that the amount has to be paid at once, and many find it a hardship, especially boys who have put together crystal sets—very few of them can lay their hands on that sum of money for their license.

I would like to suggest that owners of crystal sets should be allowed to pay their license monthly (3/- per month). I believe that it would be the means of inducing hundreds more to instal sets, and it would be less inducement for others to evade paying for the services rendered them.

Yours, etc.,
"CRYSTAL."

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