

WIRELESS AND AIRCRAFT

Wireless Communications for Africa. A Chain of New Marconi Stations.
Approved Wireless Equipment for Aircraft

BRITISH enterprise is establishing a comprehensive system of wireless communications in Africa, the Marconi Company having received orders for the erection of a chain of wireless transmitting and receiving stations through the heart of that Continent.

The stations have been ordered by the Administrations of Uganda, Kenya Colony, Tanganyika, Northern Rhodesia, Southern Rhodesia, and the Union of South Africa, and they will be used both for the operation of the new Cape-Cairo air route and, in many cases, for general communication.

The apparatus to be installed, all of which is being manufactured at the Marconi Works at Chelmsford, is of the latest design for transmission and reception on medium and short wavelengths.

By the aid of these stations, linking up all the aerodromes and enabling aircraft in flight to keep in touch with the ground throughout the journey—the aircraft also being equipped with Marconi apparatus—the trans-African aviation service will constitute the most highly-organised long-distance air route in the world, and at the same time internal and external communications will be greatly facilitated throughout the Continent.

The sites for the stations have now been decided; they are to be in the proximity of

Uganda:—Kampala;
Kenya Colony:—Nairobi;
Tanganyika:—Moshi, Dodoma, and M'Beja;
Northern Rhodesia:—M'Pika and Broken Hill;
Southern Rhodesia:—Salisbury and Bulawayo;
Union of South Africa:—Germiston, Victoria West, and Cape Town.

The wavelengths used for wireless communication between the aircraft and these stations will be 900 metres, and inter-aerodrome communication will take place on short waves.

For general communications special wavelengths have been allotted to the stations at M'Pika, Broken Hill, Bulawayo, Salisbury, Germiston, and Victoria West, which will be used for this purpose.

Short-Wave Transmitters

Five types of Marconi short-wave transmitters—types S. 3A, S. 3B, T.N. 7, T.N. 7A, and S. 100B—are to be installed in the wireless stations, according to the class of service and the wavelength required in each instance.

The type S. 3A has been recently developed to cover efficiently a very wide range of frequencies, extending from 18,750 to 4,000 kilocycles (16 to 75 m.). This transmitter is normally rated at 1-kilowatt, this being the output of the high-tension direct-current generator used for supplying power to the anodes of the magnifying valves. It incorporates quartz crystal and master oscillator control to maintain the rated frequency within a very narrow limit.

A modification of this transmitter, the Marconi type S. 3B, covers from 1,500 to 3,000 kilocycles (20 to 100 m.).

Other stations are to be equipped with the Marconi type T.N. 7 short-wave transmitter, which is similar to the type S. 3A and S. 3B transmitters, except that the quartz crystal is replaced by an independent drive circuit.

The T.N. 7 transmitter is also manufactured in two models, one operating over a frequency of 18,750 to 4,000 kilocycles (16 to 75 m.), and the other from 1,500 to 2,222 kilocycles (20 to 185 m.).

A simple and easily-operated short-wave transmitter, type S. 100b, is fitted in some of the stations. It covers a frequency range of 1,000 to 5,000 kilocycles (30 to 60 m.), and under normal conditions very long distances can be covered.

Medium Wave Apparatus

For operation on medium wavelengths, the African stations are to be equipped with the Marconi transmitters Types T.A. 4a and M.C. 6. The type T.A. 4a transmitter has a power input of 2.2 kw. and is suitable for transmission over the wave range of 400 to 1,550 m.

The type M.C. 6 equipment, which was originally developed as a powerful marine transmitter for use on large ships, is a transmitter covering the wave-bands of 600 to 800 m. and

1,900 to 2,500 m. It has a power input of 2 kw., but if working over shorter ranges this can be reduced to about one-tenth, if required.

General Purpose Receivers

The receivers employed are principally the Marconi commercial receivers, types R.G. 27 and R.G. 28. Both these receivers incorporate every modern development to secure a high degree of selectivity, stability of working over the full wave range, and ease of adjustment. The R.G. 27 covers a frequency range of 2,000 to 100 kilocycles (150 to 3,000 m.), and the R.G. 28 covers the short-wave range from 100 to 200 m.

The stations at Germiston and Victoria West are equipped with the Marconi directional receiver, Type R.G. 14, as fitted at the London Air Port, Croydon. This type of wireless direction finder, operating on the Marconi-Bellini-Tosi system, has proved its value in many important aerodrome stations in various parts of the world, including the London Air Port at Croydon.

Details of Stations

The equipment installed in the new stations is as follows:—
Kampala: T.A. 4a and S. 3b transmitters; R.G. 27 and R.G. 28 receivers.

Nairobi: T.A. 4a and T.N. 7a transmitters; R.G. 27 and R.G. 28 receivers.

Moshi: S. 100b transmitter; R.G. 28 receiver.

Dodoma: S. 100b transmitter; R.G. 28 receiver.

M'Beja: T.A. 4a and T.N. 7 transmitters; R.G. 27 and R.G. 28 receivers.

M'Pika: S. 100 transmitter; R.G. 28 receiver.

Broken Hill: T.A. 4a and S. 3b transmitters; R.G. 27 and R.G. 28 receivers.

Bulawayo: T.A. 4a and S. 3a transmitters; R.G. 27 and R.G. 28 receivers.

Salisbury: S. 3a transmitter; R.G. 28 receiver.

Germiston: M.C. 6 and T.N. 7 transmitters; R.G. 14 direction-finder receiver.

Victoria West: M.C. 6 transmitter; R.G. 14 direction-finder receiver.

Approved Wireless Equipment for Aircraft

Many hundreds of aero-generator windmills developed by the Marconi Company, in conjunction with Messrs. Haslam and Newton, of Derby, utilising variable-pitched blades operated by means of centrifugal weights, are in use in all parts of the world. The British Air Ministry has now notified the Marconi Company that the Marconi-Newton constant-speed windmills, Type 110, 140, 160 and 180, are approved for use on civil aircraft registered in Great Britain.

Owing to the differing air speeds and other factors involved, the installation of a windmill of any of these types in any particular aircraft registered in Great Britain will be subject to examination in order to ensure its safety on that machine. The Type 110 windmill has an output up to 100 watts, Type 140 up to 180 watts, Type 160 up to 250 watts, and Type 180 up to 500 watts.

These new models, as approved by the Air Ministry, include important improvements, greater strength and efficiency being obtained by the use of solid blades and a new system of governing, and the general construction being lightened in weight. At the same time head-resistance has been reduced.

Other Marconi wireless apparatus approved by the Air Ministry for use on civil aircraft registered in Great Britain include the AD.6.h. and A.D.6.m. "all-purpose" 150-watt aircraft telegraph-telephone equipments; A.D.8 long-range aircraft telegraph-telephone equipment; A.D.16 aircraft direction finder, Bellini-Tosi system; A.D.18a. 350-watt telegraph-telephone transmitter and receiver, the former having an independent "drive" system for maintaining at a constant value the frequency of the radiated wave; A.D.19 150-watt short-wave telegraph-telephone transmitter with independent drive, wave range 40-60 m.; A.D. 20 short-wave receiver, wave range 40-60 m.; and A.D.20a short-wave receiver, wave range 80-180 m.