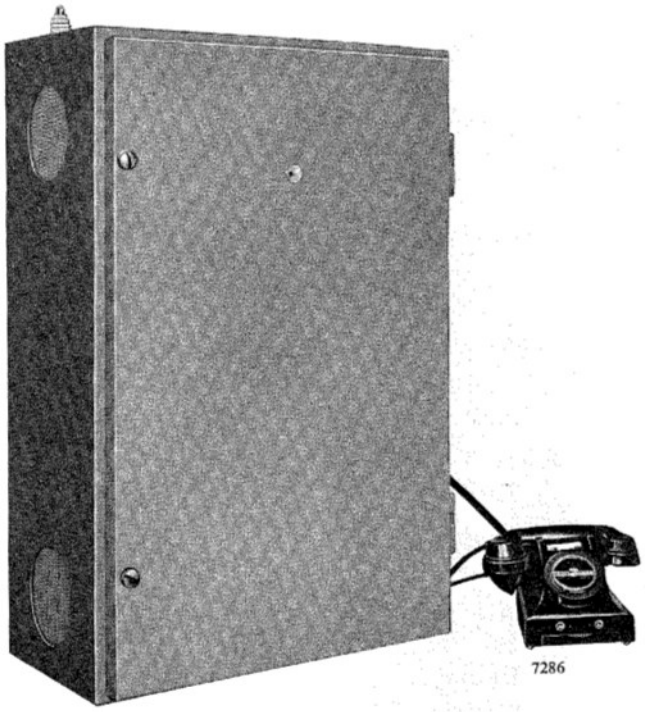
50-Watt HF Transmitter/Receiver
Type HSR 11

IN THE DESIGN of the Type HSR 11 HF Transmitter/Receiver emphasis has been placed on low initial cost, reliability and simplicity of operation. These characteristics, together with the robust manner of construction make this equipment particularly suitable for basic communication over medium distances in underdeveloped areas.

The Type HSR 11 transmitter/receiver is a pretuned equipment for telephone or hand-speed CW telegraph service. The transmitter gives 50 W power to the aerial on either of two spot frequencies. The receiver also operates on either of two spot frequencies, which may differ from those of the transmitter. When working telephony only the set is controlled from a desk telephone control unit, which may be placed up to 100 yards approximately from the main equipment. On/off switching and frequency changeover can be effected at the desk telephone control unit. For telegraph working the desk unit is not required, the headset and key being plugged directly into jacks on the front panel of the main equipment. This panel carries all operating controls needed, including a frequency changeover switch.

The facility of listening-through is provided so that, except for the case of common-frequency working, 'break-in' CW can be worked where separate receiving and transmitting aerials are installed.

Where both telephone and telegraph service are required the telephone desk unit is plugged directly into a socket on the main cabinet and the equipment is operated from that point.



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CONSTRUCTION

The main equipment comprises four units mounted in a heavy-gauge steel cabinet having a removable hinged door. These units are: the transmitter RF unit, receiver unit, transmitter modulator unit and power supply unit. Each of these is supported on angle brackets fixed to the sides of the cabinet. They are easily removable, multi-pin plugs and sockets being used on the inter-unit cabling. A switched meter is included on the transmitter RF unit for taking measurements at all important parts of the circuit.

CIRCUIT

In the transmitter a crystal-controlled oscillator drives two power tetrodes connected in parallel.

A loading coil and a range of series capacitors enable the transmitter coupling to be adjusted to deal with the wide range of load impedance presented by a single-wire aerial. The taps are preset to suit the two spot frequencies to be used.

The modulation chain comprises a line amplifier, phase splitter, push-pull triode driver stage and push-pull tetrode modulator. A limiter and limiter amplifier are also incorporated.

A tone oscillator is provided to generate AF sidetone on CW working.

The receiver is of the superheterodyne type with a crystal-controlled local oscillator. One stage of signal-frequency amplification is employed. The circuits are pre-tuned for either of two spot frequencies not necessarily those of the transmitter. A beat frequency oscillator, with variable control, may be switched into use for telegraph reception.

Conventional power supply circuits are used to provide the necessary HT, bias and filament heating supplies for the transmitter and receiver.

DATA SUMMARY

Frequency range: Choice of two crystal-controlled spot frequencies located anywhere within the range 2–12 Mc/s.

Nominal power output (to aerial feeder): 50 W on CW On/Off Telegraphy (A1) and Telephony (A3).

Frequency tolerance: 100 parts in 10^6.

RF harmonic distortion: Less than 6% at 90% modulation.

Frequency response (telephony): ±2 dB from 300–3,400 c/s.

Aerial system: Single-wire 'vertical' or inverted 'L' aerial approx. 60 ft (18 m) long.

Receiver adjacent channel selectivity:
Bandwidth at −6 dB not less than 8 kc/s.
Bandwidth at −30 dB not greater than 36 kc/s.

Receiver signal/noise ratio: With a signal modulated 30% at 400 c/s connected *via* 230 Ω to the aerial terminal, a 10 dB signal/noise ratio is obtained for an input of 10 dB relative 1 μV.

Receiver AF output: 2 W max. in 3 Ω at 1 kc/s. The total harmonic distortion under these conditions is less than 5%.

Power supply: 100–115 V or 200–250 V, 50–60 c/s single-phase AC mains.

Power consumption: 350 W on telephony (full modulation) 280 W on CW telegraphy (key down).

Dimensions:

Height*	Width	Depth	Weight
3 ft (91 cm)	1 ft 10½ in. (57 cm)	1 ft 1 in. (33 cm)	90 lb (41 kg)

* *Including aerial insulators.*

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MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED
Marconi House, Chelmsford
Telephone: Chelmsford 3221. Telex: 1953. Telegrams: Expanse Chelmsford Telex