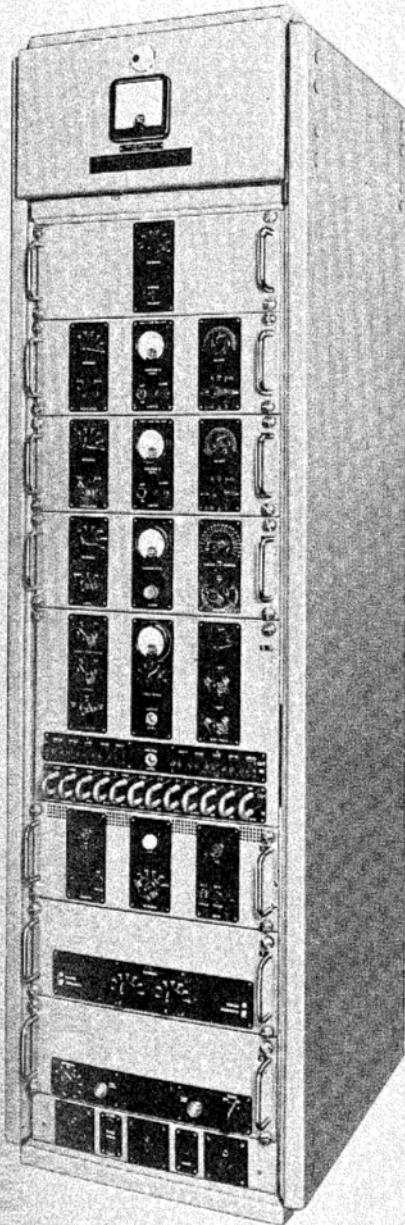




ISB Generating and Monitoring Equipment *Type HD 51*



6947

POINT-TO-POINT COMMUNICATION in the HF band utilising independent sideband transmission has been greatly extended in recent years, and performance of a very high order is required of the equipment providing the drive for ISB transmitters. The Type HD 51 ISB Drive Equipment has been designed to a standard that meets the latest specifications of the British Post Office and the Services. When supplied with two audio inputs (100 c/s to 6000 c/s) this equipment provides an output of two independent sidebands (corresponding to the two audio inputs) centred around a controlled low-level pilot carrier of 3.1 Mc/s. If used in conjunction with channel displacing equipment (see page 385) and a suitable transmitter, *four* telephone speech channels (300–3000 c/s) may be radiated. The output can be changed over instantly to low-level DSB for emergency use by the operation of two switches. The gain throughout the equipment has been stabilised by extensive use of negative feedback, and limiters are incorporated to prevent overloading on either sideband which would cause distortion on the other. These features, coupled with the inclusion of circuits providing automatic remote warning of any significant change of carrier level, make the equipment eminently suitable for unattended operation.

The equipment is assembled in a cabinet 7 ft high, and unit construction is employed throughout. The majority of units are runner mounted allowing for speedy removal and complete access. Special attention has been given to the monitoring arrangements, to accessibility of controls, and to simplification in the operations of setting up and measuring distortion.

DATA SUMMARY

AF inputs: 2 balanced or unbalanced 600 Ω lines.
Levels: +10 dB to -10 dB relative to 1 mW.

3.1 Mc/s output: Peak sideband power: 250 mW total. Carrier level: Adjustment from -32 dB to 0 dB relative to 250 mW. Normally -26 dB relative to 250 mW. Impedance 72 Ω coaxial feeder. This may be terminated *via* a 10 dB pad by *any* impedance.

Frequency tolerance: Better than 2 parts in 10^6 per week for ambient temperature changes of 10°C-40°C.

Frequency bandwidth: 3.094-3.106 Mc/s.

Spurious and harmonic outputs: All (including 3 Mc/s) are more than 60 dB below 250 mW.

Frequency response:

Within 1 dB from 200 to 5800 c/s.

Within 2 dB from 100 to 6000 c/s.

50 c/s rejected by more than 25 dB.

7 kc/s rejected by more than 5 dB.

9 kc/s and above rejected by more than 25 dB.

Gain constancy: ± 0.5 dB over any 6 hours of unattended operation for $\pm 1\%$ mains variation.
 ± 1 dB over any 6 hours of unattended operation for $\pm 6\%$ mains variation.

Limiters: No effect on performance up to full level on each sideband, less than 2 dB rise of sideband output for any further increase of input level.

Non-linear distortion:

3rd order ($2f_1-f_2$), lower than -50 dB.

2nd order (f_2-f_1), lower than -50 dB.

Both measured by standard two-tone test with 250 mW PSP.

Carrier regulation: Less than 0.5 dB total variation of -26 dB pilot carrier for any signal level up to 250 mW.

Transient distortion:

Overshoot: less than 1%. Rise and decay: less than 750 μ s. Delay: less than 1 ms. Measured with a pulse-modulated audio input.

Crosstalk: Less than -60 dB (excluding inter-modulation products).

Monitor receiver:

Inputs:

(a) From pick-up points in transmitter either at radiated frequency or at 3.1 Mc/s.

(b) From drive unit at 3.1 Mc/s or 94-106 kc/s.

Outputs:

Two independent audio outputs (corresponding to the two sidebands) at +10 dBm in 600 Ω . Distortion less than 1%.

Carrier monitoring (simultaneous with above outputs):

Range: As for drive pilot carrier.

Alarm: A change of carrier level of more than 3 dB for more than 1 second closes contacts for a local and a remote alarm.

Distortion monitoring:

In conjunction with built-in audio oscillators both 2nd and 3rd order inter-modulation products may be measured down to -60 dB below one of the two equal testing tones. The distortion introduced by the monitor receiver does not exceed -66 dB below one of the two test tones.

Double sideband: 3.1 Mc/s output PEP at 100% modulation is 250 mW. Carrier power is -6 dB below 250 mW. Distortion is less than 1% at 100% modulation.

Power supply: 110-120 or 200-250 V, 45-65 c/s single-phase AC. Voltage regulation $\pm 6\%$.

Power consumption: 500 W at 0.9 PF.

Dimensions:

Height	Width	Depth	Weight
7 ft	2 ft	2 ft 6 in.	594 lb
(213 cm)	(61 cm)	(76 cm)	(270 kg)

Marconi

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

Marconi House, Chelmsford

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