6-MHz F.M.MODULATOR MD3/502

Introduction

The MD3/502 is a frequency modulator which accepts an audio signal and produces a 6-MHz f.m. output with correct pre-emphasis. With suitable associated equipment [2] the centre frequency of the f.m. signal may be locked to a reference signal, usually line syncs.

The unit is built on a single printed card mounted in a CH1/12A chassis with index-pegs 26 and 44. It has been designed as part of the MD1M/507 Wide Band Sound and Vision Modulator.

General Specification

Modulation Input Level	
for 75-kHz deviation at 400 Hz	+11dB ±0·5 dB
Modulation Input Impedance	600 ohms balanced
Output Level (6MHz f.m.)	
PLA10 terminated with 75 ohms	1V p-p ±100 mV
PLA8 terminated with 75 ohms	greater than 2V p-p
Distortion at 75-kHz Deviation	
100 Hz	not greater than -46 dB
1 kHz	not greater than -52 dB
Pre-emphasis	50 μs
Noise Level (peak noise relative to demodulated output at 75-kHz deviation)	-60 dB
Amplitude Modulation at 75-kHz Deviation	less than 2%
Power Required	70-85 mA at 12V

Circuit Description

The circuit diagram is given in Fig. 1. TR1 is the oscillator and the modulating signal is applied to the base via the pre-emphasis circuit. TR2 helps to stabilise the emitter current of TR1 against temperature variations and also provides a convenient high-impedance point for feeding in the locking signal. The r.f. amplifier TR3/TR4 passes the 6-MHz frequency-modulated signal to the output low-pass filter. This has a cut-off frequency of 9·6 MHz and removes unwanted components from the signal. A splitter pad provides two outputs, one of which feeds the associated apparatus producing the locking signal.

Capacitor C6 has a positive temperature coefficient and C8 has a negative coefficient. Capacitors C5 and C7 adjust the frequency and C9 is set for minimum distortion of the waveform. Capacitor C7 and C9 are sealed and should not be disturbed.

Maintenance

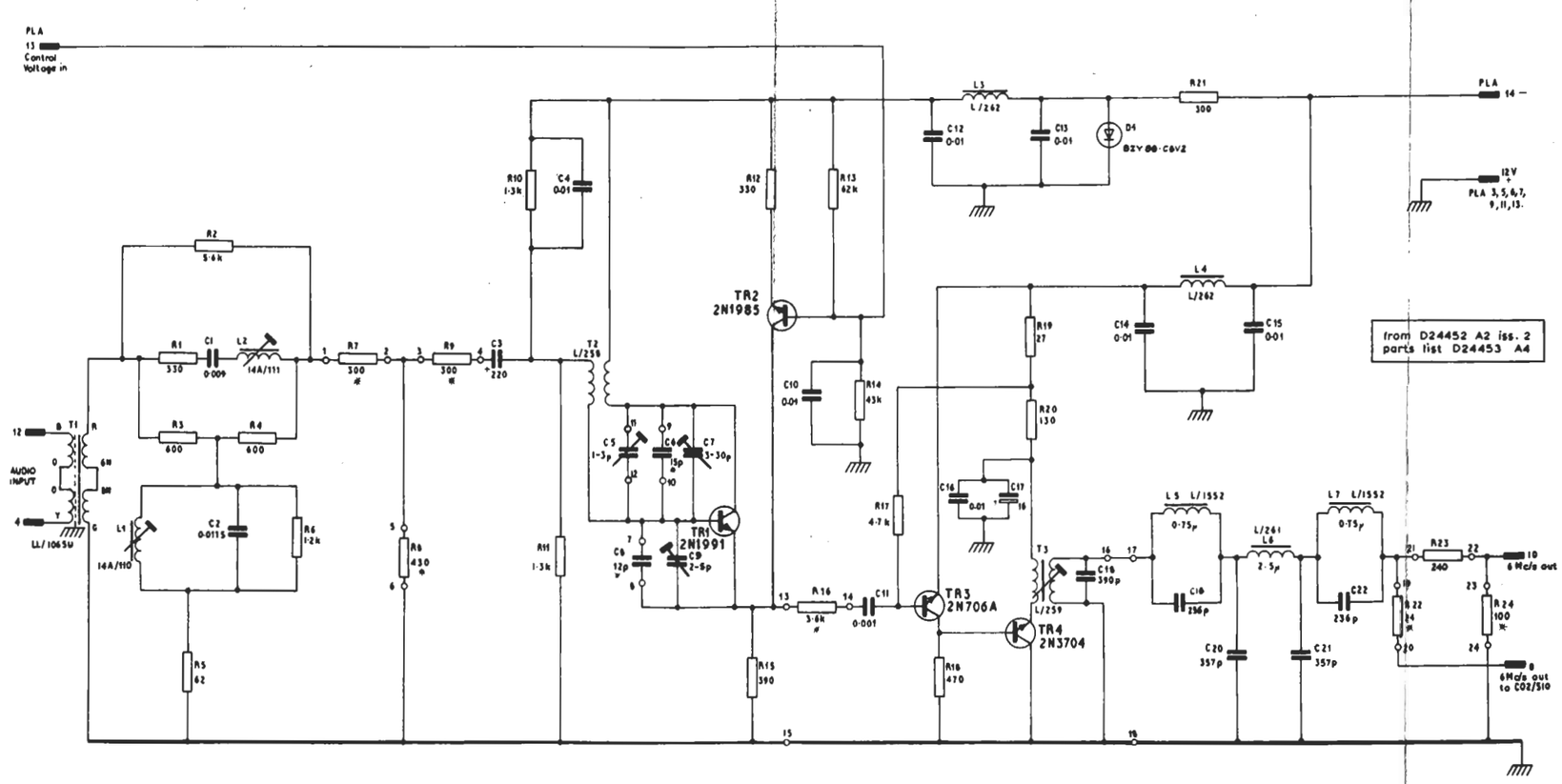
Routine maintenance is not required, but the following points can be noted.

1. The response of the pre-emphasis filter should conform to the curve of Fig. 2 to within ±0·5 dB up to 10 kHz and ±1 dB from 10 kHz to 20 kHz.
2. With *Trim* control (C5) in its mid position, the output frequency measured at PLA10 should be 6 MHz. For this test PLA should be disconnected and the unit must have reached its operating temperature (about one hour after switch-on).
3. The input level for 75-kHz deviation should be +11 dB ±0·5 dB above zero level at 400 Hz. The pad R7, R8, R9 is adjusted to meet this condition.

References

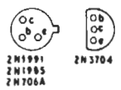
1. Designs Department Specification No.4.53(69)
2. Divider and Discriminator UN15/503

AIB 3/71



MD3/502/1T

Transistor terminations view on leads



Notes
1. Components marked thus * fitted on test.
2. Points shown thus —○— are numbered pins on printed board.

Fig. 1. Circuit of 6-MHz FM Modulator MD3/502