

SPLIT SCREEN SWITCH UNIT PA18M/518

Introduction

The PA18M/518 is a split screen switching panel normally forming part of a studio video mixer. It provides facilities for producing black-edged captions and for colour overlay working, the required mode being selected by a key at the mixer position.

The PA18M/518 accepts two video inputs and switches between them to give an output signal which, when displayed, gives a picture which is split between the two signals. It consists of the video switch system as used in the PA18/507, but augmented with a GE2/526A Caption Pulse Generator. It is similar to the PA18M/522 but does not include a control relay panel. The component units of the switch panel, mounted on a PN3/23 panel, are:

- Distribution Amplifier AM4/517
- Clamp Pulse Generator GE2/505A
- Switch Pulse Generator GE2/520
- Caption Pulse Generator GE2/526A
- Video Switch Unit UN9/521
- Power Supplier PS2/21B
- Power Supplier PS2/505

General Specification

Inputs

- Main Video 1V p-p from 75 ohm source
- Insert Video 1V p-p from 75 ohm source
- Keying 0.7V p-p from 75 ohm source
- Mixed Syncs 2.0V p-p from 75 ohm source

Input Impedances

- Video all 75 ohms $\pm 2\%$
- Syncs high

Outputs

- 3 at 1V p-p

Output Impedance

- 75 ohms

Chrominance/Luminance Ratio

- unity

Pulse and Bar Ratio 1T and 2T

- within 1% of unity

Bar Slope

- not greater than 0.5%

General Description

A block diagram is given in Fig. 1. The basic element of the PA18/518 is the fast-acting video switch in the UN9/521. This switch is fed with two clamped video signals which have nominally identical blanking-level potentials; it switches between them under control of signals developed in the GE2/520 Switch Pulse Generator. The insert signal is either a second standard video signal or caption signals from the GE2/526A.

In the caption mode, the switch pulses to the UN9/521 are developed from the vertical edges of the caption letters. The 'holes' produced in the background picture by the switch action are completely filled by processed caption letters from the GE2/526A. If black edges are required the trailing edges of the holes and the lettering are delayed and so white letters appear centrally in black spaces. The caption signal input to the

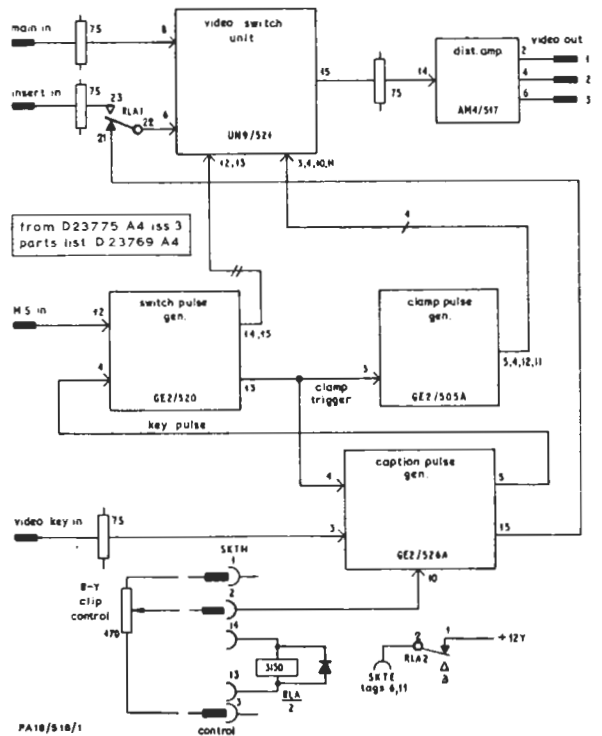


Fig. 1. Block Diagram of the Split-screen Switch Unit PA18/518

GE2/526A must consist of white letters on a black background. The change-over between the overlay and caption modes is done by relay RLA under remote control from the mixing position.

Maintenance

Routine maintenance is not required but the following checks can be made periodically.

For these checks connect 2 video signals (e.g. step wedge and grille) to the Main and Insert inputs, connect mixed syncs with a 75-ohm termination to the GE2/520 and sawtooth to the Video-key input.

1. With a 240V mains supply, the output voltages from the power suppliers should be:

- +9V between tags 8 and 3 on the PS2/505
- 14V between tags 4 and 3 on the PS2/505
- +12V between tags 4 and 5 on the PS2/21B.

2. Check that the various waveforms are as shown on the circuit diagrams of the sub-units.

3. Check that the main video is switched to the output when a voltage of -4.5 volts appears at test point 1 of the GE2/520 and the insert video when a voltage of -1.5 volts appears.

4. With a 5mV/cm. wideband oscilloscope and high impedance probe, inspect the clamping waveform at the junction of C6 and R14 in the UN9/521. The switching transients should be less than $\pm 20\text{mV}$; RV4 and RV6 in the GE2/505A provide adjustment.

Inspect the waveform at one of the main outputs, correctly loaded; any disturbance during the field blanking period should be less than 10mV p-p.

Operate PLA in the GE2/520 and repeat the above checks, this time inspecting at the junction of C16 and R53 in the UN9/521; RV1 and RV5 in the GE2/505A provide adjustment.

5. With the oscilloscope connected to one of the outputs, properly terminated, check that the blanking levels of the Main and Insert signals are equal; RV2 in the GE2/505A provides adjustment.

6. Check that the switching transients at the main outputs, properly terminated, are less than 250mV p-p; R34 in the GE2/520 provides adjustment.

7. Connect an unterminated d.c. oscilloscope to one output and, with no input signals or keying waveforms, adjust R34 in the UN9/521 to give less than 20mV d.c. at the output.

8. Adjust the gain of the UN9/521 as follows. Connect a 1V p-p test signal to the Main input terminated with 75 ohms and, with the Key input disconnected, adjust R47 to give 2.5V p-p at the emitter of TR13. Adjust R31 to give 1V p-p across 75 ohms at one of the outputs. Feed the test signal to the Insert input, operate RLA (see Fig. 1) and RLA in the GE2/520; set R8 to give 1V p-p at the output.

9. To check for crosstalk, feed a 1V 625-line chrominance/luminance pulse and bar waveform to the Main input, terminated with 75 ohms. Terminate the Insert and Key inputs with 75 ohms and operate relay RLA (Fig. 1). With the oscilloscope connected to one of the outputs (terminated in 75 ohms) and RLA in the GE2/520 operated the bar crosstalk should not be visible, 1T and 2T pulse crosstalk (very distorted) should be less than 1.5 mV and chrominance crosstalk should be less than 2.5 mV p-p.

Repeat with the test signal connected to the Insert input (RLA in the GE2/520 released).

10. With the pulse and bar generator locked from an external source, check that the clamp trigger pulses from the GE2/520 occur after the trailing edges of mixed syncs as seen at one of the outputs.

11. Apply a sawtooth waveform to the Main and Key inputs and operate the clip control. The switch should operate over more than 80% of the sawtooth; the picture split should be free of hum or noise.

Reference

1. Designs Department Specification No. 8.321(68).

AIB 8/70