SECTION 13

VIDEO SWITCHING PANEL PA18M/513

Introduction

This panel forms a solid-state switching system comprising two nine-input and two three-input switches. It provides video signals which are used for colour-burst stabilisation in the stabilising amplifiers[1] of a two-bank video mixer[2].

The inputs to the panel are:

eight colour video signals
a PAL square-wave signal
a subcarrier signal
mixed synchronising pulses
burst-gate pulses
trigger pulses

} used to generate two colour-synchronising signals

The output of the panel is a colour video signal which can be either one of the eight video input signals or one of the two internally-generated colour-synchronising signals. The output signal is selected by means of trigger pulses derived from the mixer control circuits[2].

The panel comprises the following plug-in sub-units (described in the Instructions indicated) mounted on a double PN3/23 chassis:

8 Three-channel Switch Units UN9/510	(V.14)
4 Video Amplifiers AM1/551	(V.7)
2 Colour Black-level Generators GE6/504	(V.10)
2 Video Distribution Amplifiers AM4/511	(V.7)
2 Television Equalisers EQ5/510	(V.5)

The panel also contains two delay networks mounted on printed-wiring boards and fastened to the back of the PN3/23 main assembly. Power supplies for the UN9/510 switch units are derived from the AM1/551 amplifiers. The AM4/511 and GE6/504 units have integral power supplies.

General Specification

Inputs

Composite Video (8 inputs)	1 volt p-p
PAL Square Wave	2 volts p-p
Subcarrier (4·433 MHz)	1 volt p-p
Mixed syncs	2 volts p-p
Burst-gate	2 volts p-p
Input Impedances	75 ohms
Output	composite video, 1 volt p-p
Output Impedance	75 ohms
Trigger Inputs	±12 volts
Mains Input	220—250 volts, 50 Hz

General Description

A block diagram showing interconnections between the sub-units is given in Fig. 13.1 and a circuit diagram of a delay network is given in Fig. 13.2.

The switching operations are carried out by eight UN9/510 Switch Units, each of which contains three identical switching circuits. The A and B (8-channel) sides of the panel contain three switch units; the Group-1 and Group-2 sections each contain a single switch unit. The following description is based on the operation of the A-side and Group-1 switches. The B-side and Group-2 switches function in the same manner.

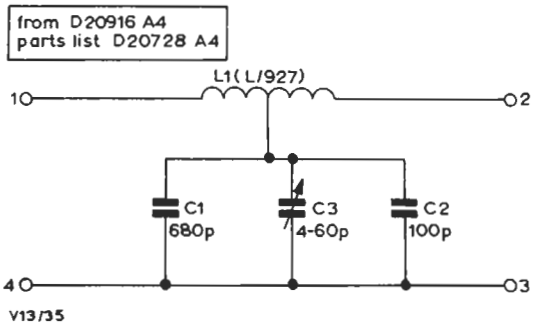

Fig. 13.2 Circuit of a Delay Network

The inputs of the first eight switching circuits on the A-side of the panel are fed with composite colour video signals (feeds of the video inputs to the mixer) and the ninth input is fed, via an isolating amplifier which forms part of the AM1/551, with a reference colour-synchronising signal generated in the A-side GE6/504 unit. The three switch units have a common output bus-bar and this is connected to the input (pin 11) of an AM1/551 Video Amplifier. The output of this amplifier is fed to the *Out A* output of the panel and it is normally U-linked from this point to the *In 1* group input.

The switches are operated by positive-going trigger pulses derived from the control circuits of the mixer; each switch unit has three trigger *On* inputs, one for each switch circuit. The trigger pulse that is used to turn a given switch on is also applied, via the common *switch-latch* line, to the *Off* inputs of all the other switch circuits, so switching off any previously on switch. A low-amplitude trigger pulse may turn the required switch on but fail to turn the previously selected switch off. If this happens a pulse is applied, via the common *diode-catch* line, to a trigger-generating circuit in the AM1/551 amplifier. The resulting trigger pulse is fed back along the *switch-latch* line and is of sufficient amplitude to turn off the unwanted switch.

The output from the A-side AM1/551 amplifier is applied, via the *Out A—In 1* Musa connector, to the first input of the Group-1 switch and to the second input of the Group-2 switch. The second input to the Group-1 switch is fed from the B-side of the panel and the third input is taken, via a delay network which simulates the delay in the A-side switch units, from the A-side Black-level Generator; this third input is applied also to the isolating amplifier input (pin 15) of the AM1/551 Amplifier.

The switching circuits of the Group-1 UN9/510 unit are operated in the same way as the A-side circuits described previously, by trigger pulses derived from the control circuits of the mixer.

The output of the Group-1 switch unit feeds an AM1/551 amplifier and this in turn feeds, via the *Out 1* connector and an external EQ5/510 equaliser, an AM4/511 Distribution Amplifier. From the distribution amplifier the output is fed, via the *DA1 Out* connector, to the Group-1 stabilising amplifier.

The isolating amplifier output of the AM1/551 provides a reference feed, which is used for measurement purposes, of the third input to the Group-1 switch unit.

Maintenance

Failure of one or more switches can usually be localised to a unit by checking monitor points or by interchanging units. When the fault has been traced the units should be returned to their original positions; if this is not done the units must be realigned (see under UN9/510).

If the fault is a switching one the following points should be noted.

(a) The system is d.c. controlled and low amplitude pulses may fail to operate the switches. Switching is initiated by the positive peak of a pulse and this should be 11·5 volts $\pm$1·0 volt.

(b) Owing to the presence of series diodes in the pulse routing circuits the fall times of trigger pulses may be very long.

(c) Between pulses the voltages on the switching lines may have any value between +3 volts and −14 volts.

References to Typical Associated Equipment

1. Sync Pulse Stabilising Amplifier AM18/513, Instruction V.7.
2. Studio Video Mixing Equipment EP5/502, Instruction V.15.

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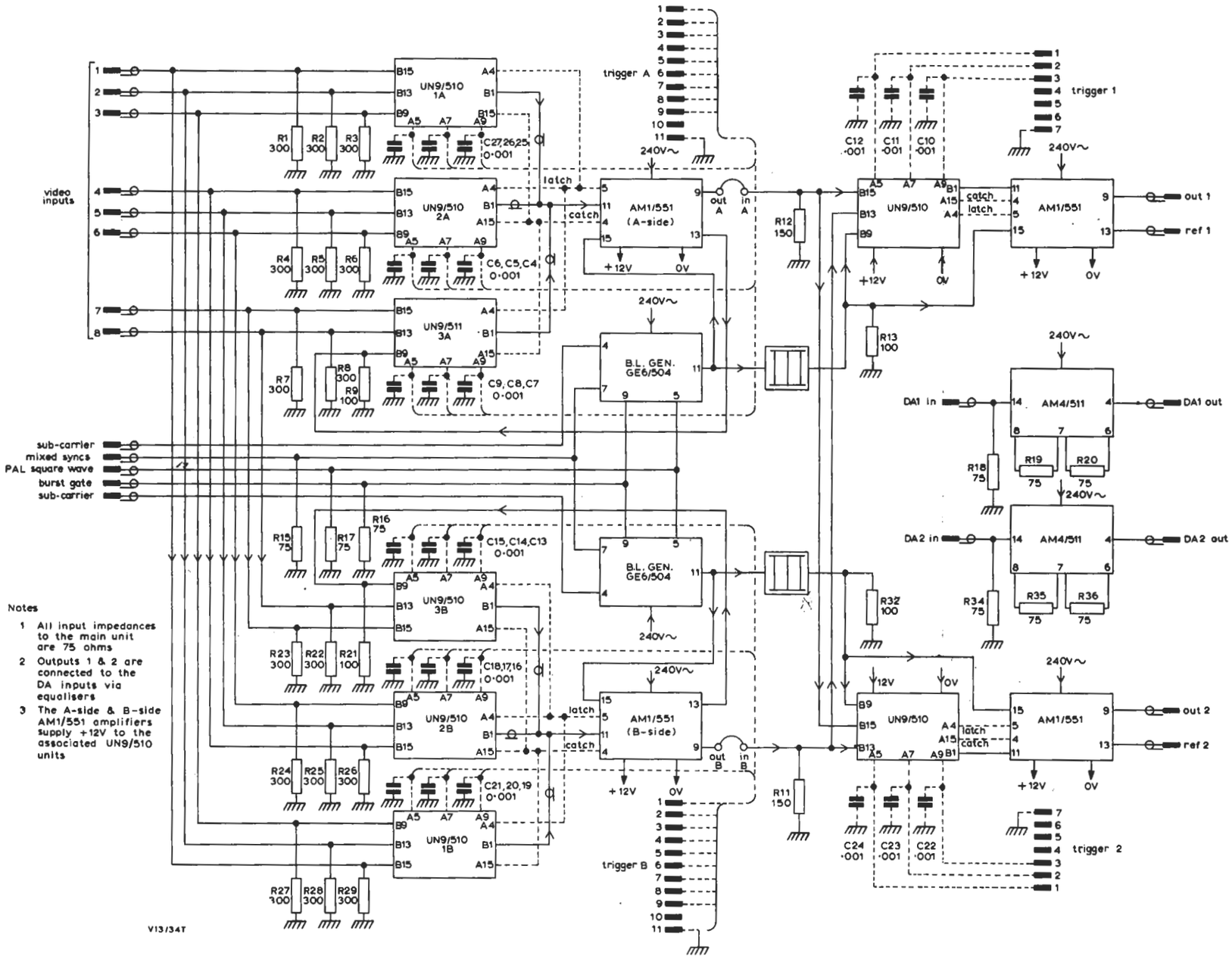

Notes

1. All input impedances to the main unit are 75 ohms
2. Outputs 1 & 2 are connected to the DA inputs via equalisers
3. The A-side & B-side AM1/551 amplifiers supply +12V to the associated UN9/510 units

Fig. 13.1 Block Diagram of the PA18M/513