



6-channel VF Telegraph Equipment Type HL 13/14

THE Type HL 13/14 is a voice-frequency telegraph equipment of advanced design, comprising Transmitter Type HL 13 and Receiver Type HL 14. It utilizes the techniques of single sideband transmission and double diversity reception.

For transmission each channel keys one tone for 'mark' and another for 'space', alternately. The combined tone output is used to modulate a single sideband or independent sideband transmitter.

On reception the mark and space tones are dealt with as independent on/off signals. Since space diversity reception is used the information content of each channel is available four times, e.g. two mark tones and two space tones. The space signals are inverted in the demodulators. The four demodulated signals (two mark and two

space) are now in phase and are combined in a linear manner, to provide a polar output.

Features

Six 100-baud telegraph channels contained in a single 3 kc/s speech band, or eight channels within 3.1 kc/s band.

Effective quadruple diversity system effected by a combination of space and frequency diversity techniques. Gain over comparable FS system of up to 4 dB.

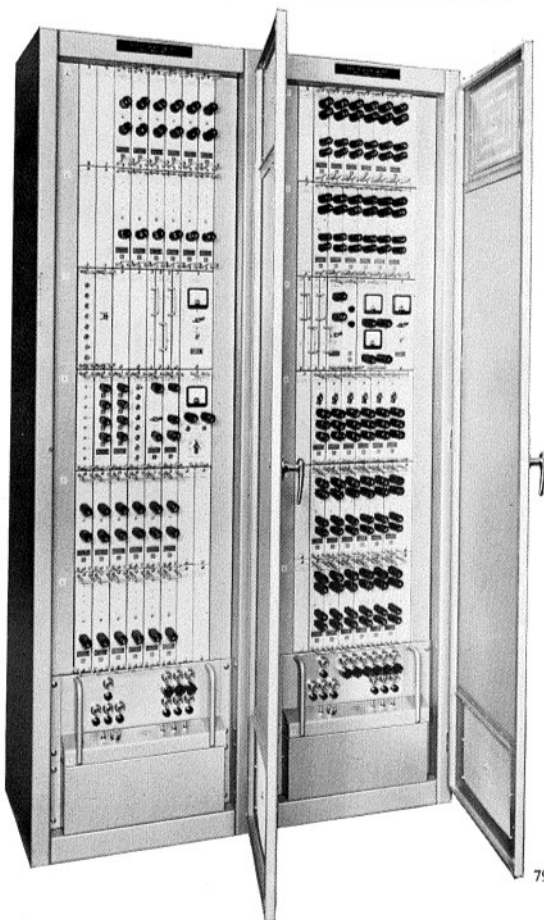
10 to 1 error improvement over a simple double diversity system.

Monitoring of output and input signal levels.

Constant transmitter peak envelope power is maintained when two or more channels are in use.

Advanced construction techniques using printed-wiring boards.

Transmitter Type HL 13 (left) and Receiver Type HL 14.



7967

Data Summary

GENERAL

Frequency range: 6 channels between 645 and 2755 c/s (alternative edition provides 8 channels between 300 and 3100 c/s).

Keying speed: 50–100 bauds, synchronous or non-synchronous working.

Tone frequencies: Tone separation 170 c/s; Lowest and highest frequencies 765 c/s and 2653 c/s (425 c/s and 2975 c/s on 8-channel edition).

Filter bandwidth:

140 c/s at –3 dB points.

250 c/s at –40 dB points.

Demodulation factor: 4 to 5 dB.

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

Power consumption:

Type HL 13, 400 W; Type HL 14, 850 W.

Dimensions (each cabinet):

Height 7 ft 0½ in. (214 cm)

Width 1 ft 11½ in. (59 cm)

Depth 1 ft 10 in.* (56 cm)

TRANSMITTING EQUIPMENT (TYPE HL 13)

Telegraph input:

5–0.5 V to 80–0.80 V square-wave keying. 15–0–15 V to 80–0–80 V sine-wave keying.

The input resistance is 10 k Ω .

Frequency stability: Less than ± 2 c/s for $\pm 10^\circ\text{C}$ change in ambient temperature with $\pm 10\%$ change in mains voltage. (Less than ± 1 c/s with $\pm 1\%$ change in mains voltage.)

Tone output: –15 dBm to +10 dBm in 600 Ω (adjustable in steps of 1 dB).

RECEIVING EQUIPMENT (TYPE HL 14)

Input level: –10 dBm median input to path amplifiers.

Input impedance: 600 Ω .

Return loss: Greater than 20 dB.

Slide-back time constant: 200 ms (approx.)

Telegraph output: 30–0–30 V, 10 k Ω .

* If cabinet is fitted with front and rear doors add 3 in. (7.6 cm) to depth.

Marconi

Marconi's Wireless Telegraph Company Limited
Marconi House, Chelmsford, Essex
Telephone: Chelmsford 3221 · Telex: 1953
Telegrams: Expanse.Chelmsford Telex