

# WIRELESS WEEKLY

3<sup>d</sup>

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AUSTRALIAN RADIO  
JOURNAL

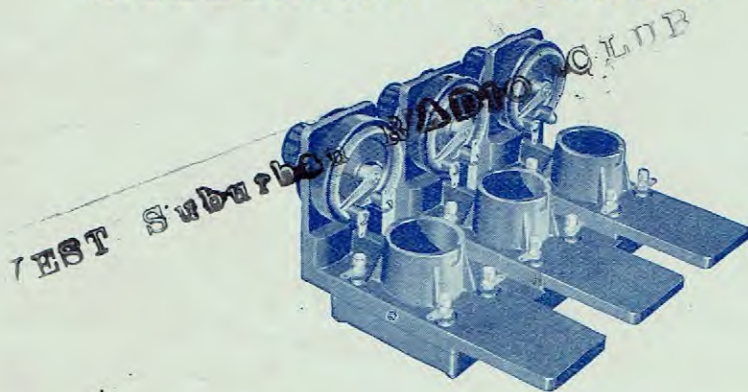
Vol. 4  
No. 3

REGISTERED AT THE G.P.O., SYDNEY, FOR TRANSMISSION BY POST AS A NEWSPAPER

FRIDAY, MAY 2nd, 1924

This Week's Feature: A NOTE MAGNIFIER

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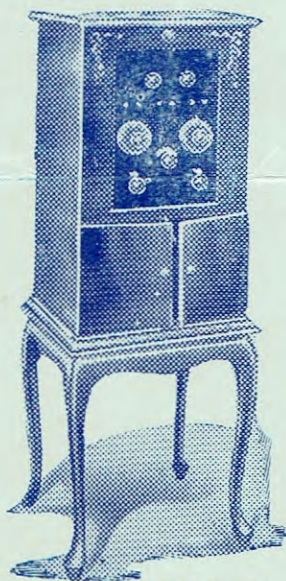
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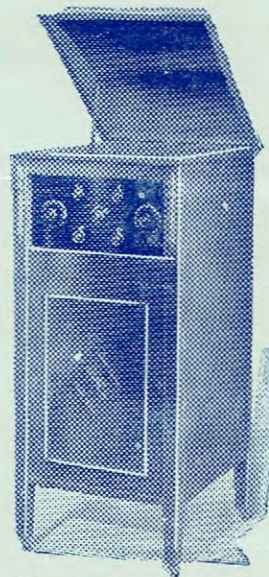
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OFFICIAL ORGAN OF THE AUSTRALASIAN RADIO RELAY LEAGUE.

Vol. 4.

Friday, May 2, 1924.

No. 3

## THE AIR HOG.

We are all familiar with the man who flashes us a contemptuous stare from behind the wheel of his big roadster as he thunders past at forty per, leaving us gasping in a swirl of dust and gasoline. He is the road hog against whom traffic cops and sane motorists have sworn a vendetta. There is a law dealing with him. Sooner or later he bumps trouble and gets it in the same place as the chicken.

Unfortunately there is no law covering the man who, against all commonsense and reason will persist in cluttering up the ether with CQ calls right in the middle of a particularly good transmission, such as may be heard from amateurs any night in the week. Just so long as he fulfils the requirements of listening-in every few minutes, his license entitles him to transmit whenever he pleases. But no license carries with it the right to monopolise the air.

The vast majority of transmitters operate un-

der what may be termed a gentleman's agreement, and it is noticeable that they courteously refrain from interfering with each others' transmissions. This tactful procedure coupled with a spirit of friendly rivalry enables them to conduct their experiments and incidentally to give pleasure to thousands of listeners.

The fly in the ointment is the transmitter who blunders along the ethereal way, wilfully deaf to the protests of those with whom he interferes, intent only upon his selfish pleasure, and forgetful of the fact that the whole experimental movement depends upon the co-operation which he repudiates.

The air hog will be tolerated just as long as the patience of experimenters allows him to continue. Sooner or later his fate must overtake him—that of being called upon to show cause why in the interests of experimenters generally his license should not be cancelled.

### Roster for Week ending 7th May, 1924

	7.30 to 8.0	8.0 to 8.30	8.30 to 9.0	9 to 9.30	9.30 to 10	10 to 10.30
Thur, May 1	2 RA 2 GR	2 IJ 2 JM	2 YI	2 UW 2 ZN	2 YG 2 VM 2 ZZ	2 ZG
Friday, 2	2 IJ 2 GR	"	2 UW	"	"	"
Saturday, 3	2 RA 2 GR	2 IJ	"	"	"	"
Sunday, 4	2 RA 2 GR	"	"	"	"	"
Mon., ..... 5	2 RA 2 GR	2 IJ	"	"	"	"
Tues., ... 6	2 IJ	"	"	"	"	"
Wednes., .. 7	2 RA 2 GR	2 IJ	"	"	"	"

# The Case for the Experimenter.

By J. J. Carroll

The constitution of the Wireless Conference just concluded, did not make provision for full representation and this omission is much to be regretted, more especially as after a survey of the proposals recommended to the Postmaster-General one cannot help but be dismayed at the scant consideration given the amateur—the one who was carrying out experiments years before broadcasting was thought of as a commercial possibility. It has been contended by some members at the Conference from whom a high standard of equity might have been expected—that there was no need for the Amateur Wireless Institute to be represented as its interest would be adequately safeguarded by the members of the Association for the Development of Wireless who predominated at the Conference.

It is difficult to understand how any well-intentioned and tolerably reasonable assemblage could pass on to the controlling authorities a request that the licenses granted experimenters should not exceed 950, of which New South Wales quota will be 300. The proposal to collect money from experimenters in excess of this quota of 300 allotted to N.S.W. simply puts a stumbling block in the path of would-be experimenters, as the suggestion narrows itself down to collecting contributions for services which the applicant may not desire, and the whole work of the Conference is emasculated by the unfairness of such a proposal. Evidently the Conference has either purposely or unintentionally overlooked this important aspect of the case.

It is regretted that the claims of the experimenter should thus be made subservient to the monetary interests of the broadcasting companies. There should be no limit as to the number of licenses issued to those who have satisfied the Government that they are carrying on the development of a great and wonderful science. Before the advent of commercial broadcasting the freedom of the experimenter had been recognised and freely admitted, but now drastic interference is suggested by an Association of individuals concerned only with the commercial success of broadcasting. The Government is faced with a grave responsibility and must reject any such officious and vexatious proposals which will

limit the activities of those who are keeping Australia in the front rank in the development of the science of wireless.

There cannot be a combination more dangerous to the development than that which advocates restrictions upon those who may experiment. Even before the war there were 1500 holding licenses and these licenses built up without cost to the public a huge army of wireless enthusiasts ready to serve their country in the case of need. To dismiss 550 of them, together with those since licensed, unless they contribute to the funds of broadcasting companies who may be only transmitting jazz music is simply monstrous. The experimenter should be left alone in the path which he has already laid to such brilliant and marvellous achievements. Non-interference must be the slogan of the amateur. Education is one of those things which it is admissible in principle that a Government should provide such regulations as will safeguard its security. It should give all its aid in providing utmost freedom from restrictions; and to encourage and offer whatever facilities, direction and guidance, as may be necessary to advance and nurture such a science as wireless.

The greatest things, it has been said, have generally been done by those carrying out casual experiments, and the few hours which have been spent have often been found compatible with the most brilliant achievements.

In a country such as Australia, where the knowledge and arts of civilised life and a high effective desire for delving into the sciences exists, it is most undesirable they be retarded to provide immediate pecuniary gain to commercialism. So we look for, in any amended regulations, an aid to the efforts of the experimenter rather than suppressive to them.

It may be interesting to read of the published opinion of some of our foremost wireless leaders touching on this matter.

Marconi states: "It is wise to remember that had it not been for amateurs, wireless telegraphy as a great world factor might not have existed at all. I think, therefore, that the suppression of the work of those amateurs who are interested in wireless would be against public interests."

Dr. J. A. Fleming, Professor of Electrical Engineering, University of London, states: "It is a matter of common knowledge that a large part of the important inventions in connection with wireless telegraphy have been the result of amateur work and private research."

E. T. Fisk, M.Inst., R.E.: "In facilitating the experimental side of wireless, the Government would be laying for itself the foundation of a national asset."

In Great Britain where broadcasting is firmly established and where the British Broadcasting Company controls so successfully many stations operating from various centres, the P.M. G. wisely adopted the recommendations of the committee lately appointed to investigate and submit recommendations in connection with broadcasting.

Briefly stated these recommendations as applied to amateurs were: experimental licenses be issued to all those who had an expert knowledge of the subject, and those researches were likely to be of value to the advance of wireless. It was considered most unwise to limit for any reasons whatsoever, the number of those whose research work might prove beneficial.

No doubt many members of the Conference just concluded in Sydney were actuated by commendable motives and were evidently over influenced by the increasing numbers of those applying for experimental licenses, many of whom are known to have no interest in wireless other than listening to broadcasting. But the real cause of so many applications was not to disregard financial liabilities to the broadcasting companies, but was a desire to secure conditions untrammelled by the restrictions of the "sealed set" regulations. Many also wished to make their own broadcast receivers which was not practicable unless an experimental license was held.

There is no question but that the consensus of opinion is that the public will not submit to any regulation that is likely to impose needless limitation of the reception of wireless. With the experience gained in Great Britain, it was found, given satisfactory regulations, coupled with first-class programmes, that there were very few defaulters among experimenters concerning the payment of the broadcast license fee.

J. C. W. Reith, managing director of the B.B.C., says: "It has been proved that the listening public is an honest public." There is not the slightest doubt that the Australian experimenters will maintain the same standard of equity as in Great Britain, contributing to the broadcasting company for any service they may use.

## CORRESPONDENCE.

To the Editor.

Sir,—Relative to the matters discussed at the broadcasting conference—one big point seems to have been absolutely overlooked, and that is that there are many genuine possibilities of experimental work which need the free and untrammelled use of wireless receiving and transmitting gear which does not necessarily involve the detailed and precise knowledge of wireless that would need to be displayed if an examination is insisted on.

This especially relates to the proposal that candidates be required to show that they possess a definite knowledge of sending and receiving in Morse Code.

Take my own instance—one of many: I am chiefly interested in certain effects of oscillatory currents on certain antennae insects and to me my wireless set is principally useful as a means to instruct myself in certain aspects of radiation phenomena of which I at present know very little. I find it a great help in my work which is finally physiological to work upwards from crystal reception to valves and so forth in understanding thoroughly the questions involved and the technic concerned in proceeding towards my final goal.

Why should I be bothered with learning to transmit and receive rapidly a code and much other technical stuff which may not at all be involved in my problem? I am also interested in research in connection with a receiving instrument of a new type, and here the usual technic of the commercial wireless operator is no advantage.

As a doctor I know that many of the finest pieces of medical research resulted from apparently useless investigations into questions quite unrelated to the main subject of prevention of disease and I feel most strongly that no trammels should be imposed on a comparatively young science with unknown possibilities in directions perhaps yet undreamed of.

Judging by some of the "experts" I have conversed with, there are many of them mere technicians who, while they can talk very learnedly of the

jargon that has grown up around the subject, are often as impotent to answer questions of basic theory as I am. God preserve us from the "expert." The record of the past is filled with the hindering influence that the orthodox expert has introduced.

Let this new child of science be freed from the fetters and develop in its various directions without let or hindrance.

BURTON BRADLEY,

M.B., Sydney, D.P.H., London.  
17/4/24.

## IS MR. MACLURCAN LIABLE?

A Sydney experimenter is considering the advisability of bringing an action against Mr. Maclurcan (2CM). It happened this way:

Last Friday evening the experimenter invited an elderly gentleman along to the house to listen to radio music. Donning the phones the old chap listened entranced to the music put out by the amateurs. About 8.30 p.m. an old familiar voice blithely announced from 2CM that the next two items would be "She sat in the sink and sunk," and "It's not the cough that carries you through, but the coffin they carry you off in" (say that quickly). Well, the old gentleman was so overcome with the humour of it that in leaning back to get full lung capacity, his chair overbalanced and the set was dragged from the table, breaking two valves. The experimenter now wants to know what 2CM is agoing to do about it?

## WAS IT THE WHISKY?

D. Craig (Walcha Road, N.S.W.) writes as follows:

Last week while transferring my station from one town to another I had the bad luck to have the panel of my receiver very badly smashed. After I had erected a new aerial 100 feet long, with a 20ft. lead in, I was again sorely disappointed when the new panel which was on order had not arrived.

Being anxious to get going again I cast about for a makeshift and finally located a piece of flat board torn off a whisky box. On this I mounted the parts of a receiver comprising 1 detector and 1 stage radio frequency, using the tuned anode coupling. I hooked up to the aerial and listened in. To my surprise both Farmers and Broadcasters came in very clearly, using the two valves and they were just audible with the detector filament turned off. VIS, VIA and most of the other Australian coast stations operating at the time could be heard

very strong. It rained very heavily and constantly during the reception and as the distance is something like 220 miles airline from Sydney, I think the results worth recording. In any case it will demonstrate that there are other uses for a whisky box besides taking bottles out of it.

## D.X. COLUMN.

A. B. Leonard (Dronin, Vic.) logged the following during last week:

N.S.W.: 2AI, 2CM, 2BC, 2XA, 2YG, 2LO, 2GR, 2JM, 2ZZ, 2ZE, and Riverina Wireless Supplies.

S.A.: 5DP, 5AH, 5BQ (exceptionally strong on phone).

N.Z.: 4AA, 1AM (music) 6GT (?) 200 metres.

Most of the above transmitted music and many others were logged who failed to announce call sign.

W. Hudson's (2AR, Dulwich Hill) log sheet from March 8th to April 12th shows a comprehensive list of stations heard QSA with 1RF and 1 detector.

CW signals from 3AD, 3BM, 3BU, 2CN, 5BQ, 2XA, 7BN, 3HL, 2EM, 3BP, 3SW, 3BH, 3JU, 4AA, 3HH, 2BV, 3UX, 3BQ, 3JH, 5AC, 3XF, 2AQ, 7AA, 3HU. Speech and music from 5BY, 5AH, 2GQ, and S.O.S. signals from Honolulu Maru. With a radiation varying from 250 to 400 M/A, signals, speech and music were exchanged between 2AR and 3BD, 2YA, 2HM, and 3QW.

## RADIO A—ZZZ

During the last four months that this station has been in operation, some very encouraging DX work has been handled.

New Zealand stations which have been worked are: 4AA, 4AH, 2AC, 2AP, 3AF, 2AI, 2AQ, while reports come from other stations there. All report ZZZ's signals Q.S.A., and several at loud speaker strength.

4AA writes that ZZZ is one of the loudest Australian stations heard. Victorian stations are 3DD, 3JU, 3JH, 3BQ, 3BM, 3BD. Again all reports give Q.S.A. and 3JU writes that ZZZ's signals are "like local."

Tasmanian station, 7AA has been worked and reports Q.S.A. while another enthusiastic report comes from 7BH.

5BQ, South Australia, has been worked also for a short period, but QRN and QRM from local jazz-birds were detrimental to the success of this test.

Of the N.Z. stations 4AA is the strongest and most consistent. 2AC

Continued on page 14, col. 2



### FURTHER NOTES ON THE AUTOPLEX.

By Q.T.C.

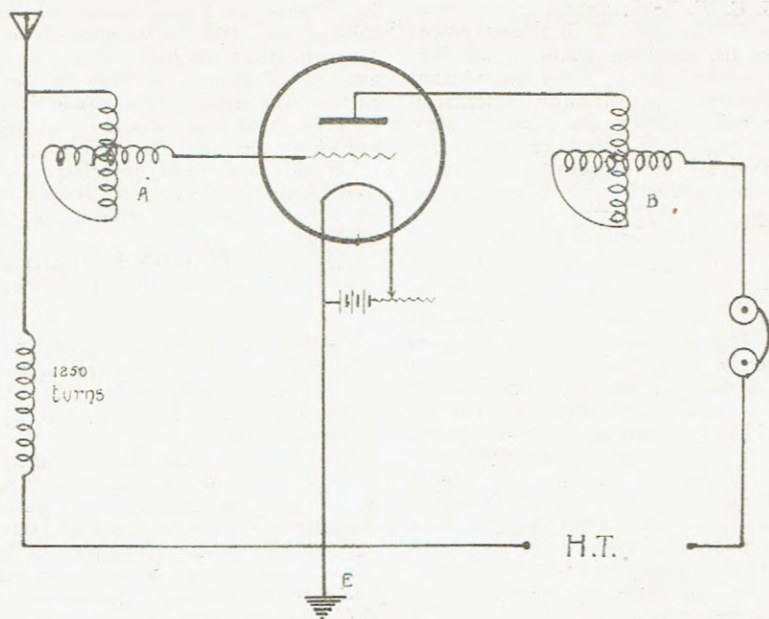
Since reading the interesting article by Percy L. Sewell in *Wireless Weekly* of March 28th, I feel that since the autoplex circuit is one that possesses great possibilities my experiences with it may be of interest to other experimenters.

The circuit is shown in the diagram and is made up of the following parts. Two Radak variometers, 1 U.V. 201 A valve, 1 "Lambda," 1250 D.L. coil, besides the usual rheostat, etc. It is interesting to note that there is not a capacity of any description in the circuit.

Tuning is effected by turning the variometers A and B. When both circuits are in tune, a whistle will be heard in the phones, but this ceases as soon as signals come through. The filament control is not critical and in fact the rheostat could be dispensed with.

When first tried out with ordinary aerial results were not very wonderful.

*Continued on page 14, col. 2*



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# The Association's Letter to the P.M.G.

The Hon. W. G. Gibson,  
Postmaster-General,  
Melbourne.

Dear Sir,—We have pleasure in advising you that in accordance with your request we have met and conferred upon the question of the proposed amendment of the existing wireless regulations insofar as they affect radio broadcasting in Australia.

In accordance with your directions, the conference was constituted as follows:—Representing the Postmaster-General: Mr. H. P. Brown, Secretary of the Postmaster-General's Dept. Representing Australian broadcasting companies: Mr. S. Wilson, Farmer & Co. Ltd.; Mr. N. Pope, Farmer & Co. Ltd.; Mr. Cusack, South Australian Broadcasting Company; Mr. J. Thomson, West Australian Farmers', Ltd.; Mr. Coxon, West Australian Farmers', Ltd.; Mr. Gardiner, Associated Radio Co.; Mr. Maclardy, Broadcasters (Sydney) Ltd. Representing Association for the Development of Wireless in Australia, New Zealand, and Fiji: Mr. R. Wilkes, West Australian Branch; Mr. Kauper, South Australian Branch; Mr. L. P. R. Bean, Queensland Branch; Mr. J. W. Derham, Victorian Branch; Mr. Holloway, Victorian Branch; Mr. Scott, New South Wales Branch, Mr. Rudolph, New South Wales Branch, Mr. Fabey, N.S.W.

Conference was fortunate in securing the services of Major C. W. Marr, M.P., D.S.O., M.C., as Chairman. We wish to place on record our appreciation for the valuable aid he rendered us in this position.

Conference also wishes to thank Mr. Brown for his courtesy and very helpful assistance.

We regret that Messrs. Wilson and Pope failed to attend the conference after the first session, and in this connection we invite your attention to the typewritten report of the conference proceedings, which will be submitted to you at an early date.

Though at first it seemed somewhat difficult to reconcile the divergent interests of the component parts of the conference, we are pleased to report that we have reached unanimity, and we attach hereto a draft suggesting alterations to the existing regulations, which we feel sure will result in the Australian public enjoying radio

broadcasting to the fullest possible extent.

We considered very many schemes, and took into consideration the conditions under which radio broadcasting is done in other countries, such as Great Britain and the United States of America.

On the conference being opened, a petition was presented from the following firms, Anthony Hordern & Sons, Ltd., David Jones, Ltd., New System Telephones Co., Harrington's, Ltd., Mark Foy, Ltd., Marcus Clark, Ltd., F. Lassetter & Co., drawing the attention of the conference to the advantages of a system of control by one big broadcasting company. The conference set a day apart for the discussion of this proposal, with the representatives of the companies who signed the petition. Notwithstanding that three days' notice was given the signatories, they declined to send a representative to the conference, saying, in effect, that it was neither time nor the place to air their views.

The conference very much regretted this decision, and debated the question of one big broadcasting company at length. Please see the verbatim report of the conference.

It is significant to note that none of the broadcasting companies present was prepared to entertain the proposal of one big broadcasting company. The whole of the branches of the Association for the Development of Wireless in Australia, unanimously condemn the idea of one big broadcasting company. We consider that this proposal tends towards monopolistic control, and is not in the best interest of the Australian public.

After full consideration of all of the different schemes discussed, the conference unanimously agreed upon the annexed scheme for altering the regulations, and emphasises the fact that its adoption will confer the following benefits upon the public:—

- (a) Open sets.
- (b) Reasonable regeneration.
- (c) Competitive broadcasting, involving the best stimulus to variety and superiority of news, entertainment and education.
- (d) An open market for the development of Australian talent.
- (e) Cheaper broadcasting fees.
- (f) Greater standardisation of the

receiving sets and consequent cheapening in cost.

We are of opinion that the scheme we recommend for adoption is sound from a business point of view and conservatively estimate that it will save the public as well over a million pounds per annum in broadcasting fees, which would otherwise have been paid under the "sealed set" regulations.

Our proposals give the public an unlimited range of reception, and the possibility of listening to international broadcasting, which as the science of radio telephony develops, will become a possibility in the very near future for the ordinary man in the street.

One of the greatest difficulties which confronted the conference was the evolution of a scheme for the equitable allocation of revenue. It was also difficult to introduce into that scheme the competitive element in broadcasting, having regard to the limited Australian population.

We are pleased, however, to report that the financial arrangements we now suggest meet with the entire approval of all of the existing broadcasting interests in Australia, with the exception of Farmer & Co., whose opinion we do not know.

If our proposals are adopted, the "open set," combined with the very low licence fees we suggest, will make radio broadcast reception so popular that the broadcast companies will receive more revenue than they would under the "sealed set" regulations.

It cannot be denied that our proposals give a limited monopoly to a certain degree to broadcasting interests. We are of the opinion, however, that the first essential of the public is that capital shall flow to the business of broadcasting. Capital will only flow to broadcasting under attractive financial conditions. Our proposals are designed to give some safeguard to broadcasting interests in order that they may avoid financial embarrassments, particularly in the earlier stages of their existence, when they may be living upon their capital. The limited monopoly ceases when these conditions are satisfied, and thereafter there will be a very big competitive inducement to excel in the efficiency and excellence of their broadcasted programmes.



The conference wishes to draw attention in passing to the withdrawal of Mr. Holloway from the conference. The Victorian branch of the Association were under the impression that it was only entitled to one representative, but subsequently found it should have sent two representatives. Mr. Derham was appointed as its first representative, and Mr. Holloway, as its second, arrived two days after the conference had opened. Mr. Holloway retired from the conference after submitting an unseconded motion, which was designed to terminate the proceedings of the conference, which was reaching an amicable solution. It was afterwards found that Mr. Holloway's motion and withdrawal did not meet with the approval of the Victorian Branch, which, in communicating by telegram, authorised Mr. Derham to continue representing them. The Victorian Association also intimated by telegraph that it would endorse any scheme other than one big broadcasting company, which would bring about "open sets." It instructed Mr. Derham to adopt this attitude at conference.

In view of the fact that the Postmaster-General, in receiving a deputation from the Association for the Development of Wireless, intimated that the Government had some moral obligations to companies which would suffer some loss through the change of regulations from "sealed" to "open sets," the conference considered how far such companies should be compensated. We attach hereto a copy of a resolution which was passed by conference on this matter, and would like to point out that the conference is of the opinion that if compensation is confined to legitimate and actual losses, it will be simple and cheap to meet the claims. It is further of the opinion that no claims will be submitted from more than five or six concerns throughout the Commonwealth. The members of the conference will use their best endeavours to discourage the submission of such claims as they feel sure that any losses incurred to date will be easily recouped from the very much larger business that will be done under "open set" conditions.

In conclusion we will point out that your conference is representative of all the broadcasting interests of the Commonwealth, except one, and of hundreds of radio dealers, and dealers, manufacturers and importers throughout the Commonwealth. We believe that the conference represents all of the dealers, importers and manufacturers of the Commonwealth, with the

exception of less than a dozen, insofar as its recommendations are concerned. The broadcasting interests are very well satisfied with the conclusions that conference has arrived at, and urges the Postmaster-General to amend the regulations immediately.

We wish to emphasise to you the fact that you selected a conference as a means of obtaining advice upon the existing impasse. We have met together and are unanimous in our recommendations. The Conference is thoroughly representative of broadcasting and trade interests, and we submit that no delay should occur in negotiation with other interests which voluntarily excluded themselves from the deliberations of conference.

We would remind you that at the recent interview you had with the representatives of the Association, you desired the present conference to find a solution of the difficulty compatible with not injuring the existing interests, which had incurred commercial obligations. We feel sure that our proposals have found a satisfactory solution of the difficulty on an equitable basis which will not sacrifice the welfare of the public to vested interests.

We respectfully ask for a decision upon this matter within a fortnight; first, because we know of your intending visit to Europe, and secondly, because the decision of this conference with regard to "open sets" must leave the radio business absolutely disrupted until the new regulations are gazetted. We would be very much obliged if you would permit us to see the proposed regulations before they are gazetted.

## Crystals

By A. F. Jacob.

Being more than ever satisfied with my S.T. 100 outfit as a receiver of broadcast music, speech etc., it appears to me to be a pity lest anybody be discouraged by Mr. Hamilton's remarks (W.W., March 7th) as to trouble in finding a suitable crystal. My location is close to Homebush Station, about 9 miles' airline from Broadcasters, and double that from Farmers. My S.T. 100 is upstairs in my house, and both the above stations come in with remarkable volume and purity; in fact, both stations may be distinctly heard downstairs.

My set includes a crystal panel carrying 8 crystals, any one of which can be connected by rotary switch, or

readily taken out and replaced by another. This admits of an infinite variety of tests being made under precisely similar conditions, and the result of such has been to show that equally good results can be had from all the recognised crystals; and further, from some very unorthodox combinations.

At the moment of writing, my panel includes Argentite with steel cat whisker; zincite, in position of cat whisker, making contact with the head of a small steel bolt; zincite-bornite; zincite-tinned brass; Q.S.A., steel-whisker; zincite-iron pyrites; zincite-bornite, and Du Tec steel whisker.

Broadcasters' programme is now (Monday afternoon) running, and all crystals functioning well, their order of merit being (1) zincite-iron pyrites; (2) zincite-steel bolt; (3) Argentite; (4) and (5) zincite-bornite; (6) and (7) Q.S.A., and Du Tec (8) zincite-tinned brass.

Leaving iron pyrites to rest on its laurels, the whole programme is being taken on zincite-steel bolt. An item, "Old Time Waltzes," was heard downstairs so that each air was distinctly recognisable and every word of the announcements understandable. The Lyceum orchestra was faint downstairs, but quite clear in adjoining rooms. The home-made loud speaker used is shown elsewhere in this issue.

Other receptions have been: 2CM (2 miles), stronger than Broadcasters; 2 RA, good on loud speaker, 2ZG clear on loud speaker, too strong for phones; 2GR faint on speaker, strong in phones; 2UW strong in phones, faint on speaker; 2YI about same as 2UW etc.

### General Conclusions.

Zincite is king pin. I would advise the experimenter if not immediately successful, not to hesitate to break a piece up, as a piece half the size of a grain of wheat is liable to show surfaces which will give results as good as a piece the size of a cheese. And the moral is, don't be downhearted, in the making of omelettes; eggs must be broken.

Have you tried disposing of that old Loose Coupler, or that Transformer, through the columns of "Wireless Weekly"?

3 lines, 1/6. 6 lines, 2/6.



# The Arts of Radio Broadcasting.

By the Little American.

Radio broadcasting has, in the short space of two years, established itself firmly as a permanent institution of inestimable benefit to humanity, combining as it does the school, church, theatre, concert hall, opera house, and ball room.

The true meaning of radio and the vital place which it occupies in the life of to-day can only be appreciated by a study of the daily mail of a big broadcast station. There you meet life in all its realities, and from the thousands of letters coming from all nationalities, all creeds, and all walks and stations of life the realisation comes that in radio lies the greatest influence and power for the good of humanity that the world has ever known.

If the voice of the ether spoke only to the lonely and the isolated, the blind, the shut-in and the sick, it would be fulfilling its mission, for there lies the great province of radio. Mary Garden sang recently over a broadcast station, not for those who are able to go to the concert hall and hear her, but for the countless thousands who otherwise never in their lives would have heard her lovely voice.

It is a new art, opening up new vocations, requiring the services of specialists who of necessity have developed with radio. Engineers have made rapid strides in the application of radio to the transmission of speech and music, but the broadcasters have also done their part in elevating the standards of broadcasting to that point where the greatest artists are glad to appear before the tremendous audiences represented by the humble microphone.

The three important developments of the broadcast station are represented by the programme manager, the announcer, and the operator. The programme manager, necessarily a musician, books and arranges all programmes. The artists are tried out in the studio to determine their adaptability to the broadcast requirements, before they are booked. The studio microphone picks up the music or speech; it is amplified in the operating room and reproduced through the monitoring horn or loud speaker. The programme manager listens to the reproduction there and decides whether

or not the artist will broadcast satisfactorily.

With sometimes four studio programmes daily, it is indeed a difficult matter to keep sufficient talent of the desired quality booked in advance. An occasional cancellation results in a frantic last minute effort to arrange a new programme, for the advertised broadcast periods must be filled even if it is necessary to make a programme out of almost nothing.

The announcer is responsible for the presentation of the programme. Personality is an essential factor which enters largely into the success of his work. The artists come and go, but the announcer goes on for ever, and if his announcements are monotonous and colorless the station will not be as popular as if a pleasing, friendly personality is radiated. Furthermore, the radio listener is at home and must be made to feel at home, even though he may figuratively be a guest in the studio. Hence a spirit of informality, dignified but friendly and sincere should be manifest.

Through experience the announcer learns the correct position of the microphone for various types of voices and musical instruments. He is able to balance accompaniments and ensembles to render a satisfactory and harmonious result. The operator listens to the entire programme through his monitoring horn and communicates with the announcer, either by telephone or a system of signal lamps, advising if more or less volume is required; if accompaniment is too strong or if the balance is imperfect in any respect. The position of the microphone is then altered to correct the fault.

The efforts of the programme and studio departments culminate when the artist performs before the microphone, and the operator then functions to properly modulate and broadcast that which comes to him from the studio.

The broadcast operator labors under considerable responsibility. The transmitting apparatus must function efficiently and without delays or breaks for the number of hours required each day. When trouble arises it must be removed immediately, for a symphony orchestra may be waiting at one end

and half a million people at the other.

Remote control is being used more and more, constituting a large portion of the broadcast from some stations. This consists of picking up a programme at some distance from the radio station by simply extending the microphone circuit. Instead of using studio microphone, which is but a few feet from radio transmitter, leased telephone lines to the desired location, are connected into the circuit and the microphone attached to the other end with an amplification unit to compensate for the line losses.

No fixed methods of procedure have been established, due to the newness of the art, and therefore each department of the broadcast station studies its individual problems, working to the general perfection of radio. The listening public constantly becomes more critical, and by means of their letters of appreciation and constructive criticism materially assist the broadcaster in visualising the goal of this effort.

## FLYING ADMIRAL.

### Ships Directed from the Air.

For the first time in history a seaplane has been used as an Admiral's "Flagship."

This unique use of naval aircraft was made during the recent manoeuvres of American warships. From a seaplane, flying his flag, Admiral Samuel E. Robinson, directed the movements of the seacraft under his command. The experiment was a complete success, and is to be much more extensively used on the other side of the Atlantic.

Admiral Robinson's commands were broadcast from the seaplane to the ships below, by means of wireless telephony. The Admiral had a perfect bird's eye view of the movements of each individual unit under his command.

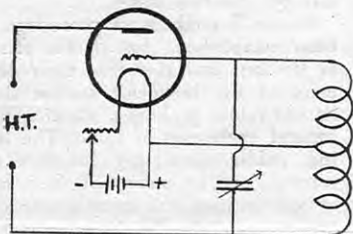
Shortly the American admiralty intends to carry out fuller and more complete tests.

Good nite, people. After you with the citronella, and thank George for the loan of his toothbrush.

# Measuring the Capacity of Vacuum Tubes.

(By R. D. Charlesworth.)

There is a certain amount of capacity between the grid and filament of a vacuum tube, usually in the neighbourhood of .00003 mfd., or 30 microfarads. While this capacity does not necessarily enter into the calculation of circuits operating at 200 metres or over, on short wave transmitters, or receivers working at 120 to 160 metres, the capacity of the tube is an important factor. The capacity between the grid and filament acts as a shunt condenser across the secondary inductance, and provides an addition capa-



city which is added to that of the secondary tuning condenser. If, for example, the circuit is tuned to 75 metres, using an inductance of 10,000 metres, and a shunt condenser with a capacity of 158 mmfds., the addition of 30 mmfds. will change the wave length to 81 metres.

It is obvious, therefore, that in short wave work a method must be devised for determining the capacity of a tube so that different tubes will not upset and destroy the calibration of the receiver.

The diagram shows a circuit of a test set for measuring the grid-filament capacity. The inductance, L, has a value of about 20,000 cms., and is shunted by a variable condenser of 500 mmfds. 2c. .0005mfd. Connected to

the inductance is a detector, wired in the usual manner, except that a 5-ohm resistance, R, is connected as shown to give the tube a larger value of negative grid voltage. The effect of this negative grid voltage is to reduce the flow of current between the grid and filament. If a comparatively large amount of current leaked across this space it would be equivalent to shunting the inductance by a resistance which would broaden the tuning, while in this circuit it is essential to have a very sharp adjustment in order to

difference in the wave length of the receiving circuit.

Suppose an inductance whose value is known to be 20,000 cms. is used at L. If the wave length at the first measurement is 110 metres, and using the same inductance and the same adjustment of the condenser, the wave length without the tube is 100 metres, the capacity of the tube can be determined from the formula:—

$$C = \frac{\lambda^2}{3552 L}$$

Where C = total capacity (mfds)

$\lambda$  = wavelength (metres)

L = inductance (cms)

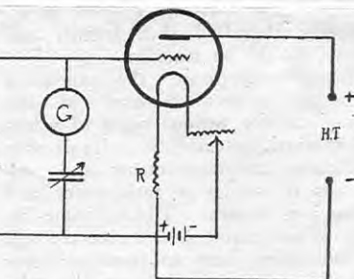
In the first case, the capacity is calculated as 173 mmfds., and in the second case 147 mmfds., the capacity of the tube is the difference between these values or 26 mmfds.

In undamped wave reception at the short wave lengths, everything must be done to keep away outside influences upon the capacity of the circuit. The inductance is not readily effected, but the slightest change in the capacity of the leads, or the effect of the hand upon the condenser, will throw the entire circuit out of operation.

Experimenters sometimes ask why the wave length is changed when the hand is brought near the apparatus. The consideration of a valve circuit will show that there is a ground side of the condenser to which the filament is connected. If the hand is brought near any part of the circuit it acts as a plate on the ground side of the condenser with respect to the side connected to the grid.

This, then, is the equivalent of a shunt capacity in the circuit, slightly increasing the wave length.

It will be found that there is a considerable difference between the capacities of various makes of tubes as well as tubes from the same manufacturers. Experimenters will find some field for investigation in the capacity of a tube with various values of plate potential, and negative grid potential, as well as filament current.



measure the capacity of the tube accurately. The tube whose capacity is to be measured is connected at the right. When the tube is lighted and adjusted to its normal operating conditions, a separate calibrated oscillator (or heterodyne wave meter) is put in operation and coupled very loosely to the inductance, L. Thus, observing a hot wire low reading milliamp meter, or galvanometer inserted as shown at G, the condenser, C, is adjusted to put the circuit in resonance with the oscillator. When the galvanometer registers maximum indication, the wave length of the oscillator should be noted. Then, after removing the detector tube from its socket, the oscillator should be adjusted again for maximum indication of the galvanometer. It will be noted that the tube made a



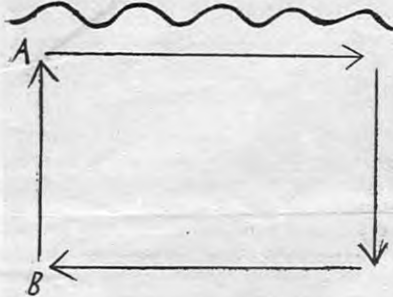
# Under Water Wireless.

By C. W. Slade (late R.N.)

*During the war it was popularly believed that a submarine when patrolling under water was isolated. Most people had a vague notion that, in the dead of night, the submerged craft came to the surface and that wireless communication was established with the aid of a temporary aerial. Mr. Slade's interesting article throws much light on the subject.—Editor's note.*

Radio waves when traversing the surface of water induce horizontal currents in the water as shown by the arrows in Fig. 1.

The horizontal distance that these currents travel is about half the length of the wave. They then penetrate in a downward direction as shown to a



varying depth depending upon the salinity and temperature of the water, and the wave length. The fresher and cooler the water, the stronger the currents are; in fact a very little change in salinity makes a great difference in current strength, and the longer the wave the deeper is the penetration.

In the English Channel, working on a wave length of 4500 metres, the strength of signals is halved for every two feet submersion. From these facts, it will be seen that a submarine patrolling at 36 feet beneath the surface is dealing with very feeble currents indeed.

### AERIAL.

The aerial system comprises two frames, each made up of 32 turns of heavily insulated wire, enclosed in a teak box. These two boxes are mounted one to the port side and one to the starboard side of the conning tower. The leads from the frames are taken through copper tubes to the receiving cabinet and switches are arranged so that port, starboard, or both frames may be used at will.

### 8 VALVE AMPLIFIER.

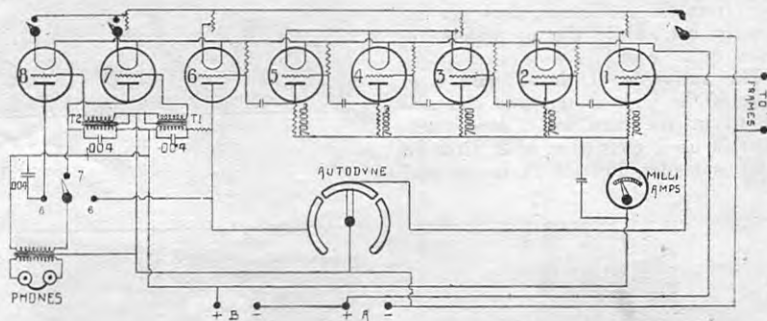
In the submarine the writer served in, an 8 valve amplifier was used. The first six valves, which are resistance coupled, amplify the radio frequency oscillations received. The sixth valve also acts as a detector, and so rectifies them into low-frequency oscillations. These are again amplified by the 7th and 8th valves. Constant communication with the base was always maintained with this amplifier even when over 1000 miles distant and when patrolling at a depth of 36 feet. When a submarine is at this depth her periscope is just awash but the frame aerials are 20 feet below the surface.

A submarine cannot transmit radio under water, but a system known as

the secondary of the telephone transformer are all connected to the negative A battery. In the H.T. supply lead to the anode there is a milli-ammeter which is shunted by a condenser to eliminate its inductive effect.

Four rheostats are used to adjust the filament current of the valves as follows: Nos. 1 and 2; Nos. 3, 4 and 5; No. 6; Nos. 7 and 8. Grid leaks of 5 megohms are used for valves Nos. 2, 3 and 4, and 1 megohm for Nos. 5 and 6. Note that the grid returns to positive A.

With an amplifier as described, Carnarvon and Bordeaux were heard with sufficient volume to fill a loud speaker.



sound telegraphy, invented by Fessenden is used very effectively. Using valves to amplify these sound waves, inter communication has been established between two submarines at a distance of 160 miles, both at the patrolling depth.

### RE CIRCUIT DIAGRAM AS SHOWN IN FIG. 2.

With the 8 valves switched in, the receiver is working at its full power; viz., stepping up the high frequency current by 6 steps, detecting it and then stepping up the detecting current by two more steps.

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## RADIO 5 B.Q.

.....

The maximum Australian distance worked by 4AA (N.Z.) to date is with Radio 5BQ (S.A.) a distance of nearly 2,000 miles. Dozens of amateurs in N.S.W. have heard 5BQ and Mr. Walker, of Clifton, Q., the well-known D.X'er, reports 5 BQ's phone clear and strong, almost every night.

The circuit used by Mr. L. C. Jones (owner of 5BQ) is similar to that used by Major Mott and 2JD (U.S.A.). The oscillator circuit contains two 5 watt radiotron valves, and the system of modulation is the Heising, employing two 5 watt radiotrons. The plate power supply is drawn from a 200 watt Benwood motor generator set which is run from 50 cycle 200 volt mains. Filament current supply is also obtained from the mains, through a step down transformer.

With a plate input on the oscillators of 50 milliamps, the maximum aerial current is 1.5 amps, and the average current in the aerial when phone is in operation is approximately 1 3/8 amps., minimum 1 amp. It may be mentioned that owing to the great amount of work that the modulator tubes have to do in dissipating the energy from the oscillators, they get extremely hot, while the oscillators remain quite cool.

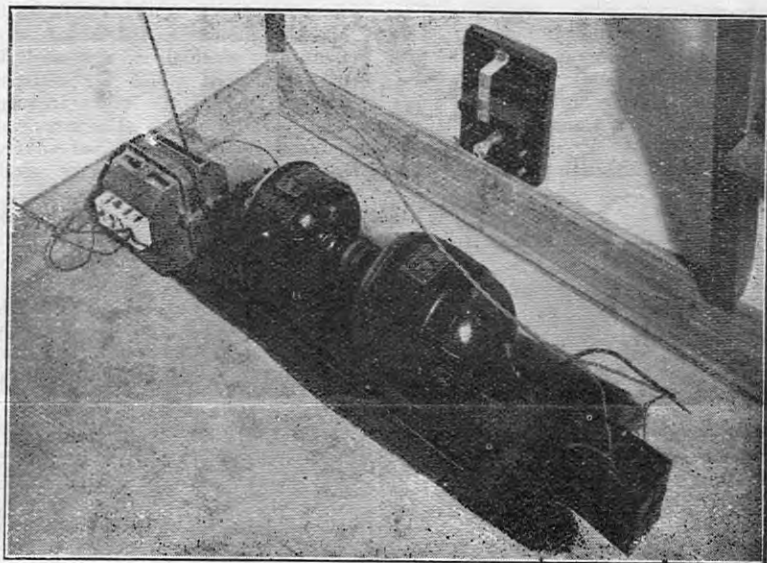
The aerial is of the 5 wire cage type, 50 ft. high at the free end and 40 ft. at the lead in. A counterpoise is used, consisting of 2 wires on a 6ft. spreader, 10ft. above the ground

and running directly under the aerial. No earth connection is used.

The receiver being employed at present is quite a temporary affair comprising 1 H.F. valve and a reflex circuit of the tuned anode type with a crystal. To read C.W. with this, the cat whisker is lifted off the crystal and the two circuits are tuned closely

so that the valve oscillates. The partial rectification in the H.F. valve then enables C.W. signals to be read. As soon as time permits, Mr. Jones intends installing a more efficient receiver when he hopes to be able to work phone both ways with N.S.W. amateurs.

Mr. Jones desires, through Wireless



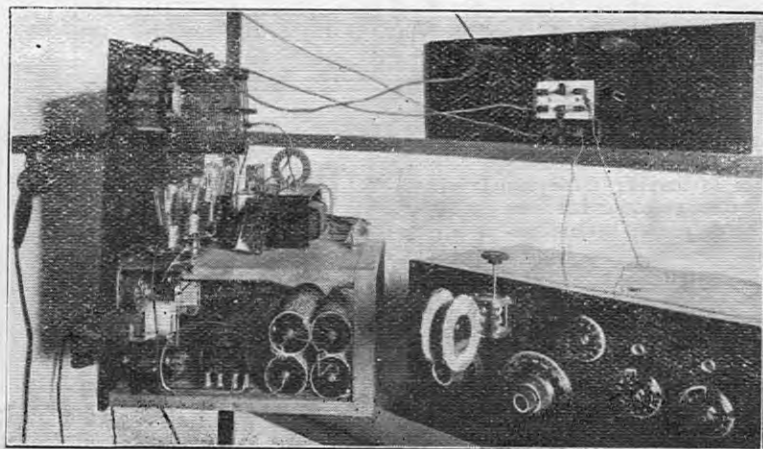
### Motor

Weekly to convey his thanks to all those who have sent along reports of his transmissions. The numerous criticisms he has received have been of the utmost value.

### ENGLISH BY WIRELESS.

Lessons Broadcast in Germany.

Wireless enthusiasts in Berlin and throughout Germany are learning the English language by wireless. A concern called "The Ullstein Service" is "broadcasting" a lesson in English twice a week. Special leaflets are being issued to "radio fans" to enable pupils to perfect their knowledge. "A thousand English words you must know" is the slogan.



Mr. Jones' Set

Tell your friends about  
"Wireless Weekly"

Up-to-date Radio Equipment of the first quality



# A Note Magnifier

By "Insulator."

Now that the fleet has gone and the Easter Show is over, I think we can settle down to serious work again. By the way, did you see the High Frequency outfit in Wiles' stall at the Show? It produced some spark didn't it? I know of one Paddington amateur who stated he could hear the row in his receivers. Personally I can still feel the sting in my arm, for I touched the operator who was drawing

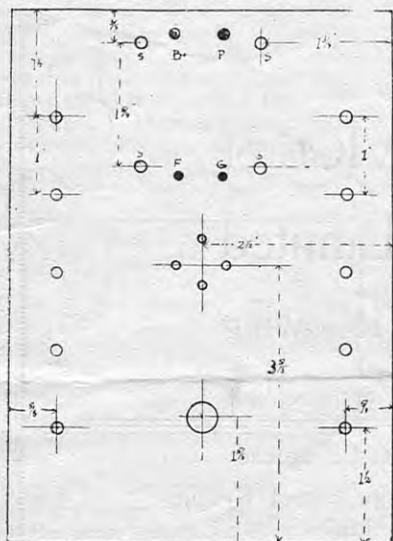


FIG 1

a fine fat 12 inch spark.

We both went up, but I reached terra firma second. Oh! how ignominiously did I land. Now all you young "Insulatees," take warning. Never touch the man who draws the spark. He will be sure to object, so will you—afterwards.

In Wireless Weekly of the 11th inst., I described a valve panel and promised to show you just how to add a stage of low frequency amplification to put just behind the valve unit. Well, here it is.

The material required for this unit is as follows:

1 cigar box (25 size).

1 bakelite panel (to fit neatly on top of cigar box in place of lid), I have estimated the size to be 7in. x 5 in.

1 rheostat, 6 ohms.

1 valve socket.

10 terminals.

1 A.P. transformer.

I would advise you when making up this unit to turn up page 7 of Wireless Weekly of the 11th inst., and keep this by you. The minor details of construction given there will apply equally well in this unit.

Figure 1, allowing the size to be 7in. x 5in., shows just exactly how to mark out and drill the panel. The four holes marked S are for the screws to attach the transformer to the panel. The transformer I use is a United, and the dimensions given are for a transformer of this particular brand. Of course you can use any good transformer for this unit, the United and the Jefferson I know to be good. There are others such as the Amertran and Nutmeg, I also know to be good, perhaps better than the two aforementioned.

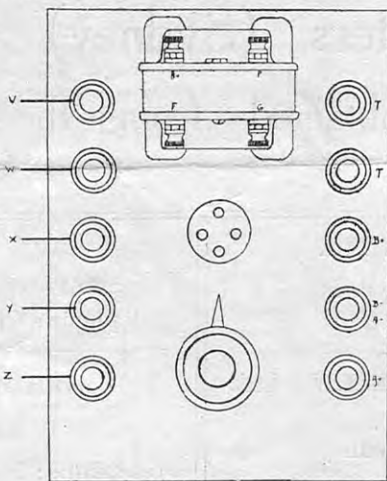


FIG 2

ed. I can't very well discuss the merits of transformers here. However, if you use any other make than United, you will have to mark out the top of the panel differently.

The four black dots marked BX, P, F, and G. are holes made to allow the connecting wires for the transformer to come through.

Figure 2 shows the plan of the panel when all the components are assembled and by following Fig. 3 the wiring will be simplified.

Now, I will presume you have completed the valve panel and have also constructed this note magnifier, and wish to know how to use it.

This is done by placing the note magnifier alongside the valve panel so

that the five terminals on the right hand side of the valve panel are right alongside of the five terminals on the left hand side of the magnifier. Using a piece of wire or brass strip, connect these terminals across from panel to magnifier. Referring to Fig. 2, here you will note connecting strips marked V, W, X, Y and Z. Strips V and W are connected to the two terminals on the valve panel marked T.T., X to BX, Y to B-A, and Z to AX.

Telephones now are connected to T. T., on the note magnifier, and the batteries to their respective terminals on this piece of apparatus.

If on the other hand you prefer to use this magnifier to amplify the volume from the crystal unit simply connect the telephone terminals of the crystal detectors unit to V and W on the note magnifier and telephones and batteries as usual.

This will be found a very useful piece of apparatus and the experimenter can add further stages of amplification as time and funds permit. You

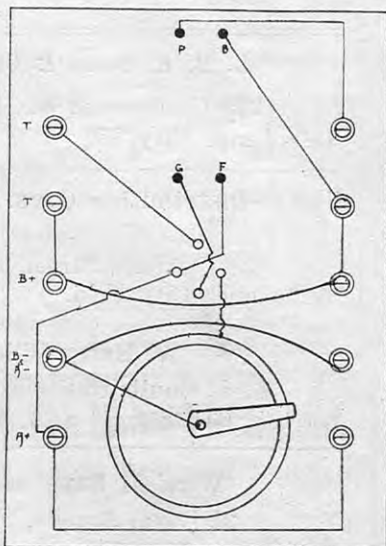


FIG 3

will all readily see the convenience of this.

Don't forget if any difficulties are experienced with this that I will be only too happy to assist you in every way possible. Address your letters to: "Insulator," c/o Wireless Weekly.

# Broadcast Receiving Sets and License Forms

Together with the FREE SERVICE of Broadcasters (Sydney) Limited may be obtained from the following

**L. P. R. Bean & Co. Ltd.**

229 Castlereagh St., Sydney.

Telephone: City 353.

**United Distributing Coys. (N.S.W.) Ltd.**

(Wholesalers)

28 Clarence Street, Sydney.

Telephone: City 3566.

**W. Harry Wiles**

60-62 Goulburn Street Sydney.

Telephone City 3688 1 door from Pitt St.

**Wireless Supplies Ltd.**

21 Royal Arcade, Sydney

Telephone: M 3378.

**E. R. Cullen**

96 Bathurst Street

Telephones: City 869, 2596.

**Radio House**

619 George Street Sydney

Telephone: City 1487.

**Colville-Moore Wireless Supplies**

10 Rowe Street Sydney.

Telephone: B2261.

**Ramsay, Sharp & Co. Ltd.**

217 George Street, Sydney.

Telephone: City 3176.

**The Home Electric**

106a King Street, Sydney.

Telephone: B 5565.

**Swains Ltd.**

119-123 Pitt Street, Sydney.



## The 1,600 Metre Wave.

(Courtesy, Wireless Weekly, Eng.)

The British Broadcasting Company, having obtained a permit to erect a high power transmitting station, are now discussing the arrangements under which this power will be used. A wave length of 1,600 metres is proposed, and as might be expected, a large number of listeners-in have been considerably perturbed. Whilst it is pointed out by officials of the company that the new transmission will not in any way supersede the present short wave programmes, the fact remains that listeners will desire to hear both programmes, and will therefore need either to have their apparatus altered, or, if as will frequently be the case, it is not practicable to alter it, will need to purchase new equipment. This is a serious consideration, but a new high-power station will be a great boon to many listeners.

We are not sure that the new wave-length is by any means so free from interference as would appear to be indicated in reports published in the Press. The longer the wave length the wider the band occupied by telephony transmission, and consequently the less sharp the tuning. The tremendous power of 25 kilowatts is not perhaps fully realised by the listener. This power is about 17 times as great as that at present used, and will monopolise the ether so far as broadcast listening is concerned for a good many miles around the transmitting station wherever it may be located. Crystal sets will be the easiest to alter to the new wave length, for in these cases an additional loading coil can be quite simply connected in circuit. Such sets, however, are by no means selective, and will not be able to tune out the local broadcasting station (if this latter is using a short wave) at 6 to 10 miles. This fact can easily be tested by anyone plugging in a suitable coil and listening on that wave length at the present time. Multi-valve sets, particularly those which are provided with high-frequency stages, are not so easily altered, but will have the advantage of a far greater selectivity. Since, however, the increase of power is presumed to be largely caused by the desire of the broadcasting company to give the crystal listener a good showing, care must be taken to prevent this highly important member of the broad-

casting community from falling between two stools, or more precisely, between two waves, being jammed by both.

On the other side of the shield there are certain advantages in using the longer wave. High-frequency amplification, rather a problem on short waves if simplicity and efficiency are all to be obtained—is greatly facilitated. The cheap and efficient resistance capacity coupling which requires no tuning on individual stages, becomes practicable on this wave-length, and it is quite a simple matter to arrange two or three stages of high-frequency amplification which requires no more attention than do corresponding stages of note magnification. Moreover, valve oscillation will matter less because radiation of this wave-length will be less.

We have been at some pains to listen-in on a 1,600 metre wave length during those hours when broadcasting is most popular, and have found that in receivers which are not sharply tuned there is some danger of interference from PCH (Scheveningen, Holland), which frequently works to ships on a long wave; from the Air Ministry transmissions which, although c.w. and on a different wave, are sufficiently powerful to produce strong "key clicks" of a distressing nature; from Ongar, the Marconi transmitting station in Essex, and from other sources.

The station should work on from 1,200 to 1,900 metres, but not 1,600 metres.

### THE LANGUAGE OF WIRELESS

Mr. Leslie Wilson, of Wyalong, tells an amusing story concerning his younger brother who is attending high school at Wagga. Hearing indirectly that his brother was interested in wireless, Leslie dropped him a note explaining what parts to buy when his license turned up. After the practice of many experimenters with a long acquaintance with the assorted parts used in receivers, he referred in abbreviated form to practically everything. Evidently the lingo containing such words as rheo, detec, poten, low freq, audio freq, rad freq, prim, sec, var con, etc., was all Dutch to the younger brother, because he retaliated by sending back a copy of the "Chinese Times" with the brief remark, "Do you understand this?"

### SHEEP DEAL BY RADIO.

Recently Mr. George Wilson, of Wyalong left for Wagga to inspect a mob of sheep concerning the purchase of which there was keen competition.

The homestead at Wyalong is out of communication by telephone, but Mr. Leslie Wilson operates a radio receiver on which amateurs and Broadcasters are listened to. It was vital that after inspecting the sheep, George Wilson communicate his decision to his brother at Wyalong. The problem was solved by the station of the Riverina Wireless Supplies Co., at Wagga, from which George Wilson spoke direct to the Wyalong homestead, thus enabling Leslie Wilson to close the deal quickly.

### QUESTIONS AND ANSWERS.

A.G.C. (Campsie): You would not be affected in the slightest, unless, of course, you refer to a valve transmitter.

### BOOKS ON WIRELESS

*Aude's Easy Lessons in Wireless Telegraphy*, Price 3/9 posted.

*Wireless Valves Simply Explained*, by Scott-Taggart, price 3/9 posted.

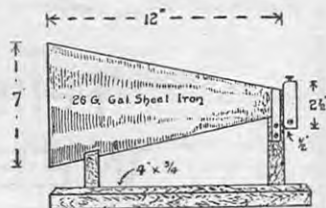
*Lessons in Wireless Telegraphy*, by Morgan, price 2/3 posted.

*The Construction of Wireless Receiving Apparatus*, by P. Tyers, price 2/3 posted.

### N.S.W. Bookstall Co. Ltd.

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### MR. JACOB'S LOUD SPEAKER.



Home made Loud Speaker used with 5 T 100 Receiver Browns 150 Ohms Phones Broadcasters Announcements quite distinct at 50 ft. in open air Distance 10 miles Experimented 1837.

FURTHER NOTES ON THE AUTOPLEX.

(Continued from page 4.)

but when 20ft. of bell wire lying on the floor was substituted signals roared in Q.S.A. The inclusion of an earth made little difference to the strength of signals

Best results were obtained when using a U.V. 201 A valve; and a 216 A power tube worked well. The little U.V. 199 functioned satisfactorily, but could not be compared to the other valves. The plate voltage was between 40 and 50 volts.

Local amateurs and 2BL were brought in on a loud speaker and were clearly audible over the whole room. On the 20 feet of bell wire, 3 D.P. and 3 B.C. (Melbourne) were quite audible in the phones.

A peculiarity was noticed in the fact that long wave stations could also be heard, Cavite and Pearl Harbor being easily read. A generator station was also heard, but Q.R.N. drowned out his call sign.

Wireless Receiving Set, 3 valve, music heard 75 feet from set; very elaborate; sell half price. A. Metham, Lloyd St., Oatley.

D.X. COLUMN.

(Continued from page 3.)

and 2A1 are both Q.S.A. also. 7AA has plenty of punch, but his 50 cycle note is drowned by the slightest Q.R. N. 5BQ's phone has been very well received, so much so that on two valves not a word was missed, even though atmospherics were in fair strength.

All the 3rd district stations are very well received, most of them being audible all over the room on two tubes, while 3BQ, 3BD and 3JH have been received on a loop with two audio amplifiers so that they were audible 5ft. from phones.

Since the plate supply at 2ZZ has been somewhat rectified, the distant reports have been much more encouraging than before, as well as more frequent.

The great obstacle to DX work now, says 2ZZ, is the prevalence of local jazz-hounds, who play selection after selection. Even this, fortunately, is becoming less menacing, as the N.Z. and Victorian stations are adopting the lower waves, below 210 metres.

2ZZ will be pleased to arrange any test with stations outside this State, and will welcome reports.

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6 months (26 issues) 6/6, post free.

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All advertising and other matter for insertion should be in the hands of the Editor by Friday.

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**DIRECTIONAL EFFECTS**

(Courtesy "Radio," San Francisco.)

By comparing notes, radio enthusiasts find that, contrary to what ordinary theory teaches, the waves do not travel outward in all directions from a transmitting station with equal intensity. Until many observations, by different experimenters, had been obtained, it seemed possible that the skill of the various operators might account for apparent discrepancies in the distance a given station could reach. Thus station ABC might be heard consistently by a listener 1,000 miles west of a certain position and practically never by a listener 200 miles east or south. Such an effect was at first attributed to the greater skill of the first listener, or superior apparatus, but by comparing many observations, by many observers, we now know that stations do not penetrate equally well in all directions and an apparently simple explanation is at hand.

It has been known for some time that a mountain range of conducting material, such as iron ore, acts as a rather effective screen for radio waves, and, of course, theory would predict

just such an occurrence. This it is often impossible for two ships on opposite sides of a mountainous island to communicate with each other when both are close to the island; but if they steam away in opposite directions, say, 100 miles, communication becomes easy. The mountain range casts a radio shadow, the conducting ore bodies of the mountain range absorbing the radiation which tries to penetrate them. In a similar manner any ordinary body casts a light shadow, either because it absorbs the light which tries to penetrate it, or reflects it.

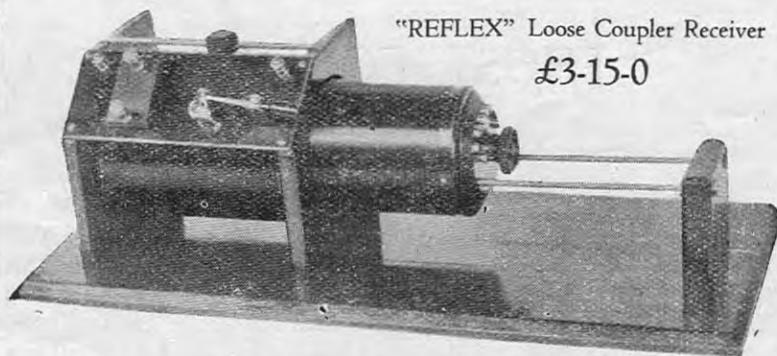
It seems also that in a city of tall iron-frame buildings, such as New York, a large part of the power radiated from the antenna of a station is absorbed within a few miles of the station. The conducting framework of the buildings have currents set up in them by the travelling waves and these currents represent just so much energy abstracted from the radio waves. The effect is much like that which would occur in trying to set up waves in water filled with floating sea weed; the ripples are able to advance only a short distance through the weed-filled water before their energy is com-

pletely used up and they disappear, whereas if set up in clear water with no floating obstructions they might travel several hundred feet.

A modern steel building city seems to act toward the radio waves just as a patch of sea weed does to the water waves. Because of this effect, it may well be that a station located, let us say, in the western part of such a city, is heard at points a thousand miles west and only a hundred miles or so in the easterly direction. The eastward travelling waves have to travel over the city and have much of their energy abstracted before they have gone very far. We have heard of a geologist being consulted as to the best place to sink a well for oil; he looks the ground over thoroughly, makes borings, etc., and then gives an intelligent guess as to where the best chances lie. In locating a broadcasting station in or near a large city (as all good stations must be located for accessibility to the performers), it seems that similar expert advice will be required in order to place the station so that minimum absorption will occur in the important directions.

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### THE LEICHHARDT AND DISTRICT RADIO SOCIETY.

The sixth lecture of the syllabus was delivered by Mr. F. Lett before the 77th general meeting of members of the Leichhardt and District Radio Society, held at the club room, 176 Johnston St., Annandale, on Tuesday, April 22nd. The attendance was good, and the subject of the lecture was "Valves."

Mr. Lett showed an excellent knowledge of his subject, and the construction and action of the various types of valves were explained in detail. The usual batch of questions followed the lecture, after which a motion of thanks was carried by acclamation.

Next Tuesday's meeting will be a business one, when applications for

membership and other formal business will be dealt with. At the following meeting the seventh lecture of the syllabus will be delivered, when Mr. W. J. Zech will deal with the important subject of "Batteries." Mr. Zech is the Society's Hon. Secretary, and any inquiries regarding the activities of the Society should be addressed to him at 145 Booth St., Annandale.

### ILLAWARRA RADIO CLUB.

The 46th meeting, held on 22nd April, drew a good attendance.

The Secretary reported progress of arrangements for the forthcoming club benefit entertainment. This has been fixed for Tuesday, 10th June at the Subway Picture Theatre, Kogarah. It is proposed to run the wireless music from 8 p.m. to 9 p.m., and after the interval the programme will be completed with pictures. Negotiations are proceeding for the help of a first-class broadcasting service for this occasion, and the receiving end of the business has been very kindly undertaken by the Western Electric Company, who have offered to place at the

Club's disposal complete standard receiving apparatus including the famous Western Electric loud speakers and power amplifiers, and also their own expert to operate same, so that as far as reception is concerned success is assured. As a result of representations to the Taxation Department this entertainment, in view of the Club's objects, has been registered as tax-free and exemption from Entertainment's Tax granted. This picture show, as is well known, is a large one, holding about 1500, and by proper organising it is hoped the show will be well filled. In view of the large number of the public who will be gathered on this occasion efforts are being made to give them the best that can be got in the way of wireless music, so that nothing but the highest impression may be gained by the public of wireless broadcasting and its possibilities. When arrangements as to the transmission have been finalised and license obtained, tickets and advertising matter will be issued, and the coming event boosted to the utmost in order to bring it well before the local public, and with the help of "all hands

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K.C. Vernier Extension Handle, Each . . 4/-	V.T. Control Panels. Each . . . . . 22/6
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and the cook" a great success is anticipated.

The Secretary then spoke in reference to the recommendations of the recent conference of broadcasting interests, and explained what action was being taken to put the experimenters' side before the P.M.G. The P.M.G. had given the experimenters an absolute and definite assurance that no finality would be attempted or decision come to by him until the experimenters had had an opportunity of putting their side of the case fully before him, as he was desirous of seeing their interests fully protected. It was understood that the Wireless Institute would shortly call a meeting of the affiliated clubs, to discuss the above recommendations as far as they affected experimenters, and formulate counter proposals protective of their rights and interests, to place before the P.M.G.

Some discussion ensued on this and the opinion generally was—that it could be safely left to our delegates in co-operation with others of the affiliated societies to do justice to the experimenters' cause and to map out some satisfactory scheme for conserving their present rights and privileges for submission to the P.M.G.

There being no lecture on the programme, the Secretary suggested an open discussion on "Broadcasting and the Experimenter," as he considered opinions expressed by members in this regard would be very helpful to the

delegates in dealing with the above questions. A discussion accordingly followed in which most present ventilated their views. Many and varied were the opinions expressed, this important topic being dealt with from all angles and aspects by the different speakers, who on occasions got in warm argument on different vexed points. The whole was most enlightening in bringing out the ideas and impressions of different individuals, and was enjoyed by all present.

The next meeting will be held at club-room on Tuesday, 6th May, at 8 p.m., when a lecture will be given. There will also be some important announcements and business in connection with the Club entertainment, so all members are asked to be present at this meeting.

The Club wants more members, and the Secretary, Mr. W. D. Graham, 44 Cameron St., Rockdale, would be pleased to hear from any such. Information will be gladly supplied on application.

#### MARRICKVILLE AND DISTRICT RADIO CLUB.

The usual weekly meeting of the above club was held in the School of Arts, Illawarra Road, Marrickville on the 14th inst., Mr. W. L. Hamilton presiding.

The most of the evening was taken up with a discussion on the proposed

new license fee, and it was decided to write the Secretary of the Wireless Institute of Australia asking him to convene a meeting of all experimental license holders in N.S.W., to discuss this all important matter.

It was also decided to write every N.S.W. Club requesting them to carry out a similar action.

The remainder of the evening was taken up with a lecture on Dual Amplification, by the President.

Secretary A. W. Hemming, of 23 Central Av., Marrickville, would be pleased to furnish particulars of membership to local experimental license holders.

#### THE NORTHBRIDGE RADIO CLUB.

A good attendance on 2nd inst., at the second general meeting, when the weather was not of the best, speaks well for the enthusiasm of the members of the Club.

Mr. R. W. L. Woolridge gave an extremely interesting lecture in which he explained the fundamental working principles of wireless. Everyone present was able to get a firm idea of the working of tuning apparatus and crystal reception. Circuit diagrams were explained by the lecturer and the various symbols were put on blackboard and compared with the actual apparatus.

*Continued on page 20*

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## The Moore Fund

The trustees announce that the fund will close at the end of this month, so that this will be the final appeal made to the generosity of those who feel the urgency of the case.

When it is remembered that the late Mr. L. F. Moore was an experimenter to whom the needs of others always came first, and the fact that he leaves behind a widow and two children to mourn his loss, then it might reasonably be assumed that those considerations alone would impel the rest of us to dip our hands into our pockets and subscribe something towards alleviating the misfortune of the bereaved ones. We cannot all donate as much as would wish to, but there is not one experimenter in N.S.W. who could not afford at least one shilling.

It is not so much a duty to give to funds such as these, but a privilege to know that when something happens that calls for a practical demonstration of the much boasted spirit of brotherhood and comradeship that is

said to exist among experimenters, and every one of us comes up to scratch. And it is a very real pleasure to feel that the humble shilling we send in plays its important part in the finest objective we can achieve in this world—the relief of those in distress.

That it is more blessed to give than to receive was never more truly exemplified than in this present case, which we want to again and finally bring home to all experimenters—the relief of Mrs. Moore. Don't let this last appeal fall on deaf ears. While there is yet time, send something.

### Contributions to date:

Proprietors Wireless Weekly	£5 0 0
United Distributing	10 10 0
Mr. Quaife	0 10 0
Wireless Weekly Staff	1 3 6
P. Renshaw	3 3 0
Mr. Jones	0 10 6
G. Taylor	1 1 0
J. W. Robinson	1 1 0
F. Basil Cooke	1 1 0
O. Sandel	1 1 0
Mr. Allsop	0 10 6

Mr. Saunders	0 10 6
Robert H. Doyle	1 1 0
Miss Day	0 10 6
A. F. Price	0 10 6
R. C. Marsden	1 1 0
A. Dare	0 10 6
M. McInosh	0 10 6
Colville Moore	1 1 0
Herker	0 5 0
Sanders	0 1 0
Concord Radio Club	2 10 6
V. J. M. Darby	0 12 6
Wireless Institute	5 5 0
J. Usher	0 5 0
D. T. Hinchin	5 0 0
R. W. Faulkes	0 2 6
A. Dixon	1 1 0
J. Lendlaw	1 1 0
C. Storm	0 15 0
H. Carter	0 5 0
A. Larkin	1 0 0
E. Mason	0 5 0
N. Ambrose	0 3 0
J. G. Prichard	1 0 0
Keith Davis	0 5 0
C. Leaver	0 5 0
R. Seach	0 2 6
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# ANNOUNCEMENT

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O. F. Mingay . . . . .	0	10	0
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Mr. Howell . . . . .	0	10	6
Marrickville and District Radio Club . . . . .	0	10	6
Croydon Radio Club . . . . .	1	1	0
Leichhardt District Radio Society . . . . .	1	1	0
Newcastle Radio Club . . . . .	1	10	0
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<b>Total . . . . .</b>	<b>£110</b>	<b>9</b>	<b>0</b>

**FADING**

By Ionic in Irish Radio Journal.

When listening-in to music or morse on a radio receiver there is nothing more annoying than to hear the signals, which have been coming in quite strong, begin to die down in strength until they are inaudible. Then they return to their original strength, only to repeat this performance. At first one puts this down to some defect in the apparatus, and after extensive examination can still find nothing to explain this dying down of the signal strength. This effect is known as "fading."

I have had personal experience of these effects throughout the world. Using a carborundum crystal receiver, a galena crystal receiver, and a valve receiver, with all types of ships' aerials, the effects were the same. This fading does not interfere with all stations at the same time. For instance, there are several stations near one another, and at night they can be heard at great distances to the south and east. The stations referred to are all working on 600 metres. They can be heard working almost continuously with shipping, and at times one of these stations will be heard to fade completely out, while other stations near it will keep at their normal strength.

One station, Easthampton, Long Island (near New York City) (WSA), using about 8 K.W., can be heard at a great distance south of New York, and at night I have heard it at the mouth of the Amazon River regularly, and even further south than that. At times its signal strength would be very good and steady. Then suddenly, for no apparent reason, it would decrease in a few seconds until it could not be heard, and in the space of a few seconds it would return to its previous strength, and might even increase still in strength until its signals were stronger than when first heard. These effects are not confined to great distances such as that just mentioned. At 700 miles, and even less, the same effects have been noted with the same station. Fading is not confined to one station, but affects nearly all stations, though not necessarily at the same time, even though the stations be near one another.

In the West Indies several stations are noted for their fading. One of the worst of these is Port of Spain (VPL), Trinidad. This is a 5 K.W.

spark station, and by day has a range of between 300 and 400 miles. At night I have known it to fade out for no apparent reason at a distance of 50 miles, and at even less than this, while other stations nearby at long distances remained at their normal strength. Other stations notorious for their fading effects are Aden Radio (BZF) and Colombo Radio (VPB). Colombo Radio is the only station that I have known to fade during the day.

Fading is not unknown in our own part of the world. I have found at times that it is very bad around Great Britain and Ireland, and also along the coast of Western Europe. Great trouble is being found in parts of Great Britain in receiving the Broadcasting stations, and during the demonstrations given in Dublin last summer fading was one of the worst difficulties that was met with.

It has been noticed that fading is found mostly on waves of less than 1,000 metres. Above this wave length fading is seldom noticed. At the same time it has also been found that nearly all short wave stations have a much greater range by night than by day. This gave rise to the conclusion that the trouble must be caused by the state of the atmosphere between the transmitting station and the receiver, and that there is a considerable change in the state of the atmosphere at night as compared with day.

One theory put forward is that the sun is radiating a continuous stream of particles of dust which contain a charge of electricity, and a certain number of these particles get within our atmosphere. They make the parts in which they appear semi-conductors of electricity and, to a certain extent, they absorb some of the electrical energy radiated by radio-transmitting stations. During the day this effect is steady, due to the fact that the stream of charged particles is steady. Now at night, the surface of the earth that was exposed to the sun is turned away from it, and we find our range increased. It is at this time that we find the fading effects. This may be due to the fact that the stream radiated by the sun is driven past the earth, and some of these particles get brushed or shoved into the atmosphere around the part of the earth that is not exposed to the sun. The number of these being irregular, the absorbing effect is not a steady one, and this gives cause for the conclusion that it may be the cause of what is known as fading. There is also the much-

Continued on page 20 col. 3

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Continued from page 17

On 16th inst., after the 2nd general meeting, Mr. Forsyth (2BF) explained and demonstrated his transmitter and four valve receiver. On the first try-out he received reports from a number of local amateurs and one from Melbourne.

The next meeting and lecture will be held at the club room, on Wednesday, 7th May next. Local experimenters are asked to come along, and persons interested in wireless. Any enquiries regarding the club may be addressed to the Hon. Sec., A. Cameron, "Ogilvie," Clanwilliam St., Chatswood.

#### WAVERLEY RADIO CLUB.

Mr. E. Bowman presided at the meeting of the Waverley Club held on the 22nd April. The chief business of the night consisted in arranging for alterations to the existing aerial, to render it suitable for the club's transmitting set. A cage, with a loop aerial, would be used. Improvements to the club-room were also discussed; nothing definite, however, was arrived at.

During the course of the meeting, Mr. M. Perry moved: "That the meeting put on record its appreciation of Mr. A. Burrows' articles in the press, which did so much in the fight against the sealed set restrictions."

Mr. Perry said that the club should acknowledge the work done by Mr. Burrows in this connection. The motion was seconded and carried. In reply, Mr. Burrows said that, as an entirely disinterested observer, he could perhaps see more clearly the difference between right and wrong than those who had axes to grind on either side. What little he had done he thought was in the right; and he would have been unable to do it without the aid of the club members. He was of the opinion that Mr. Perry overstated the facts, and that the motion was not necessary.

We regret that we omitted to announce that the article on "The Electronic Theory of Matter" which was published in a recent issue of *Wireless Weekly*, was the subject of a lecture given to the Illawarra Radio Club.

Published by A. W. Watt, "Strathaird," East Crescent St., McMahon's Point, for the proprietors and printers, *Publicity Press Ltd.*, 33/37 Regent St., Sydney.

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discussed Heaviside Layer theory, but up to the present no definite conclusion has been reached regarding fading.

At the present time the Radio Research Board has the matter in hand, and with the aid of the radio societies in Great Britain and in Northern Ireland, they are arranging for observations of the broadcasting stations and other stations to be taken from the effects noted. For this purpose forms have been prepared and distributed to various observers, with instructions as to how they are to be filled up. These forms are sent in monthly to the Board and the various reports are examined. By this means it is hoped that it will be the means of gathering data of effects in many places at the same time. The most important points are the time and the strength of the signals, also the length of time over which the variation lasts.

It is to be hoped that Irish enthusiasts will soon be taking part in this interesting branch of radio research. When a satisfactory conclusion has been come to and the remedy found, one of the most difficult problems that has confronted radio transmission will have been solved.

F. Thompson (Balmain) announces that his station (2 H.F. wave length approximately 230 metres) is now "on the air." Transmitting times are as follows. Mondays, Wednesdays and Thursdays, from 10 p.m. to 11 p.m. Sundays 10 a.m. to noon, 2 p.m. to 4 p.m., and 10 p.m. to 11 p.m. As 2 H.F. is only a new station, the above times will be adhered to until adjustments are completed, so that the usual roster programme will not be interfered with. Telephone W1457 will find Mr. Thompson, and reports will be welcome.

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