

CARRIER AMPLITUDE MODULATOR MD2/506

Introduction

The MD2/506 is a ring type modulator¹ (or synchronous demodulator) intended mainly for use as a colour sub-carrier amplitude modulator. It was designed specifically for use in the Fixed Frequency Modulated Oscillator OS2/517 and is a modified version of the MD2/504, which it very closely resembles. The main difference between the two versions lies in the input transformer which, in the MD2/506, has a ratio of 2.5 : 1 : 1 instead of 1 : 1 : 1 and provides a more favourable load for the preceding transistor drive circuits.

The unit is contained in a screening can with connecting pins protruding through the base to allow direct mounting on to a printed-circuit board.

General Specification*Inputs*

Subcarrier (3.58 MHz or 4.43 MHz) +6 dB to +10 dB relative to 2.5 V p-p from a 400 ohm (approx.) source

Video At least 16 dB below p-p level of subcarrier input

Modulated Subcarrier Output Amplitude of modulated envelope, p-p, is $e_v + e_{dc}$ where e_v is p-p video input volts and e_{dc} is added d.c. component

Modulation Factor
$$m = \frac{2e_v}{e_v + e_{dc}}$$
 For suppressed carrier operation $e_{dc} = 0$ and $m = 2$

Output Phase Input and output subcarrier in phase when pins 1, 4 and 8 are joined and a positive potential, with respect to pin 1, is applied to pin 5.

Subcarrier Input Impedance 250 ohms nominal

Video Input Impedance 100 ohms nominal

Output Impedance 75 ohms nominal

Carrier Leak (4.43 MHz) At least 75 dB below p-p level of applied subcarrier

Bandwidth (3.58 MHz or 4.43 MHz) ± 1.5 MHz for equal amplitude of side bands to within ± 0.1 dB

Linearity Satisfactory for use as subcarrier modulator or as synchronous demodulator for 525 or 625-line NTSC or PAL colour systems

Dimensions $2\frac{1}{4}$ in. \times $1\frac{3}{8}$ in. \times $\frac{5}{8}$ in.

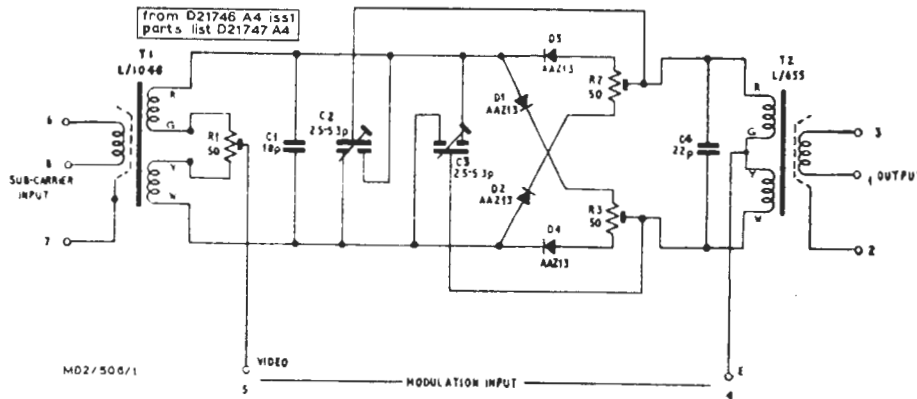


Fig. 1. Circuit of the Amplitude Modulator MD2/506

Circuit Description

The circuit diagram is given in Fig. 1. The forward resistances of diodes D1 and D4, D2 and D3 are equalised by the preset variable resistors R3 and R2. Circuit balance is adjusted by means of R1, C2 and C3 and all adjustments are made for minimum subcarrier output with no video input.

Maintenance

The balance of the modulator may be checked in the parent unit by making a measurement of the residual carrier at the output of the parent unit². Alternatively, the test circuit of Fig. 2 may be used. For both tests first set all controls to the mid position and then adjust R2 and R3 followed by R1, C3 and C4 to give minimum sub-carrier output.

Using the test circuit, the detector is set to give a convenient mid scale reading with the modulator in circuit. The change-over switch is then operated and the attenuator adjusted until the same reading is obtained. The attenuation should be 75 dB minimum and 85 dB typically.

An additional quick test is to measure the resistance between pins 4 and 5, using an Avometer model 8. Irrespective of the polarity of connection of the meter a reading of between 300 ohms and 400 ohms should be obtained.

References

1. See Technical Instruction L.1.
2. Typically, Fixed Frequency Modulated Oscillator OS2/517.
3. Designs Department Specification No. 9.109(68).

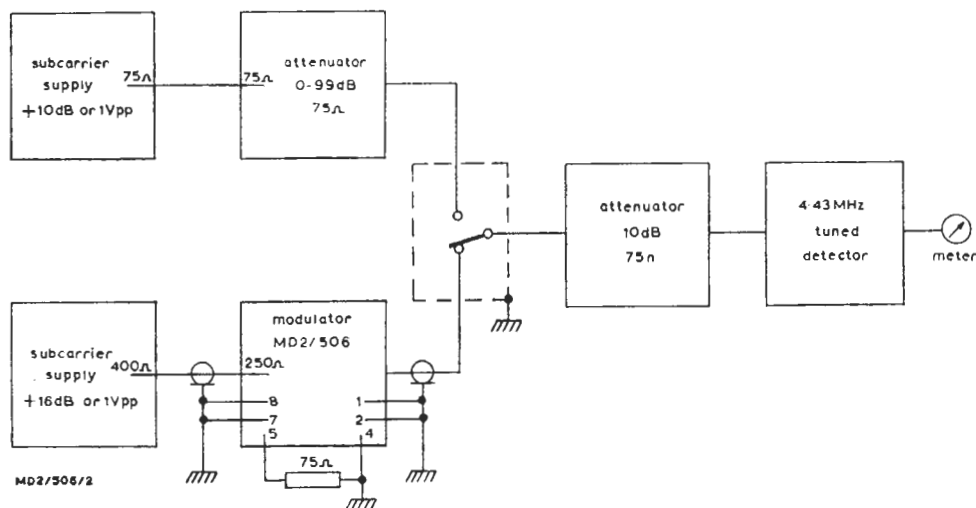


Fig. 2. Test Arrangement for the MD2/506