COLOUR SEPARATION OVERLAY AND CAPTION OVERLAY MODIFICATIONS

INTRODUCTION

The following information applies specifically to Type-2 C.M.C.R.s but is generally applicable to Type-1 C.M.C.R.s also. The main differences for Type-1 C.M.C.R's are:

(a) The Clipping Level control is located on a separate panel instead of on the PA6/507B.

(b) An extra UN1/640 Video Switch and Delay Unit (with the delay network short-circuited) is used for foreground selection instead of the preview matrix.

(c) The foreground selection is controlled from a separate push-button panel (known as the Synthesiser/C.S.O. Panel) instead of from the Engineering Manager's Preview Panel.

GENERAL

The colour separation overlay facility (c.s.o.) enables any of the mixer camera channels to provide the foreground for a complete c.s.o. shot. The keying waveform is obtained from the foreground channel by means of a (B - Y) matrix and any synchronous source available at the mixer can be used to provide the background.

The background of a c.s.o. shot is selected on the off-air bank; the foreground signal and the corresponding keying waveform are selected on the Engineering Manager's preview panel. The composite signal is then previewed and the (B - Y) clipping level control is adjusted to obtain the correct switching level. The c.s.o. shot is put on-air by selecting the foreground camera on the on-air bank and so achieving a 'button-match' between the on-air and preview buttons. The next shot selected on the on-air bank takes the mixer out of the c.s.o. mode.

The caption overlay facility enables the output from a caption source, selected on the off-air bank of the mixer, to be overlaid on to the on-air video signal. The composite picture can be previewed by pressing the Insert preview button on the PA6/507A control panel and is put on-air by moving the three-position Mode key to the Insert position. A sequence of captions can be overlaid on the same on-air video signal by cutting between caption sources on the off-air bank.

A block diagram of a modified MX1/501A is given in Fig. 6b. The additional units required for modified mixers are:

Video Distribution Amplifier	AM4/517
E.M.I. Camera Overlay Matrix	AM23/507
Caption Pulse Generator	GE2/526
Switch Routing Unit	UN1/639
Video Switch and Delay Unit	UN1/640

Switch Unit	UN21/511
Video Switch	NE1/524

The E.M.I. Camera Overlay Matrix units (one per camera channel) are mounted in the camera control units, not in the mixer.

Units which are changed on modified mixers are:

PA6/507B replaces PA6/507A
GE2/506A replaces GE2/506
GE2/525A replaces GE2/525
UN4/501A replaces UN4/501

The modifications provide:

(a) a (B - Y) keying waveform for each camera channel

(b) a means of selecting any one of six keying waveforms

(c) a third video input to the mixer (the foreground signal)

(d) a modified split-screen unit which includes a Caption Pulse Generator and the additional relay switching

(e) a modified fade/wipe changeover circuit in the stabilising amplifier to give a field-phased cut.

Individual Instructions are provided for the additional coded units and also for the modified units with the exception of the PA6/507B. The circuit of the PA6/507B is given in Fig. 6(a) and those parts of it which differ from the PA6/507A are dealt with in the Description of the Modified Mixer.

OPERATING INSTRUCTIONS

(a) Colour Separation Overlay

1. With the mixer on the air on one bank (say bank A) select C.S.O. on the wipe-pattern button.

2. Select the required background source on the off-air (b) bank.

3. Select the required foreground camera on the left-hand (Engineering Manager's) preview panel.

4. Move the three-position Mode key to Insert.

5. Preview the composite shot, either by depressing the joystick or by using the Insert preview button.

6. Set the Clipping Level control.

7. To put the c.s.o. shot on the air, select the foreground camera on the on-air bank (A).

8. To return the mixer to normal operation, select the succeeding shot on the on-air bank (A). Move the three-position Mode key to Fade to avoid inadvertently returning to the c.s.o. condition at a later time.

It is essential that the operations listed above are performed in the order given. The Engineering Manager's preview buttons cannot be used normally whilst a c.s.o. shot is being set up or transmitted; for all other modes of operation the function of the preview buttons remains unaltered.

(b) Caption Overlay

1. With the mixer on the air on one bank (say bank A) select Caption on the appropriate wipe-pattern button.

2. Select the required caption source on the off-air (B) bank.

3. Preview the composite shot, either by depressing the joystick or by using the Insert preview button.

4. Set the Clipping Level control for the best picture.

5. Select black edges as required. (The control is on the GE2/525A Blanking Pulse Generator in the Split-screen Effects Unit.)

6. Put the overlaid caption on the air by moving the three-position Mode key to Insert.

DESCRIPTION OF THE MODIFIED MIXER

The following description deals only with those parts of the MX1/501A which are concerned with c.s.o. and caption-overlay working. All the relays mentioned in sections (b) to (e) of this description are shown in Fig. 6b. For information on other aspects of the mixer see the General Description.

(a) FUNCTIONS OF ADDITIONAL AND MODIFIED UNITS

The foreground signal is obtained, via a distribution amplifier, from the output of the preview matrix and is routed by relay contacts to either the A or the B side of the UN9/514 Video Switch Unit, as required. The background signal is obtained from either the unfaded output of the A-side cut/fade amplifier or the unfaded output of the B-side cut/fade amplifier; the required output is selected by relay contacts. All relays which handle the signals or switching waveforms concerned with c.s.o. or caption overlay working, are located either on the relay card on the GE2/525A Blanking Pulse Generator or in the UN21/511 Switch Unit. The operation of these relays for specific operating conditions are dealt with in sections (b) to (e) of this description.

(B - Y) keying waveforms are obtained from each of the E.M.I. Type 2001 camera channels attached to the mixer by matrixing the gamma-corrected B', R' and G' colour signals. Matrixing is carried out by AM23/507 E.M.I. Camera Overlay Matrix units which are mounted on the monitor card in each

camera control unit. The (B - Y) waveforms are fed to a UN1/640 Video Switch and Delay Unit where the required waveform is selected by means of relay contacts which are controlled from the Engineering Manager's Preview Panel. The selected waveform is then fed, via a delay network which compensates for the delay introduced by the coders and other signal paths through the mixer, to the GE2/526 Caption Pulse Generator.

The GE2/526 unit accepts either a video signal or a (B - Y) signal (see Fig. 6b) and provides a switching waveform which can be used to drive the GE2/506A Switch Pulse Generator; the switch-drive output of the GE2/506A is modified by the switching waveform when the mixer is working in the c.s.o. or caption overlay modes. The GE2/526 also provides a processed video signal which can be used as infill for letter captions with black edges. This infill signal is selected by relay circuits and fed to the UN14/514 Video Switch Unit when the mixer is working in the caption overlay mode.

The output of the UN9/514 is fed to the stabilising amplifiers via the NE1/524 Video Switch. This unit consists of an electronic switch which is fed with the output of the UN9/514 and the faded output of the A-side and B-side cut/fade amplifiers. The electronic switch can change state only during field-blanking periods; it thus ensures that clean on-air cuts can be made into and out of the c.s.o. mode.

(b) OPERATION OF CONTROL CIRCUITS FOR C.S.O. WORKING

It is assumed that the A-bank is intially on-air.

Select C.S.O. on the wipe-pattern buttons

Relays RLC, RLD and RLJ are energised.

Select the required background on the B-bank

The unfaded signal from the B-side cut/fade amplifier is routed via relay contact RLE-1 to the video switch.

Select the foreground camera on the Engineering Manager's Preview Panel

The (B - Y) signal from the selected foreground camera is routed via relay contact RLA-1 to the caption pulse generator. The switch pulse output of the caption pulse generator is routed via contact RLC-1 to the switch pulse generator. The line waveform normally fed to the switch pulse generator is interrupted by relay contact RLJ-1. The switch pulse generator output is routed via contacts RLH-1 and RLH-2 to the video switch.

The video signal from the foreground camera is selected in the preview matrix and is routed via contacts RLB-2 and RLD-1 to the video switch.

The faded signal from the A-side cut/fade amplifiers remains routed to the stabilising amplifier via the electronic fade/wipe switch in the NE1/524 unit.

Move the three-position Mode key to Insert

Relay SA in the PA6/507B panel cannot operate because its positive supply is interrupted by the C.S.O. Select button; therefore relay SB cannot operate either and so the fade/wipe switch in the NE1/524 remains in the fade condition.

The composite c.s.o. shot should now be previewed and the clipping level adjusted.

Select the foreground camera on the A-bank to put the c.s.o. shot on-air

The positive supply is routed via the cut button, the preview button and the C.S.O. button to relay SA which operates. Relay SB operates also and the fade/wipe switch in the NE1/524 unit changes state to route the split-screen output to the stabilising amplifier.

If the B-bank is initially on-air instead of the A-bank, then relays RLB, RLC, RLF, RLG and RLH are energised. Apart from the consequent changes in relay routing, the method of putting the c.s.o. shot on the air is as described above for the condition where the A-bank is initially on the air.

(c) OPERATION OF CONTROL CIRCUITS FOR CAPTION OVERLAY WORKING

It is assumed that the A-bank is initially on-air and that the caption to be overlaid is on the B-bank.

Select Caption Overlay on the wipe-pattern buttons

Relays RLA, RLC, RLE and RLJ are energised.

Select the required caption source on the B-bank

The unfaded signal from the B-side cut/fade amplifier is routed via relay contacts RLG-1 and RLA-1 to the caption pulse generator. The switch pulse output of the caption pulse generator is routed via contact RLC-1 to the switch pulse generator and the infill output of the caption pulse generator is routed via RLB-1 and RLE-1 to the B-side of the video switch. The line waveform normally fed to the switch pulse generator is interrupted by relay contact RLJ-1. The switch pulse generator output is routed via contacts RLH-1 and RLH-2 to the video switch.

The composite shot should now be previewed and the clipping level adjusted.

Move the three-position Mode key to Insert to put the overlaid caption on-air

Relay SA in the PA6/507B panel is operated via the de-selected C.S.O. button and hence relay SB is operated also. The electronic fade/wipe switch in the NE1/524 unit changes state to route the split-screen output to the stabilising amplifier.