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IN AUSTRALIA & NEW ZEALAND

Incorporating "Sea Land and Air"

VOL. I. JULY 25, 1923 No. 9

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RADIO
IN AUSTRALIA & NEW ZEALAND
Incorporating [illegible]

Managing Editor: S. E. TATHAM. Associate Editor: M. DIXON.

CONTENTS

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Broadcasting Regulations Will Succeed

IT is sometimes necessary to remind the people of Australia that the contrast between conditions here and in other countries does not necessarily mean that we lack progress.

It may, in some cases, indicate greater conservatism, but if in the end that leads to the adoption of better methods, and consequently a fuller measure of success who will argue that the path of caution was not the right one?

The question of broadcasting stands very much in that position to-day. America demonstrated how it could be applied on a huge scale, and England, after observing the working of that system, evolved a better one and put it into operation. Both countries are going merrily ahead to-day. Their methods may not be perfect, but the millions of "listeners-in" in both countries testify that a fair measure of success has been achieved. In view of the problems which had to be solved and the lack of precedents to guide them the authorities have done surprisingly well.

The inevitable agitation for broadcasting in Australia commenced shortly after stories began to filter through of how home entertainment had been revolutionised in Great Britain. Those in a position to advise counselled caution until the defects of the overseas systems could be carefully analysed. The authorities recognised the wisdom of this, and no attempt was made to frame regulations until first-hand information was available as to how the difficulties which had developed in other countries could be obviated here.

The Conference which assembled in Melbourne some months ago represented, as far as possible, the interests likely to be affected by broadcasting in Australia. The regulations recommended to the Postmaster-General, Mr. Gibson, were the outcome of full and free discussion in which the success of broadcasting as a factor in home entertainment and education was kept strictly foremost.

Criticism of these proposed regulations has been met by the Minister with the assurance that if anomalies are discovered or difficulties develop in practical operation they will be suitably amended.

One clause in the regulations which some critics contend will restrict public interest in broadcasting is that stipulating that each station can transmit on one wavelength only. This will mean, in effect, that purchasers of "listening in" sets desiring to hear a greater volume or variety of entertainment than any one station will provide will have to subscribe to an additional station. To obviate this it is contended that one set should be adjustable to receive any or all of the broadcast programmes without extra cost.

It is difficult to understand just why radio broadcasting should be singled out for the application of what is practically a "free for all" policy. The man who regularly buys one particular daily paper does not claim that all the others should be available to him free of cost, nor does the theatre-goer expect that a ticket for one show will give free entry to any or all of the others. Similarly, a railway ticket between two particular points is restricted to that journey alone. Of course, one can buy an "all lines" ticket, but that represents a convenience rather than a saving in cost, and it is on the latter points that critics of the broadcasting regulations wish to score.

The principle just referred to applies all round, and the success of the competitive services in the cases mentioned dismisses any doubt that broadcasting will lack popularity because it will have to be paid for. If the theatres were performed in the parks they would soon fail—not from lack of attendance but financial drought.

If broadcast programmes were offered to the people free of all cost they would be immensely popular, no doubt, but there would soon be no programmes to listen to. Artists have to be paid for their services and money to finance the working of stations must come from some source. The cost of subscribing to the programmes of additional stations is hardly likely to be so high as to debar the average person from doing so if he wishes. The Australian people are always prepared to pay for good service in whatever direction it applies, and if our broadcasting stations "deliver the goods" the public will unquestionably respond.

Trans Pacific Tests

THE Presidential report on the Trans-Pacific tests in this issue makes interesting reading. It tells how Australian experimenters performed a feat in the reception of low power American signals which would have been considered impossible a year or so ago. Victorian experimenters scored remarkably well in this test, but as *"Radio"* pointed out at the time, it was not a case of individual against individual or State against State. The prestige of Australian experimenters as a whole was at stake, and they rose to the occasion magnificently.

Trans-Pacific Tests

Presidential Report

By H. KINGSLEY LOVE

SOME considerable time ago when receiving some of the American High-power Stations on long wave-lengths, I was impressed with the great strength with which some of the stations' signals came in. It then occurred to me that possibly American experimental stations on the Pacific coast might be audible in Australia and I gave the matter a great deal of thought. Some little time later, when the results of the Trans-Atlantic experimental tests were published, I was convinced that American "amateur" stations *could* be received in Australia and placed the idea before the Victorian Division of the Wireless Institute of Australia, who took up the scheme with enthusiasm. I then wrote to four of the leading Pacific Coast organisations in the United States with a view to arranging a test to bridge the Pacific. Subsequently a letter arrived from the Council of the Victorian Division of the Wireless Institute, sanctioning the appointment of a committee, of which I was elected president, to act on behalf of the Institute. The proposal was to attempt to receive signals on a wave-length of 200 metres from American "amateur" stations whose power did not exceed 1000 watts.

I did not consider the proposed tests would be easy to conduct in view of the fact that the first Trans-Atlantic test was unsuccessful and the work of the committee soon became arduous. The distance to be covered was about 8,000 miles, the actual air line distance between Melbourne and San Francisco being 7872 miles, and at the time it was not generally considered that the chances of success were very bright, but a small band of enthusiasts commenced organising the scheme. After consideration it was decided that the tests should be open to every experimenter in the Commonwealth, all States being invited to participate and Wireless Institute in each State was advised. To the initial letter only the South Australian Division replied, and they unfortunately had to decline to enter. As no reply was received from the New South Wales Division, and as it was considered that N.S.W. experimenters were most favourably situated for the reception of the signals, the advice of certain leading Sydney experimenters was sought and, as a result, the Waverley Club was delegated to control the test in New South Wales. After a lapse of three months a letter was received from N.S.W. Division, asking why they had been overlooked. In replying, I informed them that matters had then gone too far to make any changes in organisation. The Waverley Club thus acted for N.S.W. After much negotiation, the test was organised both in New South Wales and Queensland. The final number of entrants was: Victoria 15, New South Wales 15, and Queensland 5.

H. KINGSLEY LOVE,
President, Radio Trans-Pacific Tests Committee, also President of the Victorian Division, Wireless Institute of Australia.

At this stage the work of the Victorian and Commonwealth Committee became so heavy that Mr. Philpot and myself were deputed to handle the organising, and Messrs. Hull and Hiam the collation of technical data of all kinds.

Just as the Central Committee in Melbourne came into being, a letter was received from Mr. Robert J. Portis, President of the Long Beach Radio Association, at Long Beach, California, U.S.A., who welcomed the proposed tests with typical American fervor and stated that the matter would be taken up all over America. I then sent a schedule to Mr. Portis, embodying the times and types of transmission. This was considered necessary, as the Americans did not seem to know our local conditions. This schedule was in due course approved subject to further details to follow by the "next mail." The "next mail" did not arrive, however, but a communication was received from the *Radio Journal*, of Los Angeles, California, which stated that the enormity of the task of organisation in the United States was beyond the powers of an experimental organisation, and that they had taken over control from the Long Beach Radio Association, *Radio Journal* stated they had received more than 500 entries from all over the United States, and they were preparing a list of code words to be allotted to each station competing. When replying, I asked *Radio Journal* to forward a copy of this code direct to the Controller of Wireless, Melbourne, in order that reception might be confirmed at this end. Despite my request to the contrary a copy of the code words was sent to me also, and I was thus debarred from entering the tests. This was rather a bitter pill, but I felt that if the tests were a success that would consitute sufficient reward for my work. I might state that the code list was incomplete and I am still waiting for the complete list. Owing to the delay in conducting arrangements by mail the final details had to be arranged at the last moment by cable and this caused me much anxiety. However, as

correspondence shows, the delays and misunderstandings did not originate at this end and had the test fallen through it would not have been through lack of energy and comprehension on our part.

The actual listening-in for the American amateur stations was commenced on the 1st May, and Station 3JU (Messrs. C. Hiam and R. A. Hull, of St. Kilda) reported hearing the signal "Mott" on the 5th May. This signal was also heard by Messrs. Maclurcan, Pike, Crocker, Gorman, and other Sydney experimenters. The next signal heard by Station 3JU on the 10th was 6CGW. During May the 1st and 13th atmospheric conditions were very bad. There had been a drought since December and the ground was extremely dry. When the drought finally broke on the 10th May, the resultant atmospheric disturbances were very severe. This condition gradually moderated and by May 17th the air was moderately clear, though far from perfect.

Receiving Station 3JU, operated by Messrs. Hiam and Hull at St. Kilda, Melb.

The tests were originally arranged to date from the 1st to 17th May, but the experiences of two or three nights showed that work was impossible and *Radio Journal* was accordingly cabled to defer further tests to the period 20th to 31st May, and the official test, therefore, did not start until the former date.

The following is a list of prizes which will be divided between the Victorian 1st and 2nd prize winners:

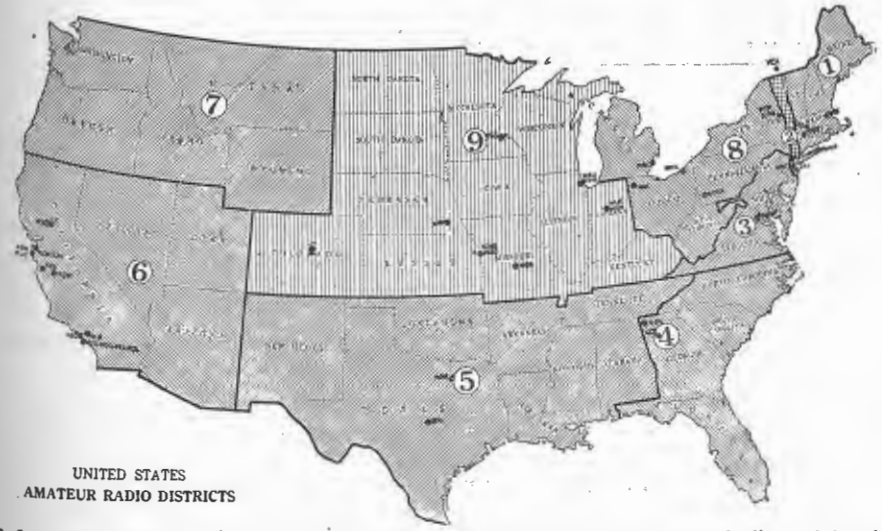
O. J. Neilson Pty. Ltd., open order £10.

Amalgamated Wireless, up-to-date Panel Tuner.

P. H. McElroy, Homecrafts, Melbourne, open order £10, or £5 cash.

Melbourne "Argus," £3.

The Australasian Electrical Times, £1/1/-.



UNITED STATES
AMATEUR RADIO DISTRICTS

Reference to the above map and the stations heard in Australia as indicated in this report and the copy of the logs published herewith will indicate where the American signals emanated from. The figure in the signals denotes the district.

The First Prize was to be allotted to the most complete log of coded stations forwarded to the deciding authorities and this was won most decisively by Mr. M. Howden, of Box Hill, Victoria (3BQ), who logged no fewer than twenty stations in all, although in the official period he only logged six *coded* stations. A copy of Mr. Howden's log, which shows the thorough and consistent nature of the listening-in carried out by him, is published elsewhere in this issue of *"Radio."* It must be noted that Mr. Howden has been allotted the prizes for Victoria only, the gold medal donated by *"Radio"* (which incorporates *Sea, Land and Air*) is for the Commonwealth and other prizes donated in other States have yet to be adjudicated upon.

Receiving Station 3BM, operated by Mr. H. Kingsley Love, at East Malvern, Melbourne.

The next log was that presented by Messrs. Hiam and Hull (3JU). These gentlemen were unfortunately dogged by persistent induction from a nearby power station, and strong interference from electric trains and trams. Under the circumstances their results—four *coded* stations—during the official period were very good.

Mr. E. C. Gorman's log (Sydney) Station 2EC, arrived too late for this report, but, on looking through it, highly creditable results are observed and for the Commonwealth results Mr. Gorman's log will, of course, be considered with that sent in by Messrs. Hull and Hiam.

Mr. Howden's log for the period 13th to 31st May is a masterpiece of consistency, the same stations being logged almost nightly. Mr. Howden, who bears his success with characteristic modesty, has been the recipient of countless congratulations from

members of the radio fraternity. He was tendered a social evening by the local Radio Club, the Box Hill Section of the Wireless Institute, to commemorate the event. Mr. Howden's apparatus, which is described in this issue of *"Radio,"* consisted of a 200-metre tuner of the spider-web coil type and a two-stage radio frequency amplifier, detector and one stage of reflected audio frequency amplification. In view of the results obtained this set must have been particularly efficient.

Messrs. Hull and Hiam's apparatus consisted of spider-web tuner, three and four stages of radio frequency amplification. They could not use audio-frequency owing to local induction.

Mr. Gorman's station is also described in this issue. Mr. Maclurcan only reports having logged one station, and that outside the official test period.

The American point of view of reception will be highly satisfactory to the gentlemen concerned. The first ten stations heard were:—

6BV: C. H. Keller, 5501 So. Park Street, Los Angeles, California.

6CGW: No data available, but Californian station.

6JD: V. M. Bitz, 825, 53rd Street, Los Angeles, California.

6PD: J. J. McArdle, 263 Day Street, San Francisco, California.

6VUM: No data available, but Californian station.

5AEC: No data available, believed to be Texas Station.

3IRD: No data available, believed to be New Jersey or Virginian station.

7LA: David Phillips, 6601 Union Avenue, Tacoma, Washington.

9ARL: W. H. Althoff, 3019 No. Jefferson Avenue, St. Louis, Missouri.

9AUC: W. L. Major, First Street, Albany, Indiana.

These call signals have not all been verified, but it appears that everything is in order. When the American report is received absolute confirmation will be possible. Of these stations, 6PD was by far the strongest, his signals being loud and clear; 6JD was next, and a complete message was received from this station both in New Zealand and Australia on 17th May. The message was:—

Australia de 6JD 17th May. "Cable list of first ten calls across. Will pay half tolls.—Radio Journal."

That is the first confirmed message ever received in Australia from an American experimental station. I replied by cable, agreeing to the offer, but hope that we shall one day be able to do so by radio. That the reception was absolutely genuine is proved by a further radio from 6JD (Mr. Bitz, Los Angeles, Cal.): "Your cable received. Thanks, Radio Journal. 6JD."

Owing to details being unavailable concerning the power of the American stations received a direct comparison cannot be made with the results of the Trans-Atlantic tests, but the considerably greater distance bridged is sufficient grounds for the statement that the Australian reception is a far greater feat. Considering all the adverse conditions under which Australian experimenters laboured and the simplicity of the apparatus used—*6JD having been heard in Adelaide on a single valve receiver*—I think Australian wireless experimenters can claim to have contributed something of very great value to science. Despite what is said concerning "fading" on short waves reception of certain stations was quite consistent throughout the period of the tests.

In October next the tests will be continued, and I hope that even more satisfactory results will then be obtained. I have had to strive against much apathy amongst the experimental fraternity and the tests were carried on by a devoted few. Next time I would like to see the entries run into hundreds.

The complete and convincing results of my scheme have been a source of keen gratification to me, and I have to thank all the enthusiasts in the States concerned for their co-operation and kindly help. I feel proud to have originated a scheme that has been the means of placing the Australian experimenter in the front rank of wireless "amateurs."

Signed: H. KINGSLEY LOVE,
President Trans-Pacific Test Committee.

Logs of Trans-Pacific Tests

Station 3BQ

TIME P.M.	Call Letters From	To	RECORD.
			May 13, 1923.
7.34	7LA	7DP	—"- - - for - - - on - - - 17 to nil QTC." (Signals faint but quite readable, except for QRM.)
7.38	9URE	9XK	—Signals quite readable. Note fairly pure.
7.39	9ARL	6UPE	—"K." (QRK. Pronounced A.C. ripple.)
7.44	9ARL	?	—? ? ?
P.M.			May 14, 1923.
6.30	BV	Aust.	— - - - - - (Spark QRM. Slight A.C. hum.)
7.00	?	?	—Faint pure C.W. unreadable.
7.15	?	4?	— - - - - (Good strength, bad hum. Jammed local transmitter.)
7.20	6CGW	Aust.	—Sent word Australia five times, then TJ de 6CGW (15 times), then "Australia TJ must - - - nw 6CGW Test Australia TJ de 6CGW." (Sigs. strong. Very bad hum. Five other CW stations going.)
7.45	6?	?	— - - - - (Just readable until jammed, hum bad.)
8.15	3IRD	Aust.	—"H Australia (3 times) x x x to Australia de 3IRD." (Fairly weak. Static getting worse. Ripple not bad.)
P.M.			May 15, 1923.
7.15	6CGW	Aust.	—"Australia (3 times) TJ de 6CGW." (Hum bad. QSA.)
7.18	6JD	Aust.	—"Australia (3 times) CDO. Hope you receive us O.K. Let us now will you. CDO de 6JD. (QSA. Fairly smooth.)
7.35	5AEC	?	— - - - (Fairly strong. Jammed spark.)
7.40	6PD	6JD	— - - - - (Very QSA.)
P.M.			May 17, 1923.
7.20	6BV	Aust.	— - - - - (Faint and fading.)
7.35	5NO	?	— - - - - (Very faint.)
7.50	9AUL	Aust.	— - - - (Fair strength.)
8.00	6JD	Aust.	—"Australia (6 times) CDO de 6JD pse copy. Cable list of ten calls across. Will pay half toll.—Radio Journal." (This was repeated en-masse three times at a very fair strength at times, but occasionally went right out.)

TIME	Call Letters From	To	RECORD.
8.15	6AVN	Aust.—	- - - - - (Weak and fading badly.)
8.25	5AEC	Aust.—	"Australia HOD de 5AEC. (Faint but steady.)
8.37	6PD	5AEC—	"O.K. Will try to see him Sunday a.m. any time K." (QSA. Read through strong local spark.)
8.50	6BUN	UY—	- - - - - (Faint and fading.)
9.00	6JD	Aust.—	"Australia CDO de 6JD Pse copy. Cable list of ten calls across. Will pay half toll. Radio Journal de 6JD. Now look for more msg later." (QSA.)
P.M.			May 20, 1923.
7.06	6CGW	Aust.—	"TJ test Australia de 6CGW. (Fairly faint and very broad.)
7.22	6CGW	Aust.—	"TJ test Australia de 6CGW."
7.43	9GG	CH—	- - - - - (Faint with very bad A.C. hum.)
7.45	6PD	?	— - - - - (Very weak compared to 17th inst.)
7.50	6CGW	Aust.—	- - - - - - - .
8.00	7AU	HU—	- - - - (Faint C.W. very pure.)
8.07	9GG	CH—	
8.37	6CGW	Aust.—	
P.M.			May 25, 1923.
7.15	6JD	Aust.—	"Australia (3 times) CDO de 6JD pse copy —Your cable received. Thanks.—Radio Journal." "Australia de 6JD hr. msg pse copy—Your cable recd. Thanks.—Radio Journal." v v v QRX for msg few min de 6JD K. (Fair strength, very bad keying, fading slightly, wave-length higher.)
7.27	?	?	—"A good - - - - Los Angeles - - - 6JJ - - - yo - - - j - - - for - - - -." (Too faint to read through QRM.)
7.55	6?	CQ—	"- - - - - ill s - - - - - Doctor - - - - -. (Jammed by spark, fair strength, bad keying.)
P.M.			May 27, 1923.
7.05	6CGW	Aust.—	
7.14	6CBI	Aust.—	Very pure C.W. fading, but quite readable. No code word.

TIME	Call Letters From	To	RECORD.
8.10	6CGW	Aust.—	"Test Australia TJ de 6CGW. (Medium strength, fading and jammed.)
			May 28, 1923.
8.35	6CGW	Aust.—	"Test Australia TJ de 6CGW." (Repeated twice, fair strength, stronger than on 27th.)
9.00	6CGW	CQ—	"CQ Test Australia TJ de 6CGW." (QSA strength as at 8.35 p.m.)
P.M.			May 29, 1923.
7.00	6CGW	CQ—	"CQ Test Australia TJ de 6CGW." (Same but keying bad. Using coupled circuit.)
7.35	6BP	Aust.—	"Australia ZS de 6 BP" (three times). (QSA hum bad, keying fair. Using coupled circuit.)
7.40	6BP	CQ—	
7.41	6KU	6BP—	(Medium strength, bad hum.)
8.10	6BIC	WWW—	"WWW de 6BIC Australia" (three times). "WWAW de 6BIC Australia de 6BIC." (Medium strength, keying fair, hum bad.)
P.M.			May 30, 1923. (Using Coupled Circuit.)
7.10	6BP	CQ—	"Australia ZS de 6BP" (three times). (QSA, keying fair, hum bad.)
8.15	6BP	6AU—	"Australia ZS de 6BP." (Fading slightly.)
P.M.			May 31, 1923. (Using coupled circuit.)
7.00	6BP	Aust.—	"- - - - show J - - - - yr - - - -" (Jammed by spark.)
7.10	?	Aust.—	"Australia - - - ch - - - y p - - - bk - - - -" (Fading and jammed.)
7.15	9ZA	9MIA—	"FUU." (Strength fair, spacing bad, could not tell whether 9MIA or 9ZA.)
7.50	6BP	Aust.—	"Australia de 6BP" (three times). (Jammed.)
8.57	6CBI	Aust.—	"Australia de 6BCI" (three times). "Australia de 6CBI" (three times). "CQ de 6CBI Los Angeles." (Fairly strong, very pure, keying good—no code word.)

Signed: MAXWELL HOWDEN,
"3BQ."

Station 3JU

Messrs. C. Hiam and R. A. Hull operated station 3JU at St. Kilda, Melbourne, and their log is published hereunder:—

TIME	Call Letters From	To	RECORD
P.M.			May 1, 1923.
			No definite call sigs. received.
P.M.			May 2, 1923.
8.45	3?	?	—Third district station—calling indefinite—sending letter "H" repeated.
			May 3. 1923.
			No definite calls received.
			May 4, 1923.
			No definite calls received.
			May 5, 1923.
			No definite calls received.
			CW on 200 metres repeating word "Mott."
			May 6, 1923.
			No definite calls received.
			May 7, 1923.
			No definite calls received.
			May 8, 1923.
			No definite calls received.
			May 9. 1923.
			No definite calls received.
P.M.			May 10, 1923.
7.25	6CGW	2AWL—	Calling.
P.M.			May 11, 1923.
7.25	6CGW	CQ—	Calling.
			May 12, 1923.
			Nothing definite received.
P.M.			May 13, 1923.
6.50	6CGW		—Calling Australia.

TIME	Call Letters From	To	RECORD
7.12	6CGW		—Calling Australia.
7.25	6CGW		—Calling Australia. The best part of this evening was wasted waiting for 6CGW to send a code word.
8.45	5ME		—(Call indefinite) sending long message. (Copied complete.) Enquiries made of all South Australian transmitters proved that this message was not sent by any experimenter there.
P.M.			May 14, 1923.
7.31	6CGW		Sending "TJ."
P.M.			May 15, 1923.
—	6JD		—Calling Australia, sending "CDO," also "Hope you break every record, if this is O.K., let us hear from you."
7.45	6CGW		—Sending "TJ," calling Australia.
8.25	3IRD		—Station 3IRD. (Doubtful.) Repeating letter "H."
			May 16, 1923.
			Atmospherics very strong; closed down.
P.M.			May 17, 1923.
7.45	6JD		—Calling Australia, sending "CDO."
8.10	6JD		—Calling Australia, sending "Australia de 6JD Hr. copy msg. Cable list of first ten calls will pay half tolls. Sig. Radio Journal." These signals were readable 25 feet from 'phones and this message is word perfect.

TIME	Call Letters From	To	RECORD.
8.50	6PD		—Sending: "Try drop U card 2 morrow we won't be on until sun a.m. nil hr. nw. mgm. de 6PD." This station was even stronger than 6JD.
9.0	6JD		—With same message as above.
			May 18, 1923.
			Forced to close down on account of interference from motors or generators.
P.M.			May 19, 1923.
			Forced to close down on account of interference from motors or generators.

SUMMARY OF PERIOD ENDING MAY 19, 1923.

Station.	Calling.	Code word.
6CGW	2AWL	MOTT
6CGW	Australia	TJ
3IRD	Australia	H
5ME	Australia	H

Log of Period ending May 31, 1923.

P.M.			May 20, 1923.
8.15	6CGW		—Sending "TJ."
8.45	6CGW		—Sending "TJ."
9.10	6CGW		—Calling Australia.
			May 21, 1923.
			No definite calls received.
			May 22, 1923.
			No definite calls received.
			May 23, 1923.
			No definite calls received.
			May 24, 1923.
			No definite calls received.
			May 25, 1923.
			No watch kept on account of illness.
			May 26, 1923.
			Interference from motors prevented any reception.
P.M.			May 27, 1923.
8.40	6JD	Aust.	—Calling Australia, signing "CDO," Los Angeles." (Bad QRM.)

TIME	Call Letters From	To	RECORD.
P.M.			May 28, 1923.
7.44	3AIL		—(Call indefinite), sending "ENEA" repeated
9.10	6CGW		—Calling Australia.
			May 29, 1923.
			Motors prevent operation of receiver.
			May 30, 1923.
			Motors prevent operation of receiver.
			May 31, 1923.
			Motors prevent operation of receiver.

SUMMARY OF PERIOD ENDING MAY 31, 1923.

(May 20 to May 31.)

Station.	Calling.	Code word.
6CGW	Australia	"TJ"
6JD	Australia	"CDO"
3AIL	Australia	"ENEA"

During the whole period of the tests interference was caused by some motors or generators unknown, running in the neighbourhood and since this continuous noise was usually audible all over room with the 'phones on the bench reception of any faint signals was always impossible. On several nights of the test this interference was so bad that no reception was possible, the receiver having to close down.

The strength of the signals that were readable through the above interference was frequently very great, almost any of the stations included in the Log being readable strength at twenty-five feet from the telephones during some nights, and the writers thus believe that under these conditions the above stations would have been readable, using a single valve.

Further, in the opinion of the writers, the Trans-Pacific Tests have proved highly satisfactory and the results obtained certainly speak well of the efficiency of some of the American amateur transmitters.

During the greater portion of the test period, five valves were used, but at times the signals were heard using three valves.

Signals from one station were read when using an aerial ten feet high and 30 feet long, the normal aerial being 40 feet high and 80 feet long.

Signed: CHARLES HIAM,
ROSS A. HULL.

3BM's Log

The call signal 3BM belongs to the station of Mr. H. Kingsley Love, President of the Trans-Pacific Test Committee. Mr. Love had a run of bad luck with his apparatus before and during the tests. The night before the tests he burnt out the motor used in connection with his charging plant. Then, as explained in his report, the American organisation sent him a copy of the test Code words and thus he could not contest for any of the Prizes. The last week of the tests he was unable to spare time to "listening-in" on account of other work in connection with the tests. All Mr. Love's reception was carried out with two steps of radio frequency amplification.

TIME	Call Letters From	To	RECORD.
			May 1 and 2, 1923.
6.45 p.m. to 3 a.m.			—A number of CW 200 metre carrier waves were constantly picked up, also some very faint signalling. Nothing was, however, strong enough to be copied.
P.M.			May 3 to 5, 1923.
			Same remarks as above.
			Note: We have had no rain for over six months. The ground is hard and dry, and there is a noticeable difference in the strength at which even local station "come in." We have started under drought conditions and very bad receiving conditions indeed. However, should rain come the signals will surely follow.
			[They did.—Ed.]
P.M.			May 6, 1923.
6.40	?	MOTT	—Station calling MOTT; very faint but persistent. Sounded like CW with a hum.

TIME	Call Letters From	To	RECORD.
7.30			—Closed down owing to QRM.
P.M.			May 11, 1923.
7.25	6CGW		CQ—Repeated message over and over again about 30 times. Note:—Not a very good night for reception.
P.M.			May 13, 1923.
7.10	6CGW	Aust.	—"Australia de 6CGW" signals very strong. Good night for reception. Static quiet. Note:—My "A" Battery gave out.
P.M.			May 14, 1923.
7.29	6CGW		TJ—"6CGW sending TJ." Static fair, had few showers.
7.45	?	?	—"AU AU AU v v v QTC R OK NW OM. HW do u give a compensation - - - 14th 5ABI I shouldn't be - - - - at all ostr wn os - - up - - sorry OK really drafting - - - nephews my No. 10 - - - about same time - - - ar. - - - is better than mine I will call Canada until - - - Hav camp om I am - - - Hw - - - man KK.
8.18	?	?	—- - - - will get - - sri - - u about - - nature of timber - - - - - - pretty rotten I guess too - - - - - 3 IRD.
8.25	Bell, N.Z.	3BD	—"3BD de Bell New Zealand KKK." Note:—The above was wonderful strength, but persistently faded and was very hard to follow. It would die out altogether at times, and at others came in very QSA. Static also grew worse as the night progressed. Signed: H. KINGSLEY LOVE.

Short Wave Receiver

Mr. C. A. Gorman's Set

THE short-wave receiver operated so successfully by Mr. C. A. Gorman (2EC) during the recent trans-Pacific test was designed specially to suit the aerial, which is of the following dimensions:—Height of main mast 55 feet, small mast 25 feet, length of aerial wire 70 feet, lead-in 20 feet, earth lead 10 feet. Two wires are used on 7 feet spreaders, and the earth consists of water pipes, buried plates and about 100ft. of copper wire.

The circuit used is a very simple one, although it proves extremely critical on short waves.

The tuner is a vario-coupler of the following dimensions:—Primary 15 turns on a 4in. former, secondary 30 turns on a 3½in. former, both windings being 24 gauge silk-covered wire. No taps are used on these coils, all tuning being done by means of the series condenser, which is a .001 mf. The secondary coil is not tuned at all, this being found to be unnecessary with this size winding. The variometer method of radio frequency amplification is employed, this method being found by test to be the most efficient for short waves. Variometer windings are as follows:—Stator 30 turns on 4in. former, rotor 30 turns on 3½in. former, 24 gauge silk-covered wire being also used here.

Mr. C. A. Gorman.

A 200 ohms potentiometer shunted across the "A" battery is used for grid biassing. The grid condenser is a .0003 fixed. The 'phones are Brandes Navy Type 3000 ohms. The valves used during the recent tests with Major Mott, and also the official Trans-Pacific Tests were a Radiotron UV 200 as radio frequency amplifier and an Auditron as detecter; 110 volts were used on the plate of the amplifier and 44-48 on the detector.

Prior to using a soft Radiotron valve as an experiment for one night, a V24 had been used consistently for radio frequency work, but the former gave such surprisingly good results that it has been persevered with.

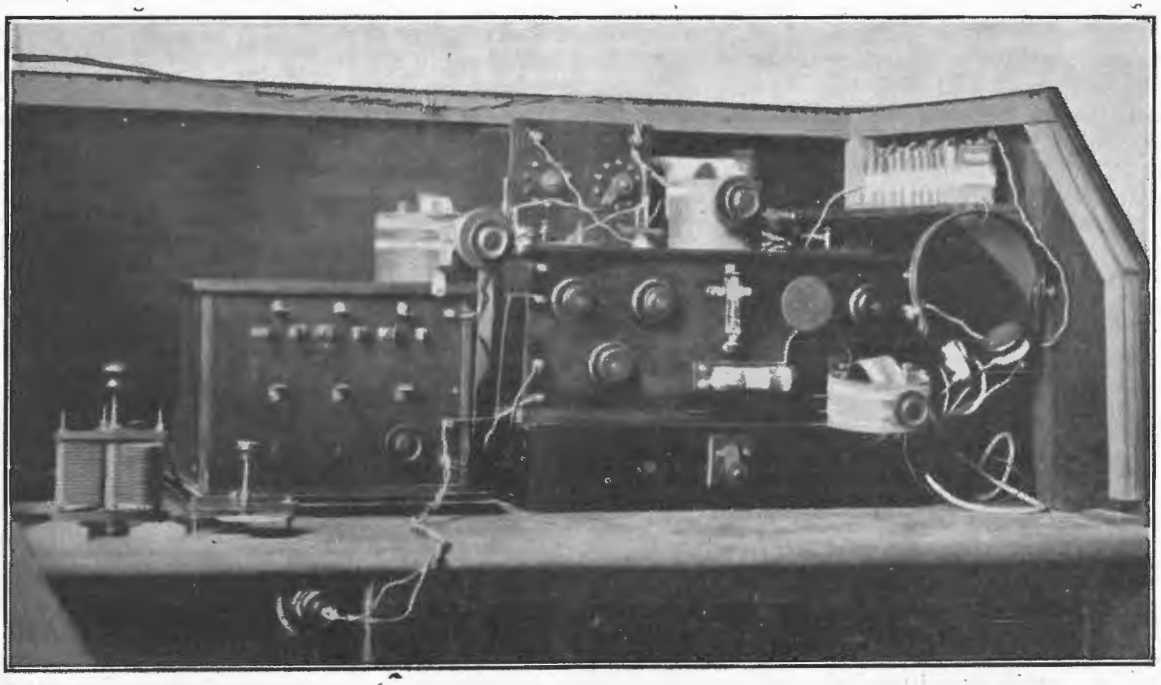
No other part of the set needs any description, as it is quite an ordinary home-made job.

The following brief details of the results that have been achieved will prove of interest:—

From May 1st to 3rd static conditions were bad, and beyond the copying of West Australian Station 5BP nothing out of the ordinary was heard. Mr. Gorman did not listen-in again until May 5, when, as is well-known, the "Mott" signals were heard. At that time he was working in conjunction with 2CM.

On May 6, American Station 6CGW, working with Station 5ADO, was copied. Station 6CGW is situated at Los Angeles, California. This was the first 200 metre American Station heard. Results up to May 15 were nothing out of the ordinary, but at 7.33 p.m. on that date, Station 6JD (V. M. Bitz, Los Angeles, Cal.) called Australia and sent: "Hope you

(*Continued on page 205.*)



—Courtesy of "Wireless Weekly."

Mr. Gorman's Set, on which he received signals from American amateur stations.

Radio Filters

By MELVILLE EASTHAM

RADIO filters are most useful in decreasing interference when a single circuit tuner is used, because the inductively-coupled tuner is fairly satisfactory by itself. However, there are many cases where a filter will more than justify itself on a very selective set. Comparatively little has been done by experimenters with filters, apparently, and it seems to the writer to be a particularly fruitful field for investigation. I am, therefore, describing some of those I have worked with.

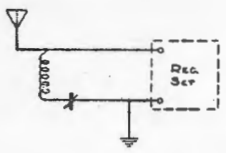


Fig 1
Type A Filter

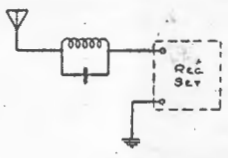


Fig 2
Type B Filter

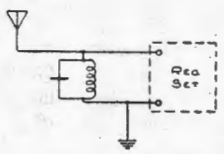


Fig 3
Type C Filter

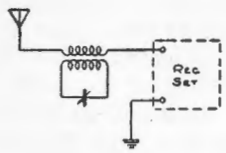


Fig 4
Type S Filter

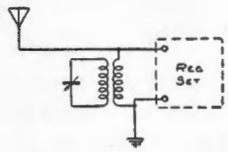


Fig 5
Type P Filter

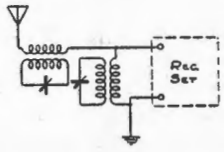


Fig 6

A simple form of filter is a series capacity-inductance circuit, connected across the receiving set (see Fig. 1), and tuned to the interfering signal. We will call this a "Type A" filter. Interfering signals are, to quite an extent, shunted through this circuit, but it is not very selective, so it will not be useful on waves of nearly the same length. It is quite a help where a nearby broadcasting station is strong enough to make a detector insensitive, or where a spark station on a materially longer or shorter wave length bothers. For use on interfering waves of 150 to 250 metres the variable condenser should be about 0.0005 m.f. and the coil about 1 M.H., which will be obtained by winding about 22 turns of No. 28 D.C.C. wire on a tube 3in. in diameter. For 300 to 500 metres, the coil should have about 40 turns of the same wire.

The filter shown in Fig. 2 (Type B), consists of one or two turns of heavy wire shunted by a mica condenser. It is tuned to the interfering station, and when in resonance, a local current flows around it, setting up a potential across its terminals almost equal to and opposing that due to the incoming wave, so very little current of that frequency flows into the receiving set.

It will only work successfully on a C.W. station, so it may be used to receive a spark station through a much stronger tube station on the same wave-length. This arrangement has been used quite extensively by the British Navy, and called a rejector circuit. They usually use a single copper turn about 10in. in diameter, having a cross-section of about ½in. x 1in. A sliding contact, revolving about the centre of the turn, varies the inductance from a minimum to a full turn. A mica condenser of about 0.1 M.F. (usually adjustable in steps), is connected by very short and heavy leads, to one end of the turn and to the moving contact. This arrangement works very well for cutting out a C.W. station, but is rather difficult to build, as great care must be used to keep the losses low, due to the comparatively large current that flows in it.

It will not, however, cut out a spark signal. The mica condenser and single turn may be replaced by a condenser of 0.0005 or 0.001 M.F. and a coil of 35 to 50 turns on a 3in. tube and very fair results will be obtained although the interfering wave will be a little different in wave-length, as the tuning is not extremely sharp. It is sometimes called an "anti-resonant circuit." It may be connected across a receiving set, as shown in Fig. 3 (Type C), and is then called an "acceptor," and acts as a by-pass for all interfering waves, but allows the frequency for which it is tuned to get into the receiving set. It is most useful in receiving C.W. through strong spark interference.

The filter shown in Fig. 4 (Type S) operates in the same way that Type B does, but it has several advantages. Instead of placing the filter directly in the aerial circuit, it is inductively coupled to several turns, which are wound directly over the filter coil, these turns being in series with the antenna circuit. *This is the best thing I have used to cut out a nearby broadcasting station, or a C.W. transmitter;* but, like Type B, it will not stop spark stations. It should be understood that this type will cut out the one C.W. station to which it is tuned, and allow normal receiving on wave-lengths differing by about 1% from the interfering signal. It will not satisfactorily eliminate a spark station. The tunin is extremely sharp. To get the best results, the losses in the coil must be low, and the condenser should be one having a low resistance at high frequencies.

Fig. 5 (Type P) shows this coupled type as an "acceptor," and it operates about the same as Type C, but is simpler and sharper in tuning. It is very

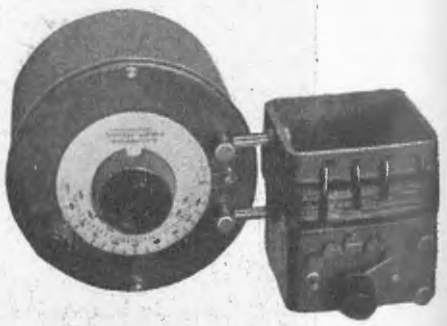


Fig. 7.—Filter or Wave Trap. May be used as either Type S or Type P.

satisfactory in cutting down interference from C.W. or spark sets, as well as arc light noises, or A.C. hum. It is rather more difficult to adjust than the "S" filter because it usually makes necessary the readjustment of the receiving set, but when one learns to handle it correctly, it is even more useful than Type S.

QRM from induction coils, with a spark gap in the antenna, may cause quite a little trouble, but a Type P filter will usually *eliminate it entirely*. If your aerial is very small, it will help to put a coil of about 20 or 30 turns in series with it, to increase its natural period. This will bring a point of lower voltage across the receiving set, and the filter will absorb less energy from the desired signal. Working an aerial just at its natural frequency, however, means that the

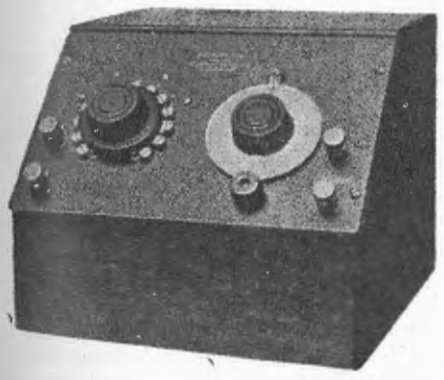


Fig. 8.—Filter equipped with special switch for shifting from Type "P" to type "S" or cutting instrument out of circuit.

receiving set has almost no voltage at its terminals (though the capacity and inductance separately have) and the filter will not be very selective, though it will help with waves of materially higher or lower frequency.

Several of the "S" filters may be used in series, each for eliminating a single C.W. station, and they may also be used when a "P" type is in operation. I have used three filters with a real gain. *When one particular station is working, I set one "S" filter on his wave-length, and forget him,* though he is only one mile from me and seriously interferes on a single circuit regenerative tuner working at 360 metres.

The filters I have used have been wound on insulating tubes about 3in in diameter, and, to cover a range of 150 to 500 metres with a 0.0005 M.F. condenser. There should be about forty turns of No. 28 D.C.C. wire, which will make it about 1in. long. Over this coil is wound about three or four turns of heavy writing paper for insulation between the two coils. The outer coil should have eight turns of No. 24 or 26 D.C.C., tapped at three and five turns. The inside, or secondary, coil is connected to the variable condenser, and the outer coil may be connected in series with or parallel to the receiving set. For the "P" type, three or five turns should be used; for the "S" type, five or eight turns.

Fig. 7 shows a filter of this kind but wound on a 3in. square tube so that a switch may be mounted directly on the coil for changing the turns or cutting the filter out of circuit. The filter coil has 36 turns of No. 28 D.C.C. and the small binding posts on the coil can be connected to three, five, or eight turns, short-circuited, or open-circuited. *The off position in the "S" filter is with the posts short-circuited; in the "P" filter with them open-circuited.* (Note that the *same* filter may be used as a Type S or a Type P.—Ed.) The coil is supported by two brass rods, which are held by the binding posts on the condenser, and also connect the filter coil to the condenser. The range of this instrument is 150 to 500 metres, and a scale on the dial of the condenser reads directly in wave-length, so that it may be used for measuring the wave-length of an incoming signal, as well as for setting for a known signal. The purpose of the primary switch is to

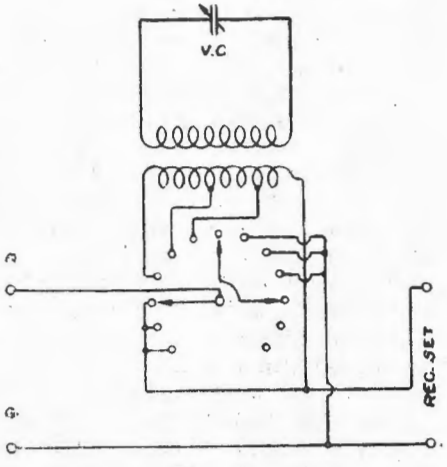


FIG 9
WIRING DIAGRAM
305 FILTER
(SHOWN IN FIGURE 8)

vary the coupling of the secondary circuit to the antenna system. In the case of the Type S filter, a very narrow band will be "blanked out" if only a few primary turns are used and a somewhat wider band if more primary turns are used.

A more elaborate filter is shown in Fig. 8, the principal difference being in the switching scheme, as it allows the filter to be cut out of circuit completely, in parallel with three or five turns or in series with five or eight turns. The coil data (*concludes the writer in "Q.S.T."*) is the same as the round one described above having 40 secondary turns. The switching scheme is shown in Fig 9, and it will be noticed that a special double-blade switch is necessary, but is well justified if one lives in a neighbourhood with several transmitting sets.

CALL SIGNALS OF AUSTRALIAN AND NEW ZEALAND RADIO STATIONS.

VIA	Adelaide.
VIB	Brisbane.
VIC	Cooktown.
VID	Darwin.
VIE	Esperance.
VIG	Port Moresby.
VIH	Hobart.
VII	Thursday Island.
VIJ	Samarai.
VIL	Flinders Island.
VIM	Melbourne.
VIN	Geraldton.
VIO	Broome.
VIP	Perth.
VIR	Rockhampton.
VIS	Sydney.
VIT	Townsville.
VIU	Kieta.
VIV	Madang.
VIW	Wyndham.
VIX	Misima.
VJZ	Rabaul.
VKN	Navy Office, Melbourne.
VKP	Flinders Naval Base.
VKW	Garden Island Base.
VKR	Cockburn Sound Base.
VKS	Port Stephens Base.
VKT	Nauru.
VLA	Awanui.
VLB	Awarua.
VLC	Chatham Islands.
VLD	Auckland.
VLW	Wellington
VMG	Apia.
2MB	Radio Concert Service, Amal. Wireless A/sia. Limited.

Wireless Concert and Lecture at Manly

Huge Audience--Great Enthusiasm

A Token of What is to be

HUNDREDS of people crowded into every corner of the big room at the Manly Literary Institute on July 9 to listen to a lecture on "Broadcasting," by Mr. E. T. Fisk, and a radio demonstration given by the Club. A second room was requisitioned in an attempt to accommodate the huge audience, and when it was filled the passage ways became crowded and scores of people were obliged to go away disappointed. A long line of motor cars outside the building testified to the keen interest taken in the proceedings by the well-to-do people of Manly.

The arrangements to provide the demonstration were carried out under great difficulties. A temporary aerial had to be erected, and the license of one of the Club members (Mr. Symes) transferred to the Institute for the occasion. A "loud speaker" and other apparatus was generously loaned by Mr. W. H. Wiles, of Sydney, and Amalgamated Wireless (Australasia) Ltd. granted the right to use its patents for the demonstration.

The first concert items were transmitted from Mr. R. C. Marsden's experimental station at Edgecliffe, and the second part of the programme was supplied by Mr. Marks, whose station is at Rose Bay.

The whole evening's entertainment was entirely novel to the great majority of those present. Few of them had ever previously had an opportunity of learning, at first hand, of the methods adopted in giving a demonstration of wireless telephony. When Mr. Fisk explained the tremendous boom that attended the commencement of broadcasting in America and England, the audience was able to visualise what this newest form of home entertainment will mean to Australia.

The educational effect was undeniable. The mystery and misconception surrounding the practical application of radio science was swept away, and every member of the audience felt that the progress which Mr. Fisk informed them had been made in other countries constituted a challenge to Australia to do as well—if not better. When the lecturer expressed the opinion that Australia *would* do better, his hearers applauded.

The Club President, Mr. F. C. Swinburne, in opening the proceedings, emphasised that so far as the demonstration was concerned it was purely the work of amateur enthusiasts. "Mr. Fisk had always proved a staunch friend to Australian experimenters, and his own excellent work in that direction automatically established a bond between himself and those carrying the torch of progress in radio research in Australia."

Before calling on Mr. Fisk to address the audience, the Chairman announced an apology from Councillor A. G. Parr, President of Warringah Shire, who was prevented by illness from being present.

Mr. Fisk, who was warmly received, dealt, in the course of a 50 minutes' address, with the progress made by wireless telegraphy and telephony in recent years. "Wireless first won its reputation," said Mr. Fisk, "as the greatest life-saving agent the world has known. Its application to shipping has tremendously lessened the risks of those 'who go down to the sea in ships.' Now it has been developed to a point presaging the dawn of a new era in home entertainment in Australia. It is already well-established in that direction in America where there are about six hundred broadcasting stations and over 2,000,000 'listeners in.' England followed America's lead, but on a different basis and now Australia is about to throw down the gauntlet to older countries with a scheme far in advance of any yet formulated to regulate the broadcasting of entertainments.

"The American public are treated to a multiplicity of programmes and confusion sometimes results, whereas England has only one broadcasting company operating from eight stations. One disadvantage of this is that the programmes are not sufficiently varied to suit the tastes of the English public.

"The competitive element which was to be one of the features of the Australian system will effectively prevent this. The public will be free to subscribe to any station they wish, and if they want a greater volume or variety of entertainment than any particular one will provide the cost of subscribing to an additional station will still leave radio the cheapest of home entertainments.

"Outback Australia has urgent need of a broadcasting service," said Mr. Fisk. "It will be very nice for the people in the big cities to have nightly concerts in their homes, but to settlers in isolated districts, who are really the backbone of Australia, it will prove an inestimable boon. It is impossible to convey in words the great practical value of a radio broadcasting service. Actual experience will teach that to the people of Australia, as it has taught it to those of other countries."

Mr. Fisk entertained his audience with numerous first-hand stories of broadcasting in England. "Grand opera from Covent Garden was enjoyed by unseen audiences in various parts of Great Britain to a greater extent than was possible from many parts of the theatre," he said.

Coming nearer home, Mr. Fisk touched on the unique possibilities for advertising open to health and pleasure resorts such as Manly. The broadcasting of local band performances, concerts, etc., would rivet the attention of the Australian people on the source of the entertainment—to its unquestionable advantage. "It should even be possible," said Mr. Fisk, "to broadcast the roar of the

breakers as they roll in on your beautiful beach. What feelings of envy this would arouse in the breasts of people in outback localities such as Bourke, when on a sweltering summer day, they are gasping for a breath of fresh air!" (Laughter.)

At the close of the lecture, Ald. A. T. Keirle (Mayor of Manly) moved a vote of thanks to Mr. Fisk.

"The proceedings here to-night have been a revelation to me," said Ald. Keirle. "I am convinced, after what I have heard, that the possibilities of radio telephony are impossible to exaggerate. I trust the time is close at hand when I will be able to put a set in my own home, and I am confident there are thousands of others who feel likewise."

Mr. Phil Renshaw, secretary of the N.S.W. Division of the Wireless Institute of Australia and a member of the Manly Radio Club, seconded the motion. Mr. Renshaw paid a tribute to the active and personal interest which Mr. Fisk had always taken in amateur experimenting in Australia.

In the course of his reply, Mr. Fisk counselled those contemplating the purchase of receiving sets to wait until broadcasting was about to commence. To instal a set now might mean disappointment, which a brief period of waiting will entirely obviate.

At the close of the entertainment the audience crowded round the wireless set and evinced the keenest interest in the explanations given by those operating it.

Radio telephony is now "on the map" so far as Manly is concerned, and the substantial addition to the Club membership following on the lecture and demonstration is distinctly encouraging.

Radio Affairs in New Zealand

DESPITE the fact that June was one of the wettest months in the history of the Dominion, Nature's copious weeping made no difference to the Wireless enthusiasts. If anything, "broadcasting" and "listening in" is on the increase. New Zealand is at present in the happy position of having few broadcasting stations and there is consequently an absence of chaos and confusion in the ether.

Scotts Hall, Auckland, is again in full swing and concerts, speeches, and other items are broadcasted at specified hours each day and night. The Wellington and Dunedin Stations are also doing good business.

Before a large and appreciative audience at the Auckland Wireless Society's monthly gathering recently Mr. W. H. Scott, late director of the London Training College, delivered an interesting lecture entitled "The Relationship between Pressure, Resistance and Current." A water analogy, showing the pressure clearly, was used as a demonstration.

Mr. Scott also gave valuable information in regard to crystal detectors, showing the various combinations The lecture, which was illustrated with blackboard diagrams, was of a most simple and explanatory nature and was listened to with rapt attention.

The Chairman, Mr. H. S. Hartle (Hartle & Gray), in introducing Mr. Scott, stated that he had been director of the London Wireless College for 15 years and had his subject at his fingers' ends. In fact, there was no better exponent in Australasia. During the war Mr. Scott was instructor to members of the Air Corps in London.

The fine buildings of the Y.M.C.A. in Auckland contain a nest of wireless plants, no less than a dozen showing out at various points. The principal set, which was presented to the institution, is a three-valve one. Many members have carried out their own ideas in various rooms. A healthy rivalry exists amongst the boys, and gramophone selections rendered in the lounge room are "wirelessed" from other parts of the building.

An interesting lecture entitled "Inductance and Capacity" was delivered at the Y.M.C.A. recently by Mr. R Burrell (Radio Ltd.). Mr. Burrell explained the manufacture of coils and their make up, and dealt at length with the subject of Wave lengths. Numerous questions were asked, members displaying the keenest interest in the subject.

Now that Parliament is in session it is expected that the question of wireless regulations will be discussed. The matter will probably come before the House when the report on the lighting or erecting of a radio direction finding station on the Three Kings is presented. This is a matter of vital importance not only to New Zealand and Australia, but to the whole of the Pacific.

SHORT WAVE RECEIVER.

(*Continued from page* 201.)

read us." Conditions on May 16 were hopeless through static. On the 17th 6JD was again easily copied; he sent the following message: "Cable list of ten first calls across—will pay half tolls—Radio Journal." 6JD and 6CGW were easily the strongest stations heard; 6CBI came in well, but not quite as strong as the other two. Other stations heard were:—6XAD, 6CDQ, 6KGN, 5ADO and 5BCH. These were of readable strength. Several others were heard, but were not readable.

One feature which used to interest Mr. Gorman greatly and which broke the monotony, was the Melbourne Police reports sent nightly. These messages came in remarkably clear on a wave-length of about 250 metres.

Amongst other station heard on this set during the time of working on the tests were West Australian experimenters 5BP, 6BQ and 5BG. Also New Zealand broadcasting and Mr. Bell, of Wahimeno, N.Z., came in very well on about 280 metres, as also did his friend at Gisborne, N.Z. Mr. Orbell, of Christchurch, N.Z. (3AA) came in strongly on 200 metres

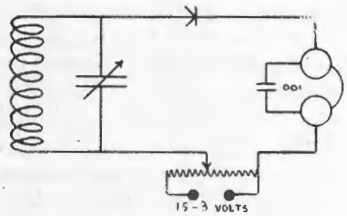
During the tests, Mr. A. T. Whitaker, 2OI, of Banksia, rendered material assistance to Mr. Gorman. At times the adjustments were very critical and one soon got tired of it. As an instance of how tiring the work was, it might be mentioned that for 10 nights the two men listened three hours a night to nothing but static, which does not tend to encourage even the most enthusiastic.

It may interest others to know that American amateurs are best heard here between 6 and 10 p.m. After 10 p.m. they begin to fade away. Sunday is a good night to try for them, as more seem to be working then.

FACTS ABOUT CRYSTAL DETECTORS.

ALMOST without exception the beginner commences his radio career with some form of crystal receiver. Although by no means as sensitive as a regenerative valve receiver or amplifier, it possesses the property of reproducing speech and music much more faithfully. The cost of upkeep of such a receiver is practically nil, and, although not so foolproof as many make out, it takes but a short time to become skilful in the handling of the crystals of the detector.

Practically any mineral crystal can be employed in combination with some



other crystal or metal to perform the functions of a detector, but the efficiency varies over wide ranges, and from practical experience it has been found that only a limited number are worth while.

Carborundum is a very stable and easily adjusted crystal which works best under a considerable pressure from a steel, copper or brass electrode. The most sensitive crystals are those between a dark gray and an olive green colour, with a coarse granular surface. Those with a multi-coloured glassy surface perform very poorly. This crystal gives best results with a polarising potential of from 1.0 to 1.5 volts, and being of fairly low resistance the associated telephone receivers must possess a correspondingly low impedance. If high resistance telephones are to be used they should be coupled with a suitable telephone transformer. Figure A shows the manner in which the polarising potential can be obtained by using a potentiometer. This applies to all types of crystals, although the direction and magnitude of the potential will vary for different samples.

Iron Pyrites is a good all-round detector, and can be recognised by its golden colour. It needs a fairly light contact from a wire of about No. 36 gauge. Several experimenters get excellent results with a single strand from a piece of electric light flex for a "catwhisker." Its operation is improved by the application of a very slight potential. Silicon also behaves in much the same manner and in both cases the most sensitive spot will be found in a sharp corner or surface crack.

Galena, which is a compound of sulphur and lead, is one of the cheapest and most sensitive of crystals. When fractured, it breaks up into small cube-shaped pieces. Like most sensitive detectors, it needs a very light adjustment, although it functions fairly well with a sturdier contact. In addition to this, it is very sensitive to heat, and in fact will not stand even the moderate temperature of Woods' metal low temperature alloy. Owing to this, it is best held in the cup by means of small screws or an amalgam, as used for dental purposes.

Combination crystals form quite a collection. The best known is that which forms the Perikon detector consisting of Zincite and Copper Pyrites. Zincite is a very rare mineral with a reddish colour somewhat like the crystals of bichromate of potash used for battery solutions. The copper pyrites, a compound of copper iron, and sulphur, is of a brass yellow colour, and is also known as chalcopyrites. Bornite, a somewhat similar mineral, can also be used in combination with Zincite. The usual mechanical layout of this type of detector provides for a spring adjustment of the pyrites crystal, enabling it to make contact with any one of several pieces of Zincite which are mounted in a large crystal cup opposite. Experience shows that this combination is improved by the application of a slight potential of about 0.25 volts.

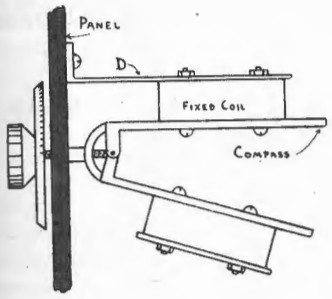
Artificial crystals whose trade names generally end with the usual "ite," are almost without exception fusions in which galena plays an important part. Their surface appearance has usually a bluish or blackish grey color, with granular structure covered with a multitude of minute crystals. The surface is remarkably uniform in its detecting properties, is very sensitive, and stable in adjustment, with a catwhisker of springy wire, such as German silver or Eureka. These crystals usually deteriorate with exposure to the atmosphere, and are best restored by refracturing the mineral.

When mounting a crystal in its cup with screws, it is advisable to pack the latter tightly with tinfoil, allowing some of it to come up the side of the crystal to distribute the pressure of the adjusting screws. After being in use for some time, the crystal will collect a surface film of dust and oil from the atmosphere, which can be removed by washing in benzine or carbon disulphide. So that this will not be a frequent operation, provide some means of shielding the crystal, such as enclosure in a glass tube. Rectification being a surface property, it is

best to buy crystal in large pieces, for it can then be broken up into smaller pieces, which gives a greater area of fresh material to work on.

A HONEYCOMB COIL MOUNTING.

Many experimenters would like to incorporate the very compact form of inductance known as the honeycomb or duo-lateral coil, in the design of their portable cabinet receivers if only some form of coupling adjustment were available whereby they could be conveniently operated inside the cabinet, instead of outside, as is usual. The accompanying illustration



shows in a very simple manner how this difficulty may be overcome. It makes use of an adjustable drawing compass and a few pieces of brass and machine screws. An engraved dial mounted on the threaded portion of the compass shaft gives a uniform appearance with the other dials for condensers and filament resistances. To each of the compass legs is soldered a strip of brass about three-quarters of an inch wide, and three inches long. These form back supports for the coils which are held in place with the two screws which pass through the centre. One coil is stationary and is attached to the inside of the panel by means of the angle bracket "D," which must be about 1/16in. at least in thickness as it has to carry the entire weight of the coils and compass mounting. The hole through the panel should provide sufficient clearance for the screw thread to turn freely. For use with the average experimenters aerial when receiving 400 metre signals, the primary —using a series condenser—should be a 75-turn coil, with one of similar dimensions for the reaction circuit. This type of coupling also provides the much sought after vernier adjustment, for it requires several turns of the dial shaft to change from minimum to maximum coupling.

A TABLE TYPE VALVE HOLDER.

There are available on the experimental market many forms of very cheap panel sockets for the English and Continental four pin valves, but when it comes to those suitable for table use in experimental wire-ups there is a big difference in price. These panel sockets can be very easily adapted for table use in the following manner. Secure a circular wooden block similar to those used for mounting ceiling roses in electric light work and in the centre drill four holes to accommodate the four legs of the socket. To ensure that these are drilled in the correct position, and that the socket will be nice and central, take it and stand it in the desired position and press the legs down on the surface of the wood. This will leave a mark on the surface which will serve as a guide when drilling the holes. Use a No. 26 or a 9/64 drill for this purpose to allow a slight clearance. Spaced equidistant around the wooden block are screwed in four terminals for connection to the grid, plate and filament respectively. Use short pieces of bare No. 20 copper wire for connecting from the legs to the terminals and preferably solder them. After testing out to make sure that the connections have been made properly, fill in the space at the bottom of the block with molten composition from old dry cells and scrape smooth.

Broadcasting the Grand National

Intense excitement prevailed at the "Herald Ideal Homes Exhibition," Wirth's Park, Melbourne, where a vivid description of the Grand National Hurdle was broadcasted while the race was actually in progress.

The description of the race was telephoned direct from the racecourse by Borham's Press Agency to the A.W.A. Broadcasting Station at "Collins House," and was transferred to the Wireless Transmitter.

The reception at the Ideal Homes Exhibition was perfect.

Long before the race started there was spirited debate on the chances of the "cracks." Large crowds gathered round each of the sets. So keen were some of the women listeners that they demanded the result before the race started.

When the winner was announced a member of the audience, in his excitement, brushed everyone aside and rushed for the exit, presumably to collect his winnings, which were stated to be £1,000.

A touch of humour was unconsciously introduced by the Transmitting Station, which played a cornet solo entitled, "Oh, Dry Those Tears." This brought forth roars of laughter from the audience.

Wireless in the West

(By Our Special Correspondent.)

A DEMONSTRATION of wireless telephony for the education and entertainment of the Insurance fraternity of Perth was given in Viking House some little time ago. The music was transmitted from Mr. W. E. Coxon's experimental station and the demonstration was supervised at the receiving end by Mr. Silby.

A crowded audience indicated the keen interest amongst Perth people. Prior to the commencement of the musical items, Mr. J. Scaddan, Minister for Forests in West Australia made an important statement regarding the Government's proposed intention of utilising wireless telephony to give warning of forest fires.

As is generally known, West Australia is the proud possessor of some wonderful forests which cover thousands upon thousands of acres. These densely studded tracts of land foster profuse undergrowth, and in dry seasons, despite the efforts at preservation, tremendous fires pass through at various points, carrying all before them.

Each year special gangs are employed for the purpose of protecting the huge forests, but there are times when the arrangements made are not very effective, chiefly on account of telephonic breakdowns through the ravages of fire, and the slow and almost useless means of transport.

Realising that the initiation of wireless would absolutely revolutionize the whole position, Mr. Scaddan remarked that plans were already being formulated to instal a central wireless plant, and in turn provide the various gangs with portable outfits, by means of which prompt and more effective measures could be taken whenever a big fire was sighted from look-outs.

Mr. Scaddan also pointed out that such plants had long since been adopted in America, and, were giving good results. The outlay for the projected West Australia scheme is quite a moderate one. It is not expected to cost more than £100 for each fire-control area, whereas the annual saving to the timber and forests department would be very considerable.

If, as is most likely, wireless is also brought to the aid of the Perth Electric Power Department for notifying breakdowns in the system, portable outfits will necessarily be used on motor lorries travelling to the scene of breakdown, so that the linesmen will be enabled to conduct continuous communication with the station. In this regard, however, it is not expected that anything will be actually done for about another twelve months.

BREAKING UP THE HAPPY HOME.

The lure of radio reports, lectures, popular songs and bedtime stories is given as the cause for marital disaster in a petition for divorce filed by an American lady recently. She alleged that the attractions of the wireless waves kept her husband up "far into the night, listening to the music and messages." And when he finally came to bed he kept her awake the rest of the night arguing about new sets and wiring problems, she charges.

Her husband admitted that he was a radio enthusiast, and his fondness for the hobby was only equalled by his good lady's aversion to it.

6855 Miles

Ship to Shore Record

R.M.S. Maunganui and San Francisco

The Union Steam Ship Co.'s Royal Mail Steamer *Maunganui* and the Radio Corporation coast station at San Francisco, California, have established a record for direct wireless communication between a ship and coast station in the Pacific.

The *Maunganui* was bound from San Francisco to Sydney at the time, and left Wellington, New Zealand, on Friday, July 6. On the night of Sunday, July 8, when the ship was approximately half-way across the Tasman Sea, at 10.15 p.m. (Sydney time), Mr. Robert S. Taylor, Chief Wireless Officer of the *Maunganui*, called up KPH, the Radio Corporation marine coast station at San Francisco, and sent the *Maunganui's* position. Immediately after Mr. Taylor heard San Francisco reply to him and say: "O.K. received. Your signals strong."

This achievement, we believe, constitutes a record for ship to shore communication, and it is all the more remarkable and speaks well of the efficiency of both the ship and coast stations when it is known that the apparatus used was:—

Maunganui: 1½ K.W. Marconi set, with an "Expanse" Type P1 receiver using one "Expanse" B valve.

San Francisco: 5 K.W. Radio Corporation Transmitter and Receiver, the latter using two valves.

The *Maunganui* transmitted to San Francisco on a wave-length of 450 metres, and San Francisco (KPH) replied on a wave-length of 600 metres.

When the long distance, and the great number of stations working in each vicinity is considered, equal praise is due to both Mr. Taylor on the *Maunganui* and the operator at San Francisco.

Items of Interest

On Friday afternoon, July 6, something unique in the way of Broadcasting in Melbourne was conducted by Amalgamated Wireless in conjunction with the Herald Ideal Homes Exhibition. M. Benno Moiseiwitsch, world-famed pianist, played at the Company's Offices, Collins House, Melbourne, the items being reproduced on a loud speaker at the Concert Hall of the Ideal Homes Exhibition with sufficient volume to enable a crowd of 800 people to hear. The demonstration was an unqualified success, the music being reproduced with great purity at the Concert Hall, where a number of musical critics had gathered to listen. So good was the reproduction that all agreed that it was equal to Moiseiwitsch's recent performance at the Town Hall.

A few words regarding the technical arrangements may be of interest. The transmitting apparatus was the Marconi ½ k.w set which has been employed for the last couple of years in transmitting the well-known Monday evening concerts. The piano (Mason and Hamlin) was a small grand. At first, a large grand was contemplated, but it was found too big to enter the goods lift at Collins House. The room in which M. Moiseiwitsch played was specially draped with heavy material to deaden echoes and resonance effect. Special microphonic arrangements were made for picking up the piano, and it is due to this that such excellent results were obtained. Immediately after the conclusion of the demonstration, Mr. Connelly (3 B.U.), one of Melbourne's leading experimenters, rang up Collins House and congratulated the Company on the performance. He stated that using three valves he heard the playing of Moiseiwitsch faithfully reproduced at a distance of 125 yards from his set.

This is the first time the famous pianist has been broadcasted in Australia, and, incidentally, in the world. Messrs. Cutler, Jones and Hosking were in charge of all the arrangements at the transmitting end, whilst Mr. Pringle, assisted by Mr. Milsom operated the receiving set at the Concert Hall.

Movements of Wireless Officers

Mr. C. Williamson signed on s.s. *Barwon* at Sydney, on June 27.

Mr. M. G. Crockett signed off s.s. *Ellaroo* at Melbourne, on June 1.

Mr. E. D. Nicholl signed on s.s. *Kaikorai*, at Port Chalmers, on June 8.

Mr. T. H. McWilliams signed on s.s. *Waihora*, at Port Chalmers, on June 16.

Mr. G. Maxwell, who signed off s.s. *Ceduna*, at Sydney, on June 26, signed on s.s. *Lammeroo*, at Sydney, on June 28.

Mr. C. F. Griffiths relieved Mr. J. A. Heavey on s.s. *Manuka*, at Sydney, on June 28.

Mr. F. C. Davies relieved Mr. C. F. Griffiths on s.s. *Montoro*, at Sydney, on June 28.

Mr. A. T. Parry signed on s.s. *Kaiapoi*, at Wellington, on June 26.

Radiofun

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

RADIO RALF AND HIS FRIENDS---

By Jack Wilson

Music to be broadcasted shortly by the Hertzian Revue Co. on a wavelength of 4ft. 6ins.:—

"Somewhere a Valve is Squealing."

"What are the Wireless Waves Saying?"

"Down Where the Vacuum Tubes are Glowing."

"That Moaning Magnavox Rag."

"The End of a Perfect 'A'."

"How 'yer goin', 2CM?"

"Hummin' Thro' the Sky."

"My 'loop' at Woolloomooloo."

"Life on the Eether Wave."

"Speed On, My Spark!"

"By the Silvery Rheo-stat."

* * *

1st Electron Explorer (in V.T.): "These volcanoes seem to me to be dangerous—likely to erupt any time."

2nd Ditto (on Crystal): "Yes, I'll be on the safe side, and stick to these mountains and valleys."

"Very put out," said the Crystal Detector, when he received a jar.

* * *

An amateur chap in the City,
Had a set, well constructed and pretty.
In the valves of all sorts,
There were "opens" and "shorts,"
And the set wouldn't work—what a pity!

A real enterprising young "Ham,"
When hopping one day on a tram,
Dropped a parcel of four
Vacuum tubes on the floor,
And he tore at his hair and said—
"Gracious!"

* * *

"What a nice figure Miss Radiotron has."

"Yes, such a graceful characteristic curve"

—Contributed by R. H. E. CHANNON.

* * *

Radio is not a new thing by any means. Even in the olden days Noah had his "Arc" when a "Continuous Wave" swept the land!

* * *

MODERN JACK HORNER.

Little Jack Horner
Sat in the corner,
Over his Radio set.
He plugged in for a trial,
Tuned in on his dial,
And said, "I've got Sydney,
You bet."

* * *

An American story says a darky entered a radio store and "desired very much to get a Venus condenser of a certain captivity."

THOSE "TR" FIENDS.

By "Short Wave."

When the *Iron Prince* was "in extremis" a certain foreign ship asked him for his "TR."

When you're in trouble, and times are tense,
And you sadly need assistance;
When the ether trembles with your suspense,
And help seems at a distance;
Isn't it fine when a brainless bloke,
With Morse that's weak in the knees,
Fumbles his key in his nervous haste,
And asks for your "TR" please!

Hard and fast on an iron-bound reef,
Racked by the rising sea,
It hardly seems within belief
That such blank fools there be!
But we all grinned when he thumped his key,
And said when the call was done—
"Change your foot, you're QSC,
And TR? Ain't got none!"

* * *

Every cloud has a silver lining. So has the mess of gurgles and squeals on 400 metres!

Trans-Pacific Test Receiver

Mr. M. Howden's Station

A brief description of the aerial and set may prove of interest. The aerial consists of two 8-gauge copper wires 75 ft. long, supported by two 55 ft. masts. The lead-in, coming down at a slight angle, is about 60 ft. long and of the same gauge wire. The

Mr. Maxwell Howden, designer, builder, owner and operator of Station 3BQ.

earth consists of a few wires going through a window and down into a well that was apparently dug there for the purpose.

Shortly before the tests started, reports came through from New Zealand that American low-power stations were being heard on a single valve, and that the tuning was the hardest part to accomplish in receiving them. Armed with this knowledge Mr. Howden decided that two stages of high-frequency amplification would be quite sufficient to bring them in, in Victoria. To use more than this would make tuning very much more difficult.

The next point to be considered was the method of amplification to be employed. From previous experience it was realised that transformer coupling was not quite as efficient as the choke coil or variometer method, but since it is very much easier to handle at high frequency, Mr. Howden preferred to use it. Some doubt was felt as to whether audio frequency amplification would be necessary or not, so one optional stage of reflection was put in, making sure that a quick change-over could be accomplished. This was done by shorting switches across 'phone terminals and transformer secondary, and a plug socket for primary or 'phones in the plate circuit of the detector.

B.T.H. valves were used as amplifiers and the signals came in with either "Expanse" A, Annaka or UV 200 as detector.

The H.F. transformers were made as follows:—Two 2-inch diameter discs were turned out of ½-inch fibre, and a single slot ¼-inch deep was cut in the edge of each. In this slot the two coils, each consisting of 40 turns of 36 D.S.C. were wound together. Four split plug contacts were then screwed into the face of each former to fit interchangeable sockets. Across the primary of these transformers small variable condensers—consisting of four fixed and three movable plates, the fixed plated being 3-16th inch apart were connected. A similar condenser varied the tuning across the input terminals.

The tuner consisted of 20 spaced turns of 18 gauge bare copper on a 4-inch former for the primary, and 90 spaced turns of 30 S.S.C. on a 2-inch former for the secondary. No taps were used in either case; a series condenser tuning the aerial circuit.

The 'phones used were pre-war Ericssons, 1000 ohms., which do not bring in loud signals as well as some of the modern types, but certainly respond well to the weak ones.

The receiving apparatus built and used so successfully in the Trans-Pacific tests by Mr. Howden (3BQ).

Club Notes & News

WIRELESS INSTITUTE OF AUSTRALIA

N.S.W. DIVISION.

A large gathering of radio enthusiasts greeted Mr. G. A. Taylor, who lectured on the experimenter and his position under the broadcasting regulations at the July 12 meeting of the above division, held in the Education Building. The members of the various clubs around Sydney had been invited and the response was generous.

As an added attraction, a demonstration of wireless telephony, transmitted from Mr. R. C. Marsden's experimental station at Edgecliffe was given during the evening. The receiving apparatus, which was supplied by the Burgin Electric Co. and supervised by the firm's technical officer, Mr. O. F. Mingay, consisted of a three-valve receiver (detector and two steps of audio-frequency amplification) using an Armstrong circuit and a Western Electric Loud Speaker, which made the items audible throughout the room.

Mr. Raymond Shaw operated the receiving set.

The demonstration was held by special permission of the Controller of Wireless and under a temporary patent license from Amalgamated Wireless (Aust.) Ltd.

In opening the proceedings, Mr. Phil. Renshaw, secretary of the Institute, emphasised the important part occupied by experimenters in wireless development. He felt sure that Australia was on the eve of many new and wonderful discoveries in radio equipment for which experimenters would be responsible.

Mr. Taylor, in the course of an interesting lecture, gave an outline of the proceedings at the recent broadcasting conference. He emphasised the unanimity and goodwill, combined with scrupulous thoroughness with which the delegates tackled the problems confronting them. He felt sure that Australia would soon have the finest broadcasting regulations in the world, and genuine experimenters would receive greater encouragement and enjoy more freedom than was possible in any other country.

A full report of Mr. Taylor's lecture will appear in next issue.

n responding after a vote of thanks had been accorded him, Mr. Taylor spoke of the good work which lay ahead of the Society for the Improvement of Wireless in Australia. It was essential that Australia should have a voice in international wireless affairs, and the Geneva Conference of the League of Nations in 1924, which he proposed attending, provided an ideal discussion ground.

Subsequently, Mr. O. F. Mingay moved the following motion, which was seconded by Mr. W. J. Maclardy and carried unanimously:—

> "That the representatives of the Radio Societies here assembled desire that the universal encouragement of wireless and other sciences should be considered by the League of Nations, and that a motion be passed at the coming conference of that body that the matter be placed for discussion at the Conference in 1924, and that Mr. George A. Taylor be an honorary delegate at same."

ILLAWARRA RADIO CLUB.

The Club concluded the first year of its operations with the 26th meeting, which was held on July 3. The election of one new member brought the membership up to the half-century mark.

Nominations were received for office-holders for the ensuing year, and auditors were appointed to audit the accounts in preparation for the annual meeting.

In emphasising the satisfactory progress made by the Club, the President expressed the hope that the future would see an even greater measure of success.

Mr. Hewett (delegate) and Mr. Atkinson in detailing the activities of the Radio Association referred, amongst other things, to the proposed formation of a local Board in Sydney (comprising representatives of the Wireless Institute and the Radio Association) to deal with future applications for experimental licenses.

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

MANLY RADIO CLUB.

A demonstration of radio telephony and a lecture on "Broadcasting," by Mr. E. T. Fisk, attracted hundreds of people to the meeting of the above Club on July 9.

The arrangements for the concert were in the hands of Messrs. Clarke, Swinburne, Symes and Perdriau, and very creditable results were achieved. The huge audience enjoyed Mr. Fisk's lecture, and at the close of the meeting a substantial addition to the club membership resulted. A full report of the lecture appears elsewhere in this issue.

NEWCASTLE DISTRICT RADIO CLUB.

At the July 4 meeting of the above Club, the volume of general business necessitated the postponement of the lecture which had been arranged. After a discussion regarding the rent of the Club premises, Mr. Denny generously donated the quarters rent free to the Club for six months. This will permit the money that would otherwise have been absorbed by rent to be used to purchase wireless apparatus. Mr. Denny's action was warmly commended by members.

The following time-table has been adopted by the Club:—7.30 to 8.30 p.m., "Listening-in"; 8.30 to 9.30 p.m., lecture; 9.30 to 10.30 p.m., "Listening-in."

WESTERN SUBURBS AMATEUR WIRELESS ASSOCIATION.

At the second annual meeting of the above Association on June 4, the election of officers resulted as follows:—President, Mr. R. S. Burman; Vice-President, Mr. F. B. Wade; Secretary, Mr. G. R. Challenger; Treasurer, Mr. J. Hoile.

Technical committee, Messrs. Challenger, Wade, Wetton, Hoile and Burman. A social committee consisting of Messrs. Gow, Burman, McEvoy, Wetton and Wade was appointed to finalise arrangements for the second annual entertainment to be held in the Auburn Town Hall early in September.

All enquiries regarding the Club should be addressed to the Hon. Secretary, 77 Park Road, Auburn.

KURIN-GAI DISTRICT RADIO SOCIETY.

Despite adverse weather conditions there was an excellent attendance at the last meeting of the above Club on July 11.

Portion of the evening was devoted to questions, and members gleaned much useful information from the answers supplied by Messrs. O. F. Mingay and H. A. Stowe.

A discussion on broadcasting, initiated by Mr. Mingay, subsequently engaged the attention of members.

At the next meeting Mr. Best will lecture on transmitting circuits, and all members are urged to attend.

EXAMINATION RESULTS.

The following students of the Marconi School of Wireless recently passed the Government examination and secured First-class Certificates of Proficiency in Radiotelegraphy:—

Messrs. A. W. Weston, T. S. Mitchell and R. W. S. Bailey.

WHERE RADIO BEATS THE TELEPHONE.

The telephone plays a very necessary part in our everyday life. Business would not exactly be impossible without it, but it would be very much more difficult. Despite the fact that for scores of years the network of telephone lines has been growing, one frequently desires to communicate between points not yet linked by a landline. It is here that radio scores. One instance will serve to demonstrate it.

Quite recently a Sydney man communicated by urgent telegram with East Malvern, Victoria, requesting that a certain article be forwarded by return mail. East Malvern had to communicate with Box Hill to procure that article, and there is no telephone connecting the two places. Fortunately, however, the East Malvern gentleman possesses a wireless transmitting set, and his Box Hill friend a receiving set. It was a simple matter to flash the desired message through the ether, and the article duly reached Sydney on time—and a day earlier than would have been possible had radio not been available to bridge the gap.

This incident emphasises two points, firstly, the practical value of wireless in commercial work, and, secondly, its growing popularity as indicated by the fact that it is available to communicate between points not yet connected by telephone, despite the latter's hoary age in comparison to radio.

Dance Music by Radio

Novel Event in Adelaide

(By Our Special Correspondent.)

THE "house full" sign had to be displayed outside the Hall of the Royal Institute for the Blind at North Adelaide on June 28. The occasion was the first public demonstration of broadcasting music in this State supplied for dancing for the Blind inmates of the Institute. The novel plan was thoughtfully arranged by the Wireless Institute of South Australia. Included in the throng were a number of foremost citizens. Permission had to be obtained from the Controller of Telegraphs and Wireless. The programme opened with numbers transmitted by radio from the premises of Mr. H. Austin of Norwood, and every item was rapturously received. Mr. L. Jones had charge of the receiving set installed in the hall.

There was an outburst of applause when the M.C. from a platform announced, "Take your partners for the next dance—the music for which will come from the sky." At the same moment the introductory strains could be faintly heard from the corner of the hall. Everybody was spellbound, and on the faces of the afflicted ones there was a look of joy. Here was something they could appreciate that did not require visionary power. The tune then broke out into a lively fox-trot, but the dancers, still mystified, failed to take the floor until the record was almost half completed. Soon, however, a large number were waltzing, fortified by the knowledge that they were participating in an historic event.

Addressing the gathering, Mr. J. W. Hambly Clarke said that in South Australia there had been many historic events, including the opening of the first mail route, the first tram cars, the first train, the first telegraph wire, and the first telephone. Each of these had been pointed to with interest as a milestone of progress. Public wireless broadcasting, however, eclipsed them all. The fact that Adelaide was able to participate in it almost simultaneously with the rest of the world, showed that South Australia had a place in the vanguard of progress. The world knew nothing more wonderful at the present time than wireless telephony, and those present were fortunate in being able to attend the first public demonstration in the State.

The speaker's remarks were received with loud applause.

Such an event is eloquent of the spirit of enthusiasm that exists among the pioneers of the movement in South Australia.

Personal

Mr. D. G. Wyles, of the Technical Department of Amalgamated Wireless, returned to Sydney by the R.M.S. *Niagara* on June 27, after an absence of fourteen months, during which he visited England, the Continent, Canada, and the United States.

Mr. E. S. Ralls returned to Auckland, N.Z., last month, after a business visit to Sydney.

Mr. J. Malone, chief manager for Telegraphs and Wireless in Australia, visited Sydney on official business about the middle of this month.

Coastal Radio Service

STAFF CHANGES.

Mr. D. Buchán: 5th Class Radio-telegraphist, Relieving Staff, has been promoted to Radio-telegraphist, 4th Class, and transferred from Melbourne to Samarai.

Mr. G. Foot: Radio-telegraphist, Samarai, transferred to Port Moresby Radio as Radio-telegraphist in charge.

Mr. C. J. Lennon: Radio-telegraphist, Port Moresby, transferred to Townsville Radio.

Mr. F. C. Davis: Radio-telegraphist, Townsville Radio, transferred to Melbourne Radio, on completion of his term of Tropical Service.

W. M. (Tongola, Vic.) asks: (1) Range of his set (particulars submitted). (2) If a fixed condenser were used in place of the grid condenser would it increase the range. (3) What would be the best circuit to use. (4) What amateurs would I receive on the above set. (5) If a V24 Valve detector were used in place of the Crystal, what would the Telephonic range be?

Answer: (1) You should be able to pick up Melbourne and Sydney Stations. (2) If you are using a grid condenser with leak resistance as a telephone condenser, there will be an improvement if you use the other fixed one. (3) Connect aerial and earth to primary, and in series with the secondary wire up the crystal and telephones. (4 and 5) No definite figure can be given, as so much depends upon local conditions.

V. W. (Brisbane) asks: (1) If a dynamo of about 40-50 volts d.c. with a 240 volt motor connected to the house current can be used for the purpose of supplying "A" and "B" battery, thus eliminating accumulators and dry batteries. (2) What would be the most suitable amperage of a dynamo for that purpose, or (3) is transformed and rectified current equally as suitable for "B" battery as well as "A."

Answer: It is possible to do this, but elaborate filter systems would be needed to cut down commutator and brush noises. The best method of using power supply is to rectify it with a vibrating rectifier for the low tension battery, and charge a bank of test tube accumulators through an electrolytic rectifier for the high tension.

The construction of both these rectifiers was described in previous issues of "Radio."

J. W. G. (Nana Glen) asks: (1) If he could hear Sydney amateurs (2CM), (2JM), etc., on a three-valve set, situated about 300 miles from Sydney (particulars of aerial submitted). (2) How long would a four-volt 40-amp. accumulator light the filaments of three Expanse "B" valves? (3) How long would the H.T. battery last with the above valves? (4) Would three-wire aerial 6 feet apart instead of two wires be an improvement.

Answer: (1) Using one step of radio and audio amplification, you should hear distinctly the two stations mentioned if no local screening exists. (2) Approximately 15 to 20 hours for a continuous discharge. Use the Expanse "B" as the detector and two V24's or R's for the amplifiers. (3) The average life is about six months. (4) Except for use with a transmitter, the additional wire is hardly worth the trouble of erecting.

Valve (Adelaide) referring tc article in "Radio," June 13, "The Construction of a Magnetic Rectifier," asks (1) number of turns of No. 24 D.C.C. wire required for primary 210 volt working. (2) Number of turns and taps 16 D.C.C. wire for secondary to obtain current for charging six-volt accumulator, etc.

Answer: (1) 1050 turns. (2) The same number of turns will do for four or six volt work, as regulation of the charging rate can be provided by means of a rheostat of three feet of No. 16 nichrome wire. The usual charging period for small accumulators is ten hours, therefore, charge the 30 A.H. battery at about 3 to 3.5 amps, and the others in proportion.

G. R. (Bombala): We have noted your remarks with interest. It would be very inefficient to use so long a lead in wire. Why not erect the aerial closer to the house. The loose coupler is best for short waves and the honeycomb coils for long waves.

A. B. L. (Drouin) asks capacity of condensers to be shunted across primaries of radio and audio frequency transformers.

Answer: The radio transformer condenser should be a 0.001 m.f. variable, while that across the audio is a 0.001 m.f. fixed.

C. H. (Hamilton) asks: (1) Wavelength of coils (measurements submitted). (2) Best coils to use with a valve set? (3) Could signals be received with outdoor frame aerial and crystal set, using 2,000 ohm 'phones (sketch of aerial submitted)? (4) Best circuit for a crystal and a valve set.

Answer: (1) Without a knowledge of the shunt capacity you intend using we cannot state the wave-length range of the coils. (2) Spider webs and single layer for short waves, and honeycombs for long waves. (3) Yes, over a short range. (4) See the combination circuit in the "Experimenters' Corner," published in previous issue of "Radio."

G. C. C. (Bellingen): No definite range can be quoted for your queries, owing to the very variable local conditions.

E. F. A. (Kerang): Your queries would take too much space for reply in these columns. Suggest you obtain copy *Wireless Experimenters' Manual*, by Bucher.

Thanks for your complimentary remarks of "Radio."—Ed.

H. G. (Taree) asks: (1) Wavelength of ships and other stations and time of transmission. Submits parti-

culars and diagram of receiver. (2) Cause of buzzing sound in 'phones on 200 metres? (3) Would a double wire aerial be better than a single?

Answer: (1) The best time for reception is between 8 p.m. and midnight. Except for weather reports from VIS and VIM at 8.30 and 9 p.m. respectively on 600 metres, and time signals from VIM at midnight, there are no other stations you are likely to hear which have a definite operating time. (2) The induction is probably caused by buzzer signalling on nearby telegraph and telephone wires. See issue "Radio," April 18. (3) This depends on length of your aerial, but would not make very much difference for receiving.

Canza (Mildura): Description and particulars of your set have been read with interest. The circuit you use is an excellent one for all-round work. The only suggestion we have to offer is that you adapt it for use as a two-valve reflex amplifier, described in "Radio" No. 5 issue. The only additional apparatus required would be an audio frequency transformer, a .001 and a .0005 M.F. fixed condenser. Ebonite or bakelite is to be preferred, as fibre absorbs moisture during humid weather. The coil holder is satisfactory for small size coils, but we suggest the standard American mounting for larger coils. The secondary and tickler coils should be 75 turns each, owing to the .0005 M.F. condenser being used for tuning the former, use a 50-turn coil for the primary. The "Phillips E" Valve should function the same as a French "R." Use three to four volts on the filament and 30 to 40 volts on the plate.

E. S. (Mincha West) asks: (1) Number of turns of wire for the following wave lengths, using .001 M.F. variable condenser:—(a) 170-375; (b) 200-515; (c) 240-730; (d) 330-1030; (e) 450-1460. (2). Is cotton-covered wire better than enamelled for above coils?

Answer: (1) Assuming a mean diameter of two inches wind as follows: (a) 25; (b) 35; (c) 45; (d) 60 and (e) 75. These values are for use in the secondary only and the ranges will be approximately that which you require, but will vary with different values of circuit capacity. (2) Use D.C.C., as it keeps the internal capacity down.

J. C. M. (Gretna), who at times has trouble to receive the concerts from Melbourne, asks: (1) Would placing of ATI close to a stone wall in the room affect the signals? (2) Would better results be obtained using a 7/20 lead to earth instead of No. 16 copper wire. (3) What is wrong with circuit (sketch submitted).

Answer: (1) Probably your coils are affected by the atmospheric humidity. Treat them according to the process described in "The Experimenters' Corner" of Radio No. 8, pp. 182, under heading of "Improving Honeycomb Coils." (2) Yes, a slight improvement would result. (3) Probably you are not using sufficient reaction coupling.

E. M. (North Melbourne): Your query No. 1 has been referred to Mr. J. H. A. Pike, at Epping, N.S.W. Regarding queries Nos. 2 and 3, we refer you to *The Wireless Experimenters' Manual*, an excellent book by Elmer E. Bucher.

V. R. (Windsor, Melb.) asks: (1) Advantage of honeycomb coil over tuning coil and condenser? (2) How to prevent howling using amplifier in conjunction with crystal set? (3) Can music be received 65 miles on crystal set and one valve? (4) The most suitable aerial?

Answer: (1) A honeycomb coil is merely a concentrated form of inductance and has no special tuning properties which will enable you to dispense with a tuning condenser. (2) If used as an audio frequency amplifier, you need not fear the generation of radio frequency oscillations, but if used in the reflex circuit as described by Mr. Reed in No. 5 issue of "Radio," you can determine if it is oscillating by tapping the grid terminal, when a dull click will be heard. (3) Yes, if local conditions are favourable. (4) The aerial bears no relationship to the valve used.