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# RADIO

IN AUSTRALIA  
& NEW ZEALAND

VOL. I.

FEBRUARY 6, 1924

No. 23



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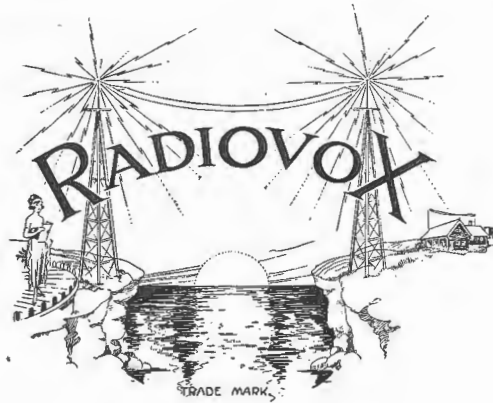
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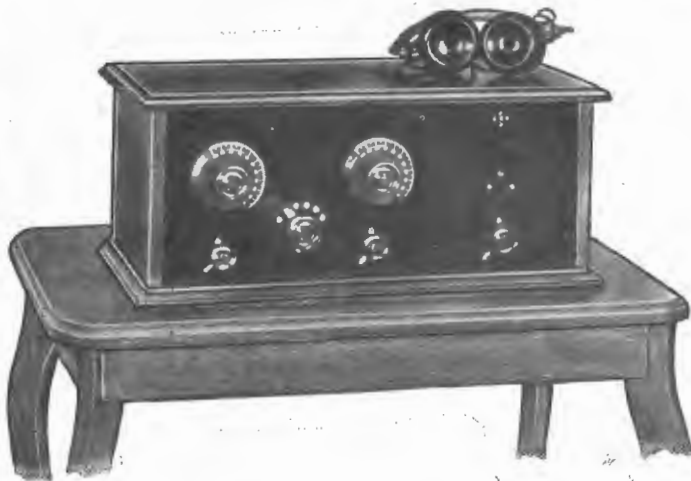


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## The Accessibility of Radio

**I**F the average person had been told two years ago that in a short while he would be able to listen to spoken words transmitted over miles of space without the use of wires, for the small outlay of a few pounds, it is more than likely that, to put it mildly, his credulity would have been strained to the utmost. To recall how that same state of affairs has continued down all the ages, even from the very beginning of Time to the present day, it is only necessary to mention the circumstances that surrounded the invention of the cotton loom, the steam engine, the watch, the telephone, the printing press, the motor car, the aeroplane and many other wondrous things that have now entered entirely into our daily life and become a part of us.

**T**HERE have always been the scoffers and in the cases of a great many inventions and discoveries they have returned again and again to scoff. Hitherto, long has it been before they at last remained to pray.

**T**HERE have been excuses for this "state of stodge." The great discoveries and inventions of the last five hundred years have been perfected and made, comparatively speaking, in the Dark Ages. The men who aided their fellowmen with the products of the brilliance of their brains were head and shoulder above their fellowmen in mentality and broadness of vision. The people, on the other hand, as far as a standard of education and enlightenment were concerned, were not far removed from the beasts of the field. That long period in history was well termed the Dark Ages.

**A**LL that passed the comprehension of the masses was Magic, and as Magic was unclean, unlawful and often as not punished by the penalty of death.

**T**O-DAY, we tell ourselves that we live in an Age of Wisdom. We maintain that Knowledge is strength. Never before have we had so many schools, public and private, universities and technical institutions. Furthermore, possessing the abilities, one can reap the manifold benefits of any or all these institutions for the mere cost of the books required. Education is all but gratis.

**U**NFORTUNATELY, it would appear, we are not so far from the time of intolerance of progress as we would at first suppose. There still remains in us a streak of that suspicious unbelief in the New that has come down to use from our forebears. In this particular instance we refer to Wireless and its attendant facilities.

**P**UTTING it plianly: Wireless seems too good to be true!

**B**Y a turn of the fingers it is possible to actually hear the human voice in speech, song or story instantaneously as it leaves the lips of a person hundreds of miles away. Upon the pressing of a key, which causes an electrical signal, this signal will leave the point of transmission, encircle the earth, return, go round again and yet again in less than a second. Photographs can be sent through the ether and reproduced in their entirety and full detail at the receiving point. There seems not the slightest doubt that moving pictures will eventually be transmitted in the same manner.

**A**LL these marvels can now or will be performed by a mere half turn of the wrist.

**T**AKE the apparatus that enables one to be master of so much. Once given the parts, the veriest school-boy can erect them. Once built a child can control them. On the other hand, those who possess no mechanical or electric "bent," can stand on an equal footing with the most expert operator without the hammering of a single nail or the tightening of one small brass screw. Such is the simplicity to which so great a discovery has been brought to-day.

**H**AND in hand with ease of operation has come lowness of cost. Wireless is the only perfected invention the world has ever seen whose cost has been far below proportion to the benefits conferred. In the short time in which, to us, it has been in existence, it has come within the reach of all. We have had the motor car for over a quarter of a century, but it is still far from the possession of most. Telephones, aeroplanes, gramophones, and many other discoveries and inventions have long been the privilege of the fortunate, but it will be long before they become part of the possessions of the majority.

**R**ADIO in all these respects is unique. It can be had in a form fit for a prince or a pauper. It can be cased in the richest and most beautiful of rare woods, and the ornamentations and appurtenances carved and made by a hand of master-cunning and skill. It can be bought for a song or at the price of a king's ransom. It can be bought in a form so complicated and powerful as to require years of study to understand and control it.

**R**ADIO is open to all and can be enjoyed and controlled by all. It is almost as cheap and universal as the very air we breathe.

**L**ET us, then, all enjoy it as such!

# Broadcasting from Outside the Studio

By ALFRED N. GOLDSMITH, B.S., Phd., Fellow I.R.E.,  
Director of Research, Radio Corporation of America

(Special to "Radio.")

**T**HE long arm of broadcasting is reaching out further and further—both to gather the programme, and then to scatter it again. Although broadcasting is a young art, it has already changed radically from the conditions which the broadcast listeners of a few years ago can remember. In the early days of broadcasting, the programmes all originated in the studio of the broadcasting station, and every artist or speaker had to come to the studio in order to send his message to the world. This was an inconvenient plan since it required that important persons and famous artists had to leave their homes or places of business and travel

to the broadcasting station, wherever it might be located, and sometimes at an inconvenient hour. Nowadays broadcasting stations, which are wisely planned, are located at the musical and artistic centre of their city, and this has made it easier for the performers to be at the station in person.

There are, however, many types of current events which should be broadcast, but which cannot be brought physically to the studio. For example, a theatrical performance or a musical comedy is generally unavailable for studio broadcasting. So also are church services, a dinner given to a world-famous celebrity, a great con-

cert given outdoors or in an auditorium, meetings of legislative assemblies, athletic and sporting events, and the like. In other words, there are many occasions of intense interest to the broadcast listener which, nevertheless, are not transferable from their place of usual occurrence. Fortunately, broadcasting has found the means of gathering them into the station, and then scattering them to its million listeners in unimpaired form.

The most common way of bringing the desired event to the broadcast station is by means of what is termed "wire line transfer," or, as it is sometimes called, "remote control." This consists in using a telephone line to connect the concert hall, for example, to the broadcasting station, and then sending the concert over the wire before broadcasting it. To do this, suitable pick-up transmitters have to be placed in the concert hall at carefully chosen locations. The music is picked up by these, and the corresponding telephone currents are amplified or strengthened by a "line amplifier." The line amplifier is a carefully designed vacuum tube amplifier, somewhat like that in a high-grade radio receiver except that extreme care is taken to maintain the quality of the music perfectly and to get a suitable amount of power out of the amplifier before sending the telephone currents over the wire from the concert hall to the broadcasting station. When these currents, which carry the music, arrive at the station, they are again strengthened in the control room amplifiers of the station, and are then used to control the radio telephone transmitter in just the same way as if the concert had taken place in the studio of the station. In other words, instead of controlling the radio telephone broadcasting transmitter by telephone currents coming over a short wire line from the studio at the station, it is controlled by currents which, when amplified suitably, have



The Pick-up Microphones at the Lewisohn Stadium, New York City, from which the concerts of the famous Philharmonic Orchestra are broadcasted by station WJZ.

come over a long wire line from a distant hall. This is why the process is called wire line transfer of events originating at distant points, the transfer in question being from the distant auditorium to the broadcast station over a wire line.

It is very necessary to place the pick-up telephone transmitter in the concert hall with great care, the problem of a proper location for it being even more serious than in the studio at the station, where conditions are more readily controlled. If an orches-

cept by accident, are interrupted by applause, and by the frequently serious echoes which are found in theatres. Many hours of experimentation are generally required before an important event can be properly picked up for wire line transfer to the broadcasting station.

The first illustration of this article shows the location of the pick-up transmitter at the Lewisohn Stadium, New York City, from which the concerts of the famous Philharmonic Orchestra were broadcast by station

amplifying apparatus, as well as the important "gain control" which enables the supervising operator to regulate exactly the strength of the telephone currents which he places on the wire line to the broadcasting station. It also contains the "volume indicator," which is an instrument that visually indicates the strength of this same current, and thus shows that the transfer is taking place correctly.

Exceptionally good wire lines must be used for this sort of work. If they are noisy, or if they do not transmit



Operator adjusting "line-amplifier" at Station WJY, thus regulating the quality and strength of the broadcasted music and speech.

tra is playing, the transmitter must be placed so that every instrument will be heard in just the right proportion of loudness, and that the orchestra will stay "balanced" when its playing is reproduced for the listener. If a sermon is being broadcast, the preacher, the choir, and the organ have to be submitted correctly, and this may require several pick-up transmitters skilfully placed and appropriately used by a supervising engineer. Theatrical performances are still more difficult to transmit, because the actors move around the stage, do not face the transmitter, ex-

WJZ of the Radio Corporation of America at Aeolian Hall, New York. Such important performances as these bring the best entertainment of the day to every listener.

The line amplifier is a specially designed piece of equipment, as can be seen from the second photograph of this article. This is the type of amplifier which was designed by the Research Department of the Radio Corporation for use at stations WJY, WJZ and WRC. The left hand box contains the batteries and some of the individual transmitter controls. The right hand box contains the tubes and

all tones, of whatever pitch, equally, they will fail to give satisfaction. Consequently facilities for securing such lines and for testing them to determine their characteristics, are needed if acceptable wire line transfer of outside events is required. The broadcast listener to a church sermon, faultlessly transmitted, will often fail to appreciate the elaborate process whereby his favourite preacher's words are being carried to his home by radio.

There is another way of broadcasting outside events which is known as

*(Continued on page 576.)*

# Hearing Through the Teeth

## Journalist's Latest Invention

### Enables Deaf to "Listen-in"

ONCE more science has come to the relief of those who suffer more or less from deafness. Mr. H. Gernsback, the well-known American inventor and editor of *Science and Invention*, and *Radio News*, New York, has just perfected one more of his long list of inventions. The apparatus, the successful completion of which has taken Mr. Gernsback through many months of intricate thought and labour, is for the alleviation of the handicap under which all deaf or partially deaf persons labour.

Hitherto, those who have suffered in a greater or less degree from the lack of their auricular faculties, have hoped, if at all, to one day hear through the ear again. The clever New Yorker in this brain-child has got quite away from that idea. By using the "Osophone" one regains the use of one's ears, not through the ordinary channels at all, but through the teeth!

The "Osophone" consists of two electro-magnets mounted on flexible laminations of iron. Attached to these are two hard rubber bits which are to be placed between the teeth. When the instrument is in operation,



How the invention is used to talk to a person who is hard of hearing. To hear with the "Osophone" the normal person must close his ears tightly when the sound transmission is completely through the teeth. In this experiment an ordinary telephone transmitter connected with a 6-volt battery was used.

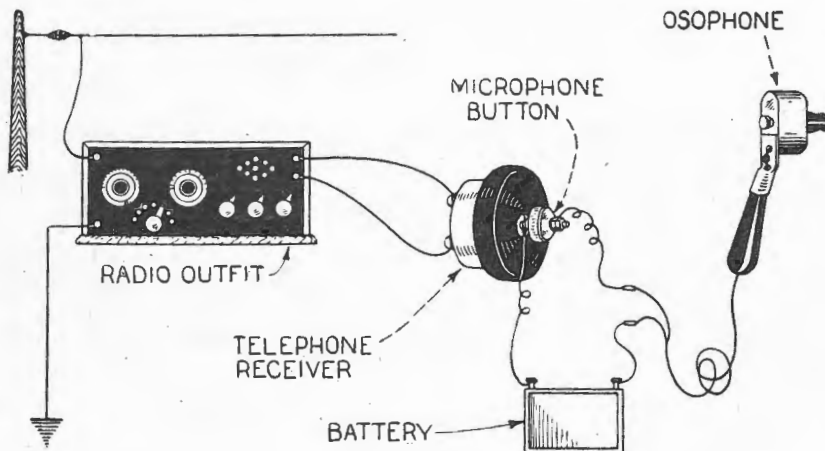
two soft iron pole tips which form the partition between the electro-magnets and the "bits" move to and fro, and the vibrations caused are

transmitted to the teeth. Thence, these are conducted through the bony structure of the head to the aural nerves.

A remarkable feature of this mechanical marvel is that it can easily be connected to a broadcast receiving set, to the telephone, to a phonograph or even to a pocket transmitter such as is used with a pocket dictaphone by many partially deaf persons.

In cases where the Ear Diaphragm is destroyed, although the nerve still remains, the "Osophone" has been found to function particularly successfully in making the deaf hear.

For the hopeless cases where the auditory nerve no longer remains, the inventor makes no claim to restore hearing; hearing, that is, as we know it. But, on the other hand, the use of the "Osophone" by many hitherto completely deaf persons has led to a most startling discovery.



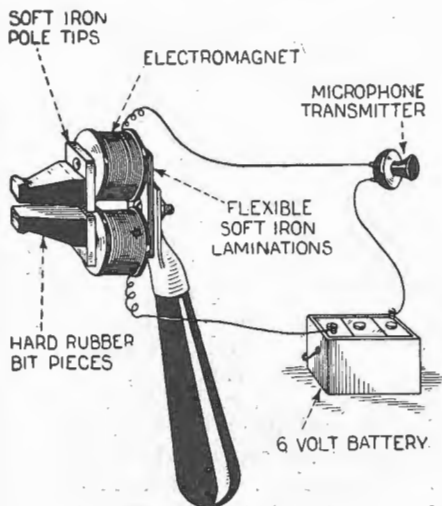
The above diagram shows how the "Osophone" is connected to a radio outfit to enable the partially deaf to enjoy wireless concerts.



Persons who were entirely without the sense of hearing, after persevering with the use of the apparatus, were eventually able to translate the vibrations imparted to their teeth in

To those whom the endless pleasure of listening to broadcasting has been denied through shortcomings of the ear, the "Osophone" will prove a perfect boon. This invention has been

mounted in the centre of its diaphragm a microphone button and the "Osophone" is then connected in series with it and a four to six-volt battery. Sound coming through the



The above illustration clearly shows the wonderful simplicity of the "Osophone." Although it will not make the deaf hear, it will prove a boon to the partially affected.

terms of sound. That is to say, certain sounds caused certain similar and sympathetic vibrations on the teeth, and these, in time, the sufferer learnt to regard as meaning certain sounds which represented words spoken into the microphone transmitter. Striking as this may seem, it is only a variation of the well-known fact that totally deaf persons have in many cases learnt to "hear" telephonic conversations by placing the tips of their fingers on the diaphragm of the receiver and feeling the vibrations trembling there.

come quite a common adjunct to radiotelegraphy receiving sets as used in the United States. The method of its addition to the set is simple. An ordinary 1,000 ohm receiver has

telephone receiver operates the microphone which, in turn, energizes the "Osophone." Simple, is it not?

All great inventions are.



Here the "Osophone" is used by the inventor, Mr. Gernsback, in connection with a radio receiving outfit.

**PLACE YOUR HOME ON THE AIRLINE.**

Instal a broadcast receiving set, and a high-class programme of music, news and information will be available each day and evening for a whole year — and as long after as you wish. You owe it to yourself and family to help in the grand ideal of having "A Receiving Set in every Home."

**At 250 Miles a "Burginphone" Receiver brings in Farmer's Service on a Loud Speaker in daylight**

**USING 3 VALVES.**

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All Burginphone receivers are made in our Australian Factory to suit Australian conditions and regulations. EXPERIMENTAL ACCESSORIES are stocked by us, and include such lines as KELLOGG, DE FOREST, CHELSEA, MULLARD, REMLER, MASTER, and other well-known makes.

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# Low Power Trans-Pacific Tests

## C. D. Maclurcan's Venture

### New Station 2CDM

THE arrangements for the forthcoming voyage across the Pacific from Australia to America and back on board the Union Royal Mail steamer *Tahiti* are well in hand, and the duplicate set of station 2CDM has been completed, and at the time of writing is being tested out by Mr. Chas. D. Maclurcan.

wishes reaching both Mr. Maclurcan and Jack Davis from all points.

One outstanding feature is the hearty co-operation that is being promised to 2CDM, and it will not be for the lack of co-operation and enthusiasm if the tests are not a wonderful success. That, of course, remains to be seen, but with the great

ception entertainment, San Francisco. Warner."

That proves that the Americans recognise the importance of these tests, and from what the writer knows, by personal experience, of the American experimenters, they will surely tell the world about C. D. Maclurcan and Jack Davis from Australia on the arrival of the *Tahiti* in San Francisco. Furthermore, they will accord the visitors a very hearty welcome, and it will be found that the short space of four days in San Francisco will be totally inadequate to see all the sights and accept the numerous invitations that will be showered on them. However, be that as it may, the most important thing is the tests, and the Americans will do their share, that's certain.

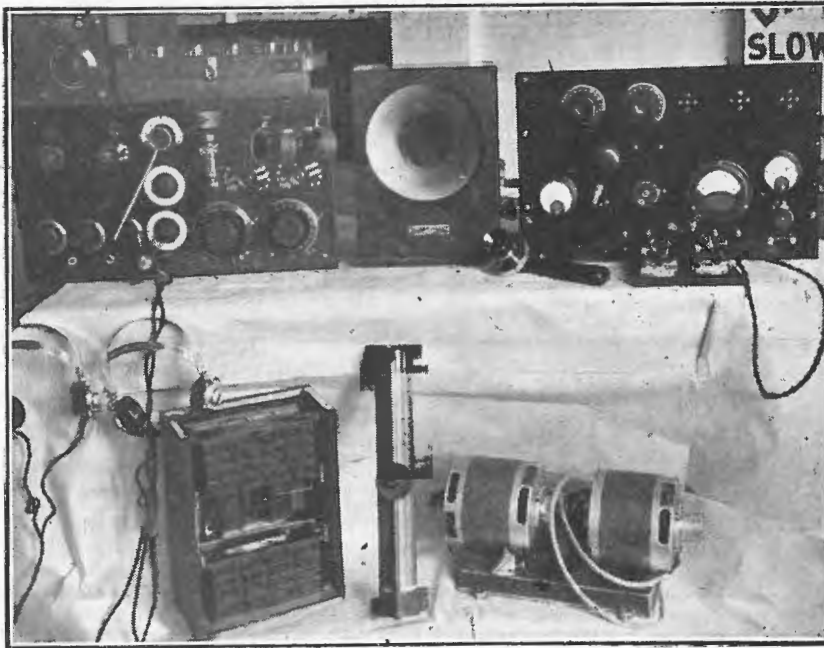
Major Lawrence Mott, of Catalina Island, off Southern California, whose station, 6XAD, is so familiar to Australian and New Zealand experimenters, will journey to 'Frisco to meet and help entertain the Australian visitors.

Mr. Maclurcan has just received a letter from Mr. K. A. Cantin, manager of the American Radio Relay League at Honolulu, who states that all Hawaiian members of the ARRL will work tests with 2CDM during the voyage.

New Zealand arrangements will be finalised when the *Tahiti* calls at Wellington on the outward voyage. Mr. Frank D. Bell, of Waihemo, N.Z. (station 4AA) advised Mr. Maclurcan, via amateur Radio, that he (Bell) will journey to Wellington to meet the *Tahiti*, and then finalise the schedule between 2CDM and New Zealand amateurs.

The Victorian arrangements for tests to 2CDM are being taken care of by Ross A. Hull.

Mr. Basil Cooke, F.R.A.S., assisted by Mr. Bon Gow, will be in charge



The complete apparatus for station 2CDM. On top, left to right, is the complete receiver, on top of which is the wave trap and wavemeter and audibility meter, loud speaker, and transmitter. Below is motor-generator, field regulator, smoothing-out chokes, and condensers.

Accompanying Mr. Maclurcan will be Mr. Jack Davis, of 2DS fame. The call signal of the special station on the *Tahiti* will be 2CDM.

That this venture has the best wishes of all experimenters in Australia, New Zealand, Canada and the United States is evidenced by the fact of the numerous congratulatory

strides being made in low-power transmission to-day, everything points to some records being established.

Mr. K. B. Warner, secretary of the American Radio Relay League, cabled Mr. Maclurcan on January 23 as follows:—

"Congratulations 'Tahiti' expedition. Director Babcock arranging re-



Front View of Transmitter.

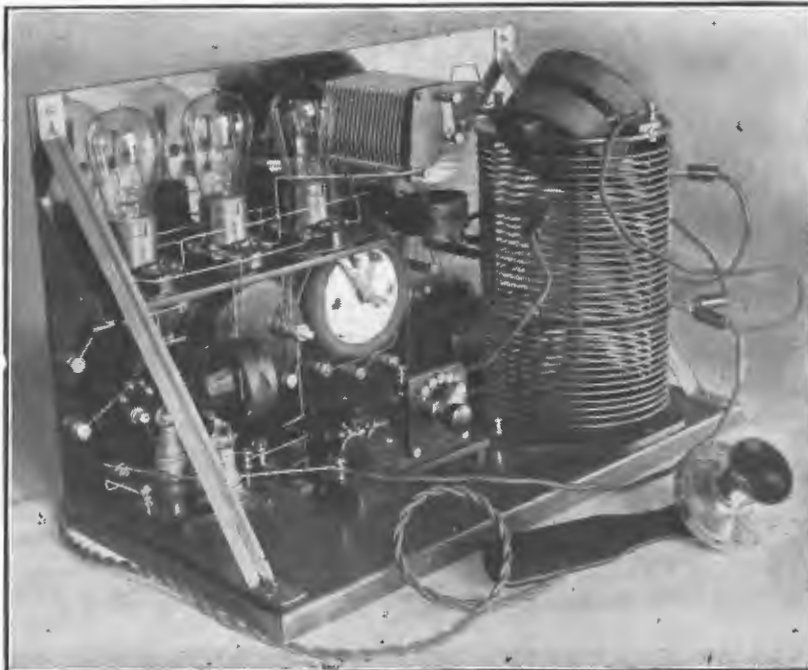
of Mr. Maclurcan's station at Strathfield (2CM) during the latter's absence, and will conduct the special tests with 2CDM.

Hereunder is the scheduled times during which experimenters can call 2CDM:—

**SCHEDULE FOR N.S.W. AND VICTORIAN EXPERIMENTERS TO CALL 2CDM, S.S. "TAHITI."**

Sydney—Wellington.

February 28—March 4 inclusive:  
3—3.30 p.m. Feb. 28 and 29: 9—10.30 p.m.



Back View of Transmitter.

Wellington—Papeete.

March 5—10: 10.30—11.30 p.m.

Papeete—Frisco and back to Papeete.

March 11—April 8: 8—9 p.m.; 9.30—10.30 p.m.

April 9—18: 10.30—11.30 p.m.

April 18—24: 9—10.30 p.m.

Note.—During these times Mr. Maclurcan will be listening-in, and any experimenter may call 2CDM. Any calls heard will be logged together, with the strength of signals. From March 10 to April 9 the higher powered transmitters only should call.

With such splendid enthusiasm and co-operation it seems certain that big things will happen. The very best wishes of all experimenters go out to Mr. Maclurcan and Jack Davis for the attainment of every success.

**DAVID JONES' RADIO SECTION.**

Directed by

**Mr. F. Basil Cooke, F.R.A.S.**

Consequent upon the demand for high-grade Wireless Apparatus, David Jones' have installed a special section for the sale of these goods. This presents an opportunity for all interested in wireless to avail themselves of ideal purchasing conditions. Licenses will be issued upon payment of required fee.

Of interest to experimenters — David Jones' have made a special feature of providing all wireless accessories, including the following:—

- Accumulators, 2-volt units, priced at ..... 21/- 33/- 40/- and 50/-
- Valves, all standard makes, including Cunningham type "300." Price ..... 35/-
- Type "301A." Price ..... 42/6
- Type "299." Price ..... 42/6
- Marconi R Valves. Price ..... 25/-
- Phillip's Detectors or Amplifiers, Price ..... 22/6
- All gauges of Winding Wire kept in stock.
- Silver and Nickel-plated Terminals. Price ..... Each 6d.
- Silver and Nickel-plated Switch Studs. Price ..... Dozen 1/6
- Transformers, Jefferson type, 45. Price ..... 55/-
- Transformers, Jefferson type, 41. Price ..... 37/6
- Transformers, Jefferson Star type. Price ..... 37/6

**DAVID JONES'**

Radio Department,  
22 York Street,  
SYDNEY.

# The Policy of 2FC

## A Comprehensive Programme

### Managing Director Speaks

THE test period of 2FC (Farmer's Wireless Broadcasting Station in Sydney) is now concluded, and the full regular service programme is now available to subscribers. Thus, at almost the actual inception of the service it might be as well to give a brief outline of the statement issued recently by the company's managing director, Mr. George Wright, to the public on the policy that will be adopted.

Almost since wireless was first put on a practicable working basis, it was seen what an important place radio would take in the development and life of Australia's scattered communities. Nor was there a failure to realise that a broadcasting station to achieve success would have to be of the most modern type, together with the most up-to-date equipment to be had from the best wireless engineers of to-day, Mr. Wright explained. Again, to a company of Farmer's nature, wireless presented an unique field to do "the State some service"; particularly in the case of the outlying and more or less isolated districts. The coming of broadcasting to Australia would be the means of more closely linking together the country dwellers to those of the city, and also enable the former to enjoy the many pleasures and privileges of the latter.

"By making this service as efficient as possible, and to cover a wide range of entertainment and general information of an educational value, it is possible to go a long way towards breaking down the isolation of those who live in the bush to-day," he explained.

Upon the issuing of wireless broadcasting regulations for Australia, the directors of Farmer & Company Ltd., took immediate and definite steps for the establishment of as powerful a broadcasting station as was allowed under the regulations. A contract with Amalgamated Wireless (Australia) Ltd. for the building of a station embracing the most modern

#### NO DIFFICULTY NOW.

"When Lord Northcliffe asked me in 1914 to estimate the cost of the electric transmission of a picture for a few hundred yards, I replied, '£150,000.' A picture the size of a postage stamp would cost £10,000; but to-day, anyone who puts down £10,000 can very shortly have practical radio vision over hundreds of miles."—Mr. Sanger Shepherd, a leading London maker of radio apparatus.

apparatus known to wireless science was entered into, it also providing that as from time to time modern improvements were made and tested, these were to be embodied in the station. These precautions would insure the highest degree of efficiency in transmission.

The next question to be met by the directors was the type of programme that would give most pleasure to most subscribers. With this object in view, agreements were entered into between the firm and Messrs. J. C. Williamson & Co. and J. and N. Tait for sole rights to broadcast selections from their theatrical and musical productions.

With regard to a news-service, arrangements were made with the *Syd-*

*ney Morning Herald* for the sole rights of their morning news service and also with the *Evening News* and the *Sunday News* for their sole evening and Sunday morning rights.

For the farmer, special arrangements have been made. Market reports, covering price fluctuations, etc., so far as wool, wheat, and stock are concerned, will be issued by Messrs. Dalgety and Co., Ltd., while regular market quotations for other general kinds of farm products will be made available by the Coastal Farmers' Co-op. Society Ltd.

By special arrangement with the Sydney Stock Exchange Committee, quotations and stocks and shares sales will be broadcasted daily.

Matters of public interest which would take place at the Town Hall would be broadcasted, this having been arranged through the City Council, a direct wire from the Civic Centre to the Company's studio being connected.

For those who delight in the fare provided by the New South Wales Conservatorium another wire would be run from there to the studio, and various items would consequently be broadcasted from that centre.

"This service," concluded Mr. Wright, "which is most comprehensive, will at all times be supplemented by regular entertainments and educational items, which will be transmitted from the broadcasting studio in our own building, Pitt Street. This studio has been specially constructed on the most modern lines after collecting information gained by experts in other parts of the world."

## **MAKE SURE**

of Receiving "Radio" regularly by placing a standing order with your news agent, or sending 10/- for one year's subscription to:

**THE WIRELESS PRESS, 97 CLARENCE STREET, SYDNEY.**

# Great Men and their Voices

## Radio Confutes Prejudices

**T**O the majority of Australians, politics are food and drink. It is doubtful if there is a country in the world that takes so close an interest in its own governing and its leaders. Consequently, we have our likes and dislikes. That is, likes and dislikes for those men who, by reason of a majority vote, are entitled to sit in the High Places. We base them, these likes and dislikes, in a general way, on what we are told. We have few opportunities of really judging for ourselves, and so we take a good deal for granted. We read the newspaper reports of political debates, we see these men opening bazaars or laying foundation stones, in the cinematographical gazettes, but it is only a rare occasion on which we actually hear them speak. An opportunity gained to listen to their little tricks of speech and mannerisms; the fervour which they may put into their expressed sentiments. In cold print, this will often fail to stir us; things written and things spoken take on a very different complexion. To be able to hear these words as they are spoken, brings us into direct contact with the personality of the speaker, for personality expresses itself most strongly through the voice. Thus, until we actually hear these men, we are in danger of forming wrong or second-hand opin-

ions, based on a somewhat superficial and, at times, inaccurate method of re-telling.

When the words of politicians and public speakers are broadcasted and only then, will the whole of the public

that have been swept away after listening to such a broadcasting.

These opinions collected after that much-discussed man, Lord Curzon, had made a broadcasted speech at the recent T. P. O'Connor dinner, are enlightening. Several said: "We had no idea Lord Curzon was such a kind, friendly, humorous man. We always thought he was pompous and haughty, but the voice we heard was certainly that of a genial, good fellow—a really nice uncle at a party."

Lloyd George's speeches generally appear meretricious and almost vapid on paper, but people who have listened to him say that it is a delightfully enchanting entertainment. Mr. Asquith's voice, which possesses a mellow richness of utterance, heard by wireless telephony has been likened to a fine 'cello. It is a compelling voice and one that make you hang on every phrase.

Who would think now, that Ramsay MacDonald spoke in deliberate and thoughtful Scottish accents? Most of us have gained the impression that he is a sort of oratorical stormy petrel with a voice like a maddened bull. What could be more disarming than his grave and cautious speech? Mr. MacDonald has been known to thaw a whole luncheon club of city men by the sweet reasonableness of his voice.

### RADIO FOR PUBLIC SCHOOLS.

The other evening, Mr. Bruntnell, N.S.W. Minister for Education, at his home heard for the first time a wireless concert transmitted by Broadcasters, Ltd., from the station on top of Smith's Newspapers Ltd.'s building.

"I am simply amazed," the "Guardian" reports, "at what I heard to-night," said Mr. Bruntnell. "I heard every word distinctly."

"I was very much impressed with the talks to children and the bedtime stories. I think the programme was excellent."

Mr. Bruntnell's enthusiasm is soon to take an active form. He is proposing the introduction of wireless and cinemas into the State schools.

be afforded the proper facilities to accurately judge for itself and draw its own conclusions.

This, of course, has already been done in England and it is interesting to read of the pre-conceived ideas of the speakers' personalities that have been refuted and of the prejudices



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Recently, for the first time in the British history of broadcasting, a whole church service was witnessed. Evensong at Saint Martin's in the Fields was transmitted by means of microphones in the church. Canon Sheppard, who conducted the service raised the point as to whether listeners-in should voluntarily contribute to the offertory.

Although the following appeared in an American radio publication in all seriousness, there seems a catch in it somewhere. When an American "drummer" (commercial traveller) in registering his appreciation of broadcasting, talks about—well, read for yourself:—

"I carry a radio set about with me and instal it in my hotel room. When I arose this morning, the sixth Sunday since I have had word from my home and realised it was to be just another lonesome day, minus the usual work of week-days, you can well imagine the sincere feeling of gratitude I felt when I was able to listen to hymns that were all familiar to me and to enjoy the service so vividly that the feeling was created that I was part of the church congregation, instead of many miles away.

It doesn't seem quite natural, does it?

New Zealand "listeners-in" have been recently delighted by the broadcasting by Wellington Broadcasters, Ltd., of an act from "Woman to Woman."

Quincy Roberts, America's vice-consul at Apia, Samoa, has logged many U.S.A. stations. Among those are KGW, WBAP, KPO, WDAP, KFI, KHJ, and WJAZ, and also Honolulu, which broadcasts programmes from the Californian stations.

Two Hamilton (N.Z.) radio enthusiasts are reported to have recently picked up musical items broadcasted from Key West, Florida, U.S.A., with a reflex set.

## 2FC

### BROADCASTING TIMES.

Sydney Mean Time.

P.M.	
12.55	Chimes.
1.00	Time Signals; News Items;
to	Weather Reports; Stock
1.45	Exchange News; and Produce News.
3.00	Chimes.
3.05	General News and Orchestral Items.
to	
4.00	
6.30	Chimes.
6.33	Children's Bed-time
to	Stories; Late News; Stock
7.15	Exchange Reports; Late Sporting & Market Reports.
7.55	Chimes.
8.00	
to	Entertainment.
8.45	
9.05	
to	Entertainment.
10.00	

On the evening of Sunday, January 13, the Bega (N.S.W.) branch of the Burgin Electric Company, Sydney, heard Oakland, California, U.S.A. Speech and music were very loud between 8.30 p.m. and 10.30 p.m., and the excitement caused among the three "listeners-in" can be well imagined. The receiving set used was one made from Burginphone parts.

The Henry Ford of the radio world has appeared in the person of Powel Crosley, Jr. This firm, the Crosley Manufacturing Company of America, claims to turn out 1,000 complete broadcast receiving sets a day!

A good deal of amusement was caused at an Australian broadcasting studio the other evening when a man rang up and said, "I'm going to be married to-morrow night to the prettiest, etc., etc., girl in the world." When he had eventually finished the announcer congratulated him. "Thanks very much," returned the bridegroom-to-be, "but will you do me a favour? We're going to have a little radio party at the wedding and I'd like you to get your orchestra to play the Wedding March." "Sorry, can't be done for Friday as our orchestra will not be playing that night. Could you put it off to Saturday?" came the reply. A pause followed while the candidate for connubial bliss conferred with his future life-partner. Then came the voice again. "Right, we've agreed to put it off till Saturday!" This will account for the wedding march you may have heard the other night.

The master of a native school in Reibell-Chelalla, Southern Algeria, has an inventive mind. From parts that were to his hand he succeeded in making a loud speaker on which he received broadcasts from Paris. A list of the various articles that went to its construction is unique. It reads, "A poilu's helmet, a tube from a camera tripod, the horn from a bugle, the neck of a lawn sprinkler and two portable electric lamp cases."

The other night when an Aberdeen newspaper reporter was carrying on a confidential telephone conversation with an editor of a Glasgow paper, his words were mysteriously broadcasted all over the country by an Aberdeen radio station during its evening programme. Experts explain the phenomenon as a freak of induction due to the nearness of the telephone-wires to the broadcasting station.

# The Japanese Earthquake

## How the First News Came Through

One morning in last September the World came down to breakfast, poured out its coffee and opened its daily paper. It turned to the cable page, and then: "Dear me! How frightful! 'Yokohama has ceased to be.' 'Tokyo burnt to the ground!' Teh! Teh! Teh! Terrible! Terrible!" it murmured, reaching for the marmalade. "How awful to live in an earthquake area!" And that perhaps was all. It never wondered how the news came through. The marvellous facilities of modern journalism in the search and gathering of news had become familiarised into contempt. There were the facts, or the rumours, nicely "set up" in beautiful, long symmetrical columns, with nice, bold, black headings at the top. There it was and that was all.

It was not.

The real thrill was in how the news came through. How, when the disaster fell upon the Yellow People, and Japan, for the moment, was completely cut off from her fellow men by the ravages of fire, flood and 'quake, through the heroic devotion to duty of a wireless operator, the first dread news and call for succour and help came through to the unsuspecting world.

The wireless hero of the Japanese disaster was K. Yonemura. He is superintendent of the Iwaki radio station, which is the high-power station used by the Department of Communication, and marks the western limit of the trans-Pacific circuit of the Radio Corporation of America. The control and receiving station is at Tomioka, many miles north of Tokyo, while the transmitting station at

Karanomachi is some 20 miles further on still. It is from here that the bulk of the trans-oceanic traffic between Japan and America is handled, it being worked in co-operation with the stations at San Francisco and Honolulu.

At the head of the bay of Tokyo is Funabashi, the high-power station belonging to the Japanese Navy, while Shiomiasaki, Shimotsui and Choshi are coastal stations of the Department of Communication. Shiomiasaki is situated near Cape Ushio, in the Wakayama prefecture, and Choshi is placed almost due east of Tokyo. It would be as well to remember these localities in order to exactly understand what follows.

In a letter, a copy of which *Radio* has received, Yonemura describes how at midnight on September 1 he felt a

*(Continued on page 576.)*



Wireless days *and* nights—

Into the Home a radio set will  
make you a member of the  
World's greatest audience.

It places you and your friends in the best seats  
for "listening-in" to the wonders brought to  
you through the air on waves which travel  
with the speed of light.

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set must be a Western Electric.

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# Radio Telephony and the Police

## Universal Adoption

AS soon as a crime or a misdemeanour is committed, and the police are called in, the fight begins. Not so much a fight between the law-breaker and the police, the one trying to evade, and the other to effect capture—that comes later. The all-important factor met by the police at the outset of the chase is Time. The quicker the description of the wanted man is circulated after the occurrence of the circumstances which lead to the police's interest in him, the greater difficulty he has of escaping recognition and detection. A brief description circulated immediately and widely is worth volumes distributed a few hours later.

It may be of interest here to recall the first time on record when wireless telegraphy was used by the police—in the famous Crippen murder case of 1910.

Crippen and his companion, Ethel Le Neve, hurried to the Continent and booked from Antwerp to Quebec on the C.P.R. liner *Montrose*. A message was despatched to all vessels fitted with wireless, containing a description of the murderer and his friend, and also offering a reward in the event of their arrest. Upon receipt of this message, the Captain of the *Montrose* became suspicious of two of his passengers, and a radio message was sent to New York. Then followed a further exchange of Marconigrams, and it was not long before Scotland Yard were firmly convinced that the reserved stranger and his young male companion (Le Neve being dressed as a boy) were none other than the "wanted" couple. Thereupon Inspector Day was instructed to proceed on the White Star boat *Laurentic*, which was speedier than the *Montrose*, to Canada, and arrest "Dr." Crippen and Miss Le Neve on their arrival.

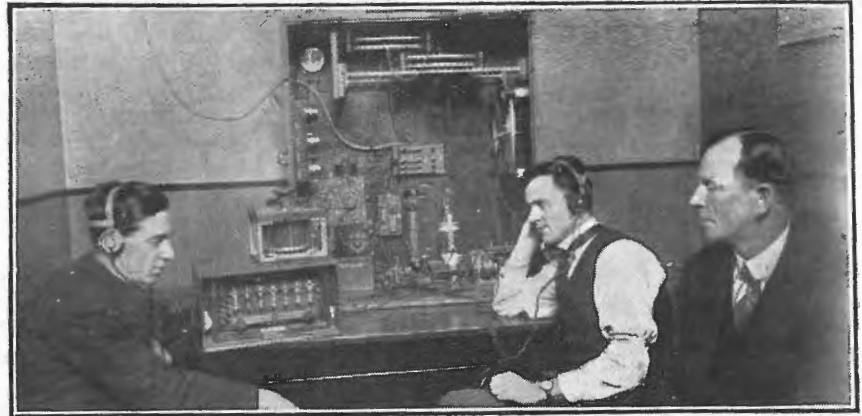
All the way across the two vessels maintained constant radio communication between each other and the land, while in America and England daily bulletins were published showing the relative positions of the two boats and the rate at which the *Laurentic* was overhauling her slower

sister. All the world stood still and watched, while the two causes of the intense excitement which raged both sides of the Atlantic remained sublimely unconscious of their danger. The dramatic arrest of Crippen and his friend by Inspector Day, who boarded the *Montrose* at Rimouski, St. Lawrence River, dressed as a pilot, is criminal history.

In New York the Police Department is fully awake to the importance of radio-telephony as a factor in the suppression of crime, and has installed at headquarters at Center Street the first broadcasting station

police, and on October 31, 1922, Amalgamated Wireless (Australasia), Ltd., fitted a receiving set in the No. 1 Patrol Car, and on the same afternoon and evening numerous tests were carried out most successfully. Soon, however, the real test was to be given.

Some time after the installation had been effected, at 3.15 of a summer's early morning, the following message came through on the car's head set: "Please get in touch with the C.I. Branch immediately." Three minutes later the car was at a police station, and Constable West was in



The Wireless Apparatus that is installed at Russell Street Police Barracks, Melbourne. Mr. R. S. Bastin is on the left, Mr. F. J. Williams in the centre, and Mr. W. F. Downie, who is in charge of the equipment of the Police Department, is on the right.

ever used exclusively for police purposes.

Both the Sydney and Melbourne police have included motor night squads among their activities, but these laboured under the obvious disadvantage of only keeping in touch with their head office through the medium of hourly telephone calls. This meant that anything could have occurred between the time the hourly calls were made, and that it was impossible to communicate with the patrol, who, even at the moment of the disturbance, might have been, unknowingly, hurrying away every minute from the scene of it.

This state of affairs was, of course, quickly grasped by the Victorian

touch with Russell Street. Without the Radiophone it would have been 4 a.m. before the patrol would have been in touch with the C.I.D.

At the present time at Russell Street Police Barracks, a half k.w. quenched spark system of transmission is being used. However, this is only temporary, the installation of a valve transmitter being contemplated. Satisfactory results are gained by the spark set, but the valve system is preferred on account of the more selective tuning on the radiated wave.

Radio telephony used in connection with police activities means a new terror for law-breakers, and an enormous assistant in the keeping down of the crime statistics.



# Variometer or Variocoupler?

**V**ARIOMETERS are frequently confused with vario-couplers and *vice versa*. They are quite different, however, both in construction and in the method of connection to a receiving circuit. A variometer consists of two coils of wire connected together in series. To alter the tuning of the circuit in which they are placed the distance between them is altered. A vario-coupler is made up of two independent coils, each of which is connected to a separate circuit. The tuning of both coils is effected independently, the degree of coupling regulating the amount of energy transferred from one coil to another. Boiled down, the main differences between the two coils are: (1) a variometer is a single length of wire wound in two coils, whilst a vario-coupler is made up of two separate coils which make no metallic connection with each other, and (2) a variometer forms a single instrument in a circuit, whilst the two coils of a vario-coupler are each connected up to different circuits.



This photo shows the two pine trees between which is suspended the aerial of Mr. J. S. Marks' station (2GR) at Rose Bay.

A vario-coupler is usually employed to secure selectivity in reception. One coil is connected directly between aerial and earth, and the second is connected across the receiver.

When receiver signals are travelling up and down the first coil some of their energy is transferred *inductively* to the second coil; the exact amount depends upon the distance between the coils. If these are set widely apart strong signals can be weakened considerably and weak ones eliminated. In this way interference from "jamming" can sometimes be prevented.

## TWO THINGS WHICH GO WELL TOGETHER—

a broadcast receiving set and "RADIO" magazine. Both are necessities in every Australian home.



PRICE  
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## "ATLAS" AMPLITONE LOUD SPEAKER

**T**HE prime distinction between the *Atlas Amplitone* and other loud speakers is that the *Amplitone* is first of all a musical instrument. It **rePRODUCES**, not a semblance, but the full, clear, natural tones of the music as actually sung or played. It is the same distinction as that between the old-fashioned wax cylinder tin horn, scratchy phonographs of a few years ago and the finest phonographs of to-day, whose reproductions deceive even the trained ear.

### THE DOUBLE DIAPHRAGM.

This astonishing faithful re-**PRODUCTION** is largely due to a patented construction known as "the double composition diaphragm"—the exclusive feature of the **ATLAS AMPLITONE, Loud Speaker**. It compensates for the shortcomings of broadcasting and receiving conditions, and gives you the programme clear, sweet and natural.

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# Broadcasting Station 2FC World's Largest Telephony Station

## How Work is Done

(Special to "Radio")

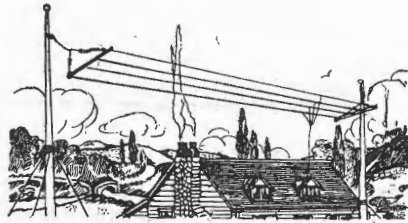
APPROACHING the higher portions of North Sydney one of the first objects which attracts the eye is the huge wireless station, 2FC, belonging to Farmer and Company's Broadcasting Service. The two large lattice steel towers which stand almost six hundred feet apart, and each of which is two hundred feet high, cannot fail to arrest attention, even at a considerable distance, and as the station is neared, the huge squirrel-cage type of aerial which is suspended between them and the complicated earth screen situated below, come into view.

2FC represents the latest developments in connection with the science of wireless as far as telephony is concerned, and yet the visitor who hopes to see something very spectacular in the main operating house is sadly disappointed. The buildings used in connection with 2FC are all situated on the ground in the centre of the two towers, and comprise main operating house, experimental room, store rooms, and living quarters for the staff.

In a previous article which appeared in *Radio* a description of the station was given, and since then much construction work has been carried out. The aerial system has been completed, and the leads from both the antenna and the earth screen have

been secured to special lead-in insulators and attached to the special small steel tower set in concrete at the side of the main operating room.

In this room the 5000-watt transmitter is being constructed, and a 500-watt transmitter is now in operation. A motor generator is situated under the house, and is controlled by switches placed in a small booth or room near the transmitter itself. On a bench in one corner of the room a receiving set stands that will function strongly enough to work a loud speaker with a single valve, and without an aerial, providing it is placed only a few feet away from the transmitter.



When transmission is being effected on 500-watts, two power tubes are used, both being of the Marconi type. One of these acts as the modulator, and impinges the pulsating electrical currents delivered from the studio in Sydney by land line on the waves which are created by the second tube, acting as a generator of high-frequency oscillations. A comparatively

simple system is then employed to tune the whole transmitter and convey the waves which it creates, to the aerial system.

Switches and transformers are grouped together at one point of the room, and strict control is thus kept on the incoming lines, which carry the various items from the theatres and the studios to the station.

Beyond a slight, purring sound made by the motor generator, which is quite inaudible in reception, the station works in silence. The old days of spark transmission, when operators worked high powered stations from specially insulated seats, have now passed away, and no crash of sparks serves to indicate that the station is working. Only the brightly glowing power valves give a visual indication. Except for this, one would hardly realise that musical items were being received into the station and radiated through miles and miles of space.

The whole of the transmitting apparatus, with one or two minor exceptions, has been manufactured in Australia, and the results which have been achieved since the station commenced operating have gone far towards proving that Australian radio engineers and Australian radio apparatus are second to none in the world.

### RADIO RALF AND HIS FRIENDS---

By Jack Wilson



# Seeing Round the World In Ten Years

"I AM certain that television, will be accomplished in 1924, otherwise seeing by wireless, and I will stake my scientific reputation on it," Professor Fournier d'Albe, of London University, is reported to have said in a recent special cable to the Sydney Sun.

Professor d'Albe invented the Optophone, an instrument to enable totally blind persons to read ordinary print, the needle periscope for trench warfare, and the tonoscope, an instrument for making speech audible to totally deaf persons.

"I think television, though somewhat crude at first, will be among the wonders of the Wembley Exhibition," said the Professor, who has been working on the problem and has reached the point where success is assured. Other scientists are studying the problem, and there is the keenest competition to be the first to construct a satisfactory apparatus. Professor d'Albe's most recent achievement is to perfect an apparatus by which photographs taken from an aeroplane may be transmitted by wireless to a land base.

"It is highly probable," said the Professor, "that within 5 or 10 years an audience will be able to sit in a big hall and watch the Derby, a naval review, boxing matches in America, and even a big battle, by means of moving pictures projected on a screen at the moments the events happen. Explorers will carry television cameras in climbing Mount Everest, penetrating to the North Pole, or examining the ocean bed in submarines; and we, sitting in ordinary picture theatres, hundreds or thousands of miles away, will accompany them step by step.

"As far as vision is concerned," the Professor concluded, "as wireless waves can be relayed almost indefinitely, I see no reason why we, a decade hence, should not be able to watch what is happening on the other side of the world."



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**£8**

Blast and distortion conquered!!!  
Patented Double-diaphragm Re-PRODUCES the full range of musical sounds. Adjustable to varying receiving conditions.

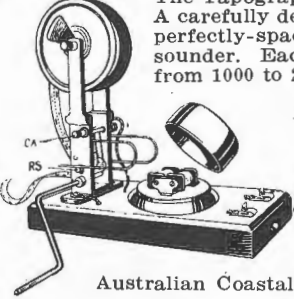
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will definitely teach you the Morse code at home, in your own time, with the least possible expense. No need for you to spend weeks and months de-coding the indifferent sending of another amateur or in attending classes of instruction. The Tapograph will make you an efficient operator in a few weeks. A carefully designed series of machine-perforated tapes, containing perfectly-spaced signals, is used in combination with a buzzer or sounder. Each tape may be used hundreds of times, and contains from 1000 to 2000 signals, commencing with single letters at a slow rate and ending with complicated telegrams, radio calls, press and coded messages at a fast rate. Endorsed, used and recommended by Wireless Operators, Telegraphists, Post-office and Railway Officials everywhere.

**Mr. WIRELESS AMATEUR**, get this outfit at once. Do not be content to listen to broadcasting only. Tap the world's wireless messages and experience the thrills of catching messages from ships at sea, American and Continental stations.

**TELEGRAPHISTS and OPERATORS**, begin right by learning to receive perfectly-timed signals in your spare time at home.

**PARENTS**, encourage your boy to take an interest in things electrical. The Tapograph is a most acceptable gift; it will amuse and instruct.

Price, complete with tape, high-toned buzzer, also valuable charts and instructions for learning the Morse code **30/- each** (Postage 6d. extra).

Obtainable from dealers or direct from **G. E. BRAY**, Manufacturer's Agent, Box 781, Particulars Post Free on request.



## Mica Transmitting Condensers

**C**ONDENSERS, both fixed and variable, which are used in receiving circuits, are subject to only small differences of potential, which call for no special precautions in design. Those, however, which are used in transmitting circuits have to withstand electrostatic stresses of considerable magnitude, and if proper attention is not paid to design failure will result.

Two classes of condenser will have to be considered, viz., those which have to work in conjunction with potentials, due to direct current or low alternating current frequencies from that due to the ripple in a rectified a.c. supply to fluctuations within the range of speech frequencies, and secondly, those which function in circuits which carry currents of extra high or radio frequency.

Mica is the only suitable dielectric for use in these condensers, and an economical thickness from an electrical, as well as financial, view point is three mills or 0.003 inches. A sheet of mica of this thickness will operate safely under potentials up to 1500 volts, where only a direct current or low frequency component exists. When radio frequency currents are present the safe maximum voltage is reduced to 500 volts.

Experimentation has shown that the safe operating voltage is not materially increased by an increase in thickness of the dielectric, and when a condenser is required to operate at a voltage higher than specified above, two or more units should be connected in series depending upon the multiple by which the working voltage exceeds the safe value per

dielectric. Each section must have a capacity greater than the resultant in proportion to the number of sections in series. This means that if a condenser is required to have a capacity of 0.001 microfarads and be capable of operating at a potential of 2500 volts high frequency, there must be five sections, with an individual capacity of 0.005 microfarads connected in series.

Regarding the assembly of the plates of such condensers, they may be made up as separate units and wired in series as shown in Fig. 1a,

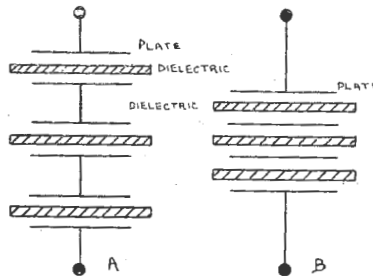


Fig. 1.

or put together as per Fig. 1b. The latter method is by far the most economical as regards material and space, as well as being easier to construct. Having worked out the capacity required for each unit, the area of the plate that must be used can be calculated from the following

$$C \times 4 \times D$$

formula:—A ———— where A

K

equals the area of the active plate in square centimetres, C equals the capacity required in centimetres (900,000 cms. equal one microfarad), D equals thickness of dielectric in cms., and

K equals the specific inductive capacity of the dielectric, which for mica as radio frequencies is approximately five. The mica sheets used for the dielectric will have to be larger than the brass foil by an amount that will allow a clearance of about one centimetre all around the edge. The two end plates of the condenser must be cut long enough to provide terminals, while the intermediate ones need only be large enough to provide the necessary active area. The electrical similarity between this construction and the more usual one, where separate units are connected in series, will be apparent when it is considered that it is only the surface area of the plate which is active. The small quantity of conductor between the two faces of the material, due to its thickness, takes the place of the connecting wire.

In experimental transmitters using Radiotron valves operating with plate voltages below 1000, the plate feed condenser should be designed to withstand a potential of 2000 volts high frequency, and that for the grid circuit 1000 volts. Calculating the size from the foregoing information, the plate condenser for a capacity of 0.001 microfarads will have to have a four section series bank consisting of sheets of brass foil 8 x 8 cms. separated by three mil mica, while the grid condenser of similar capacity will require two series sections with active plates 6 x 6 cms. Brass foil should be used for the conducting member. This can be obtained from any large automobile or motor cycle supply house if three mil shim brass is asked for.

# "Australia De G5AT"

## English Amateurs to Try

At the present time, although the general public may not be aware of it, wireless amateurs in England are attempting to get into direct touch with others in Australia.

Arrangements made are that the British stations will transmit on 1,200 meter wave-length, calling "Australia de G5AT," followed by any code word decided upon. These communications will be attempted on the following dates (Greenwich mean time): 5.30 p.m. to 8 p.m., February 10, 17, 24 and March 2, 9, 6 p.m. to 8 p.m.

Continuous wave telegraphy will be used and the messages will be tapped out in Morse, although the transmission of speech is likely to be essayed.

Those Australian experimenters who receive these messages are requested to forward their reports to the hon. secretary of the Wireless Institute, South Australian Division (Mr. Clement E. Ames, Grange Road, Hindmarsh), so that full particulars may be forwarded to England as soon as possible.

At the opening of the Empire Exhibition, a message from King George to the Governor-General will be relay-



The sealed set from "Woop-Woop," exhibited at the recent Wireless Exhibition in Sydney.

ed through America, while, as a preliminary, a trial message will be sent by an English station from March 1 to March 15 and relayed from a Canadian or American one. The latter will most probably be 6KA.

These arrangements have been made by Mr. Newman, a Victorian member of the Wireless Institute, now in England, and further details are shortly expected from him.

## The "Tapograph"

### An Australian Invention

Radio has just inspected a model of the new "Tapograph" instructor advertised in another column of this issue. The instrument, which is an Australian invention, can be made to reproduce any wireless signal from the simplest single letter to the most complicated code message. By using an ordinary sounder, it is also possible to learn to receive ordinary land line messages.

Wireless amateurs should appreciate this invention, as by its use is eliminated the drudgery and tediousness hitherto invariably associated with buzzer practice. Every wireless amateur is anxious to decipher the

innumerable messages flying to and fro in the ether, and the use of the "Tapograph" will fit him to do this the sooner, and the better.

Further particulars can be gained from all first-class dealers or from Mr. Bray, Somerset House, Martin Place, Sydney.

## N.S.W. Transmitters Note

To the Editor of *Radio*.

..... "Will you remind 2nd District "hams" that CW punches longer holes in the ether than phone and that we would pick up a lot more of them on small receivers if they would sign off in CW two or three times after phone and music."

Yours, etc.,  
WM. S. WEATHERSTON,  
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- 0/300 H/W Ampmeters, £5;
- 0/10 H/W Ammeters, £4/10/-;
- Magnetic Keys, Detectors, £2;
- Large Variable Condensers, £2;
- .01 Fixed Condensers, 1/6;
- Send and Receive Switches on Ebonite Base, £1/10/-;
- 12in. Tuning Inductance on Ebonite, £1/10/-;
- Polished Travelling Cases, 1/6 each;
- Marconi Telephone Condensers, 12/6;
- Static Chokes, 7/6 each;
- Switches, all sizes, 2/-;
- Position Switches, 2/-;
- Dictaphone, £5;
- Amplifying Transformers 8/-;
- Wire Winders, 6d., 63 Way Cable, 6d. ft., Cardboard Boxes (small), 2d each;
- Circuit Breakers, £8;
- Reaction Coils, 5/6 each;
- Double Coil Resistances, 12/-;
- Single Coil Resistances, 8/-;
- Radial Switch Arms, 2d. each;
- Battery Switches, 4/-;
- Crystal Detector Stands on Ebonite Base, 3/-;
- Test Tubes (ebonite and glass), 1d. each;
- Spring Switch Arms, 2d. each;
- Botton Lampholders, 3d. each;
- Contact Studs, 6d. dozen;
- Strop Insulators, 1/8;
- 3in. Heart Thimbles, 6d. each;
- Brass Nuts, 6d. dozen;
- Round Nuts Assorted 6d. dozen;
- Screws, 6d. dozen;
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# Wireless Institute, N.S.W. Division

THE January meeting of the N.S.W. Division of the Wireless Institute of Australia was held at the Royal Society's Hall, 5 Elizabeth Street, Sydney, on Wednesday, January 16, 1924. The question of the centralisation of control of amateur activities as relating to the Federal authorities was discussed. The position was outlined by Mr. Phil. Renshaw, and it was announced that the Institute had already taken the

initial step toward the formation of a central council for N.S.W. Similar action is being taken in Victoria, South Australia, and West Australia.

Dr. W. G. Woolnough, D.Sc., then gave an intensely interesting address on wireless and geological conditions in Central Australia. This was illustrated by lantern slides, and gave a very vivid idea of the enormous difficulties encountered, not only by the wireless enthusiast, but by the settler

in the outback country. The lecturer concluded with an appeal for wireless for the outback settler for the purposes of intercommunication, education, and medical aid. He said that wireless, motor cars and aeroplanes, would be the biggest factors in developing the interior of Australia.

The next meeting will be held at the Royal Society's Hall on Thursday, February 21, 1924.

## Radio Clubs

### Co-ordination Proposed

With the object of consolidating the work of all radio clubs and societies throughout N.S.W. it is gratifying to note that the wireless Institute has come forward with a proposal to hold a conference during the latter part of February.

The time has now come when all radio bodies must pull together in their own interests and we feel satisfied a workable scheme can be evolved whereby all clubs and societies can meet on common ground and work

together in all matters of mutual concern.

To set the ball rolling the Institute will invite each club or society to send one delegate to the conference and it is desired that these delegates shall be empowered to act on behalf of the club or society they represent, and, furthermore, it is desirable that any suggestions for assisting this scheme along should be sent along as soon as possible to the Honorary Secretary of the Wireless Institute in order that

same may be tabulated and arranged in order, so as to be placed before the conference.

It is up to all clubs and societies to now get busy on this matter which is approved and considered necessary on every hand, if only for the one reason that it will greatly strengthen the experimental movement, thus materially adding to the safety of the privileges now enjoyed by experimenters.

## Cockaday Four-Circuit Tuner

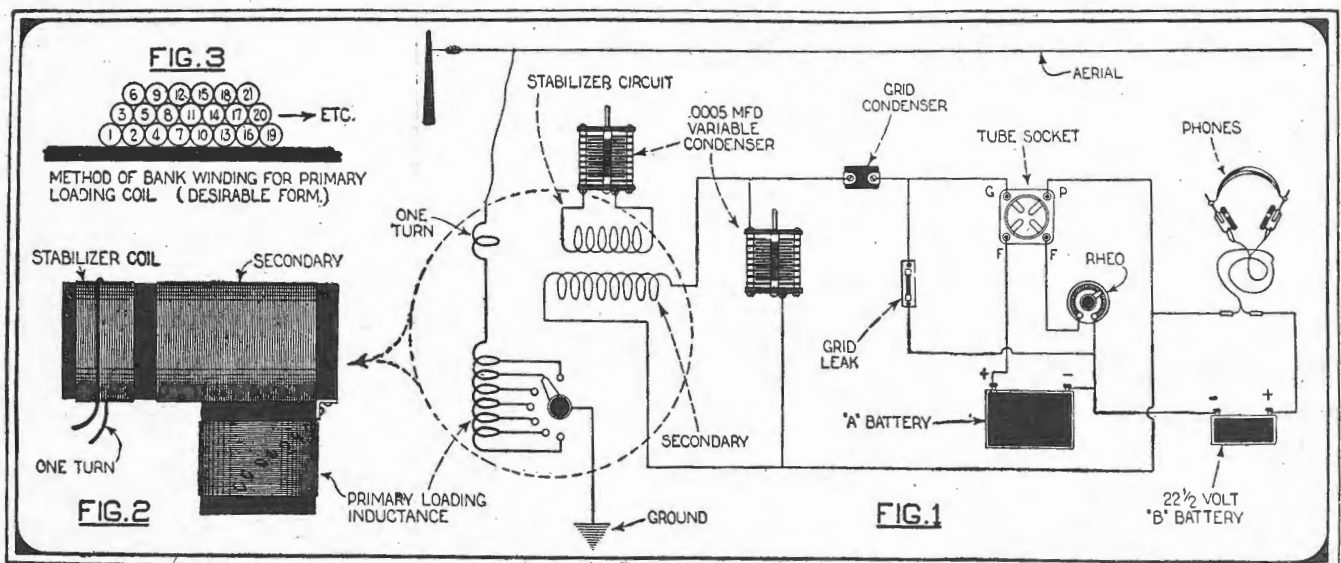


Fig. 1: Circuit of the very selective Cockaday Four-Circuit Tuner. Fig. 2: Position of the coils, all wound on 3 1/2 inch tubes. The stabiliser coil consists of 35 turns of No. 18 S.C.C. wire, the secondary 65 turns of the same size, and the primary 43 turns, Bank wound. Fig. 3: Tapped at the first, fourth, eighth, fourteenth, twenty-second, thirty-sixth and last turns. The One Turn is of square Bus Bar wire.

—By Leroy Western in "Science and Invention."

## Wireless Service

**O**F all the gifts of Science that have enriched mankind none is of more vital importance than Wireless communication.

Communication constitutes the nervous system of a country, and is an indispensable factor in commercial and social progress.

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# Queries Answered



A. L. C. (Leeton) submits particulars of aerial and asks: (1) Approximate natural wave-length? (2) Using above aerial, what size stator and rotor would be suitable for receiving Broadcasters (Sydney) Ltd. and 600 metre stations?

*Answer:* (1) Approximately 190 metres. (2) Stator 50 turns No. 22 D.C.C. on 4-inch former for the aerial circuit, Rotor 75 turns No. 30 D.S.C. on 3-inch former for the secondary. Owing to the reduced size of the rotor you will not be able to use 22 D.C.C. wire, unless bank winding is employed.

R. M. D. (Mildura) asks: (1) Has Mr. Reed's article on "Measuring Instruments" been published? (2) Make of ammeter referred to in article on "Meters for the C.W. Transmitter" published in *Radio* No. 4? (3) Type of ammeter for measuring aerial input accurately, also price for 0-1 calibration?

*Answer:* (1) This article is now under preparation and will appear shortly. (2) Jewel and Weston moving coil pattern. (3) Thermo-couple ammeters are most accurate for this work. A 0-1 will cost about £4, while a hot wire expansion type will cost £2 to £3.

"Acoutre" (Melbourne) asks size of coils and number of turns of No. 40 D.S.C. wire for radio frequency inter-valve transformers with wave range from 200 to 2,500 metres.

*Answer:* An article will appear in *Radio* shortly, describing the construction of in-

terchangeable radio transformers for waves between 200 and 3,000 metres. You can use 40 gauge wire for most of the coils, although the wire specified should be used for best result.

J. K. (South Singleton) asks: (1) Why VIS cannot be received more clearly on 1,800 metre transmission using frame aerial with tuned inductance, although good results are obtained on 600 metres? (2) Would placing 'phones in aerial lead be satisfactory for transmitting speech, using circuit described in article on "Continuous Wave Transmission" published in *Radio* No. 6? (3) Most suitable valve for amplifying with an "Expense" B, using six volt accumulator for filaments of both valves? (4) What plate voltage would be required?

*Answer:* (1) You must tune the loop with extra inductance, or better still, wind on three times as much wire. (2) Only for very short distances. (3) An "R" or UV 201A. (4) About 40 volts.

C. J. C. (Kensington Park) asks if a three-coil circuit with absorption method of modulation, using a "Phillips" 2½ watt valve as power amplifier, would be satisfactory for transmitting?

*Answer:* Use grid modulation as described in article dealing with Mr. Marsden and Mr. Davis' transmitter published in *Radio* Nos. 16 and 18 respectively.

R. O'N. (Arnccliffe), referring to article on "A Cheap Crystal Receiver," published in *Radio* No. 18, asks: (1) Would this set receive broadcasting programmes at a dis-

tance of 25 miles? (2) What would be most suitable aerial 130 ft. single wire or 100 ft. double wire, both about 30 ft. high? (3) Does the height and length of an aerial affect the receiving range?

*Answer:* (1) Yes (2) The twin wire aerial is better owing to its larger capacity. (3) Yes.

L. R. F. (Newcastle) asks for circuit employing 1 Detector, 1 Stage Radio and 1 Stage Audio Amplification, suitable for Farmer's broadcasting wave-length.

*Answer:* See circuit published in "Questions and Answers" column *Radio* No. 5. Thanks for complimentary remarks re *Radio*.—Ed.

A. T. C. (Kelvedon, Tas.) submits particulars of aerial and asks if any improvements can be made to increase receiving range?

*Answer:* Alteration to a "T" aerial will enable you to tune down to short waves with greater efficiency. Failing this, reduce the length to about 100 ft.

R. H. S. (Woollahra) submits diagrams and particulars of spark-coil valve transmitter and asks reason for failure of the transmitter to oscillate.

*Answer:* Look over all the insulation on your transmitter. It must be some very minor trouble that is holding you up. Mr. Renshaw, 2DE, has worked Third District experimenters with this circuit. The "R" valves should be operated at 4.5 volts when the electron emission will be 15 m.a. Your low plate current points to too low a filament voltage.

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Date.....

## Coastal Radio Service

Mr. L. A. Fontaine, Radiotelegraphist, has been transferred from Perth Radio to Esperance (W.A.).

Mr. J. A. Grant is on transfer from Esperance Radio to Broome (W.A.).

Mr. R. Simons, Radiotelegraphist, Melbourne Radio, is proceeding to King Island for Relief Duties.

## Marine Radio Service

Mr. S. J. McVeigh relieved Mr. E. F. Hayes on s.s. *Macumba*, at Sydney, January 10.

Mr. E. F. Hayes signed on s.s. *Kadina*, at Sydney, January 10.

Mr. J. R. Hodder signed off s.s. *Wear*, at Melbourne, January 7, and proceeded on Home Port Leave.

Mr. M. Webb-Watts signed on s.s. *Komura*, at Melbourne, January 8.

Mr. T. Alexander signed off s.s. *Koorringa*, at Melbourne, January 3, and signed on s.s. *Wear*, at Melbourne, January 9.

Mr. G. Fullwood signed off s.s. *Niagara* as 2nd Operator, at Sydney, January 2.

Mr. A. V. Middleton signed off s.s. *Enoggera*, at Sydney, December 18.

Mr. G. Tracey signed off s.s. *Taiyuan* as 2nd Operator, at Sydney, January 8.

Mr. E. Meissner signed off s.s. *Eurelia*, at Sydney, January 12, and signed on s.s. *Yankatilla*, at Sydney, January 14.

Mr. G. Maxwell signed off s.s. *Lammeroo*, at Sydney, January 12, and signed on s.s. *Barunga*, at Sydney, January 15.

Mr. L. F. O'Donnell signed off s.s. *Werribee*, at Melbourne, January 10, and signed on s.s. *Era*, at Geelong, January 11.

Mr. J. A. Cooper signed on s.s. *Kanna*, at Sydney, January 14.

Mr. J. L. Skinner signed off s.s. *Komura*, at Melbourne, December 22, and signed on s.s. *Kooyong*, at Geelong, January 11.

Mr. F. G. Forest signed on s.s. *Werribee*, at Melbourne, January 11.

Mr. A. G. Ross relieved Mr. D. N. Quinn on s.s. *Zealandia*, at Sydney, January 14.

Mr. D. N. Quinn relieved Mr. A. G. Ross on s.s. *Riverina*, at Sydney, January 14.

Mr. J. A. Guy, signed off s.s. *Camira*, at Sydney, January 20.

Mr. F. Exon signed on s.s. *Malayan*, at Sydney, January 15.

Mr. C. Williamson signed on s.s. *Camira*, at Sydney, January 16.

Mr. N. W. Scott signed on s.s. *Age*, at Newcastle, January 16.

Mr. J. P. Banney signed on s.s. *Australmead*, at Sydney, January 16.

Mr. S. McVeigh signed off s.s. *Dilga*, at Sydney, January 3.

Mr. W. S. Ringrose signed off s.s. *Cooma*, at Melbourne, January 14, and relieved Mr. W. H. George on s.s. *Loongana*, at Melbourne, January 15.

Mr. W. H. George terminated service January 15.

Mr. R. E. Abbott relieved Mr. A. C. Jackson on s.s. *Hobsons Bay* as 3rd Operator, at Sydney, January 18.

Mr. L. E. Ternes signed on s.s. *Koorringa*, at Melbourne, January 18.

Mr. J. C. Cleary signed on s.s. *Kowarra*, at Melbourne, January 17.

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## Japanese Earthquake

(Continued from page 565)

severe shock. As soon as it ceased he tested the land wires and found the Haranomanchi circuit in order, but all other lines down and out of commission. Realising his only method of communication would be by wireless, he kept a close watch, but it was not until the evening that he heard Choshi calling Shiomiasaki, and Shimotsui, who was trying to send a message from the Yokohama Chief of Police to the Governor of Osaka. This message had been transmitted by the *Korea Maru*, then in Yokohama harbour, to the Choshi station. Yonemura had read that day in the newspaper that the Chief of Police, unable even in his official capacity to secure a sampan, dived into the harbour and swam to the *Korea Maru*. Boarding the boat, he fainted, but, upon his quick recovery, wrote his report, and the wireless operator of the ship succeeded in getting it to Choshi.

Yonemura copied this report, and by means of a temporary wire that had been rigged up, sent it to the authorities at Sendai. This was the first news of the disaster that the officials there had received. Then followed the first bulletin to Hono-

lulu, and the Japanese continued transmitting whatever authentic information he could come across until the foreign newspaper men resumed their activities a week later.

On September 2 Yonemura first commenced to try and raise Funabashi, but it was not till the afternoon of the fourth that that station answered and began sending official messages to Europe and America. The first message addressed to the Secretary of State at Washington was received on September 4 at 3.30 p.m., and the second on the fifth at 11.55 a.m.

The Honolulu message read: "Conflagration, subsequent to severe earthquake at Yokohama at noon to-day. Whole city practically ablaze, with numerous casualties. All traffic stopped."

This was immediately passed on to San Francisco, and delivered to the several newspapers there.

## Broadcasting from Outside the Studio

(Continued from page 557)

the "radio relay" method, and which has been experimentally tried with considerable success. This involves sending the material from the concert hall, for example, to the broadcast

station by radio on a special wave length, and then receiving it at the broadcast station, and automatically re-transmitting it on the usual wave length of the broadcasting station. More specifically, a small radio transmitter working on the unusual wave length of, say, 100 meters is placed at the concert hall and sends out the concert. The average broadcast listener will not be able to receive this. But the broadcasting station will pick up this concert on an excellent receiver, amplify it in the control room amplifiers, and send it out again at full power at the usual wave of say 400 meters. This latter wave length will be readily received by the listeners. The radio relay method, which may be used more in the future for certain types of events, simply replaces the wire line from the concert hall to the studio by a radio telephone connection.

In this modern aspect, broadcasting not only flings out entertainment, but also literally draws it in. From all points it takes the best and most entertaining material, draws it to the station by wire line transfer or radio relay, and then sends it out powerfully to an expectant audience. The outside event supervisors are literally musical "reporters," who carry their "news" to the station, where it is published widespread for the benefit of the listeners.

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