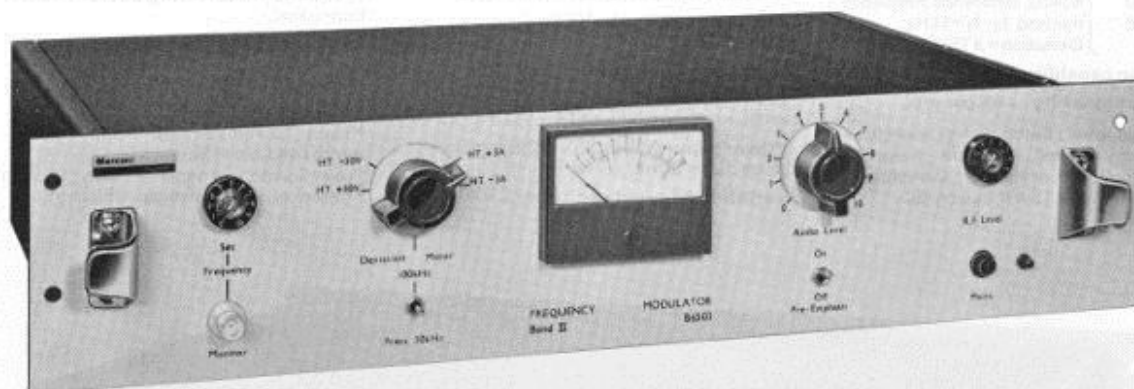




Frequency Modulator

B6503



Features

- Exceptionally good long-term frequency stability**
- Immune to overmodulation 'frequency lock-out'**
- Solid-state throughout**
- Built-in demodulator for aural monitoring**
- Suitable for stereo and S.C.A**
- Separate frequency-monitoring connector**
- Mains powered but oven can be energized from external 24V supply**
- Pre-emphasis remotely switchable**

Description

This frequency modulator embodies conventional techniques to the extent of using a varactor modulated L-C oscillator. However, a novel feature is employed in the a.f.c. circuit which both eliminates the instability of the discriminator from the overall frequency stability and also prevents 'frequency lock-out'. The latter phenomenon is experienced in frequency modulators using conventional a.f.c. circuits under conditions of excessive modulation, when the frequency deviation is such that a.f.c. voltages of the correct magnitude, but of reversed sign, are produced. This can lead to unwanted stabilization of the centre frequency at a point several hundred kHz from the correct value.

In the B6503, the a.f.c. correction voltage is obtained by mixing a sample of the frequency-modulated oscillator output with two separate reference frequencies at 0.5MHz above and below the oscillator frequency. The input of a single discriminator is switched, at a sub-audio rate, between the two mixer outputs. The discriminator output is synchronously switched into two integrators, the outputs of which are compared in order to obtain the a.f.c. correction voltage.

The signal from the frequency-modulated oscillator is passed through a limiting amplifier to suppress any amplitude modulation. In this amplifier the third harmonic is selected, limited and amplified to a level of 1W.

Pre-emphasis is provided, a choice of 50µs or 75µs being made by means of an internal soldered link (normally factory set to the required position). The selected pre-emphasis can be switched out of circuit either by means of a front panel switch or remotely for test purposes or transmission of stereo programmes.

A deviation meter is fitted on the front panel, and measures the frequency swing of the

basic oscillator, but is calibrated in terms of output frequency deviation. Full scale deflection of 0-30kHz or 0-100kHz can be selected.

For aural monitoring a simple a.f. monitor, complete with 50µs or 75µs (as appropriate) fixed de-emphasis, is provided.

Centre frequency can be checked at one third radiated frequency using a front panel monitoring point provided.

The B6503 Band II frequency modulator is designed to fit into standard international 483mm (19in) racking.

Data Summary

Power output: Adjustable from approx. 250mW to not less than 1W max. (by front panel control).

Working frequency: Factory adjusted to specified frequency in the range 87.5 to 108MHz.

R.F. output load impedance: 50 Ω unbalanced. No damage will occur as a result of either a short or open circuit at the output.

R.F. output connector: TNC, at rear.

Frequency stability without modulation: Better than ±1kHz per year within a temp range of ±10°C.

Centre frequency stability with modulation: ±200Hz (±75kHz deviation, 30Hz to 75kHz mod. frequency).

Audio input impedance: 600 to 2000 Ω, balanced or unbalanced.

Audio input level: (1kHz tone for ±75kHz deviation):

600 Ω input: -10 to -12dBm

600-2000 Ω input: 0-35V to 4-5V peak.

Audio frequency input adjustment (front panel): ± 5 dB within the range given above (position in range determined by internal pre-set).

Audio frequency response (referred to 1kHz): ± 0.3 dB, 30Hz to 75kHz ± 0.1 dB, 40Hz to 43kHz

Audio harmonic distortion:

	± 75 kHz	± 100 kHz
30Hz to 15kHz	0.2%	0.3%

Pre-emphasis: 50 or 75 μ s (pre-set at factory). Can be switched out locally or remotely.

Intermodulation distortion between 15kHz and 53kHz:

d_2 : -54dB
 d_3 : -54dB

Measured according to DIN 45403, difference frequency method. $f_2 - f_1 = 1$ kHz.
Deviation = ± 75 kHz.

Deviation capability: Exceeds ± 200 kHz.

Deviation stability: $\pm 5\%$ per year.

F.M noise level: Better than or equal to -65dB (unweighted) or -70dB (weighted) relative to ± 75 kHz deviation, r.m.s values measured within a 15kHz bandwidth.

A.M noise level: Better than -50dB (r.m.s noise to 1W carrier).

Amplitude modulation: Better than -50dB relative to 1W carrier when deviating ± 75 kHz at 1kHz.

Auxiliaries:
Deviation meter with 0-30kHz and 0-100kHz f.s.d scales.

Frequency monitor connection, at one third radiated frequency, on the front panel (TNC connector).

A.F monitor with fixed de-emphasis (corresponding to drive pre-emphasis), giving 0.15 to 0.25V r.m.s into 600 Ω (unbalanced) for ± 75 kHz deviation. Connections at rear.

Ambient temperature: 0°C to 45°C.

Maximum altitude: 3000m (approx. 9850 ft).

Maximum relative humidity: 95%.

Warm-up period for full performance with ovens initially cold: Less than 45 min

Power supply: 110, 220, or 240V, single phase, 50 or 60Hz.

Variation of supply voltage: $\pm 10\%$.

Variation of supply frequency: ± 2 Hz.

Power consumption: Approx 35W.

Oven supply: Internal or external 24V, 1.1A max.

Mains and external oven supply connector: 14-pole plug at rear (mating free socket supplied).

Audio input and a.f monitoring connector: 18-pole plug at rear (mating free socket supplied).

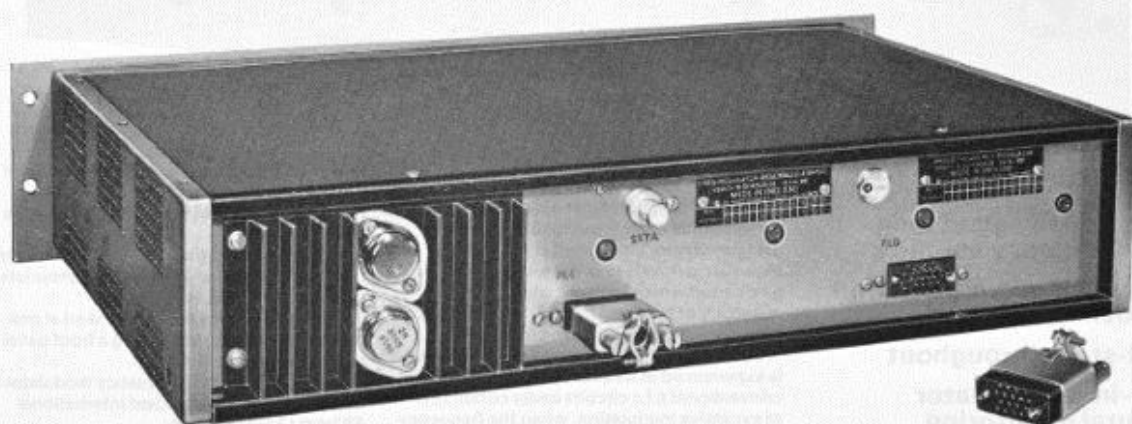
Front panel controls: Set frequency. Audio input level, R.F level. Pre-emphasis on/off. Deviation meter range. Switched d.c. voltmeter. Supply circuit breaker.

Frequency monitoring point: TNC, on front panel.

Finish: Morning mist.

Legend: English.

Dimensions:
Height: 100mm (3 $\frac{1}{8}$ in)
Width: 483mm (19in)
Projection behind panel: 311mm (12.25in)
Projection in front of panel: 25mm (1in)



This document gives only a general description of the product(s) and shall not form part of any contract. From time to time changes may be made in the products or in the conditions of supply.

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