

### COLOUR SUBCARRIER FREQUENCY CONVERTER CO2/521

#### Introduction

The CO2/521 accepts a feed of a colour subcarrier signal and produces two outputs at 15/16 of the input frequency. The CO2/521 is used to feed one or more Digital Phase Shift Units CO2/522. If more than two CO2/522 units are fed from a CO2/521, a distribution amplifier must be used to improve the isolation between the inputs of each of the CO2/522. The CO2/521 contains a Modulator MD2/504 and four bistable units UN9/528.

The CO2/521 is constructed on a CH1/12A chassis with index-peg positions 7 and 32.

#### Circuit Description

A circuit diagram of the CO2/521 is given in Fig. 1 on page 3. The input subcarrier signal, amplified in transistor TR1, is fed to two emitter followers TR2 and TR3. The output of transistor TR2 is fed to a squaring circuit which includes transistors TR4 and TR5. This circuit is similar to a Schmitt trigger circuit except that the emitter resistor R17 is decoupled by capacitor C8 (0.1  $\mu$ F  $\approx$  0.36 ohm at 4.43 MHz). Thus at this frequency the circuit is a slicing amplifier. The slicing range is less than the backlash of the equivalent Schmitt circuit, and so gives a shorter rise-time of the output waveform fed to a divide-by-sixteen counter.

The 277-kHz square-wave output of this chain is fed via a low-pass filter and emitter follower to an input of the modulator MD2/504. A second input of the modulator is fed with subcarrier signal from emitter follower TR3.

The output waveform of the modulator takes the classic form (see Instruction L.1) with 16 cycles of the subcarrier signal within one cycle of the lower frequency envelope. This output is fed via a preset level control resistor R19 to a tuned two-stage amplifier. The tuned circuit L3 and C12 is tuned to the unwanted sideband output of the modulator 4.71 MHz to provide negative feedback at this frequency. Tuned circuit L2 and C11, tuned to the wanted sideband at 4.16 MHz, is loosely coupled to a similar tuned circuit L4 and C14 via the potential divider C11, C13.

Transistors TR8 and TR10 form part of a complementary two-stage negative-feedback output amplifier.

#### Test Procedure

The test procedure for the CO2/521 is given as part of the test procedure for the EP1L/509.

MJR 9/67

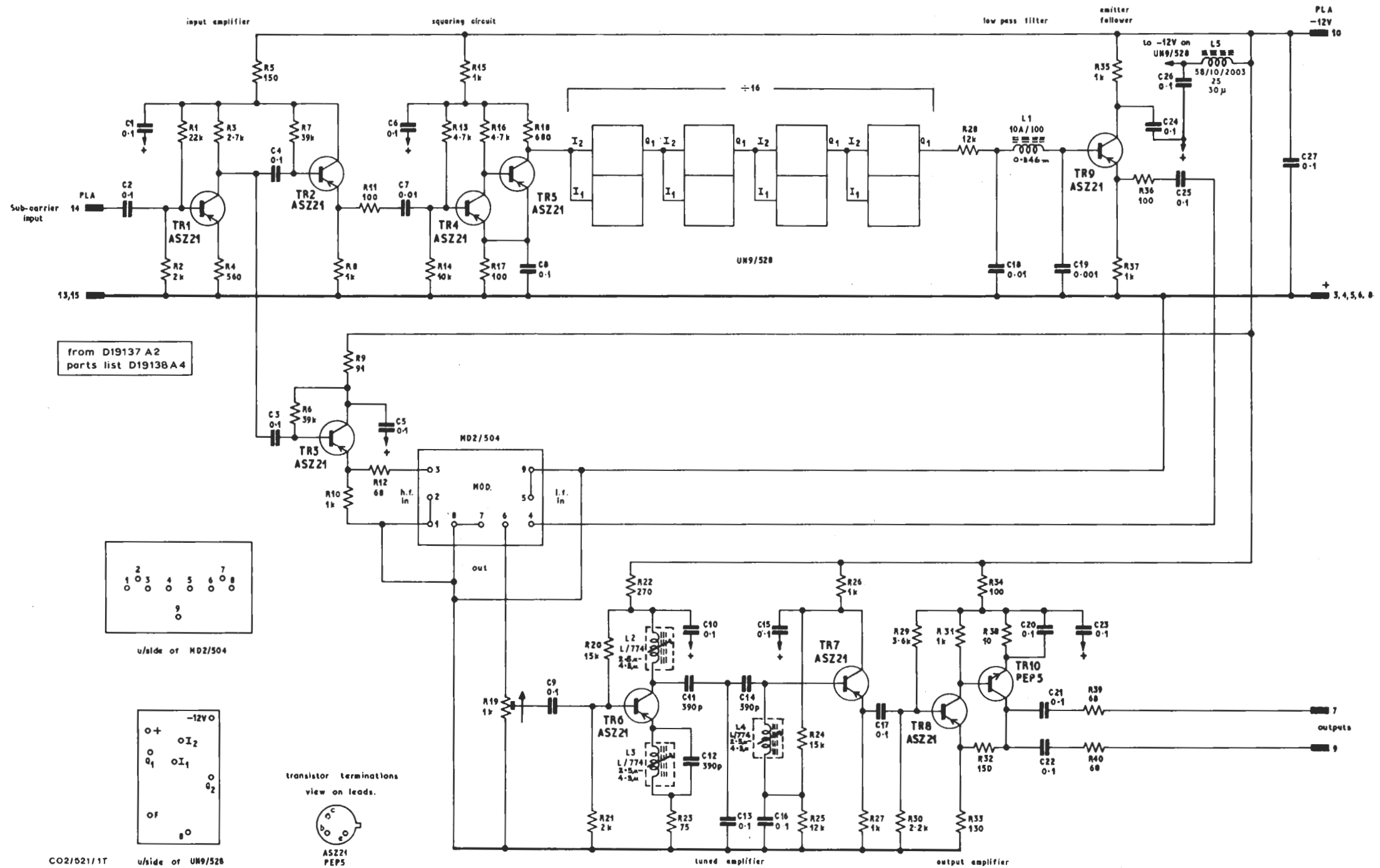


Fig. 1 Circuit of the CO2/521