



Three-Channel HF Receiver Type HR51



THE TYPE HR 51 RECEIVER is of the communication type, suitable for reception of telephone or telegraph signals on any one of three pre-set HF channels. The receiver may be controlled remotely over a distance of up to ten miles. The remote facilities are: control of channel selection and AF output. This control is effected over the same pair of wires that carry the audio-frequency signal output from the receiver. The control circuit must not exceed 1000 Ω loop resistance.

The receiver can be used to operate a recording unit such as the Type HU 11 (see page 369). Furthermore two receivers may be connected together for diversity reception, feeding a recording unit such as the Type HU 12.

The receiver and its power supply components are housed in a self-contained aluminium cabinet for bench mounting. The equipment is also available in a form suitable for rack mounting. A

hinged door at the front of the case encloses all controls to obviate accidental interference. An aperture is provided through which lamps indicating the selected channel are visible. When the door is opened all the receiver controls are exposed and the valves, which are mounted on vertical chassis, are then immediately accessible. Further access is gained by the removal of panels.

The remote control unit is housed in a self-contained metal case, suitable for bench or rack mounting. It requires connection to a mains supply point.

CIRCUITS

The pre-set RF tuned circuits are triplicated, the required one being selected by locally or remotely controlled switching. The basic receiver circuit is a double superheterodyne having intermediate frequencies of 2.6 Mc/s and 100 kc/s.

One stage of signal frequency amplification is used. The first oscillator is crystal-controlled. The buffer stage following, in addition to feeding the first mixer, has a $75\ \Omega$ termination by which drive can be fed to, or received from, another receiver if diversity reception is employed. Signals at the first IF are taken from the first mixer through tuned circuits to the second mixer. The crystal-controlled second oscillator has a $75\ \Omega$ termination for diversity working. The output from the second mixer is passed through a two-stage amplifier. There is a choice of two bandwidths at this point. Switch-selection of the narrower passband automatically switches the

BFO into use. After detection the signal is taken through an output amplifier to a $600\ \Omega$ line termination. The automatic gain control may be switched out of use if not required.

A half-wave bi-phase rectifier circuit is used for the HT DC supply with conventional smoothing and a stabilovolt for voltage regulation.

Remote selection of any one of the three frequency channels is effected by means of three relays and two motor-operated switches. The relays respond to three different signals that may be sent from the remote control unit, and under their control the motor-operated switches perform the actual selection switching.

DATA SUMMARY

Frequencies: Three crystal-controlled pre-set channels available anywhere in the range 3–27.5 Mc/s, with local or remote channel selection.

Input: $75\ \Omega$ coaxial.

Sensitivity: To give 10 dB signal/noise ratio the input signal required (modulated 30% at 400 c/s) in series with $75\ \Omega$ is $1.6\ \mu\text{V}$ up to 16 Mc/s and $3.2\ \mu\text{V}$ above 16 Mc/s. The CW input signal required to give 20 dB signal/noise ratio is $0.8\ \mu\text{V}$ up to 16 Mc/s and $1.6\ \mu\text{V}$ above 16 Mc/s.

Noise factor: 6 dB below 16 Mc/s.
12 dB above 16 Mc/s.

Image signal protection: 94 dB at 3 Mc/s.
60 dB at 16 Mc/s.
43 dB at 27.5 Mc/s.

Selectivity (Second IF): ± 0.75 kc/s at 6 dB attenuation (telegraphy) and ± 3 kc/s at 6 dB attenuation (telephony).

AGC: The output does not increase by more than 10 dB when the input is increased 60 dB.

AF output power: 20 mW max. in $600\ \Omega$. 1 mW max. in high or low resistance phones.

Power supply: 100–120 V or 200–250 V, 40–60 c/s single-phase AC mains.

Consumption: 70 W approximately.

Dimensions:

| | Height | Width | Depth | Weight |
|----------------------------|----------------------|---------------------|----------------------|-------------------|
| <i>Receiver</i> | 10½ in. (26.7 cm) | 19 in. (48.3 cm) | 14¾ in. (37.5 cm) | 44 lb (20 kg) |
| <i>Remote control unit</i> | 3½ in. (8.8 cm) | 19 in. (48.3 cm) | 11 in. (27.9 cm) | 15 lb (6.8 kg) |



MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

Marconi House, Chelmsford

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