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OFFICIAL ORGAN OF THE AUSTRALASIAN RADIO RELAY LEAGUE.

Vol. 3.

January 4, 1924.

No. 13

## The Poor Amateur

Probably every new development in civilisation has met with opposition from all quarters.

Men have been killed and tortured for beliefs and theories which are now established facts in the every day routine of life.

To-day, though things are different, many a strong and bitter fight has to be waged before adequate recognition is given to anything new.

In nearly every line of progress we are indebted to the amateur—the man, who through pure love of the hobby in which he is inter-

ested, works at his own idea and brings it forth to the light of day.

Then the other section of the world comes in and steals the idea, puts it on the market and reaps all the benefit.

A case of this kind happened in London recently and concerned a simple but excellent addition to wireless sets.

The amateur received £10 for the idea. The firm who bought it has probably made £10,000.

This sort of thing will always happen under the present antiquated patent laws.

Isn't it a matter for Commonwealth Government consideration?

### Roster for Week ending 9th January, 1924

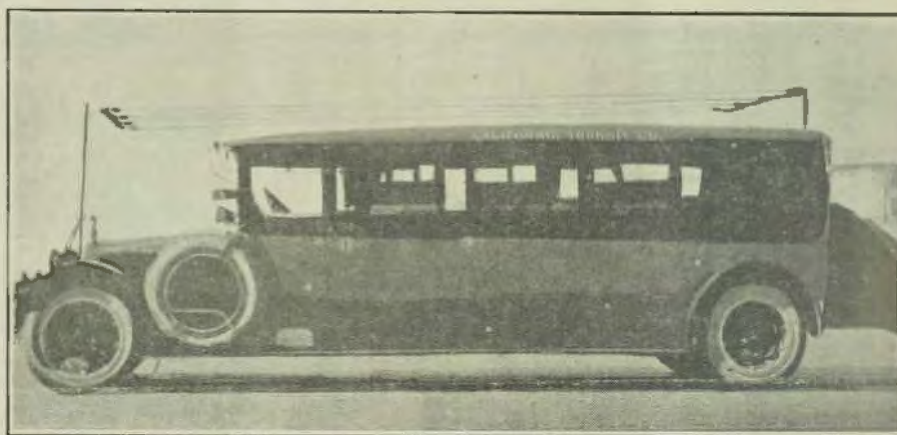
	7.30 to 8.0	8.0 to 8.30	8.30 to 9.0	9 to 9.30	9.30 to 10
Thur, Jan. 3	2 GR	2 UW	2 ZG 2 VM	2 YI 2 RA	2 YG
Friday, ..... 4	2 FA	..	2 JM	..	..
Saturday, .. 5	2 GR	..	2 FA	2 FA	..
Sunday, .... 6	..	2 JM	2 YI	2 YG	..
Mon., ..... 7	2 ZG	2 FA	2 FA	..	..
Tues., ..... 8	2 FA	2 GY	2 ZG	2 FA	..
Wednes., ... 9	..	2 FA	..	2 ZG	..



## NEWS IN PICTURES



NOT THE MILSON'S POINT TO BALMORAL BUS—



—but one of San Francisco's up-to-date Motor Transports. This bus has been equipped with Radio to entertain passengers while travelling

### BRITISH PROGRESS IN WIRELESS



Operating tables at Radio House, London, where actual transmission and reception are carried on between London, New York and Canada

The Continental circuits for communication with France, Spain and Switzerland and other European countries

## Unique Design for Short and Long Wave Receiver

The unique feature of this set is the method whereby a standard three-coil honeycomb hook-up may be adapted for experiments with a vario-coupler or other modifications. Its range covers the amateur, broadcast and commercial wave lengths.

After having constructed, used, torn apart and rebuilt many kinds of receiving sets, I decided that the next

panel. As every builder uses his own pet parts, no attempt has been made to give exact dimensions in the layout.

- 14 binding posts.
- 5 lengths bus bar wire.
- 1 plate variometer.
- 1 rheostat.
- 1 socket; combination preferred.
- 1 mica grid cond. with G.L. mounting.
- 2 extension handles for H.C. mount (hard rubber or bakelite).

This set was designed as a combination long and short wave tuner and is adaptable to the use of the amateur, broadcast listener or ex-commercial operator who enjoys copying a bit of 600 metre traffic or press on longer waves. I, being in the latter class, know how they feel.

Referring to Fig. 4, front view, the parts from left to right are as follows: antenna and ground binding posts; primary condenser, under which is the anti-capacity switch for placing the primary condenser either in series or

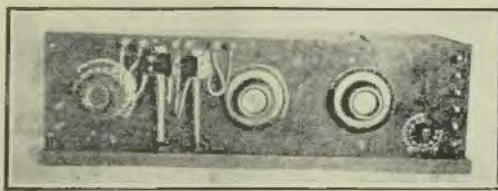


Fig. 1 Front View of Completed Receiver

one I built would be a permanent fixture in my station, writes Herman A. Fischer, Associate Member, I.R.E., in December "Radio." This, however, was not an easy matter to do, as the market was saturated with a large assortment of new circuits and designs. My main desire was to have a set with which I could experiment and change about a bit, but still have an outfit constructed in a cabinet which would present a finished appearance. It could not be of the sectional panel idea, neither could it have a lot of stray wires reaching out in all directions. So, after careful consideration, the set which I will describe was decided upon, and, after testing, I found that I had a set which was complete in every respect.

Figs. 1 and 2 are front and rear views, respectively, from which the reader will get a fair idea of the construction. The circuit, Fig. 3, is of the conventional three-coil honeycomb, but with slight modification. Fig. 4 shows the layout of instruments on the

- A list of parts required to complete the outfit is as follows:
- 1 panel, 7 in. x 24 in.
  - 1 cabinet, 7 in. x 24 in. x 6 in. deep.
  - 1 3-coil honeycomb mounting.

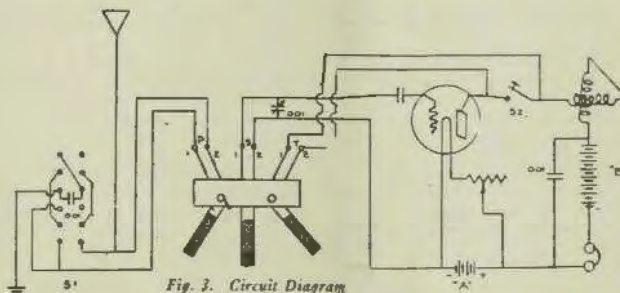


Fig. 3. Circuit Diagram

- 2 .001 MF vernier var. cond.
- 3 4 in. dials.
- 1 anti-capacity switch.
- 1 rheostat dial.

shunt; honeycomb mounting, above which are six binding posts, two each for primary, secondary and plate circuits are as indicated in Fig. 3; secondary condenser; plate variometer, under which is the small push-pull canopy switch for cutting in or out the tickler (see Fig. 3S2); rheostat control; tube windows; and six binding posts, two each form B battery, 'phone and A battery, respectively top to bottom.

Care must be taken when wiring the anti-capacity switch. Needing only a double-pole double-throw switch, and as the anti-capacity switch I used was a four-pole double-throw, I soldered



Fig. 2 Rear View of Completed Receiver

the two poles together on each side (see S1, Fig. 3).

S2, in Fig. 3, is a small single-pole, single-throw, push-pull, dash-board switch or, as in my case, a small push-pull canopy switch as used in electric fixtures. This switch opens the plate to the tickler coil for regeneration by the feed-back method on waves above 525 meters (determined by size of variometer) and closes circuit so that tuned plate regeneration is used on the lower waves, in which case the tickler coil should be removed from the plug. It will be noted that the plate variometer is in series with the tickler when S2 is open. This will allow the plate to be tuned to a certain extent on the upper wave lengths.

The wave lengths which this set will cover depends on the size of the honeycomb coils used. However, the set is not limited to the use of honeycombs only, which is the reason for the six binding posts over the honeycomb mounting. The leads from the honeycombs being flexible and having solder lugs as terminals can be easily disconnected from the posts (connections being made from the outside) and the set is ready for experimental purposes.

If the user desires to try a new variocoupler, he may do so by connecting the variocoupler primary posts to the primary posts on the set and the variocoupler secondary posts to the secondary posts on the set. Keeping S2 closed, he will secure regeneration by tuning the plate variometer. His primary and secondary circuits are tuned by means of the primary and secondary condensers in the set.

Suppose he now wishes to experiment with the much-abused single circuit. Removing his variocoupler from the circuit, he connects a bus connec-

tion from primary post No. 1 to secondary post No. 1 and one from primary post No. 2 to secondary post No. 2. He then either has the choice of connecting his secondary honeycomb coil in the circuit or of using an external coil. Setting the secondary condenser at zero and tuning with the primary condenser in series, he has his standard, single-circuit, using either tuned plate regeneration or feed-back.

These are only a couple of the combinations. Others will suggest themselves.

I am using an external three-coil spider-web mounting and get fine results. With a combination of spider-web coils I can cover a wave length range of from 175 to 1000 metres. I expect to go higher when I get my honeycombs.

Just a word as to the connections to avoid body-capacity effects. The movable plates of the primary condenser should be connected to the ground and the movable plates of the secondary condenser to filament return as per Fig. 3. The stator of the plate variometer should be connected to the plate through S2 and a grounded shield is placed across the panel in back of the secondary condenser and the plate variometer. No body-capacity is experienced with this arrangement even on C. W. signals of short wave length.

The honeycomb mounting is mounted upside down with the knobs underneath. The knobs are removed and substituted by extensions which will bring the adjustment well below the coils so that the operator's hands do not touch the coils. All the instruments are mounted on the panel so that when removing the panel for inspection all connections are on the panel.

A CONDENSER BANK OF ADJUSTABLE QUALITY.

A very useful piece of apparatus for the wireless man's bench is a bank of fixed condensers wired in parallel, and so arranged that any can be removed or changed instantly. By making various combinations any capacity up to the total of that of the fixed condensers in one's outfit may be obtained readily. To be able to do this is a great boon when one is experimenting in order to find the best value of the condenser to be placed in shunt with telephones, loud speaker, the windings of transformers, the high tension battery, and so on. It will also be found particularly useful if one is making up low frequency resistance capacity amplifiers as a simple means of discovering the best value for the grid condensers.

The condensers used are of the flat metal-ended type, which fit into clips. Both condensers and clips can be bought quite cheaply from advertisers in this journal, but those who prefer to make their own are referred to the description which appeared previously in "Wireless Weekly."

A very handy formula which was given may be repeated. The capacity in microfarads equals  $O \times N \times 0.0001$ , where O is the overlap of the plates in square centimetres, and N the number of dielectrics made of the best ruby mica 0.002 in. thick.

The panel for the condenser bank is a piece of 1/4in. ebonite measuring 4 1/4in. by 6 1/4in. This is marked out and drilled as shown in Fig. 11, all of the holes being 4BA clearance. Two strips of sheet brass 5 1/4in. long and 1in. wide are each drilled with seven 4BA clearance holes to correspond with those in the panel.

The strips are now laid on the panels. The terminals are passed through the end hole of each and secured. The clips are then fixed in place by means of 4BA bolts passed through the brass strips and the ebonite. All that remains is to mount the panel upon a small box about 1in. in depth.

It will be seen that whatever condensers are placed in the clips the total capacity of the bank is the sum of their individual capacities, since all are in parallel. If, therefore, a set of condensers is made ranging from 0.0001 uF. to 0.01 uF., as described in the note already referred to, the experimenter, by using combinations of large and small sizes, can obtain a very wide range of capacities in steps of 1.0001 uF.

R.W.H.

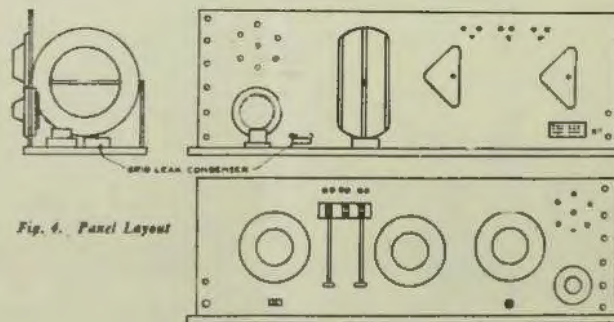


Fig. 4. Panel Layout

*Reception above the Clouds*

The pilots of two of the balloons which took part in the national elimination balloon race which started from Indianapolis, July 4th, have made interesting reports on radio conditions as they found them in the clouds high above the earth during the contest.

Ralph Upson, one of the country's most prominent aircraft engineers, was the pilot of one of the big gas bags which was equipped with a General Electric receiving set.

From the report made by Upson after the contest it appears that interference from static is confined to a low atmospheric belt, comparatively close to the earth. The report in detail is as follows:

"One of the outstanding happenings in the use of radio in the balloon race was that at altitudes of 3,000 feet and above we observed absolutely no static whatever, although we could see lightning at various points on the horizon.

"Andrus, my aide, acted as chief radio operator. He began listening in at 8.30 o'clock the night of the race.

At 9.45 o'clock, Central time, Andrus picked up the latter part of the

weather report from WGY in Schenectady. We heard just enough of it to make us wish we had heard the entire report. However, our disappointment was short, for a few moments later the whole report was repeated, every word being received clear and distinct. It was just the news we wanted.

"As a result of the information, we decided to go a little higher up, but not to try any high altitudes unless forced to it by thunderstorms. The report gave us full confidence of reaching New York State and possibly New England. Everything seemed so favourable that I turned in to sleep, leaving the balloon appendix partially closed. Then came the accident, and you know the rest—a forced landing."

Lieut. Robert S. Olmstead, pilot of the Army balloon S-6, which won the race, and who will be the leading American entry in the international race at Belgium, in September, reported that while drifting over Lake Erie on July 4th, he received radio returns of the Dempsey-Gibbons fight at Shelby, Mont., and later on picked up radio crop reports, bedtime stories and instrumental music.

Four balloons in all carried radio.

Besides Upson's and Olmstead's balloons, the other two army entries were equipped. Lieut. Jordan has not yet made a report but Captain Lester T. Miller has written the General Electric Company, informally praising the radio set and its valuable use during the race.

"Lieut. Brown and myself during our flight found your set worked very satisfactorily in every way," Capt. Miller writes. "As you know the counterpoise we used was a seven strand copper wire woven fifteen times about our basket. For our aerial we used 300 feet of the same kind of wire. During the night of July 4 and on July 5 we flew at an altitude of about 4,000 feet. All our weather reports were received very clearly, in fact the clearness of tones surprised both of us as they were clearer than our regular station sets on the ground.

"On July 5, after 8.30 a.m., we flew at a higher altitude and at heights of 5,000 feet and above we found that static was so bad that we were not able to receive satisfactory signals. We consider the set a very fine one and heartily recommend it for purposes of this kind."—Wireless Age.

**"Burginphone" Broadcast Receiver**

These receivers range in size from 2 valves up to 7 and in price from £33/10/- up to £150 for Complete instruments. NOTE THAT THE PRICE IS "COMPLETE" WITH THE EXCEPTION OF A LOUD SPEAKER.

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*We are Sole N.S.W. Agents for "Kellogg" Radio Equipment which is considered the most efficient and most attractive apparatus yet put on the market.*

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## Selector Circuits to Eliminate Interference

While telling little that is new in wave filter design, this article gives the results of experiments by a practical man. His recommendations are so simple and so easily followed that they are worth trying.

The problem of eliminating interference is that of increasing the selectivity of a receiving set, writes George C. Jones, in December "Radio." After trying out and modifying every idea that came my way, I selected that shown in Fig. 1 as being the simplest. It consists merely of a 40-turn coil, a 00025 mfd. fixed condenser and a 44-plate variable condenser added to an ordinary single-circuit regenerative receiver. This "selector" can be assembled in a separate cabinet so that it may be attached to any set at will. It may also be used as a wave meter, especially if equipped with a series-parallel switch.

While a honeycomb coil may be used, I have secured the best results with 40 turns of No. 14 wire bank-wound on a 3-in. coil with the regular honeycomb coil mounting. With an additional 25-turn and 60-turn coil it will be possible to cover a wave-range from 150 to 800 meters with a 100 ft. aerial.

The tuning inductance on a regular set need not be changed and it makes no difference how far the selector is placed from the set, as the selector coil must not be in inductive relation with the tuning-coil of the set. If the set has a series condenser in the antenna lead, the fixed condenser C5 can be omitted and the aerial lead of the selector connected to the regular A lead of the set, or—the C5 can be left in place and the condenser of the set changed to a parallel connection as in Fig. 1.

In using the selector, the switch S1 is placed at the open position and the set is tuned in the usual way. The set

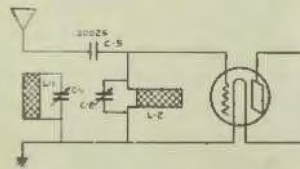


Fig. 1. Selector for Single-Circuit Set

is fairly selective this way, in fact much better than a plain single-circuit, as the condenser C5 acts somewhat as a loose coupling and signals a little off from the wave you are receiving are stopped to a certain extent and the set is not affected otherwise than by a

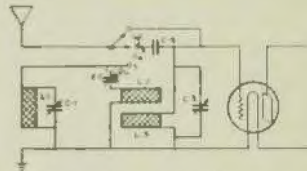


Fig. 3. Selector for Combination Set

slight lowering of the wave length and a hardly perceptible decrease in signal strength.

Next throw S1 to the closed position and the signal will perhaps fade or entirely disappear, but do not try to retune, as the signal is merely going to ground through the selector and you cannot tune the set so that it will come back. Now, by leaving the set tuned as it is moving the C1 back and forth, a setting will be found where the signal comes back to the original strength, as the selector acts as a choke for that particular frequency and it cannot get through easily.

Reasoning that if it were so good on a single-circuit tuner it would be better if adapted to the primary of a two-circuit tuner, Fig. 2 was evolved and proved superior, although slightly more complicated. In this case the fixed condenser C5 was omitted as the series-primary condenser C2 serves in its place and also tunes the primary coil L2.

In tuning, switch S1 is opened and the signal tuned in as usual with a double circuit and then the selector is switched in and the interference eliminated.

In this hook-up the desired signal is allowed to pass freely through C2 and L2, as when a coil and condenser are

in series and tuned to resonance they furnish a free path to a certain frequency and act as an impedance to others. So here we have an ideal state of affairs, C2 and L2 let the desired signals pass through, thus inductively energizing coil L3 while C1 and L1 let the undesired ones through to ground and send the wanted ones around the detour to the set.

Now I should have stopped here, but as a two-blade switch-lever was lying on the bench along with a lot of unused tappet-points, I reached out for a pencil and paper and in a short time had circuit Fig. 3, which is a handy combination of Nos. 1 and 2. By setting the switch lever S2 on two of the seven points and leaving one point unused between we have the following circuits:

- Points No. 1 and 2.—Plain single-circuit.
- Points No. 2 and 4.—Single-circuit with series condenser.
- Points No. 3 and 5.—Single-circuit with "selector" attached.

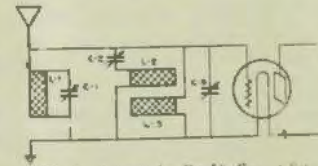


Fig. 2. Selector for Double-Circuit Set

- Points 4 and 6.—Single-circuit with "one-wave" bypass.
- Points No. 5 and 7.—Two-circuit with "selector" attached.
- Points No. 6 or 7.—Plain two-circuit.

The writer was afraid to do any more on the thing, thinking it might start to broadcast its own music, so it's all yours; see what you can do with it.

Don't forget to mention "Wireless Weekly," when dealing with our Advertisers.



January 4, 1924.

WIRELESS WEEKLY

7

## An Interview with Lord Robert Cecil

(By R. M. Clarke.)

*"We hope to broadcast the proceedings of the League of Nations from Geneva next year. It would be a very good thing for international peace."*

"Why not broadcast the proceedings of the League of Nations from Geneva?"

The question was asked at the end of a prolonged grilling by newspaper reporters. Lord Robert Cecil had just arisen as a sign that the interview was over, and stood with his back to the fireplace in the library of Mr. Thomas W. Lamont's house, in New York City, where he was a guest.

He turned to his last questioner with that quick smile that had endeared him to the inquisitive circle.

"We hope to do so next year," was his reply. "It would be a very good thing indeed, a very good thing."

That was the last piece in what might be called a picture puzzle, the subject of which was the famous statesman's opinion as to the value of radio broadcasting in furthering the cause of international peace. The other bits had been collected one by one during the previous hour and a half.

Only the night before Lord Robert had spoken at a dinner at the Hotel Astor, New York, to an immediate audience of some 2,000, and to the vast radio audience as well. His topic had been the League of Nations, on which he is exceptionally well qualified to speak, having played a prominent part in the peace negotiations in 1918 and 1919, and being at the present time one of England's representatives before the meetings of the League in Geneva.

With such a man, and such a subject, the newspapers were eager for personal interviews, and 3:30 p.m. on the day following his opening speech in America, was set as the time when reporters would be received in a body. This is the common practice: it saves everybody's time, and shows no favours to anybody.

"The Wireless Age" was represented in the group of about twenty men and women from all the New York papers and news associations, who fired question after question at the famous man.

He is a tall, lanky, stoop-shouldered Englishman, who comes from a long line of statesmen, the first of whom

won distinction by having been a minister for Queen Elizabeth.

He lolled and rolled somewhat awkwardly in his low chair at the fireside, twirling a pair of steel-rimmed spectacles in his hands, and turning his kindly eyes direct upon each questioner while he responded as well as he was able to the sometimes foolish and sometimes searching questions that were put to him.

Early in the conference he modestly explained his reason for coming to America. "I am not here to instruct the American public in its own af-

"Oh, yes, indeed it has," he responded quickly. "I am very much surprised at the tremendous development in it here. It is far superior to anything we have, you know. It was used at the dinner last night. The comparison between here and in Europe is astounding, and it is a very wonderful thing for reaching the public. I shall be most glad to take advantage of it while I am in this country, though, of course," and here a smile, "that will depend upon the people who organise the meetings for me in the various cities."

That was one piece of the picture. Questions by others developed clearly Lord Robert's great enthusiasm for the League, not as a perfect instrument, but as an organisation that already has accomplished much, and shows promise of doing more.

He told how the meetings in Geneva between diplomats and statesmen who otherwise never would see each other had promoted better understandings among them. He likened the meetings to conferences between the partners in a business, held to develop the enterprise co-operatively along the most profitable lines.

While he admitted that the men in Geneva had the same nationalistic prepossessions and political aims as they have when they are in their national capitals, still he maintained that the personal contact and public discussion of the League meetings already had prevented war and made possible the taking of certain steps toward recovery by Austria. He outlined this as the first step in abolishing war.

"You have got to get rid of fear and suspicion, bred of ignorance. Moral and intellectual disarmament must come first, through encouraging all forms of international co-operation and communication."

Quickly, before he resumes:

"Do you not think that international broadcasting, which certainly is coming soon, will do much to bring about 'moral disarmament' by promoting international understanding?"

"I certainly do," he said, turning squarely to face the questioner and

*Continued on page 15, col. 1*

### Wireless Weekly Cup

*Details of our Silver  
Cup Competition will  
be published at an early  
date.*

*Two Silver Cups are  
to be presented for the  
Best Valve & Crystal  
Sets made by any Am-  
ateur in Australia or  
New Zealand.*

airs," he said. "I am simply here to give such information as I am able to give on a subject that holds the interest of certain Americans. I hope to be able to tell you something worth hearing about, on the League of Nations. My object is to give information. I am not an impertinent inter-venor in other people's affairs."

To give information—that was a cue:

"Has not the radio telephone simplified your task of giving information?"

## Pioneer Work in Ether Waves

(By SIR OLIVER LODGE.)

Early pioneering work is too often overlooked and forgotten in the rush of a brilliant new generation, and amid the interest of fresh and surprising developments. I often think, however, that the early stages of any discovery have an interest and fascination of their own, and that teachers would do well to immerse themselves in the atmosphere of those earlier times, in order to realise more clearly the difficulties which have to be overcome, and by what steps the new knowledge had to be dovetailed in with the old. Moreover, for beginners, the nascent stages of a discovery are sometimes more easily assimilated than the finished product. Beginners need not, indeed, be led through all the controversies which naturally accompany the introduction of anything new; but some familiarity with those controversies and discussions on the part of the teacher is desirable if he is to apprehend the students' probable difficulties. For though he does not himself feel them now, the human race did feel them at its first introduction; and the individual is liable to recapitulate, or repeat quickly, the experience of the race.

A large number now interested in the most modern developments of wireless will have but little idea—perhaps none at all—of the early work, in apparently diverse directions, which preceded and made such developments possible. And even those who are high authorities in wireless telegraphy, and know nearly all that can be known about it, can hardly know the early stages quite as well as those who have lived through the nascent and incubating period. Only those who have survived the puzzled and preliminary stages of a discovery can fully appreciate the contrast with subsequent enlightenment. It may suffice to say that the term "inductance" or "self-induction," which we now use so glibly, did not at first exist; and that so late as 1888 Sir William Preece still spoke of it as "a bug-a-boo"; whereas it is the absolute essential to tuning, and even to electric oscillation, Lord Kelvin, who first introduced it as a mathematical coefficient, without any explanation, called it "electro-dynamic capacity." The name "self-induction" was given to it by Maxwell, though it was long before it was understood or utilised, and the name "inductance"

was a nomenclature of Heaviside. It must be very difficult for some of you who are so familiar with these things now to realise the dense state of ignorance in which your scientific ancestors were.

Silvanus Thompson, well-known as an historian of science, wrote in 1911 a carefully drawn up pamphlet about the history of wireless (though it was never published) for use in a trial before Mr. Justice Parker, when my patent for tuned or selective wireless came up for extension. This patent, dated May, 1897, was extended in 1911 for seven years, and was then acquired by the Marconi Company from the Lodge-Muirhead Syndicate. Its validity was subsequently contested before Lord Moulton, but was triumphantly upheld, after twelve days trial, as containing the necessary and fundamental principle of all tuned wireless not involving continuous wave transmission.

But my present subject has nothing to do with details of tuning, nor with wireless in its present condition. That all dates after 1896, most of it after 1900; and I wish to say practically nothing about anything later than 1896. What I have to deal with is the early pioneering work, apart from practical developments. And let me here say at once, to avoid misunderstanding, that without the energy,

*Continued on page 15, col. 1.*

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(Republished from the Sydney Morning Herald.)

In some branches of discovery and invention it is often asserted that Australia lags behind the rest of the world, but this cannot for one moment be applied to her activities in connection with the transmission and reception of wireless messages. During the past year Australian experimenters have achieved some remarkable results, particularly in regard to the transmission of wireless signals using extremely low power; in fact, world's records have been created by Australian experimenters. Some little time ago Mr. Charles MacLurean, of Strathfield, who may rightly be regarded as the leading experimenter in the Commonwealth, commenced a series of tests with a view to determining just exactly what distance could be covered with a very small power. Commencing with the power usually needed to operate his set he gradually reduced, until, after considerable experimenting, he was operating his station on about one-fortieth part of the power ordinarily needed to light the tail lamp of a mot-

or car, and on this almost negligible force communicated with a fellow experimenter in New Zealand.

### Electric Torch Battery.

His tests in connection with the reception of long-distance signals have been almost as remarkable. Using a special circuit he has during recent weeks clearly received American signals using only one valve, and supplying the power necessary to operate the receiver from two small batteries, one of them taken from an ordinary pocket torch, and the other a slightly larger one, supplying a stronger current. The receiver was built by himself, and fitted into a small wooden cage not much larger than the ordinary attache case, and weighing considerably less than most handbags.

Of course it must not for one moment be imagined that ordinary commercial communication could be established and maintained under these test conditions. The receivers used in New Zealand to secure Mr. MacLurean's low power transmission were ex-

tremely sensitive, and were operated by an expert, and the reception of American signals at this end was accomplished under extremely favourable conditions. At the present time a costly high-powered station is necessary to maintain constant commercial communication, but the experiments serve as a guide to show that considerable progress is still being made in connection with the wireless transmission, and also serve as a guide to the enthusiast who ventures to prophesy regarding the future of wireless.

The continuous wave method of signalling was employed in connection with the tests, and the signals were, of course, tapped out in code. So far no American telephony has been heard in Australia, although in New Zealand several amateurs have succeeded in receiving some of the programmes of speech and music which have been broadcasted from large stations on the west coast of the United States. Those who are interested in long distance

Continued on next page

## The PACIFIC RADIO COMPANY

— SYDNEY —

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PACIFIC De Luxe Model Four Valve Receivers, housed in floor model, highly polished cabinets, complete with loud speaker, Willard storage batteries, H.T. batteries, aerial wires, insulators, and flagpoles, installed free within 50 miles of Sydney

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EXPERIMENTAL STOCK includes New System Telephones, Headsets, Magnavox Loud Speakers, Western Electric Co's. Apparatus, and all makes of high-class Apparatus used in experimental Receivers.

The attention of the trade is called to the fact that we are now prepared to receive enquiries for the supply of sets tuned to the various broadcast stations.

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Works and Experimental Station: 38 DONNELLY STREET, BALMAIN

communication are anxiously awaiting the opening of the large broadcasting station 2FC in Sydney, not particularly for the purpose of receiving the programme from it, but to note whether the items broadcasted with the use of 5000 watts power will be received by American experimenters. If such is the case another record will have been created by Australian engineers.

*Special Tests.*

A special series of tests are to be made during the new year by Mr. MacLurean, assisted by Master Jack Davies, of Vauluse, a keen young amateur, who has made quite a name for himself in the wireless world. These two amateurs will leave for America on the steamer Tahiti, which will be fitted with a special short wave, low-powered set, similar to the one on which such remarkable work has been carried out by Mr. MacLurean at Strathfield. On the voyage across Australian amateur stations will be operating with the Tahiti, and logs will be kept showing the distance over which the signals from these stations are audible, and also the strength of signals over these distances. Mr. Mac-

lurean's own station will be operated by some fellow-experimenters, and will be in touch with the Tahiti on the trip across.

None of the signals transmitted from Australian amateur stations have yet been officially received in America, although the latest mail has brought word from the Secretary of the American Radio Relay League to the effect that some Australian signals had been picked up. Considerable discussion has taken place in amateur circles concerning the matter, and the view has been expressed that the fault lies with American operators rather than with Australian amateurs. It has been pointed out that in America, with a large number of stations working, many signals can be secured with a minimum amount of operating skill. Australia is, however, widely distant from the centres of wireless activity, and Australian experimenters have, therefore, by sheer force of circumstances, been compelled to specialise in careful operating in order to obtain results when attempting to work trans-ocean traffic. This training has stood them in good stead, and has enabled

them to receive from America. During the trip on the Tahiti Mr. MacLurean will endeavour to prove that this view is the right one.

He will carry with him the receiver which he has been using in Sydney, and on which he has received American signals. His own station will work at regular hours, and if he succeeds in copying its signals while lying in San Francisco harbour he will have proved the claim that Australian operating is superior to any in the world.

**IRON OR COPPER.**

The question has been asked: "Is iron wire all right for an aerial?" Iron wire can be used for short distance receiving, and it may give fair results over long distances, but copper wire would be very much better. Copper carries electricity much better than iron. If a very strong wire is wanted, copper clad iron wire may be used. This has a tough iron centre and is coated with copper. This is just as good as solid copper, for the current only flows on the surface of the conductor.



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to Experimenters  
and to those  
about to enter the  
field of Wireless*

**D**URING the month of January **LARGE REDUCTIONS** will be made of our stocks of **EXPERIMENTAL SETS and PARTS** at **COST and under COST PRICES**, all of which will carry our guarantee to give satisfaction. A Small Transmitter with Tube Modulation complete with Valves and Batteries ready for use at £25 is just one of our many bargains. *Stocks limited. Send your Order as early as possible*

# NEWS IN BRIEF

Mr. P. Holdsworth, of Adelaide, who has written many interesting items for our readers, is leaving shortly for England.

Wireless broadcasting in Victoria will be commenced in January. The Postmaster-General (Mr. Gibson) recently said that Farmers Ltd., Sydney, had been granted two licenses in Victoria. One of the licenses was for broadcasting on a short wave-length for the metropolitan area, while the other was for a long wave length to cover Victoria and Tasmania.

Mr. Mark Reid, Vice-President of the Chamber of Commerce, told the Navigation Commission on Thursday that, although Newcastle comes third on the list of ports for outward tonnage, it is without a wireless station.

"There are more than 100 cases on record," he said, "of delays to wireless messages."

Australia may rightly regard the past year as one of remarkable progress and development, says 2RN in the Sydney Morning Herald, in connection with wireless telephony, and if the events of the past may be taken as any indication of events to happen in the future, some remarkable developments may be looked for during the coming 12 months.

Sir Westcott Abell, in delivering the Hawksley lecture at the Institute of Mechanical Engineers, London, and in referring to the progress in wireless telegraphy and the regular broadcasting of weather reports, said he foresaw a time when lighthouses would be rendered unnecessary, and ships would be able to avoid collisions because they would be able to locate each other's positions even when they could not see.

A "listener-in" 200 miles from a broadcasting station hears the notes of a signal sooner than those standing in the transmitting room. This is because wireless waves travel faster than sound waves.

A recent survey made by the Department of Agriculture in U.S.A., shows 40,000 radio receiving sets on farms in more than 700 counties. On this average, it is estimated, there are more than 145,000 sets on farms throughout the country. At least 150 radio stations are featuring weather, crop, market, grain and produce reports, as well as broadcasting special farm programmes.

Intense interest has been aroused by further successful feats of broadcasting across the Atlantic. Greater progress is prophesied for 1924, but even more important are the commercial developments hinted by the Marconi Wireless Telegraph Co.

Mr. Godfrey Isaacs, managing director of the company, said on Monday, December 31: "There is a great possibility of important developments coming during the year. Signor Marconi's experiments with directional wireless may revolutionise wireless communication. An imperial chain would be an enormous step forward, if put into execution."

In consequence of the political unrest in Britain, Mr. Bruce has been unable to advance his wireless proposals to any degree.

Radio is being used successfully in India to send messages over a mountain 15,000 feet in height. Previously, considerable difficulty was found in wire communication due to heavy snow drifts and storms which severed the lines. This achievement has been effected between the cities of Srinagar and Jammu, in Kashmir. Other installations have been effected or are planned to Bhopal, Gwalior, Hyderabad and Rejkot, by Marconi engineers.

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**BROADCASTING**

*Year's Progress*

During the past year much has been done to establish broadcasting in Australia, writes 2RN in the Sydney Morning Herald. At a conference held in Melbourne a scheme which it was considered would suit Australian conditions was drafted and made law. Under it licenses have been granted in several parts of Australia, and in Sydney two broadcasting stations are now operating. One of these is controlled by a combination of retail traders, and charges no fees for its programmes, its owners looking to increased profits from the sale of apparatus to reimburse them. Another large station has now almost completed its test period, and will shortly transmit at regular hours on high power.

One of the most remarkable features in connection with the establishment of broadcasting services has been the almost unbelievable sensitivity which has been attained in the construction of some portions of the apparatus. During recent weeks in Sydney some special tests have been carried out in regard to the placing of microphones in broadcasting sta-

tions and studios. The microphone is the small but sensitive instrument which collects the sound waves, transforms them into minute pulsating electrical currents, and delivers these currents to the actual transmitter, which impinges them on ether waves, and radiates these waves in all directions.

While tests have been carried out it has been demonstrated that the machine has been perfected to such an extent as to be more sensitive than the human ear. During the rendering of piano solos the actual finger noise made by the contact between the pianist's fingers and the ivory keys, quite inaudible to the ear, has been picked up and transmitted, and some careful placing has been made necessary in order to avoid the collection of these sounds. Small noises in studios such as slight rustling of papers or drapings, also quite inaudible to the ear, have been collected and transmitted.

Tell your friends about  
Our Big Competition

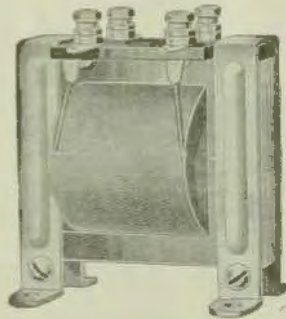
**SENSITIVE RECEIVER**

*Tests at Wingham.*

Recently Mr. E. McC. S. Hill had a wireless set installed at his residence in Bent Street, Wingham. He has during the past week or so achieved wonderful success so far as experimental tests are concerned. From Farmer's Ltd., of Sydney, songs have been heard with a distinctness that was remarkable, as also piccolo solos and piano solos. Mr. Hill has not only heard quite distinctly musical and vocal items, but more remarkable still, he has more than once heard the movement of those responsible for the items; the rustling of paper, and so forth.

During the rendering of piano solos the actual finger noise made by the contact between the pianist's fingers and the ivory keys, quite inaudible to the ear, has been picked up and transmitted. Small noises such as a slight rustling of paper or drapings, also quite inaudible to the ear, have been collected and transmitted. Mr. Hill has already experienced these remarkable results on his machine at Wingham, and his machine is simply an experimenting one, but yet serves to prove that there must be wonderful achievements ahead for wireless.

THE JEFFERSON



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## WIRELESS CONTRACT

### England to Australia

Agreement jeopardised.

Owing to the decision of the British Government not to grant a license to the Marconi Wireless Co., for the erection of a wireless station in Great Britain to communicate directly with Australia, the agreement entered into two years ago between the Commonwealth and the Amalgamated Wireless (Australasia) Ltd., of Sydney, for direct communication between the two countries has been imperilled.

Under the terms of the agreement the company was required to provide main trunk stations in Australia and the United Kingdom within two years from the date of the agreement (March 26, 1922). The company also was required to arrange within two years from the date of the agreement for the erection of a station in Canada capable of commercial communication with high power stations in Australia. The Marconi Wireless Company was the successful tenderer for the construction of a high power station in Great Britain, but its application for a license was refused by the British authorities.

In consequence of the delay in establishing the necessary station in the United Kingdom, it will be impossible to provide main trunk stations by March next, when the two years' period stipulated in the agreement, expires. Since the matter was discussed at the Economic Conference the Prime Minister (Mr. Bruce) has been in negotiation with the Imperial authorities, emphasizing the urgency of establishing a direct wireless service between Great Britain and Australia because of the existing inadequate cable service. Arrangements had been made for the erection of a station in Australia capable of communicating direct with Great Britain but the work has been held up pending erection of a station in Great Britain.

It was proposed that the Australian station should be situated between Melbourne and Sydney. The successful tenderer for this station was also the Marconi Company, the amount of contract being £487,000. It had been arranged that the station would be the most powerful in the world. It would embody all recent developments in high power wireless communication. The station, it was intended, would differ from practically all high power stations at present in use, in that ther-

monic valves would be used to generate high frequency currents for "energising" the aerial. The station would be capable of communicating direct with Great Britain and maintaining a continuous service. Each of the 20 latticed steel towers, which would carry the aerial system 800 feet above ground, was expected to be a remarkable engineering achievement.

Although the negotiations for the erection of a station in Great Britain so far have been unsuccessful, arrangements have been made to erect the Australian station as soon as the work is undertaken in Great Britain. The Postmaster-General (Mr. Gibson) is not optimistic that the Imperial authorities eventually will be induced to sanction the erection of a station on the present application of the Marconi Wireless Co. He indicated today that the Ministry would be prepared to amend the conditions of the wireless agreement, extending the time for the erection of the main trunk stations provided that there was a reasonable possibility of the Imperial authorities agreeing to erect a station. The British Government, he said, apparently desired to control the transmission of messages from Great Britain. When tenders were invited for the construction of the main trunk station in Great Britain, it was stipulated that the contractor must obtain a license from the British authorities to transmit messages. The refusal of the British Government to grant a license was the stumbling block. Mr. Bruce had continued negotiations while in London, but up to the present had not been successful.

### The Radio Telephone

This is an extremely handy little book, which no radio enthusiast ought to be without, containing as it does, particulars of how it works, what it costs, everything you want to know about radio, what to buy complete, how to make and operate radio sets, and will answer almost all the little problems and difficulties which are continually cropping up. It is on sale at any of the firms advertising in these columns, and is well worth the modest price of 2/-.

### Interstate Tests

#### Melbourne to Sydney.

A record in interstate wireless communication by experimental stations was established on Saturday, December 29, when a Melbourne station exchanged messages with three stations, two in Sydney and one in Hobart. The power used by all four stations was extremely low.

The first transmission by the Melbourne station took place at about 11 o'clock on Saturday night, and the final message was not sent until 1 o'clock on Sunday morning. At times the interstate stations were calling the Melbourne station simultaneously, but late orders of working was established and reports were exchanged. One of the Sydney stations was using an input of only four watts, but was received well in Melbourne. At the Melbourne station an input of seven watts was employed, and its signals could be received sufficiently strong to operate a loud speaker in Sydney. After nearly a month of very bad receiving weather, conditions were ideal, and during the evening a large number of interstate and New Zealand experimental stations working on low power were heard clearly in Melbourne.

#### Selfish Amateurs.

Unfortunately part of the reception of these signals was hampered by a selfish amateur somewhere in Melbourne using an illegal radiating receiver. The energy radiated from this receiver at times entirely drowned the interstate signals. A vigorous campaign against experimenters who use apparatus of this type is being commenced, and many leading experimenters are installing sensitive direction finders to locate stations which interfere with interstate and other weak signals in this manner. Offenders are liable to be fined, and to have their licenses cancelled.

### Value of Shellac

Shellac is best for finishing panels, base-boards and the like. Paint is likely to contain some metallic compound that will set up troublesome "leakage" conditions in the set. In applying the shellac work fast, or it will dry "streaky" while it is being put on. Spread it on very thin, and give it a number of coats, allowing each one to dry before applying the next.



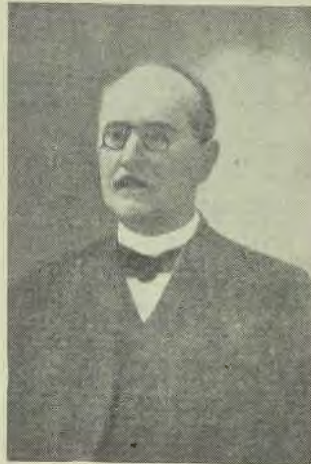
**Pioneer Work**

*Continued from page 8*

ability and enterprise of Signor Marconi, what is now called wireless would not have been established commercially, would not have covered the earth with its radio stations, and that without the valves of Fleming and Lee de Forest it would not have taken the hold it has upon the public imagination. Before 1896 the public knew nothing of its possibilities. And for some time after 1896, in spite of the eloquence of Sir William Preece and the demonstrations by Marconi, the public thought it mysterious and almost incredible; and still knew nothing about the early stages. Indeed, I hardly suppose that Signor Marconi himself really knew very much about them. He had plenty to do with the present; he felt that the future was in his hands; and he could afford to overlook the past without regrets.

It may be doubted whether the younger generations, who are so enthusiastically utilising and perhaps improving the latest inventions, will care much about the past either; but still they may like to know more about the early incipient and pioneering

**The French Savant**



M. Edouard Branly

work, on the production and detection of electric waves in the ether of space. With part of this work, it is true, I was myself concerned, but I must not hesitate on that account, since it was this early work—the outcome of splendid achievement by Kelvin and Maxwell and Fitzgerald and Hertz—which laid the foundations and made all the present superstructure possible.

**Interview with Lord Cecil**

*Continued from page 7*

leaning forward in emphasis, "Anything that promotes understanding is sure to be beneficial in the abolition of militarism. It is as the French proverb: 'to know all is to forgive all,' and I should welcome international broadcasting as a great force indeed for peace."

So there is the complete picture as seen through the eyes of Lord Robert Cecil: the great need of the times is international understanding, in which radio should play a vital part, even to the broadcasting of the proceedings of the League of Nations from Geneva, that the whole world may hear. Radio, the world peacemaker!

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# AUST. DE G.5.A.T.

Have You Heard It?

British Stations Calling!

In the next two or three months listeners-in may hear Great Britain calling.  
Low power and low wave transmission tests are now in operation.

Several members of the Radio Society of Great Britain have often expressed the desire to transmit C.W. messages to Australia.

A prominent Australian experimenter (Mr. Newman) has arranged with the Society to hold the tests from December to March.

Although this does not allow much time to organise receivers at this end, it is hoped that as many as possible to "listen in" at the times given below.

The idea is to test low power and low wave transmission from Great Britain to Australia.

The British stations will transmit on 200 metres calling "Aust. de G.5. A.T." followed by any code word they like.

Wireless Weekly will be glad to hear from anyone who may receive any of these messages.

The tests will be carried out on the following dates and times:

Great Britain Mean Time:  
December 16, 23, 30, January 6, 13, 5.30 to 8 p.m.  
February 10, 17, 24, March 2, 9, 6 p.m. to 8 p.m.

Melbourne Time:  
December 17, 24, 31, January 7, 14, 3.30 a.m. to 6 a.m.  
February 11, 18, 25, March 3, 10, 4 a.m. to 6 a.m.

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**DEAF MAY HEAR**

*Experiments in U.S.A.*

While emphasising that radio will not cure deafness, Dr. Harold Hays, an eminent American authority on the subject, declares that radio offers a source of happiness to the deafened which at present is unrealisable. One of the directors of the New York League for the Hard of Hearing, has been hopelessly deaf for years; so much so that he can only understand when an electric device is attached to each ear. Although in the music-publishing business, he had not been able to hear music for over 20 years. A friend suggested a radio receiving set. To his amazement he could hear so well that now he sits in his easy chair of an evening with headphones clapped on his ears, and hears concerts, speeches, market reports, jazz, and bed time stories. What, says Dr. Hays, does this mean for the future? It means untold happiness to those whose minds have been in darkness for many years, and it means that they or the experimenters in ra-

dio may discover some new method for alleviating deafness.

Dr. Hays goes on to say that at present the N.Y. League is experimenting with a radio set, working in conjunction with skilled radio engineers. They wish to amplify sound so that the hearers will not only be entertained, but their ears will receive exercise at the same time. However, he wishes to emphasise particularly the fact that in 90 per cent. of cases deafness begins in childhood. In many cases, it is preventible at that time. It is not preventible later in life, and, unfortunately, neither radio nor any other means has been found to increase the hearing. He sincerely hopes that radio will solve the problem to some extent, but if it does nothing more than give that added happiness of which the deafened have so little, it will have done a great deal.

**CAPTAIN'S WIFE**

*Gets Radio Craze.*

With an American captain, German officers, Chinese crew, a 5-year-old girl who has seen practically every country in the world, and a bright-eyed little American woman, the wife of the skipper (Captain Sanger), who has made the sea her home, the steamer Arcadia is one of the most interesting steamers that have ever come to Sydney.

Though an American ship, the Arcadia is registered in Panama. This enables her to carry the coloured crew. Were she registered in an American port this would not have been possible.

The captain's wife, and her daughter Cecilia, have been with the Arcadia for 16 months, and have come to love the sea.

Mrs. Langer travels as the captain's wife, "but," she explains, "I am going to be recognised officially on this ship. The wireless craze has got me. I'm studying hard, and before long hope to hold a certificate as a wireless operator."

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# The Australasian Radio Relay League

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

## Application for Membership.

Members are urgently needed and those who have not already joined up are requested to fill in the following form and forward it, together with a postal note covering fees, to the Hon. Secretary, "Milano," Edward St., Concord.

A meeting of the committee of the Australian Radio Relay League will be held in the Royal Society's Rooms, Elizabeth Street at an early date.

A general meeting of members will follow.

The business to be discussed at the committee meeting is of the utmost

importance to the League and includes the question of the actual commencement of operations.

It is some time since a general meeting of members was held, and it is the desire of the committee that as many active and associate members as possible attend.

There has unfortunately been rather a lack of interest in the League during recent months but much hard organising work has been done, and a stage has now been reached when something definite can be offered the experimenter in the direction of interesting operation of his station.

### A.R.R.L.

#### APPLICATION FOR MEMBERSHIP.

The Secretary,  
Aust. Radio Relay League,  
N. S. W. Division. .... 192

I, .....

of .....

beg to apply for admission as Active Member of the Australasian Associate Member\* Radio Relay League. If accepted I agree to abide by the rules and regulations of the League.

License No. .... Date of issue .....

Address at which Station is maintained .....

Postal Address of applicant .....

Particulars of License (transmitting or receiving) .....

Power of Station (if transmitter) enclose herewith being payment of fees for one year.

Usual Signature .....

Active membership only to persons operating transmitters for League. Associate membership to holders of receiving licenses.

Qualifications for membership.

(A) A bona fide interest in wireless; (B) Holder of an experimental license.

J. W. ROBINSON, Hon. Secretary, "Milano," Edward St., Concord.

Subscriptions: Active £2 2/-; Associate, 10/- per annum.

\* Strike out words not required.

*World Stations*

Wireless Weekly has been successful in securing a list of the principal wireless stations in the world, together with the times of operation and the matter broadcasted.

The Sydney mean time is given after the military style.

The figures 0000 represent 12 o'clock midnight; 0340 is 3.40 a.m.; 1640 is 4.40 p.m., etc.

Further lists will be published in each of our succeeding issues

Time. (Sydney)	Name.	Call.	Wave.	Type.	Remarks.
0645	Rome	IDO	11,000	CW	Italian weather report.
0700	Townsville	VIT	2,500	CW	Working with VJZ (Rabaul).
0700	Malta	BYZ	4,200	CW	Weather report.
0700	Paris	FL	7,300	CW	European weather report.
0755	Moscow	RAJ	5,000	Spk.	Time Signal (Russian system).
0800	Annapolis	NSS	16,900	CW	Navigation warnings.
0810	Moscow	RAJ	5,000	Spk.	Russian weather report.
0815	Nauen	POZ	6,300	CW	Working with WSO (Marion).
0830	Lyons	YN	15,100	CW	Press in French.
0830	Sydney	VIS	600	ICW	Weather report.
0900	Darien	NBA	10,000	CW	Working with NSS (Annapolis).
0900	Wellington	VLW	600	Spk.	Time Signal.
0930	Nauen	POZ	12,600	CW	Transocean press.
0955	Nauen	POZ	12,000	CW	Time signal (International system).
0955	Pearl Harbour	NPM	11,500	CW	Time signal (American system).
1000	Leafield	GBL	8,750	CW	Press.
1000	Paris	FL	8,000	CW	Working with FF (Sofia) and WAR (Warsaw).
1000	Darien	NBA	10,000	CW	Working with NPL (San Diego).
1015	San Diego	NPL	9,800	CW	Working with NBA (Darien).
1055	Malabar (Java)	PKX	8,800	CW	Time signal (International system).
1100	Paris	FL	8,000	CW	Working with HFB (Belgrade), and SEW (Nicolai).
1100	Tours	YG	5,300	CW	Working with CNM (Mediouna).
1100	Bombay	VWB	2,000	Spk.	Weather report.
1100	Madras	VWM	2,000	Spk.	Weather report.
1130	Karacki	VWK	2,000	Spk.	Weather report.
1130	Calcutta	VWC	2,000	Spk.	Weather report.
1130	Annapolis	NSS	17,000	CW	General weather report.
1150	Bucharest	BUC	7,500	CW	Weather report.
1150	Toulon-Bourillon	FUT	5,150	CW	Mediterranean weather report.
1157	Melbourne	VIM	600	Spk.	Time signal (International system).
1200	Air Ministry	GFA	4,100	CW	Weather report.
1200	Paris	FL	8,000	CW	Working with FF (Sofia).
1220	Paris	FL	7,300	CW	Weather report.
1227	Adelaide	VIA	600	Spk.	Time signal (International system).
1230	Nantes	UA	9,000	CW	Calls FRI (General French naval call).
1255	Annapolis	NSS	17,145	CW	Time signal (American system).
1300	Annapolis	NSS	17,145	CW	Press.
1300	Paris	FL	6,500	CW	Working with HB (Budapest) and PSO (Posen).
1300	Cayey	NZR	10,500	CW	Working with NBA (Darien).
1300	Darien	NBA	10,100	CW	Working with NSS (Annapolis) and NZR.
1315	Sidi Abdallah	FUA	5,150	CW	Weather report.
1315	Paris	FL	6,500	CW	Working with VSI (Vasluin).
1330	Paris	FL	6,500	CW	Working with OHD (Vienna).
1400	Paris	FL	7,300	CW	Weather report.
1430	Paris	FL	8,000	CW	Press in French.
1500	Rome	IDO	11,000	CW	Working with BUC (Bucharest).
1550	Königswusterhausen	LP	5,250	CW	Aviation weather report.
1555	San Francisco	NPG	4,650	CW	Time signal.
1600	Air Ministry	GFA	4,100	CW	Weather report.
1600	Nauen	POZ	9,400	CW	Working with MSP (Moscow).
1605	Paris	FL	8,000	CW	Working with WAR (Warsaw).
2100	Nauen	POZ	9,400	CW	Working with EAA (Aranjuez).
2100	Paris	FL	6,500	CW	Working with HB (Budapest).

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*Message to Mars*

*Wireless Communication?*

After a year's study of Mars through the powerful telescope at a height of 8000 feet in the favourable atmosphere of Teneriffe (says the London "Daily Mail"), Mr. P. M. Ryves, the British astronomer, has come to the conclusion that it may be possible to signal to Mars, the planet, from the earth. If beings of intelligence really exist on Mars—which is very doubtful—they should understand and be able to reply.

The distance from the earth to Mars when these two planets approach one another most closely is about 36,000,000 miles. Under the most favourable telescopic conditions, a spot in Mars to be seen at all must have a diameter of 30 miles; if the shape is to be discernible, it must be 100 miles or more across; though a long line only a mile wide could be detected with fine instruments.

*Out of Wireless Range.*

A large area, planted mainly with some dark-leaved crop, such as beet, would be visible if the size of the area fulfilled the conditions. Characteristic shapes, a square, a triangle, or a circle, would prove that intelligent beings were at work.

There are, however, other and less clumsy methods. Wireless signalling to a planet seems quite beyond our power, though the most powerful transmitting station is just capable of reaching the moon. But Mars is 150 times more distant, and wireless strength is believed to diminish rapidly in free space.

Smoke signalling, by large squadrons of aeroplanes omitting white smoke over the forests, or black smoke above clouds or snow, could produce a line of smoke 100 miles long and a mile wide, which should be visible in Mars, if Martian instruments were equal to ours.

*Chance next Summer.*

But the most favourable means of signalling is by light. A series of very brilliant flashes, each of a few seconds' duration, could be produced by chemical methods with no ruinous outlay, and should be visible. Or, again, special searchlights could be designed and coupled in series to throw very powerful beams through space.

If there is to be any experiment, the summer of next year will be the best opportunity for many years to come, as then Mars will be unusually near the earth.



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*May be obtained from  
the following firms—*

- L. P. R. Bean and Co.,  
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Colville-Moore Wireless Supplies  
10 Rowe Street,  
Electricity House, 387 George  
Street.  
Home Electrics, 106a King St.,  
Sydney.  
N. P. Olsen, 18 Hunter St., New-  
castle.  
O. H. O'Brien and Nicholl, 37-  
39 Pitt Street.  
Pitt, Vickery, Ltd., 335 Pitt St.  
Pacific Radio Co., c/o Edgar A.  
Henry, 121 Pitt St., Sydney.  
Radio House, 619 George St.  
Radio Company Ltd., 15 Loftus  
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Ramsay Sharp and Co., Ltd.,  
George St.  
Universal Electric Co., 244 Pitt  
Street.  
United Distributing Co., Ltd., 28  
Clarence St.  
Wireless Supplies Ltd., 21 Royal  
Arcade.  
W. Harry Wiles, 62 Goulburn  
Street.*

*Further Lists will appear each  
week as Agents are appointed.*

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January 4, 1921.

WIRELESS WEEKLY

Natural Production

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LOUD SPEAKER**



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