SECTION 2

SYNC PULSE MONITOR MN1/502A AND MN1/502B

Introduction

The MN1/502A and the MN1/502B are sync pulse monitors for the 405-line and 625-line standards respectively. They are designed to operate an alarm system when the sync-pulse amplitude of the input signal falls below a preset value. The monitors are insensitive to noise and their operation is independent of the picture content of the input signal.

The monitors contain their own power-supply units.

General Specification

Input	1 volt p-p composite video 405-line or 625-line signal
Output	Contacts of relay RLA rated at 600 mA at 48 volts
Operating Point	Pre-set in the range −1 dB to −4 dB on nominal sync level

Mechanical Details

The monitors are built on a plug-in CH1/12 chassis with printed wiring. Power and signal connections are made when the units are plugged into position in one of the standard mounting panels of the PN3/21 type.

General Description

The two versions of this monitor are identical except for the electrical characteristics of a transformer (T2) which gives the circuit the ability to differentiate between the 405-line and the 625-line standards ; see Fig. 1.1 on page 2.3.

The input signal, a standard television waveform, is applied between C1 and the earthed negative supply line and it is amplified by TR1 and TR2. TR3 suppresses the picture signal and together with C7, R11 and MR5 provides negative keying pulses to TR4 which acts as a black level clamp on the base of TR5. The negative-going sync pulses on the base of TR5 cause the primary winding of T2 to ring at line frequency. This oscillation is rectified and operates relay RLA.

If a fault occurs which causes the sync-pulse amplitude to drop below a pre-determined level the relay releases and gives an alarm signal.

Circuit Description

The composite video signal applied to the input of the unit is fed via C1 to the base of TR1. At this point the picture signals are positive and the sync signals negative. TR1 operates as a common emitter amplifier and negative feedback from R4 raises the input impedance sufficiently to avoid significant connection loss. The output from TR1 appears across R5 with sync signals going positively. This signal is applied to the base of TR2, which is an npn-type transistor. (A pnp-type transistor could have been used, but coupling and biasing components would then have been required. The use of an npn-type transistor avoids this by permitting direct connection between TR1 and TR2, with consequent simplification of the circuit.)

R7 forms the load for TR2 and the amplitude of the composite signal across it is approximately 12 dB up on the input signal. The output from TR2 is split two ways, one path going via C4 to TR3 and the other via C5 to TR5.

TR5 is cut off by the potential on R13 until the arrival of the signal. The picture components are positive-going and have no effect other than to increase the reverse bias across the base-emitter junction. The negative sync pulses however, if of correct amplitude, cause the transistor to conduct during each line pulse. The corresponding pulses of current in the collector circuit cause the tuned primary winding of T2 to ring at line frequency; i.e. at 10·125 kHz or at 15·625 kHz.

TR5 is a.c.-coupled to TR2, and to prevent the negative excursions of the sync pulses varying with picture content, it is necessary to clamp the base of TR5 to a fixed potential during the black-level period. This clamping is done by TR4 which, when made conductive by a pulse from TR3, effectively connects the base of TR5 to the centre point of the two Zener diodes and allows C5 to charge to the potential of this point. TR4 is quiescent during the picture period due to the reverse bias across the emitter/base junction.

The sine wave output from T2 is applied to the rectifiers MR6 and MR7 and the resulting unidirectional pulses are applied to the base of TR6. The amplified current pulses in the collector

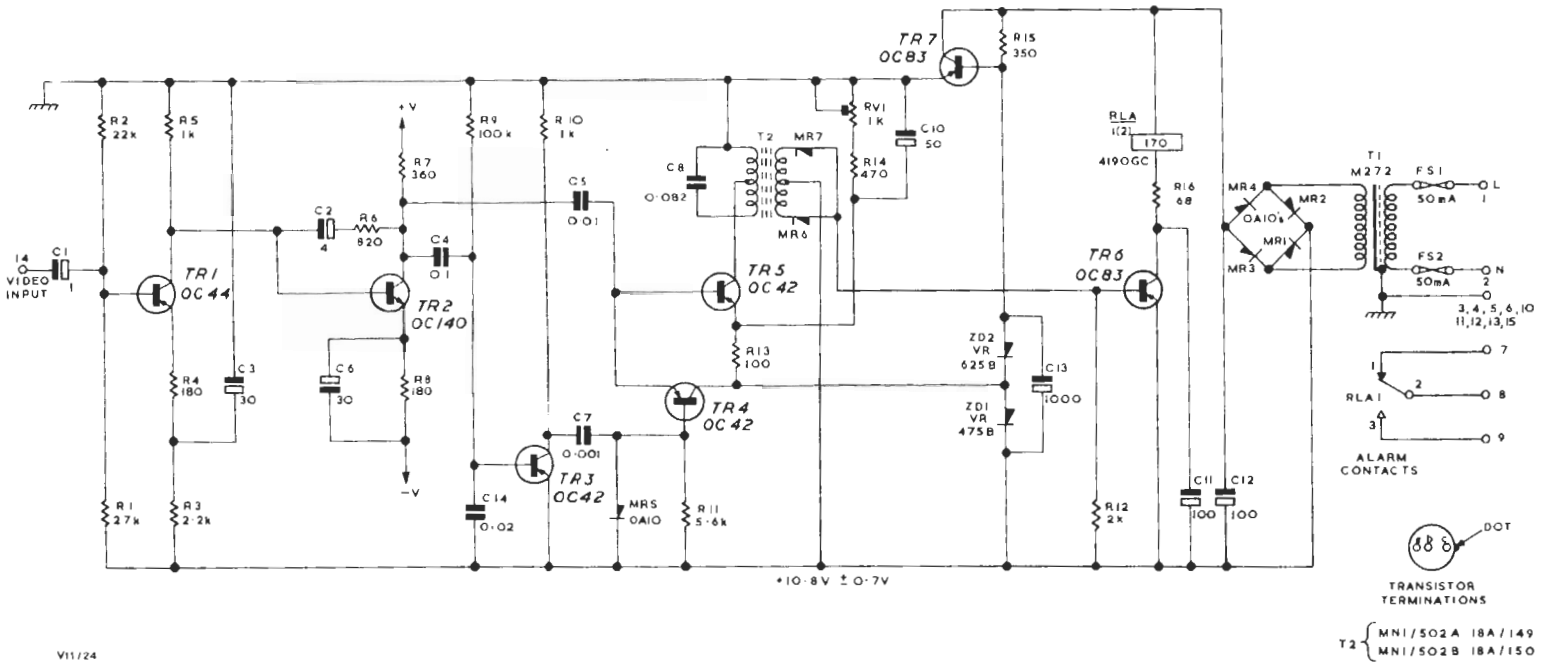

Fig. 2.1. Circuit of the MN1/502A and MN1/502B