

**SYNC SEPARATION AND MONITORING PANELS PA1M/544,A**

**Introduction**

The PA1M/544 accepts up to four colour video signals together with local reference signals of mixed syncs, PAL squarewave and colour subcarrier. It provides outputs of separated mixed syncs, colour bursts and burst-and-syncs (black level). Relay logic outputs are also provided which indicate whether each of the four input signals is synchronous or non-synchronous with respect to the local references for monochrome or colour inputs.

The PA1M/544 operates on 405-line Monochrome and 625-line PAL standards without any switching. It incorporates four Sync Separator Units, UN1/589 and four Sync Monitors, MN2/511, mounted in a PN3/23 chassis. All connectors are mounted on a PN3A/16H rear panel.

The PA1M/544A differs from the PA1M/544 by having an EP-4 type mains connector in place of an XLR-LNE type. The panels are electrically identical.

**General Specification**

*Signal Inputs* 1 volt p-p  $\pm 6$ dB

*Reference Inputs*

Mixed syncs 2 volts p-p timed 225ns later than syncs on a synchronous video input

PAL squarewave Subcarrier 1 volt p-p in phase with mean burst phase

*Subcarrier Phase Adjustment*  $\pm 12^\circ$  on each channel

*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 + 0.3 volts p-p colour bursts (combined amplitude 0.45 volts p-p)

*Impedances*

Signal inputs high impedance bridging

Reference pulse inputs high impedance bridging

Reference subcarrier Channel outputs 75 ohms 75 ohms

*Logic Outputs*

Synchronous source indicated by short-circuit and non-synchronous source by open-circuit on *Monitor Relays* plug

*Operating Standards*

405-line monochrome 625-line PAL

*Mains Input*

240 volts a.c.  $\pm 10\%$ , 150mA

*Operating Temperature*

15° - 45°C

*Chassis*

one PN3/23

*Weight*

12.7kg (28 lb)

### General Description

A block diagram of Channel 1 of the PA1M/544 is given in Fig. 1; channels 2, 3 and 4 are functionally identical.

In each of the four 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 the Monitor and also provide isolated changeover contacts for external switching. Wiring in the PA1M/544, detailed in Fig. 2, uses these contacts to declare the input signal synchronous or non-synchronous thus:

Input Signal	Logic Output
No sync pulses	Synchronous
Non-synchronous monochrome	Non-synchronous
Timed monochrome	Synchronous
Timed but not phased colour	Non-Synchronous
Timed and phased colour	Synchronous

If the separated burst from an input signal is either non-existent or below the acceptable amplitude level,

used to power the indicator lamps in the Sync Monitors. The rear panel also houses the four phase-shifter networks and gives screwdriver access for *Phase* adjustment on each channel.

### Alignment

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

### Apparatus Required

- Oscilloscope (5mV/cm)
- 4-43-MHz Vectorscope fitted with probe
- Three BNC 75 ohm terminations
- Four 300 ohm resistors
- Mullard screwdriver DT2168 for core adjustment
- Feed of locally generated PAL colour bars
- Feed of mixed-sync pulses delayed by 225ns w.r.t. those on the colour bars
- Feed of subcarrier via UN1/537 phase-shifter
- Feed of PAL squarewave

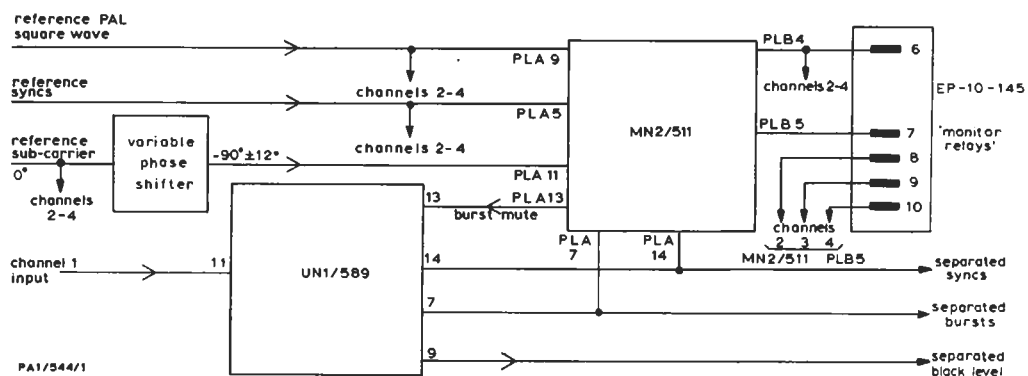


Fig. 1 Block Diagram of Channel 1 in the PA1/544

the MN2/511 feeds a burst-muting signal to the UN1/589 thereby inhibiting the burst on the burst-and-syncs output.

All video and pulse connections to the panel are made by 50-ohm BNC sockets. The logic circuits are terminated in an EP-10-14S plug. Mains input is by an XLR-LNE-32 socket, except on the PA1M/544A where an EP-4-14S plug is used. Two fuses on the rear panel protect primary and secondary of a transformer type M374, mounted inside the rear panel and

### Procedure

1. Connect the feeds of syncs, subcarrier and PAL squarewave to the panel. Terminate the sync and burst outputs from channel 1. Switch on.
2. Using the Vectorscope and the UN1/537, adjust the phase of reference subcarrier to coincide with mean burst phase at the input sockets.
3. Set all *Phase* controls to mid-range. Remove the

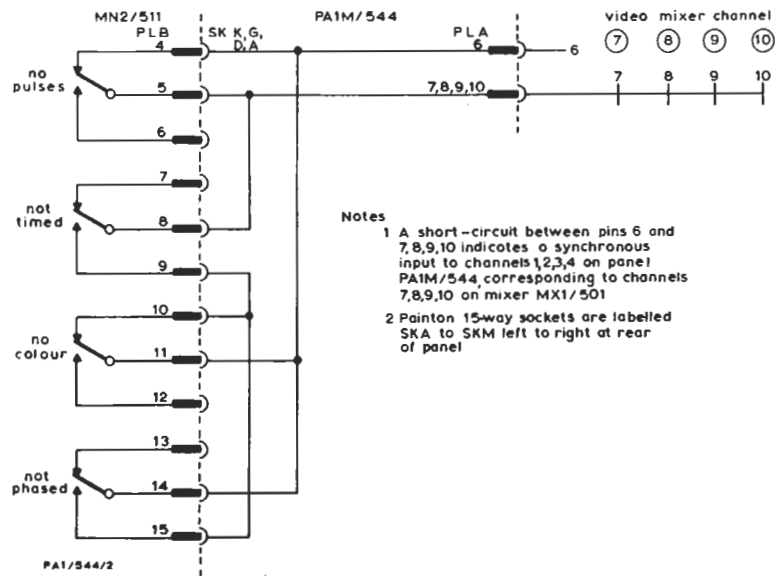


Fig. 2 Wiring of the PA1/544

4. Connect the colour-bar feed to channel 1 input and terminate the burst-and-syncs (black level) output in 75 ohms at the oscilloscope. The display should show 0.3 volts p-p syncs and 0.3 volts p-p bursts. The lamps on channel 1 Sync Monitor should indicate *Pulses*, *Timed*, *Colour* and *Phased*. Adjust the UN1/537 to ensure that the *Phased* indication holds for approximately  $\pm 10^\circ$  displacement of the phase of reference subcarrier. Return the UN1/537 to its initial setting.

5. Measure continuity between pins 6 and 7 of the Monitor Relays plug. A short-circuit should exist, indicating synchronism.
6. Displace the subcarrier phase by  $20^\circ$  using the UN1/537. The *Phased* lamp should go out and the short-circuit disappear.
7. Remove the burst from the colour-bar feed. The *Colour* lamp should go out and the short-circuit reappear.
8. Delay reference syncs by a further 650ns relative to colour-bar syncs. The *Timed* lamp should go out and the short-circuit disappear.
9. Remove the colour-bar input; all lamps should go out and the short-circuit reappear.
10. Repeat operations 4 to 9 for channels 2, 3 and 4 in turn. Measure continuity between pins 6 and 8 of the *Monitor Relays* plug for channel 2, pins 6 and 9 for channel 3, and pins 6 and 10 for channel 4.

**References to Typical Associated Equipment**  
 1. Outside Broadcast Video Mixer MX1/501