

right angles to the point he wished to reach, the side circles would cancel out one another. Thus, imagine this row of dots to represent sending aerials.

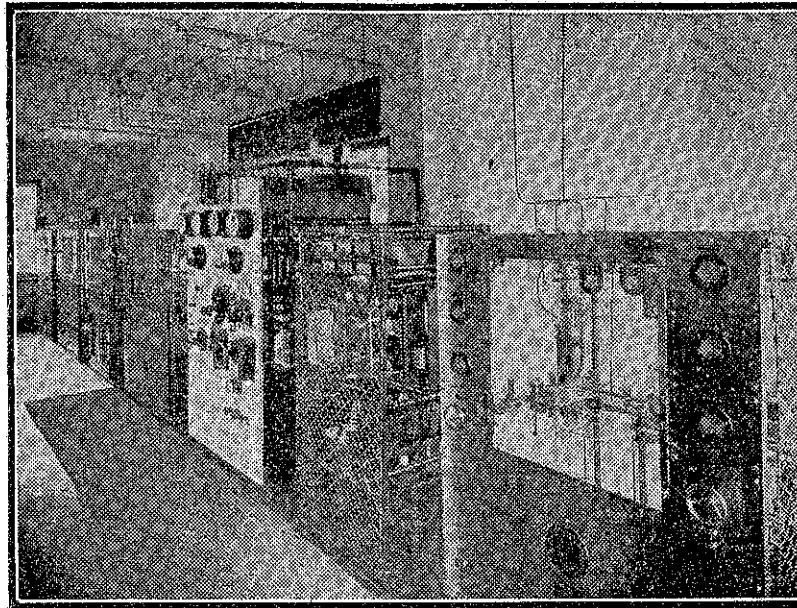
Now the side circles of all those points (except the end ones) would be cancelled out by their neighbours, and the energy permitted full expansion only forward and backward. But the leakage to the rear represented a dead waste, so a screen of identically similar aerials was erected at the back at a certain distance, thus reflecting the energy forward in a definite beam, capable of reaching the object station the other side of the world. That is the mathematical theory of the beam.

By another clever thought the up-right aerials are divided into three, one above the other with the object of giving the beam long-low-angled hops against the Heaviside layer, and so avoiding losing energy by minimising the number of rebounds to reach the other side of the world. So the beam or carrier wave connection is established. But this wave travels best in darkness, and that means that if only one way round the world was used, the time available for transmission would be limited. So two-way traffic is provided for by duplicate aerials through which the beam is switched the long or the short way round the world as occasion requires. The short way is north-west over Australia, over India and direct to Britain. The long way is over the South Pole and Home over the Atlantic. By this means contact can be maintained practically continuously.

BUT the engineers have not been content with providing the beam. They have sought to make that beam work to maximum capacity. So they have succeeded in getting three channels of communication on one beam—simply by varying the rates of frequency of the sending apparatus. So far this has given them two channels for wireless telegraphy and one for telephony.

Credit to Whom it is Due.

IMPROVED almost beyond words by the wonders of the A.W.A. services—services operating not only to England, but over the Australian coastal area in connection with trawling fleets and cargo steamers, and to all the scattered isles of the Pacific—I finally sought Mr. E. T. Fisk, the managing director of this organisation which, originated seventeen years ago, has grown to employ over 1000 men and advantageously operate a million pounds of invested capital, half being found by the Commonwealth Government. Mr. Fisk is the presiding genius of the organisation. His physiognomy is most extraordinary and he at once impresses by his personality and, in conversation, quiet efficiency and wide vision of the future. He is noted in his own circle for his great-hearted-



This is some of the transmitting gear associated with the Pennant Hills transmitter. It handles the outgoing speech from the individual telephone lines.

ness and courage. Deservedly so. He has conquered technical and business difficulties deemed insuperable. Highly qualified technically he has been fortunate in adding to that equipment a business vision and business capacity quite universal in the technician. To that combination and to his genius for selecting capable associates and loyalty in standing by them he owes the position occupied by his organisation today.

SO while the official opening of the New Zealand short-wave telephone service is proceeding, and one after another of the prominent business, political and press leaders invited to the board room of Amalgamated Wireless are waiting their opportunity to speak to confreres in New Zealand on this memorable day, I seek the views of Mr. Fisk upon the future.

"What more is there to do?" I ask, "there seems little that is left. What will be the developments of the future?"

"The immediate development will simply be the extension of the present work of direct wireless services to various parts of the world," says Mr. Fisk. "I think the telegraph services may be regarded as an omnibus which carries everybody's communications in bulk. The telephone is more of the nature of a taxi-cab which carries the individual from point to point. The wireless telegraph which is already operated at very high speed and which will be established to work as many countries direct as possible, will always handle the many millions of words which have to be sent throughout each year. The wireless telephone, on the other hand, will link the home and office telephones of New Zealand and Australia with the home and office telephones of all other parts of the world. We are already approaching the point where the private telephones of Australia and New Zealand can be connected with 90 per cent. of the telephones of the rest of the world. We now reach Great Britain, twenty-two countries in Europe, the United States and Canada, Mexico and Cuba—how many telephones they represent, I simply do not know."

"Is the wireless telephone secret?"

"Not in the absolute sense, but we regard it as secret for all ordinary purposes. On some services we can invert the language in transmission, and re-collate before the receiver is reached, but that is not done on all services. With the developments that are going on secrecy may speedily be applied to all. The cost of the services will tend to be reduced as time goes on. At present while wireless telegraphy can work over long distances for the greater part of the twenty-two hours, wireless telephony is possible only for five to nine hours out of the twenty-four, but that will be extended as we make new developments, and as the earning power is extended so costs will drop.

Pictures and Television.

"THEN the next thing to be done in a big commercial way is the transmission of pictures and facsimiles. This is waiting to be done. In part it is already being done, but further development must be made before very much greater use is made of it. However, the job is there.

"Another big thing that will develop is world-wide broadcasting. With the use now being made of world-wide telephony and the improvements that are in sight we can look forward to the time when all our local broadcasting services will be supplied regularly with special features from big world centres such as London, Paris and New York, and so on, on short-wave and picked up and rebroadcast. Some form of beam transmission will probably be used for this work.

The transmission of programmes between Australia and New Zealand should now be possible, and would be a distinct novelty and service.

"Of course, everybody is looking for wireless television, but I think it will be some years before we see it in any practical form. It will come all right, but there is a lot to do. An ordinary picture takes from five to twenty minutes to transmit. To secure television of moving pictures you have to transmit one picture in one-twelfth of a second so that there is a tremendous amount of work to be done.

Cannot See the End!

"AND I don't think it will stop there," declared Mr. Fisk. "As we attain that, we will find other things to be done. We are dealing with electricity which is a very flexible form of energy. The ether also is a very flexible thing so that on the one hand you have the unlimited possibilities of electricity, and on the other the unlimited potentialities connected with the ether. What the ultimate developments will be are largely a matter of technical science and engineering as to what we want to do and how far we can learn how to do it."

Then, interruption!—

"Mr. Heighway, you have a call in for Wellington. Stand by!"

"Are you there? Heighway here!"

"What a thrill this is, A.J. Your voice is wonderfully clear."

"So is yours. I received your letter this morning and will be glad to dine with you next Monday evening!"

And so on. Wireless telephony is here. The Tasman is bridged. We in New Zealand can now speak to the world. It IS a thrill, isn't it?

And there is the bugle call for dinner. My hand is tired. But as the shades of evening fall there comes in from the East the voice of 2YA and from the west, the call of 2FC. Radio—Radio—the wonder of it!

Programme Organisers

MR. H. C. TRIM and Mr. Owen Pritchard, programme organisers at the Wellington and Auckland broadcasting stations respectively, have exchanged positions, and each commenced his new duties last Monday.

Mr. Trim, who has been catering for listeners' tastes at 2YA almost since that station's inception, has proved himself very efficient in a position which constantly demands unlimited tact and organising ability. He was very popular, both among his fellow officials and with artists. Few people realise the difficulty of organising programmes satisfactorily—the uncertainty of securing artists for a definite appointment being an unenvied task. However, as listeners may judge by the past programmes from 2YA, Mr. Trim's unceasing efforts have met with definite success. Prior to his departure for Auckland, Mr. Trim was made the recipient of a presentation by Mr. Davies, the station director, on behalf of the staff.



MR. OWEN PRITCHARD has been programme organiser at 1YA since toward the end of last year, when his predecessor, Mr. Dudley Wrathall, was transferred to 4YA, Dunedin. He has had an extensive and varied theatrical experience, being in his time acrobat, singer, violinist, comedian, actor, orchestral leader, producer, and broadcasting artist. He frequently appeared before the microphone at 1YA in humorous and serious roles, while his flair for "finding" artists and arranging programmes has been reflected in the high standard of entertainment broadcast by 1YA.

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