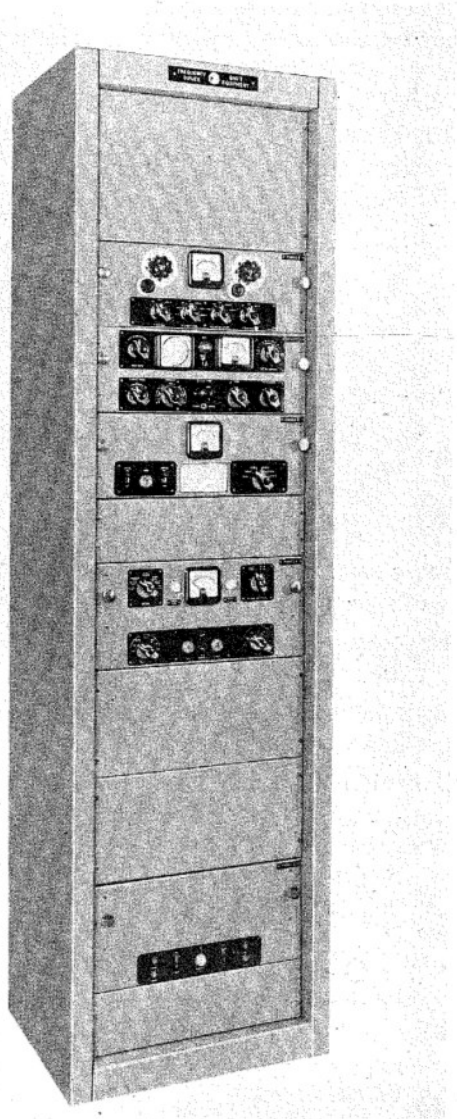
Frequency-Shift Diplex Drive and Keying Equipment *Type HD61B*

THE DIPLEX OR TWIN-CHANNEL SYSTEM of frequency-shift keying (FSK) is a development of the single-channel system. It enables two independent telegraph channels to be simultaneously operated on a single CW transmission. A diplex FSK receiving unit (see page 371) must be fitted at the receiver.

The Type HD 61B equipment is designed for keying a telegraph transmitter by the frequency-shift diplex system and will also provide single-channel frequency-shift and on-off CW keying. Any one of six pre-set crystal-controlled frequencies may be selected. The equipment is suitable for use with most Class C transmitters, including the Marconi SWB series.

The equipment is made up of five panels—mixer, crystal drive, keyer, power supply and monitor—mounted in a 7 ft metal cabinet. An oscilloscope is incorporated. The panels may be withdrawn from the front on runners and access is also given through a rear door. The construction of the crystal drive unit is of particular interest. This unit contains up to six crystal oscillators, each with a thermostatically controlled oven, and amplifiers. Each pair of oscillators with associated ovens and amplifiers forms a strip-mounted sub-assembly which may be readily removed for replacement or servicing.

All major operating controls, indicating lamps and meters are mounted on the front of the equipment. The keyer unit houses its own power supply unit; the main power supply panel feeds the remaining units.



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CIRCUITS

For diplex FSK working the signals on the incoming lines are applied to two separate chains of

DC amplifiers, each incorporating a limiter stage. The DC amplifiers govern the conduction or non-conduction of three double-diode valves. As a result four distinct values of bias potential may be applied to the grid of a reactance valve which is coupled to the tuned circuit of a 3·1 Mc/s crystal oscillator. The frequency of this oscillator may thus be increased in four steps (0 c/s, 400 c/s, 800 c/s, 1200 c/s). The reactance valve is followed by a buffer amplifier.

When single-channel FSK working is selected only one chain of DC amplifiers is used to control the reactance valve, giving normal shift keying of the 3·1 Mc/s oscillation frequency. For on-off CW working the buffer amplifier valve is keyed. The signal passed to the mixer stage is therefore 3·1 Mc/s keyed on-off.

The 3·1 Mc/s FS or on-off keyed signal is amplified and passed to the balanced mixer stage for conversion into a keyed signal at the radiation frequency. For this purpose drive frequency from one of the six crystal oscillators is also applied, *via* harmonic generators if needed, to the mixer stage. The output stage can deliver up to 20 W. There is provision for division of the basic shift should further frequency multiplication be employed following the equipment.

The monitor used in the Type HD 61B equipment has, in addition to a 3·1 Mc/s oscillator, a variable AF oscillator (100–1600 c/s) for beat monitoring. In this unit the output from the discriminator or the CW on-off signal can be passed *via* an amplifier to a built-in $2\frac{3}{4}$ in. cathode-ray tube. A frequency changer is also included to enable the output of the transmitter to be monitored.

DATA SUMMARY

Service: (1) Two-channel FSK.
(2) Normal single-channel FSK.
(3) Single-channel FSK with frequency modulation.
(4) On-off CW keying.
(5) Facsimile.
(6) MCW using external audio source

Frequency range: 4–27·5 Mc/s. Operation on one of six spot frequencies in the band.

Frequency tolerance: 10 parts in 10^6 within the temperature range 10–40°C.

Power output: Approximately 20 W into 75 Ω unbalanced feeder.

Carrier shift: Variable from 0 to 1200 c/s.

Keying potential: ±10 V into 2000 Ω.

Keying speed: Up to 100 bauds (channel A) and 50–75 bauds (channel B) service (1). Up to 400 bauds on other services.

Power supply: 200–250 V, 50–60 c/s single-phase AC mains. Frequency tolerance $\pm 2\frac{1}{2}\%$. Voltage regulation ±6%.

Dimensions:

	Height	Width	Depth
Type HD 61	3 ft 6 in.* (107 cm)	1 ft $11\frac{1}{2}$ in. (59 cm)	1 ft 10 in. (56 cm)
Types HD 61A and HD 61B	7 ft $0\frac{1}{4}$ in. (214 cm)	1 ft $11\frac{1}{2}$ in. (59 cm)	1 ft 10 in. (56 cm)

** This cabinet may be mounted on angle-iron supports which adds approximately 2 in. (5 cm) to the height.*

Marconi

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