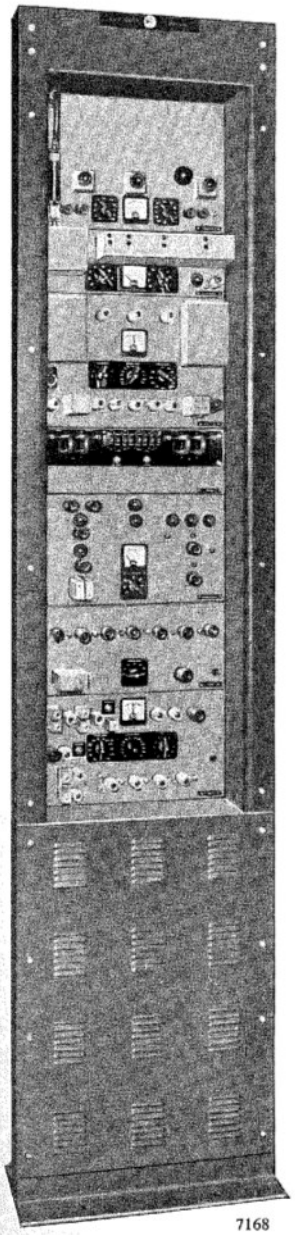
UHF Multi-Channel Equipment

HM 400 and HM 450 Series



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THE HM 400 SERIES TERMINALS and HM 450 Series Repeaters are UHF multi-channel equipments of the most modern design, capable of carrying one super-group, *i.e.* 60 telephone channels when associated with suitable frequency-division channelling equipment.

FEATURES

High stability of performance, high quality of transmission and rugged reliability.

Wide channel deviation ensures optimum channel signal-to-noise ratio.

Easily extendable from simple single-path systems to fully-equipped duplicated systems with all standby, supervisory and test facilities.

Channel-dropping facility is available at repeater stations. No loss of quality on dropped or 'through' channels.

Maximum traffic continuity ensured by *individual* repeater unit changeover on links with duplicate standby.

Exceptionally compact lightweight equipment, the basic terminal being accommodated in one aluminium rack with a second rack for EOW and supervisory equipment.

High-gain parabolic aerials utilise available power to the best advantage.

Reliability is ensured by careful circuit design, which results in valve lives exceeding 10,000 hours using normal commercial type valves.

Simplified maintenance, as most panels are common to repeater and terminal equipments.

Inter-panel wiring is conveniently housed in the vertical channel-section rack members.

Full and easy access to all components without removal of panels.

OPTIONAL FACILITIES

The basic terminal rack incorporates a carrier-failure alarm circuit, to which a bell or lamp alarm may be connected. The basic rack does not incorporate EOW, or supervisory facilities. These can be provided using additional equipment normally mounted in a second rack. Similarly at a repeater station in addition to the two basic radio racks, extra racks are necessary to provide EOW, supervisory, alarm and channel-dropping facilities. Provision can be made for the extension of alarms from repeaters to terminals in the event of certain selected non-radio faults (*e.g.* fire, unauthorised entry, etc.) at repeater stations. A comprehensive loop-test system can be provided to enable the performance of individual repeaters to be checked from either terminal. Additional panels are also available for installation at terminals, to give full transmission measuring facilities.

CIRCUITS

In the transmitter a phase-shift frequency modulator with AFC is followed by a chain of frequency multipliers and a power amplifier. The receiver is of the conventional superheterodyne type with a crystal-controlled local oscillator.

At the repeater, two 75-Ω outputs are provided on the receiver IF amplifier. On a channel-dropping repeater one output can be taken to a limiter, discriminator and base-band amplifier while the other output takes the normal 'through' signal to a frequency changer and power amplifier for onward transmission.

AERIALS

Parabolic mesh-type aerials of a new design are used. These aerials, which are 10 ft (3 m) in diameter, combine high gain with minimum weight and minimum wind-loaded area.

DATA SUMMARY

Frequency range: 335–470 Mc/s.

Frequency tolerance: 50 parts in 10^6 in the temperature range 0°C–50°C.

Aerial input and output impedance: 75 Ω unbalanced.

Channel deviation: ±100 kc/s RMS.

Max. overall deviation: ±300 kc/s RMS.

Modulation frequency range:
EOW: 300 c/s–3·4 kc/s. Traffic: 6–324 kc/s.

Power supplies: 200–250 V, 45–65 c/s AC. Permissible variation, voltage ±6%, frequency ±2½%.

Dimensions of terminal or repeater, with EOW:

Height	Width	Depth	Weight
7 ft 6 in. (228 cm)	3 ft 6 in. (104 cm)	1 ft 1 in. (33 cm)	670 lb (300 kg)

TRANSMITTER

Power output: 5–10 W.

Modulation input impedance: Traffic, 75 Ω unbalanced. EOW, 600 Ω balanced.

Modulation input level: −40 to +5 dBm per channel.

RECEIVER

Noise factor: 12 dB.

Selectivity: −40 dB attenuation at 5 Mc/s from centre frequency, with aerial filters.

Output impedance: Traffic, 75 Ω unbalanced. EOW, 600 Ω balanced.

Output level: −5 to −30 dBm per channel.

OVERALL PERFORMANCE

Frequency response: ±1 dB from 16–324 kc/s.
±0·5 dB from 60–300 kc/s.

Channel distortion:
Second harmonic −58 dBm.
Third harmonic −74 dBm

Gain stability: ±0·5 dB.

Interchannel crosstalk (worst channel): −55 dB for a single hop, terminal to terminal, with 60 channels.

Marconi

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

Marconi House, Chelmsford

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