

Marconi's Latest**Music by Beam**

STRIKING evidence of the progress which is being made by the engineers of Marconi's Wireless Telegraph Company in developing apparatus for the simultaneous transmission of telegraphy and telephony over beam wireless circuits was provided by a demonstration of the new apparatus given by Senator Marconi to officers of the Radio Corporation of America. While ordinary telegraph traffic was being transmitted to Great Britain from the Canadian terminal of the British-Canadian beam service near Montreal, a dance concert was simultaneously switched on to the beam. Without interrupting the telegraph traffic, or without being interrupted by it, the music from Canada was picked up at the British receiving station at Bridgewater, and reproduced at full volume on loud-speakers. An impromptu dance was held to it. Subsequently American engineers at the Bridgewater station heard addresses from friends in America so perfectly that every speaker could be recognised by his voice before his name was announced. It is claimed that in addition to greatly extending the amount of traffic which can be transmitted over a single beam, the new apparatus which makes it possible to use the beam simultaneously for telegraphy and telephony so affects the character of the wave radiated from the beam station that to a great extent signal fading is prevented. It is expected that the various Empire beam services will shortly be used for the interchange of broadcasting programmes between the countries in the Empire.

A series of radio talks is to be given over the air from 2YA by Mr. W. M. Dawson under the auspices of the Wellington Amateur Radio Society. Beginners are recommended to watch for these on alternate Saturday evenings.

Wireless Waves**Influence of Refraction**

FOR some time after radio communication was first effected it was thought that the wireless waves travelled in straight lines. When, however, reception was accomplished over longer distances it was realised that there existed what is now known as the "heavyside layer." It was already known, however, that the radio waves did travel horizontally for a short distance, and the natural and correct solution was reached that the waves were transmitted in every direction and that those projected upwards were deflected by the "layer" to some spot at a greater distance on the earth's surface from the transmitting station.

With the acceptance of this theory came two important discoveries—the obvious one, that of "skip-distance," and the second, the cause of "fading" which was due, according to Professor Appleton, to the simultaneous reception of two sets of waves, the horizontal and the deflected.

THE next notable discovery to be made was that the height above ground of the layer varied according to the time of day or night, an increase of 100 per cent. being apparent on some nights. This naturally makes a great deal of difference to DX (long distance) reception, for, the angle of incidence on the layer is equal to the angle of deflection, e.g., waves striking at an angle of forty-five degrees would be reflected at the same angle. From this it may be seen that, theoretically, reception at night should be possible over twice the "daytime" distance.

IT will be seen that many of what are sometimes regarded as extraordinary phenomena are really the outcome of natural functions, and it is with the general appreciation of this idea that DX reception will grow more and more in the public favour.

Growth of Radio**Wonderful Record of U.S.A.**

REMARKABLE statistics have been issued by the Department of Commerce of the United States of America to show how the wireless industry has grown in that country since the first broadcasting station was opened there about eight years ago. The first broadcasting station in America, and probably in the world, was the station KDKA of the Westinghouse Company at Pittsburg. This station was responsible for the discovery, in quite an accidental manner, of the remarkable possibilities of wireless broadcasting. The station was opened in 1920 for general experiments in wireless telephony. The object of the experiments was to develop wireless telephony as a rival to the land line for ordinary commercial communication, but while tests were being held it was resolved, as a matter of convenience, to transmit gramophone music. As soon as these transmissions began it was discovered that the number of amateur stations within range of its transmissions increased remarkably, and it then became evident that most of the new stations had been erected solely to pick up the musical transmissions. Programmes were promptly improved, and a regular service was instituted; and it was not long before the opening of this service was followed by the construction of wireless telephone stations in practically every other large centre in the United States. When KDKA began its experimental service the value of wireless apparatus sold annually in America was less than £400,000. In 1927 equipment sold was valued at more than £100,000,000. At the same time about 10,000,000 of the 28,000,000 homes in the United States were provided with receiving sets, while the number of broadcast listeners in America was estimated at 40,000,000. Nearly 500,000 persons are now employed in the American wireless industry. The number of broadcasting stations operating in the United States at present is estimated at nearly 700.

Identifying Stations

IN New Zealand one is not, as a rule, caused much difficulty in identifying the different stations received, but in Europe endless difficulties must occur. At least fifteen different languages are on the air and although some of them do give announcements in English, the majority do not. However, the various stations have done much to simplify matters and many have adopted distinctive signals. Berne uses a gong, Bratislava bells, Geneva a whistle, Graz a metronome, while most of the German stations use a metronome and a gong.

Some stations also send a Morse letter repeated many times between items. Yet these signals cannot convey much to the uninitiated listener.

Japanese Stations

AS predicted in the "Radio Record" some months ago, the Japanese broadcast stations are now audible on the loudspeakers of some hundreds of New Zealand listeners. The following list will aid beginners in locating the Japs:—

| Location. | Call letter. | Wave-length. | Output power. |
|-----------|--------------|--------------|---------------|
| Tokio | JOAK | 345 m. | 10,000 |
| Osaka | JOBK | 400 m. | 10,000 |
| Kioto | JOFK | 353 m. | 10,000 |
| Kumamoto | JOGK | 380 m. | 10,000 |
| Sendai | JOHK | 390 m. | 10,000 |
| Sapporo | JOIK | 361 m. | 10,000 |

AN important advantage to be obtained from the use of a grid bias battery is that it results in quite an appreciable economy in B battery current consumption, and thus prolongs the life of the high tension battery. If only for this reason alone a C battery should be used. The higher the voltage of the C used the greater the economy effected in the B battery consumption. Lastly, the use of grid bias enables greater volume to be obtained by reason of the fact that it allows a higher plate voltage to be employed. Without the application of a negative bias to the grid of the valve the higher B battery voltages would probably cause distortion to the signals.

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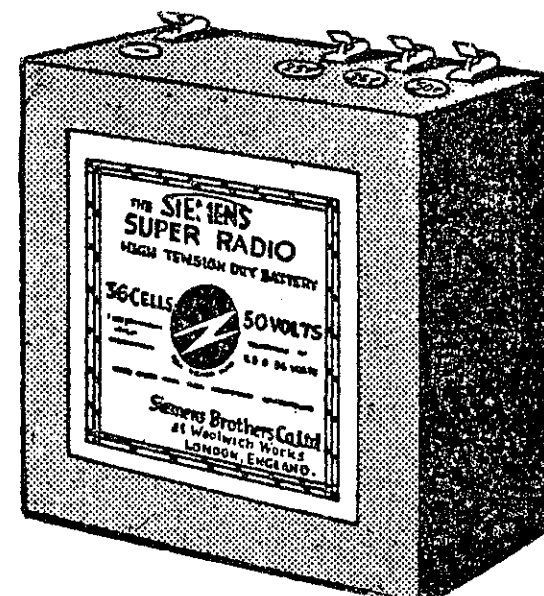
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