



Double-Diversity HF Receiver *Type HR 14*

THE TYPE HR 14 equipment is a pre-tuned three-channel telegraph receiver arranged for extended control from a point normally within the same building. It is eminently suited for installation at large stations where centralised control of a number of receivers makes for convenience of operation and economy of staff. The extended control facilities of this equipment include aural monitoring, frequency selection, second oscillator fine tuning, AFC switching, and adjustment of input signal level, IF gain and telegraph bias. Extended indication is given of AFC correction, fine tuning control position, DC output signal and IF path levels.

The receiver incorporates three crystal-controlled pre-set signal-frequency amplifiers any one of which may be switch selected.

The equipment is housed in withdrawable units assembled in a cabinet 7 ft high with a full-length door at the rear.

FEATURES

Rapid selection of any one of three crystal-controlled spot frequencies.

Extended control of major operating facilities including frequency selection.

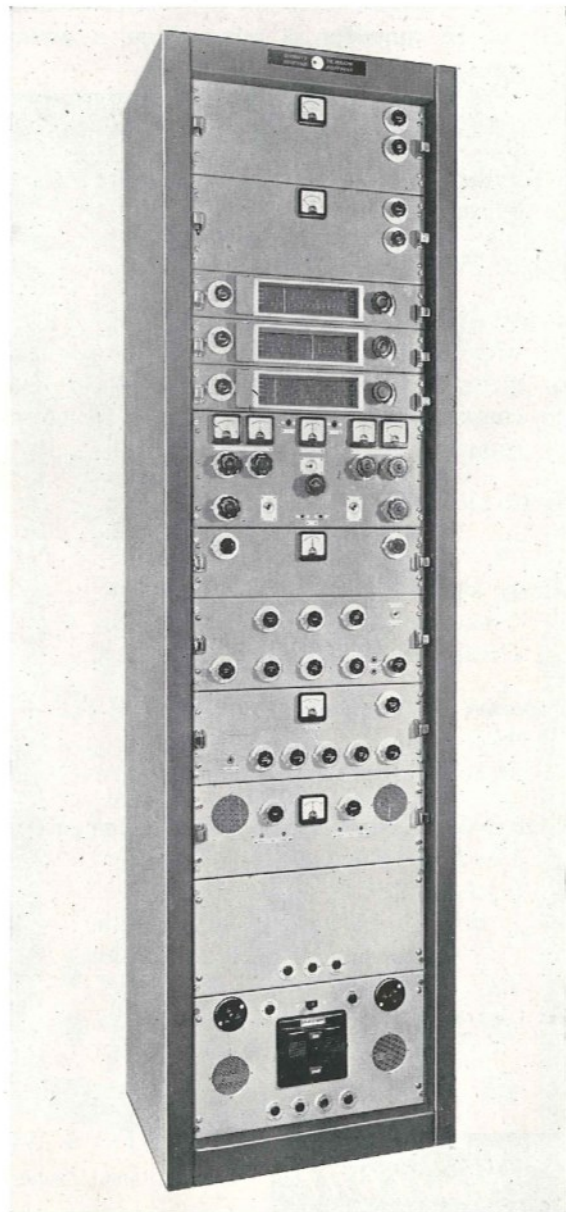
The high order of oscillator stability and selectivity enables the receiver to be operated for considerable periods without attention.

Motor-driven automatic frequency correction follows drift of up to ± 3 kc/s with substantially zero error.

Simultaneous operation of a tone-sender together with two undulators or teleprinters is possible.

Units may be withdrawn on runners to give access to all components without cable disconnection.

Adequate metering facilities are provided and zero beat or 1 kc/s monitoring can be effected.



CIRCUIT

The circuit is that of a double superheterodyne for CW on/off reception, employing intermediate frequencies of 2600 and 100 kc/s.

Two stages of signal-frequency amplification with pre-set ganged tuning are used in each path. Two stages of IF amplification with transformer coupling giving an 8 kc/s passband, precede each second frequency-changer. The second oscillator is controlled by the AFC system.

For CW on/off reception the output of each second IF amplifier is taken from a power

amplifier stage to a diode detector. The outputs of the two detectors are combined in a common load. The DC output is limited and filtered before it is taken to key two pairs of output valves.

For FSK reception the outputs of the second IF stages are taken to third frequency-changers for conversion to 10 kc/s at which frequency the signals are limited and detected. Path selection is effected at DC but is controlled by the signal levels at 100 kc/s, thus eliminating switching transients.

DATA SUMMARY

Operating frequency: One of three pre-set frequencies in the range 3–27.5 Mc/s.

Input: 75 Ω coaxial.

Sensitivity: 0.25 μ V input required at 27.5 Mc/s with 1 kc/s passband for FSK 560 c/s shift giving less than 15% distortion (1 per 1000 characters) at 100 bauds. 0.35 μ V for corresponding CW on/off signal.

Noise factor: Less than 3 dB at 3 Mc/s.
Less than 6 dB at 27 Mc/s.

Image signal protection:

Greater than 100 dB up to 8.5 Mc/s.
Greater than 70 dB above 27.5 Mc/s.

Selectivity (First IF):

9 kc/s wide at 3 dB attenuation.
34 kc/s wide at 20 dB attenuation.

Selectivity (Second IF): Switch selection of 0.5, 1 or 2 kc/s filter.

0.5 kc/s filter:

0.4 kc/s wide at 6 dB attenuation.
1.4 kc/s wide at 70 dB attenuation.

1 kc/s filter:

0.9 kc/s wide at 6 dB attenuation.
3 kc/s wide at 70 dB attenuation.

2 kc/s filter:

2.2 kc/s wide at 6 dB attenuation.
7 kc/s wide at 70 dB attenuation.

Frequency stability:

First oscillator: 1 in 10^6 per $^{\circ}$ C.
Second oscillator: 15 in 10^6 per $^{\circ}$ C.

AFC: Frequency drifts up to ± 3 kc/s are followed with a residual error of less than 4 c/s.

AGC: 20 dB change in output for 80 dB change in input.

Signalling speed: 300 bauds max. with 2 kc/s bandwidth and 850 c/s shift.

Frequency shift: 100–850 c/s.

DC output: Two outputs of 30–0–30 mA into earthed loads not exceeding 2000 Ω . 30–0–30 V output simultaneously available for keying a tone sender.

Power supply: 200–250 V, 50 c/s single-phase AC mains. Permissible voltage variation $\pm 6\%$.

Power consumption: 550 W approx.

Dimensions:

Height	Width	Depth	Weight
7 ft 0 $\frac{1}{2}$ in.	1 ft 11 $\frac{1}{2}$ in.	1 ft 10 in.	500 lb approx.
(214 cm)	(59 cm)	(56 cm)	(227 kg)

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