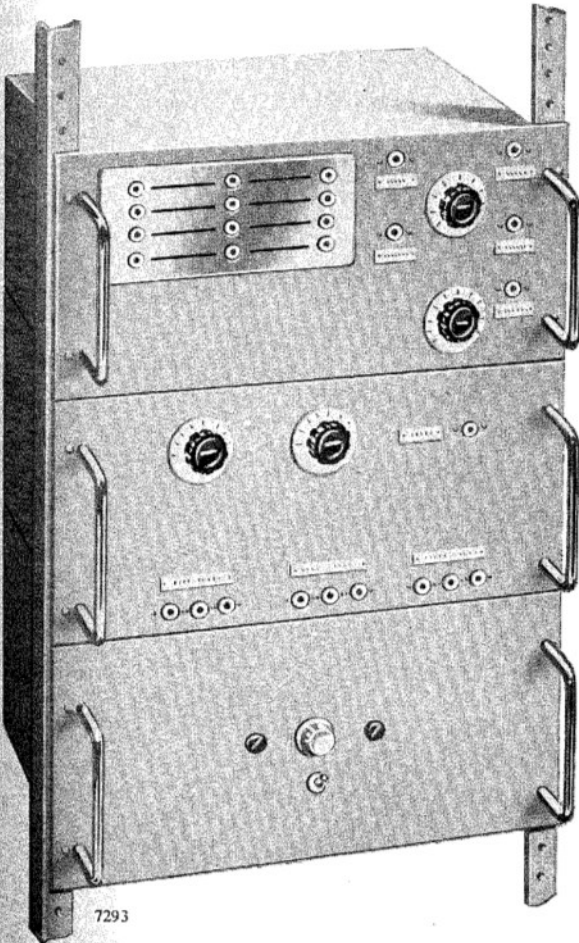




FM VF Telegraph Equipment Type HL 11/12



7293

THIS EQUIPMENT provides a means of combining three frequency-modulated voice-frequency telegraph channels within a 3 kc/s speech band for ISB transmission, and for reception of such signals on three channels by means of a FM VF double-diversity terminal in conjunction with an ISB diversity receiver.

CONSTRUCTION

The transmitting and receiving circuits are contained in withdrawable units mounted in standard 19 in. rack assemblies. The transmitter, known as the Type HL 11, consists of three panel units—an amplifier and filter unit, a tone oscillator unit and a power supply unit—mounted in a rack, usually with the associated drive equipment. The receiver, known as the Type HL 12, comprises eight units—a receiver unit and a power unit for each channel and two filter units. These units are mounted together in a standard rack, with or without other apparatus as desired. They are robust in nature, generously rated and designed to operate in tropical climates, housed in normally protected buildings.

Test points from all important parts of the circuit are brought out to the front panels of the equipment. These enable rapid checking of the operation of the apparatus to be carried out without interference with the service.

CIRCUIT

Each telegraph channel consists of a tone, frequency-shifted ± 100 c/s to produce the 'mark' and 'space' signals. The system is sometimes referred to as frequency shift tone (FST). The tone frequencies are 780 c/s, 1620 c/s and 2580 c/s, so chosen to ensure a minimum of harmonic relationship. They are generated by resistance-capacitance oscillators the outputs of which are controllable over a range of 10 dB.

Keying and output filters are incorporated to limit the frequency spectrum to that necessary for the highest keying speed, and the three channels are then combined in a common amplifier having a gain of 25 dB variable in 1 dB steps.

The combined signal modulates the transmitter through the usual ISB drive equipment.

For reception, the three tone outputs from an ISB receiver are separated by means of filters and fed via a conventional chain of limiter, discriminator and signal shaping circuits to a DC output stage. Path selection is provided by gating circuits which follow the discriminators and are controlled by the signal strengths before limiting.

A polar DC output of 30–0–30 mA, suitable for teleprinter or undulator operation, is provided.

If, in the interests of operational flexibility it is desirable to dispense with the FM VF receiving equipment, each telegraph signal can be treated as an independent narrow-band FSK signal, using a highly selective specialised receiver. A version of the Type HR 11 double-diversity receiver is available, suitable for this purpose.

DATA SUMMARY

Tone frequencies: 780 c/s ± 100 c/s

1620 c/s „ „

2580 c/s „ „

Tone stability: 2 parts in 10^8 for temperature variations between 10° and 50°C and $\pm 10\%$ variation of mains voltage.

Keying speed: 100 bauds max., all channels.

Keying potential: ± 10 V to ± 80 V DC.

Output to radio transmitter: 0 dBm to -20 dBm, into $600\ \Omega$.

Input from radio receiver: 0 dBm to -30 dBm, into $600\ \Omega$.

Output from receiver: 30–0–30 mA max. into $2000\ \Omega$ earthed load.

Fading ratios: Inter-channel level difference 30 dB max.

Power supply: 200–250 V 50–60 c/s AC.

Power consumption:

Transmitter Type HL 11: 100 W.

Receiver Type HL 12: 240 W.

Dimensions:

	Height	Width	Depth	Weight
<i>Type HL 11</i>	21 in. (53.4 cm)	19 in. (48.3 cm)	13 in. (33 cm)	78 lb (35.3 kg)
<i>Type HL 12</i>	49 in. (125 cm)	19 in. (48.3 cm)	13 in. (33 cm)	225 lb (102.2 kg)

Marconi

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

Marconi House, Chelmsford

Telephone: Chelmsford 3221. Telex: 1953. Telegrams: Expanse Chelmsford Telex