



VHF Multi-Channel Equipment Type HM 181

THIS VHF TERMINAL EQUIPMENT is designed for operation on fairly small multi-channel schemes where a limited number of repeaters are required. The equipment, which is relatively simple, provides a maximum of 24 channels to CCIF grouping, or 8 to 16 channels using 6 kc/s-spaced channelling equipment. The equipment is particularly suitable for systems in which access to channels is required at repeater stations. Frequency modulation is employed and the system is designed for unattended operation. Engineers' order wire and test facilities are provided. Aerial and feeder systems and carrier and power equipments can be supplied with the terminal. Standby arrangements with automatic changeover can be made.

In the planning of VHF stations the Marconi Company can offer expert advice, backed by much experience in this field. Complete projects from initial surveys to final installation can be engineered by experts.

CONSTRUCTION

The equipment is mounted on aluminium panels housed in a single 19 in. rack. Units (other than the power supply unit) are recessed and vertically mounted. A dust cover fits over the backs of the chassis and easy access for servicing is afforded.

Two equipments working back-to-back may be used as a repeater station. Cabling is *via* overhead racking and no floor ducting is therefore necessary.

CIRCUITS

TRANSMITTER

A balanced oscillator provides the drive and is directly frequency modulated by the incoming signal. This is followed by amplifier and multiplier stages to raise the signal to the required level and frequency. Push-pull stages provide final RF amplification. Automatic frequency control ensures a high degree of stability.

RECEIVER

A 'Cascode' circuit serves as RF amplifier and is followed by a pentode mixer stage. The local oscillator is crystal controlled. There are six IF stages followed by two limiter valves, discriminator and three-stage AF amplifier. AGC is applied, with manual adjustment of threshold level.



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ENGINEERS' ORDER WIRE (EOW)

Normal order wire facilities are provided.

The circuits used comprise an AF amplifier, a 2 kc/s Hartley-type ringing tone oscillator and a ringing tone amplifier.

POWER SUPPLY UNIT

Selenium rectifiers are used and are suitable for working at ambient temperatures of up to 50°C.

AUXILIARY EQUIPMENT

Rack- or wall-mounted *bandpass filters* of the low-loss resonant line type are usually installed to prevent transmitter-receiver interaction.

Six-element, Yagi *aerial systems* of the one, two or four stack type are available with steel, lattice masts or towers 50, 100, 250 or 400 ft high.

Frequency division carrier equipment of any standard type may be used with the Type HM 181. When 6 kc/s-spaced channelling equipment is used however an economically attractive system is provided.

Diesel alternator *power supply equipment* can be supplied if required.

A portable *test set* is available for use with the equipment.

DATA SUMMARY

GENERAL

Frequency range: 150–200 Mc/s.

Frequency tolerance: 50 parts in 10⁶ (ambient temperature range 0–50°C and mains voltage variation not more than ±6%).

Aerial input and output impedance: 75 Ω unbalanced.

Total peak deviation: ±120 kc/s.

Modulation frequency: 300 c/s to 108 kc/s (EOW 300 c/s to 3 kc/s).

Operating conditions: 0–50°C up to 95% humidity for continuous operation.

Power supplies: 200–250 V 50–60 c/s single-phase AC. Voltage regulation ±6%. Frequency tolerance ±2½%.

Power consumption: 0.5 kW.

TRANSMITTER

Power output: 10 W (min.) into 75 Ω resistive load.

Input impedance: Normally 75 Ω unbalanced. 140 or 600 Ω balanced, optional.

Modulator input level: –27 dBm for ±120 kc/s peak deviation.

RECEIVER

Noise factor: Better than 9 dB.

Selectivity: Overall bandwidth 0.8 Mc/s at 3 dB down. Attenuation at 2 Mc/s from centre frequency 30 dB minimum (without filters).

AGC: Maximum variation of output level does not exceed 0.5 dB for input signal levels between 10 μV and 30 mV.

Output level: +2 dBm for ±120 kc/s peak deviation.

Frequency response: ±0.25 dB from 12 kc/s to 108 kc/s.

Non-linear distortion: –52 dB (with aerial filters).

Signal-to-noise ratio: 58 dB for 150 μV input, on 3–60 kc/s band, relative to the output resulting from peak deviation of ±120 kc/s.

Dimensions:

Height	Width	Depth	Weight
6 ft 8¾ in.	1 ft 8½ in.	2 ft 5¼ in.	270 lb
(205 cm)	(53 cm)	(76 cm)	(123 kg)



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