SYNC SEPARATION AND MONITORING PANEL PA1M/537

Introduction

The PA1M/537 accepts up to eight colour video signals together with reference signals of mixed syncs, PAL squarewave and colour subcarrier.

It provides eight outputs of separated mixed syncs, colour bursts and black level (syncs and colour bursts). Logic outputs are also provided, giving both relay and +12V fast-switching indications of whether each of the eight 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, 525-line NTSC or 625-line PAL standards. Operation on 525-line requires an external 50V d.c. supply.

The PA1M/537 comprises eight pairs of Sync Separator Units type UN1/589 and Sync Monitors type MN2/511, mounted in a double 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
Input Impedances	
Signal	High impedance looping
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 black level	0·3 volts p-p mixed syncs plus 0·3 volts p-p colour bursts across 75 ohms
Output Impedances	75 ohms
Logic Outputs	as detailed in Fig. 2.
Operating Standards	405-line monochrome 525-line NTSC 625-line PAL
Power Requirements	240 volts a.c. ± 10%, 300mA 50 volts d.c. for 525-line operation
Operating Temperature	15° to 45°C
Chassis	double PN3/23
Weight	25·4kg (56 lb)

General Description

A block diagram of the PA1M/537 is given in Fig. 1 on page 2. In each of the eight 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

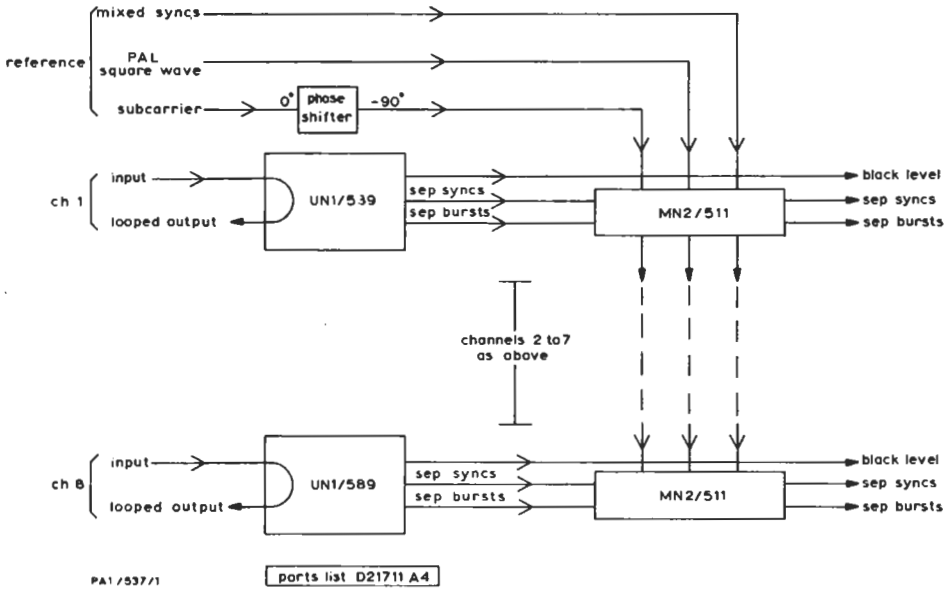

Fig. 1 Block Diagram of the PA1/537

synchronous in four stages by relays (in the Sync Monitor) which switch lamps on the front panel of the Monitor and also provide isolated changeover contacts for external switching. Wiring in the PA1M/537, detailed in Fig. 2, 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-H, the contacts on which make when *Auto* sync mode is selected on the associated video Mixer[1].

The panel connectors are mounted in three groups at the rear:

i) Video inputs, looped video outputs, separated black level, syncs and colour bursts outputs go to five PO No. 1 musa plugs per channel on a central horizontal panel.

ii) The left-end cheek (viewed from the rear) carries the three reference signal inputs (PO No. 1 plugs), the *Standards Change* plug (Painton 159 series, 7-way) and mains input socket (XLR-LNE-32), together with two fuses which protect primary and secondary of a transformer type M374 used to supply power to the Sync Monitor indicator lamps. A printed-wiring board which accommodates a 90° phase-shift network and switchable from 4·43MHz to 3·58MHz by energising RLJ, is mounted inside the cheek, above the transformer.

iii) The right-end cheek carries three Painton 159 series connectors conveying *channel sync information, mode switch* circuits, *no signal* and *non-sync* outputs. (See Fig. 2)

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 and 3·58MHz Vectorscopes with high impedance probes
CH1A/3 Extender board
17 Musa 75-ohm terminations
7 short Musa cords
Feed of locally generated colour bars (625-lines)
Feed of sync-pulses (225ns later than colour bars)

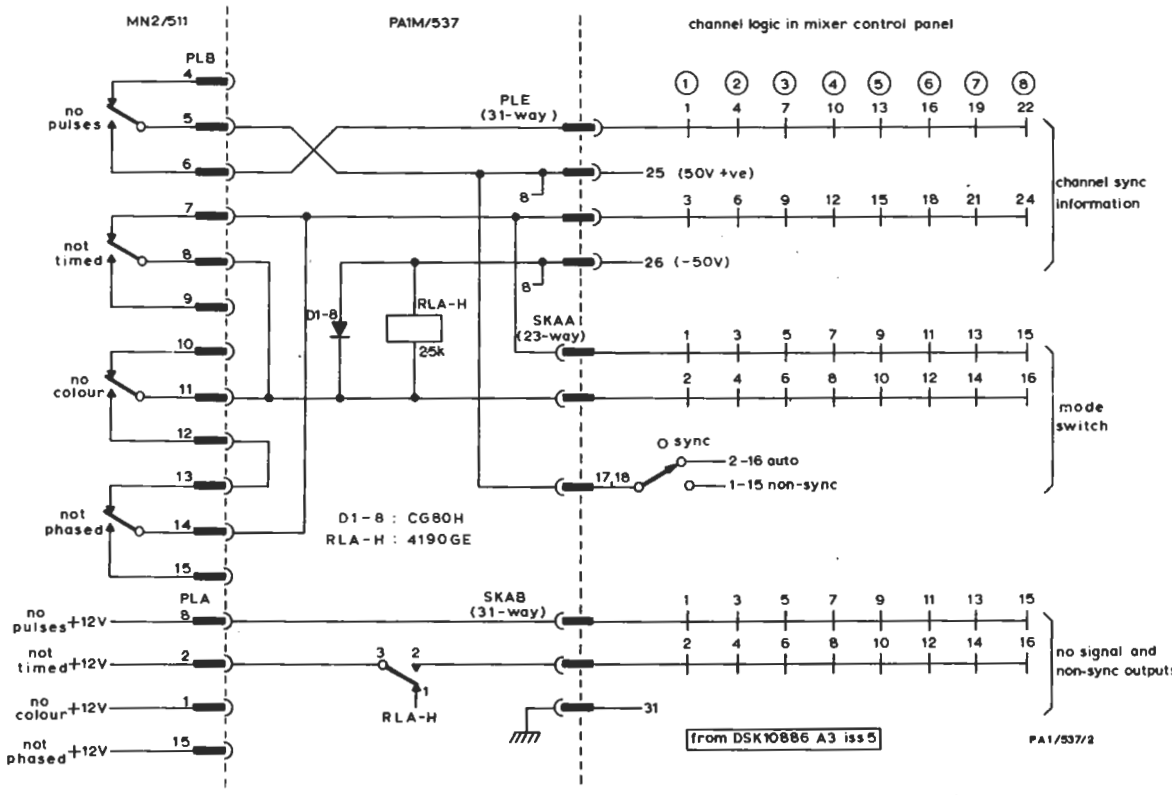

Fig. 2 Sync-monitor Logic in the PA1/537

Feeds of 4·43MHz and 3·58MHz subcarrier fed respectively via
UN1/537 Subcarrier phase shifter
Feed of PAL squarewave
Supply of 50 volts d.c.

Procedure

1. Connect the feeds of syncs, PAL squarewave and 4·43MHz subcarrier to the panel. Terminate the syncs and PAL squarewave feeds externally. Terminate the separated sync and burst outputs from all eight channels using musa terminations. Route the colour bar feed using musa cords through channel 1 via channels 5, 2, 6, 3, 7, 4 to channel 8 and terminate.
2. Apply mains to the panel and confirm that all Sync Monitors indicate *Pulses, Timed* and *Colour.* Check that a *Phased* indication can be obtained on each Sync Monitor by adjusting the UN1/537. (Delay in the input loops will prevent more than 2 or 3 units giving simultaneous indications.)
3. Using the 4·43MHz Vectorscope with a high impedance probe and an external subcarrier reference, adjust L1 on the phase-shift p.c.b. to give a 90° phase lag between the subcarrier input plug and the subcarrier feed point on one of the Sync Monitors.
4. Use the UN1/537 and the Vectorscope to set the subcarrier phase at the reference input to the mean phase of the burst at channel 1 input. Place channel-1 Sync Monitor on an extender board and adjust C47 on this unit, and if necessary C14 also, to obtain a *Phased* indication centred about this phase of subcarrier. Return the Sync Monitor to its chassis and re-check. Repeat for channels 2 to 8.
   Note: This alignment must be performed when the panel is installed in a mixer and may otherwise be expediently omitted.
5. Replace the 4·43MHz subcarrier with the 3·58MHz feed. Energise RLJ by applying 50 volts d.c. to pins 1 and 2 of the *Standards Change* plug PLA (pin 1 negative). Using the 3·58MHz Vectorscope with a high impedance probe and an external subcarrier reference, adjust L2 on the phase-shift p.c.b. to give a 90° phase lag between the subcarrier input plug and the subcarrier feed point on a Sync Monitor.
6. With the colour bar input to all channels, perform the operations in Table 1 to channels 1 to 8 in turn.

References to Typical Associated Equipment

1. Studio Video Mixers EP5/502 and EP5/507

TABLE 1

Operation	Channel							
	1	2	3	4	5	6	7	8
1. Short-circuit sep. sync output to chassis. Check that:								
a) Pulses lamp goes out on channel MN2/511								
b) +12V w.r.t. SKAB 31 appears on SKAB pin	1	3	5	7	9	11	13	15
c) s/c becomes o/c between PLE 25 and PLE pin	1	4	7	10	13	16	19	22

2.	Energise RLA–H in turn by applying 50V between PLE 26 (-ve)														
	and SKAA pin	2	4	6	8	10	12	14	16						
	Remove ref. syncs and examine SKAB pin with the voltmeter to confirm that + 12V is present and goes only when:	2	4	6	8	10	12	14	16						
	a) ref. syncs are replaced														
	b) channel relay is de-energised														
	c) channel MN2/511 is unplugged														
3.	Check that a permanent s/c exists between PLE 25 and														
	SKAA 17 and 18 and also between PLE pin	3	6		12	15	18	21	24						
	and SKAA pin	1	3	5	7	9	11	13	15						
4.	Remove the burst from the colour bar input.														
	Check that a s/c exists between PLE pin	3	6	9	12	15	18	21	24						
	and SKAA pin	2	4	6	8	10	12	14	16						
	Check that the s/c becomes o/c when:														
	a) ref. syncs are replaced														
	b) channel MN2/511 is unplugged														
5.	Replace ref. syncs and the burst on the colour bar input.														
	Repeat operation 4 to confirm that the s/c becomes o/c														
	as ref. subcarrier phase is adjusted to make each channel														
	Phased														

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