LINE AND FIELD SYNC PULSE MONITOR MN1/508

Introduction

The MN1/508 is a sync pulse monitor which gives a signal for alarm purposes or for executive purposes such as initiating the starting-up procedure at an unattended transmitter station. Additionally, when used at a station working as a slave on another, the monitors ensure correct switching of the signals between the stations when both main and reserve signal feeds can be received via the same link at the slave station. Under these conditions, slight modifications to the monitors are necessary.

The unit is designed to monitor 75 ohm circuits. It accepts composite video signals which, by prior adjustment, may be on the 405-line or the 625-line standard. It can operate with line syncs only or with both line and field syncs together.

In the line sync only mode, the alarm signal is given when the pulses fall below a predetermined level in the range −1 dB to −7 dB of normal level. In the line and field sync mode, the signal is given when the composite pulses fall below the preset level or when the field sync pulses are absent whatever the amplitude of the line pulses.

The unit is built on to a CH1/12A chassis with index pegs 3 and 36 and supercedes the MN1/502.

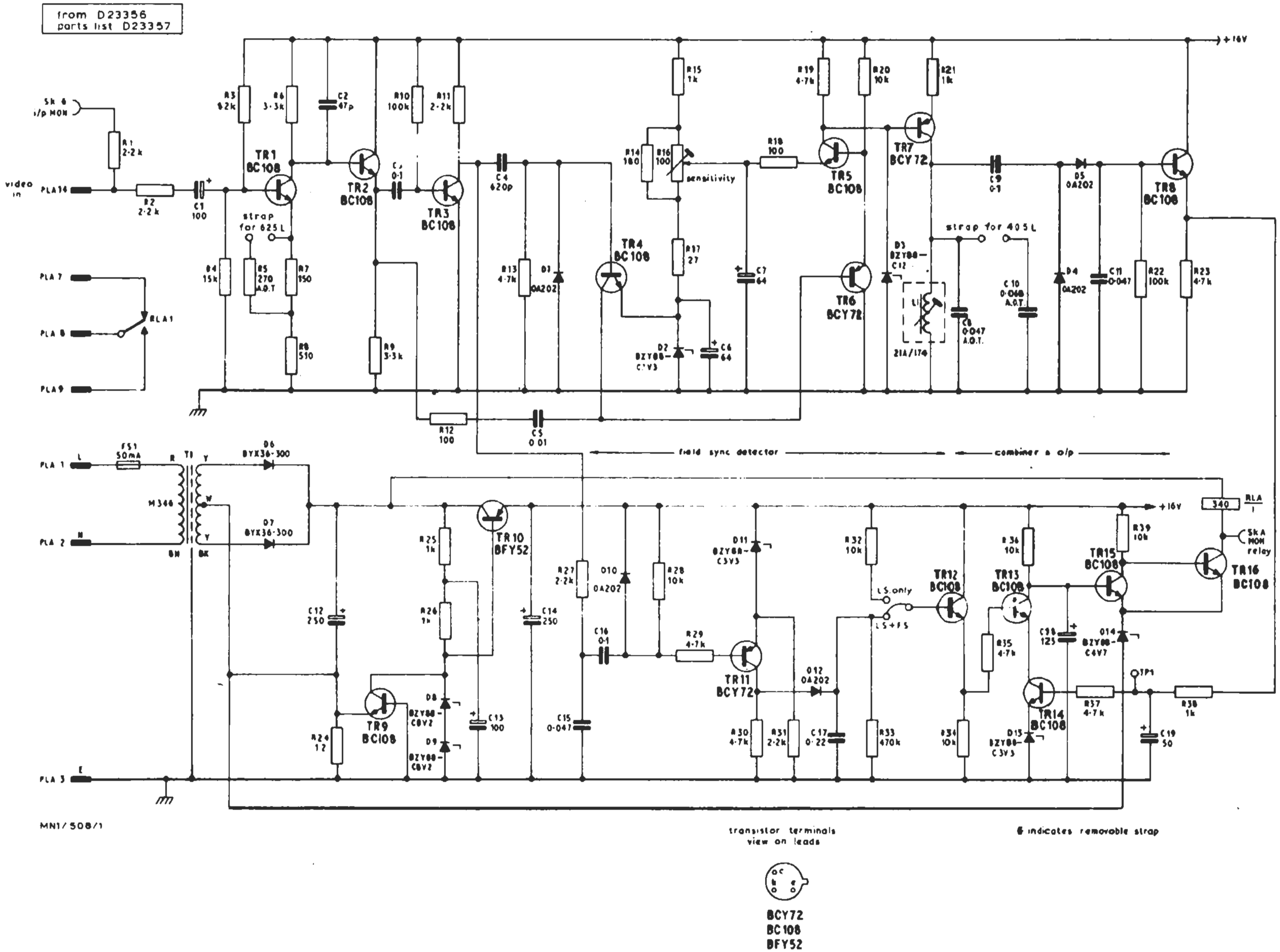

Fig.1 Circuit of the Sync-pulse Monitor MN1/508

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General Specification

Input (Composite Video)	1 V p-p
Input Impedance	12 kilohms approx.
Output	Changeover Relay Contacts
Operating Temperature Range	−10°C to + 45°C
Power Consumption	20 mA at 240 V, 50 Hz

Circuit Description

The main circuit is shown in Fig. 1. Fig. 2 shows the modifications required when the monitor is used as the main monitor at a slave station and Fig. 3 the modifications for use as a reserve monitor. TR1 is a common emitter amplifier with emitter negative feedback to give a moderately high input impedance to avoid loading the circuit being monitored. R2 is included to maintain the high input impedance when the unit is not powered, i.e., in the event of power supply or fuse failure. Under such failure conditions there is no measurable degradation of the differential gain and phase performance of the monitored circuit. Resistor R6 is shunted by C2 to reduce the effect of any h.f. noise. TR2 feeds the signal to the sync separator, TR3, and to the line-frequency detector circuit. TR3 removes the picture signal and feeds the amplified sync pulses to the clamp circuit and to the field sync detector.

C4 and R13 differentiate the pulses and D1 removes the negative peak. The positive peak from the trailing sync edge, switches on TR4 thus clamping the base of TR6 to 3·3 V from the zener diode D2 during the back porch period.

The video signal from TR2 via C5 and TR6, is applied to the base of TR5. TR5 is cut off during the picture period but is switched on by the positive going syncs pulses. The potential at the collector drops by about 6·5 volts causing the zener diode D3 to stop conducting. The point at which TR5 switches on and hence the sensitivity of the unit to line sync pulse reduction, is set by R16. D3 is used to stabilise the maximum positive swing at the collector of TR5 against supply line variations.

The pulse at the collector of TR5 causes a large pulse of current in L1 which rings at line frequency. The sine wave from L1 is rectified by the voltage doubler circuit D4 and D5 and the capacitor C19 is charged by TR8.

The signal from TR3 via R27 is integrated by C15 and d.c. restored by D10 to the 16 V line. TR11 is switched on by the integrated field sync pulses (the line pulses are lost below the 3·3 V reference from D11). The output from TR11 is rectified by D12, the time constant being fairly long to cover several field periods. The d.c. potential on C17 is applied via the link to TR12 which is held in the conducting state as long as the signal persists. If the link is in the line-sync only position, TR12 is held permanently conducting.

In the presence of signal TR13 and TR14 conduct, TR15 cuts off and TR16 conducts, operating RLA. If either TR13 or TR14 is cut off because of reduction of sync amplitude or absence of field syncs. TR15 conducts, cutting off TR16 and releasing the relay.

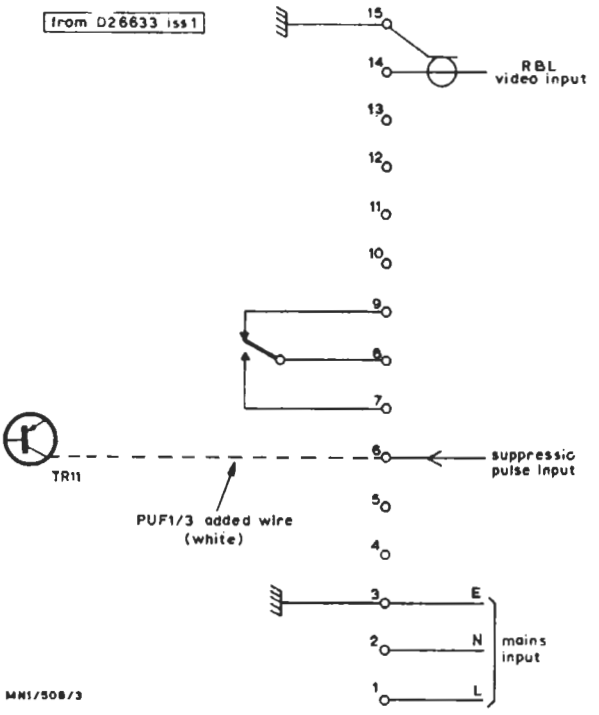

Fig. 2. Modifications Required when MN1/508 is Main Monitor at a Slave Station

When the monitor is used as the main monitor at a slave transmitting station, an extra lead is required from the collector of TR11 to pin 6 (see Fig. 2) to allow the introduction of a suppression pulse. This pulse inhibits the action of TR11 and hence of the monitor, during periods of reserve working when the function of the main and slave stations are interchanged.

When used as the reserve monitor at a slave station, an additional sub-unit, GE3/502 for 625-lines and GE3/502A for 405-lines, is required. This generates the suppression pulse for inhibiting the action of the main monitor. (See Fig. 3).

L1 is properly at resonance. If L1 is being retuned, as is essential if a change of standard has been made, it will be necessary to reduce the input to ensure that the precise resonant point has been found.

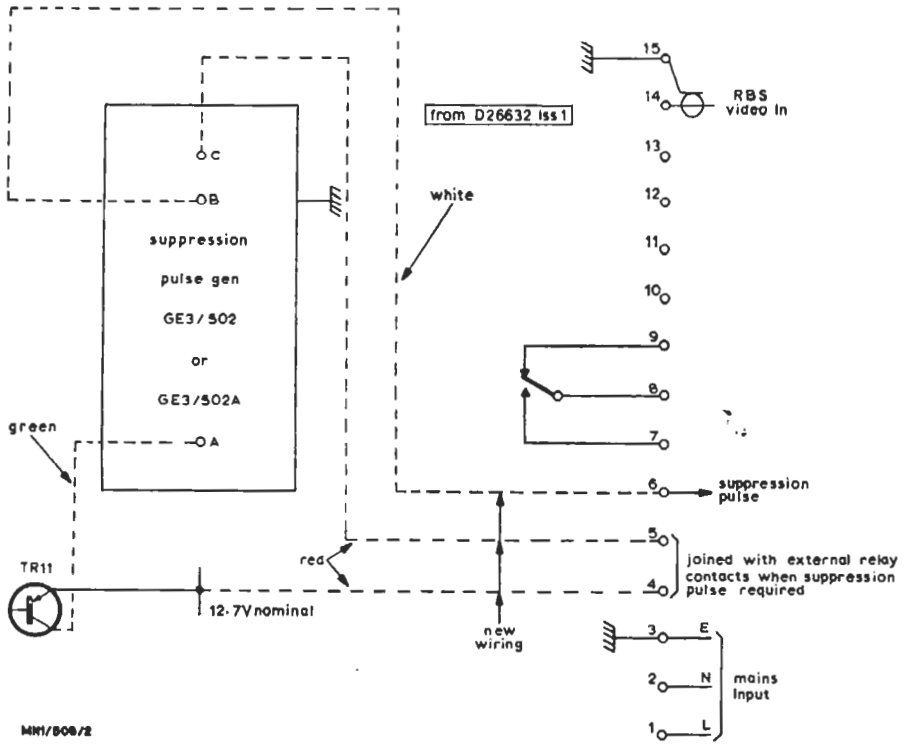

Fig. 3. Modifications Required when MN1/508 is Reserve Monitor

Maintenance

Routine maintenance is not required but the following line-up checks may be carried out if the operation of the unit becomes suspect or if a change of standard has been made.

1. The voltage of the positive supply line should be between 14·5 volts and 17 volts. No adjustment is provided.
2. With a 625-line input signal and with R16 at about mid position, the amplitude of the sync pulses at the collector of TR5 should be about 6·5 volts.
3. With an Avometer model 8 connected to TP1 and with a normal input signal, a reading of approximately 8 volts should be obtained if
4. With the Avometer on its 25 volt range and connected to SKA, apply a standard level input signal via a 3 dB attentuator and operate R16. The Avometer should read approximately 20 volts as the relay releases and 5 volts as it just operates.
5. Remove the field syncs from the input signal, the relay should operate and remain operated whatever the amplitude of the line pulses.

References

1. Designs Department Specification No. 12.36(68).
2. Designs Department Technical Memorandum No. 11.49(69).

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