SYNC SEPARATION AND MONITORING PANEL PA1M/538

Introduction

The PA1M/538 accepts up to three colour video signals together with reference signals of mixed syncs, PAL squarewave and colour subcarrier.

It provides one output each per channel of separated mixed syncs, colour bursts and burst-and-syncs (black level). Logic outputs are also provided, giving both relay and +12V fast-switching indication of whether each of the three inputs is non-existent, non-synchronous or synchronous with respect to local references while making allowance for monochrome or colour inputs.

The panel operates on 405-line Monochrome and 625-line PAL standards. It is mains powered and comprises three pairs of Sync Separator Units type UN1/589 and Sync Monitors type MN2/511, mounted in a PN3/23 chassis.

General Specification

Signal Inputs	1 volt p-p ±6dB
Reference Inputs	
Mixed syncs	2 volts p-p timed 225ns later than syncs on a synchronous video input
PAL squarewave	1 volt p-p
Subcarrier	1 volt p-p in phase with mean burst phase of a synchronous video input
Subcarrier Phase Adjustment	±12° (one adjustment for all channels)
Input Impedances	
Signal	high impedance bridging
Mixed syncs	high impedance bridging
PAL squarewave	high impedance bridging
Subcarrier	75 ohms
Outputs from each channel	
Separated mixed syncs	2 volts p-p (must be terminated in 75 ohms)
Separated colour bursts	0·3 volts p-p (must be terminated in 75 ohms)
Separated burst-and-syncs	0·3 volts p-p mixed syncs plus 0·3 volts p-p colour bursts (combined amplitude 0·45 volts p-p)
Output Impedances	75 ohms
Logic Outputs	as detailed in Fig. 3
Operating Standards	405-line Monochrome 625-line PAL
Power Requirements	240 volts a.c. ±10%, 120mA
Operating Temperature	15° to 45°C
Chassis	PN3/23 fitted with PN3A/16F
Weight	10·5kg (23 lb)

General Description

A block diagram of the PA1M/538 is given in Fig. 1 on page 2 and a schematic wiring diagram in Fig. 2 on page 3

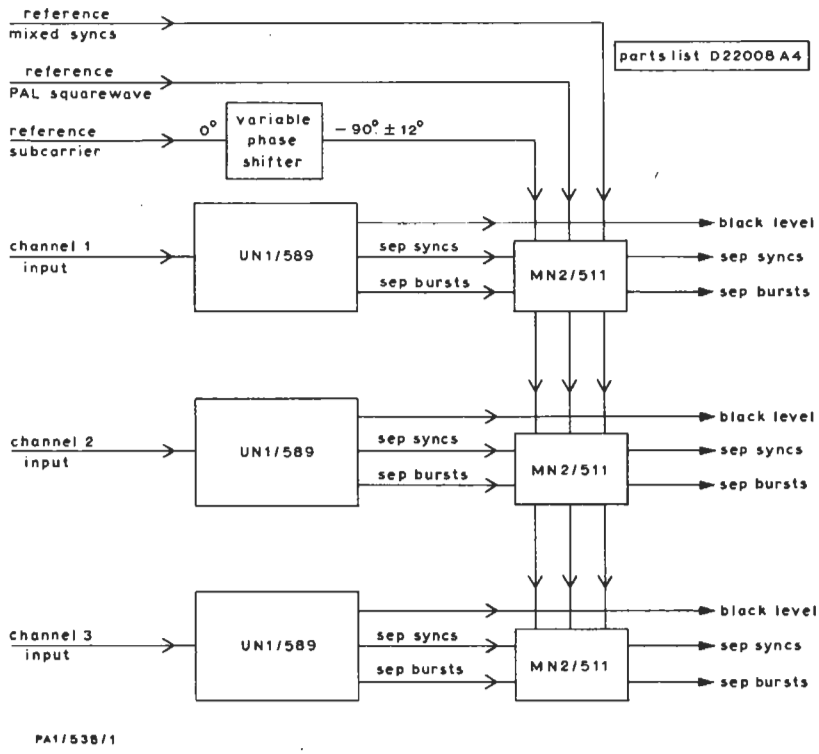

Fig. 1 Block Diagram of the PA1/538 Showing Pulse and Video Circuits

In each of the three channels the Sync Monitor MN2/511 compares separated syncs and colour bursts from the Sync Separator UN1/589 with reference signals. The channel input is declared synchronous in four stages by relays in the Sync Monitor which switch lamps on the front panel of that unit and also provide isolated changeover contacts for external switching. Wiring in the PAIM/538, detailed in Fig.3, uses these contacts and reduces the four stages to indicate:

Pulses not present or

Non-synchronous (monochrome or colour)

In addition, two +12V fast-switching (crash d.c.) outputs per channel indicate when pulses are not present and when the channel input is not sync timed. The latter indication is routed via one of the channel relays RLA–C, the contacts on which make when *Auto* sync mode is selected on the associated video mixer[1].

The rear cover of the panel houses a transformer, type M374 used to power the Sync Monitor indicator lamps, and a phase-shifter network. Screwdriver access is provided for *Phase* adjustment. The unused space in the front of the panel is covered by a PN1/6B blank panel.

Alignment

The Sync Separators and Sync Monitors must be aligned according to the procedures in the relevant Instructions.

Apparatus Required

Voltmeter (Avo 8 or similar)
Oscilloscope (50mV/cm)
4·43MHz Vectorscope with high-impedance probe
CH1A/3 Extender board
6 Musa 75-ohm terminations
Feed of locally-generated colour bars
Feed of sync pulses (delayed by 225ns w.r.t. those on the colour bars)
Feed of 4·43MHz subcarrier via:
UN1/537 Subcarrier phase-shifter
Feed of PAL squarewave
Supply of 50V d.c.

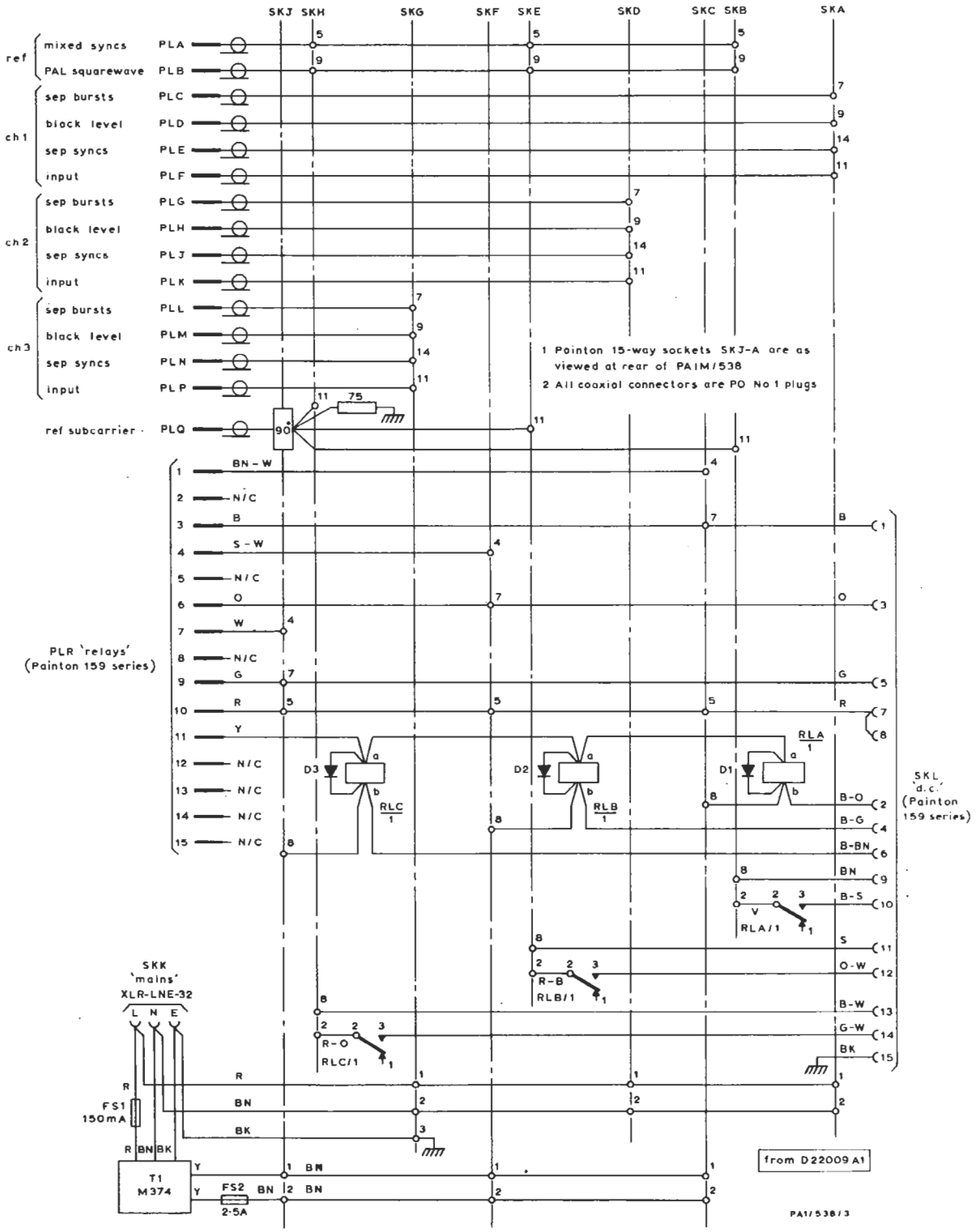

Fig. 2 Wiring of the PA1/538

Procedure

1. Connect the feeds of syncs, PAL squarewave and subcarrier to the panel. Terminate the syncs and PAL squarewave feeds externally. Terminate the separated sync and burst outputs from all three channels using musa terminations. Connect 50V d.c. between PLR pins 10 and 11 (pin 11 negative).
2. Connect the colour bar feed to channel-1 input and terminate it externally.
3. Switch on. Use the Vectorscope and high-impedance probe to identify the mean burst phase of the colour bars on the input plug. Use the UN1/537 to adjust the phase of reference subcarrier to coincide with this mean phase.
4. Examine the phase of subcarrier on the distribution tag adjacent to the phase-shift network. Set C1 (*Phase*) in the network to its electrical mid-range and then adjust L1 to give exactly 88° phase lag with respect to the phase obtained in operation 3.
   The following operations apply to channels 1, (2) and (3) respectively:
5. With the colour-bar input connected to channel 1 (2) (3), the burst-and-syncs output should be 0·3V mixed-sync pulses and 0·3V colour bursts. Channel 1 (2) (3) Sync Monitor lamps should indicate *Pulses, Timed, Colour* and *Phased.*
6. Using the UN1/537 to offset the reference subcarrier phase, ensure that the *Phased* indication holds for an equal displacement ($\pm 10^{o}$ approximately) from the mean. If not, place the Sync Monitor on an extender board and adjust C47 on this unit, and if necessary C14 also, to obtain a *Phased* indication centred about the mean. Return the Sync Monitor to its chassis and re-check.
7. Connect SKL pins 7 and 8 to pin 2 (4) (6). Confirm that PLR pin 10 is not connected to pin 3 (6) (9) but becomes so when the phase of reference subcarrier is displaced by 20°. Reset the subcarrier to its original phase. Confirm that the short-circuit between PLR pin 10 and pin 1 (4) (7) disappears when the colour-bar input is removed.
8. Confirm that +12V appears on SKL pin 9 (11) (13) when the colour- bar input is removed. Confirm also that +12V appears on SKL pin 10 (12) (14) when the input is removed and that the voltage disappears when the 50V supply is disconnected. Replace the 50V supply.
9. Perform operations 5 to 8 for both channel 2 and channel 3.

References to Typical Associated Equipment

1. Studio Video Mixer EP5/503.

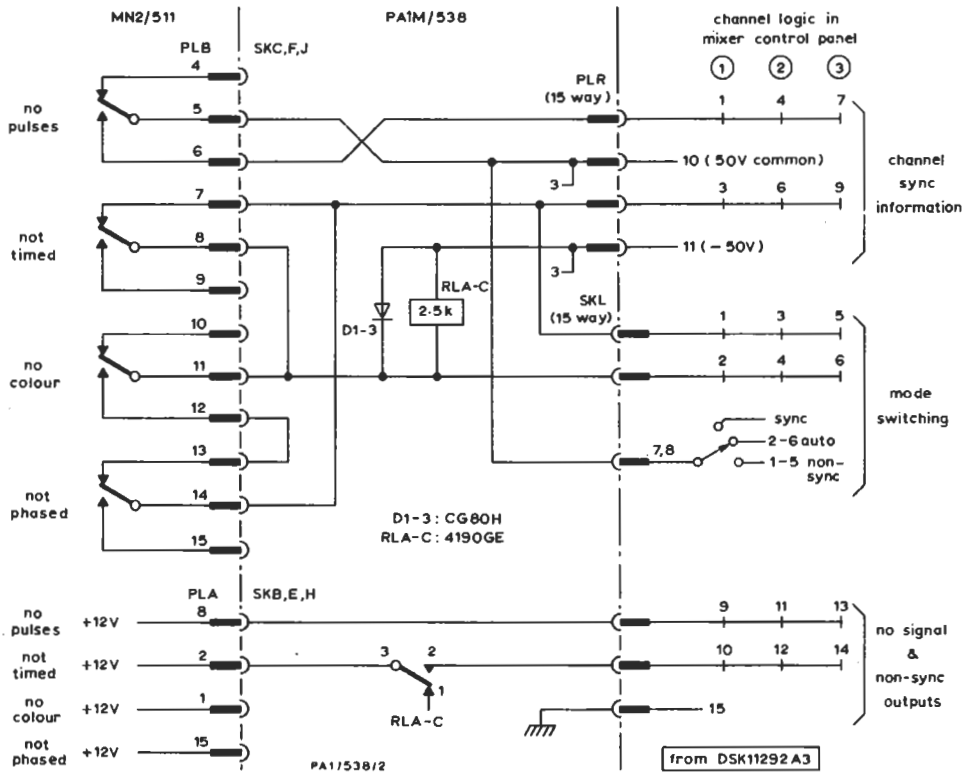

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Fig. 3 Sync-monitor Relay Logic in the PA1/538