

**Strand**  
LIGHTING

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## **OPERATION & MAINTENANCE MANUAL**

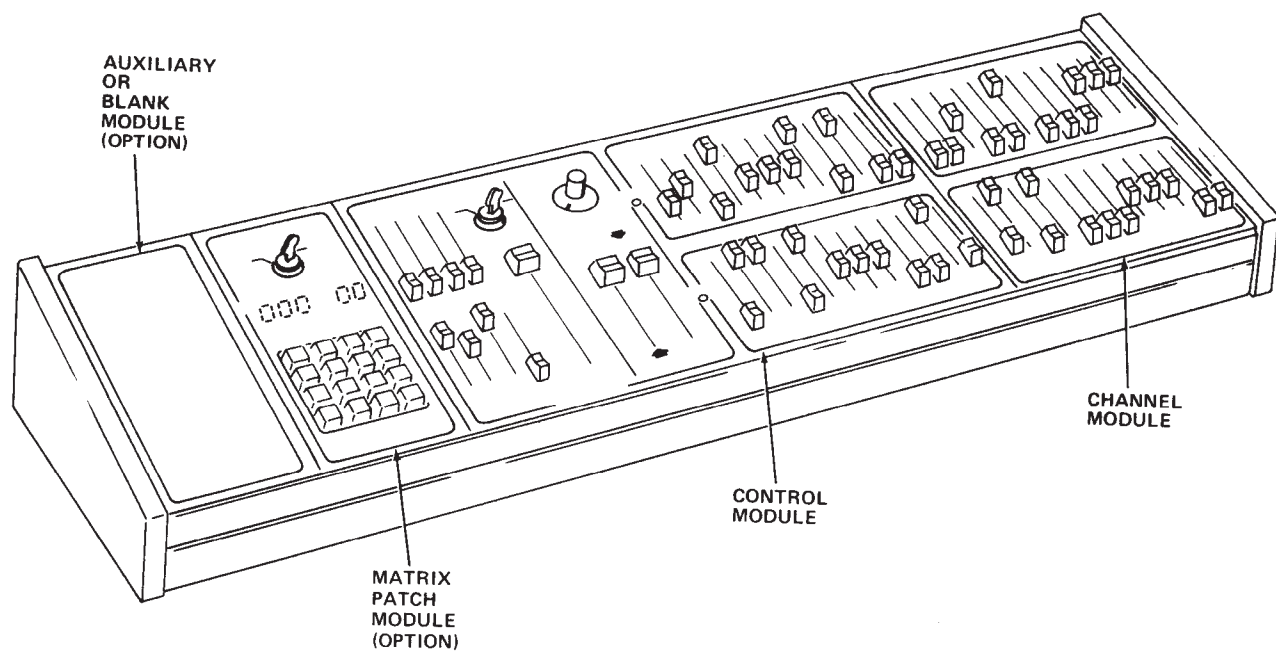
# **MANTRIX™**

## **A MODULAR, FOUR-SCENE PRESET CONSOLE**

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*MANTRIX System – Typical*

## INTRODUCTION

The Strand Century MANTRIX is a modular, four-scene preset console, with a split crossfader, master, eight submasters, and an optional matrix patch module. Additional channel modules may be used with the MANTRIX, expanding the channel capacity to a maximum of 84 channels.

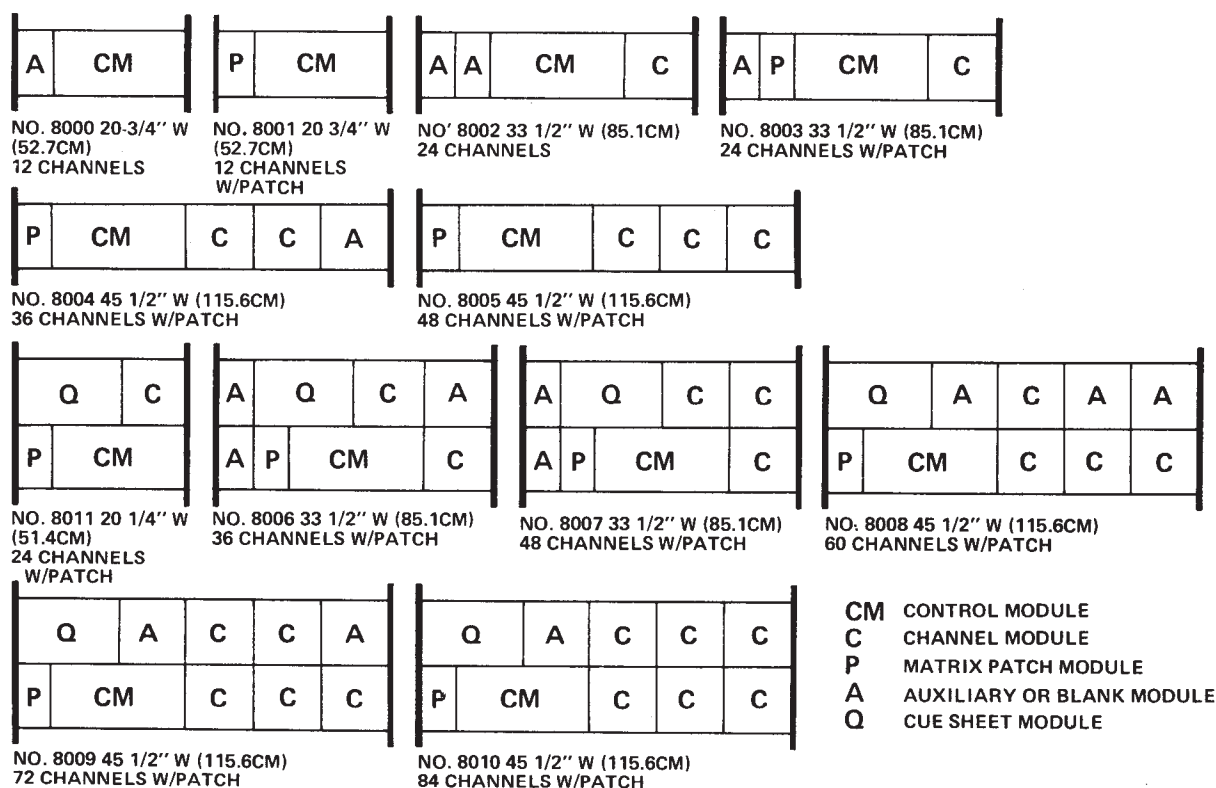
The MANTRIX provides a reliable, compact, portable lighting control system to control the multiplexed CD80 Dimmer and CD80 Pack. Analog +10-volt dimmers can be controlled by use of an external +10-volt interface. When used with the optional matrix patch module, the MANTRIX can operate a maximum of three CD80 racks or 24 CD80 packs. The optional matrix patch module provides a means for patching the MANTRIX channel outputs to up to 288 dimmers, in as many combinations as the lighting designer may desire.

The typical MANTRIX (Model 8003) shown in the accompanying figure has the basic Control Module, One Channel Module, the Matrix Patch Module, and a blank module. The blank (non-functioning) module is available as shown, as an AUX module, or as a 12-inch wide Q-sheet Module. The typical MANTRIX shown is approximately 33 inches wide. Each panel is 9-1/2 inches high. Other variations are shown in the configuration diagram, illustrating the single tier and two-tier models, providing channel capacities of 24, 36, 48, 60, 72, and 84. The two-tier models are approximately 20-3/4 inches in depth. The overall height of the single-tier arrangement is 2-1/2 inches; the two-tier arrangement increases overall height to 6-3/4 inches.

All modules are painted flat black for non-glare operating appearance, with silk-screened legends, covered with clear epoxy splatter for long-life protection.

The modules are electrically interconnected with ribbon cables for simple maintenance.

The MANTRIX operates from 120 volt, 60 Hz power, and is protected by a 2-ampere fuse. The unit may be factory-modified for use on 240 volt and 50 Hz power if desired.



MANTRIX – Configuration Diagram

## CONTROLS AND DISPLAYS

CONTROL MODULE

The Control Module (figure 1-1) is a complete control system with an integrated four-scene preset for 12 channels. The unit is mounted on a 9-1/2 inch high panel, 16 inches wide, and includes the following controls.

**ON/OFF Keyswitch**

The ON/OFF Keyswitch turns the MANTRIX system on and off. In the OFF position, all electrical power is removed from the system. In the ON position the red LED indicator above the Keyswitch is illuminated, the MANTRIX is energized, and ready for all operations.

**NOTE:** When the keyswitch is turned OFF, all patch assignments are protected, provided the BATTERY switch is ON.

**MASTER Control**

The MASTER control functions as a grand master over all level settings on-stage, overriding control of all active channels, and permitting the operator to bring down the level of all channels simultaneously. With the MASTER at 10, all channels are unaffected, while 0 corresponds to a blackout.

**BLACKOUT Switch**

The BLACKOUT switch permits the operator to instantly black out the stage. In the ○ position, MANTRIX level control and fades are unaffected; in the ● position, all outputs to the stage are at zero (blackout).

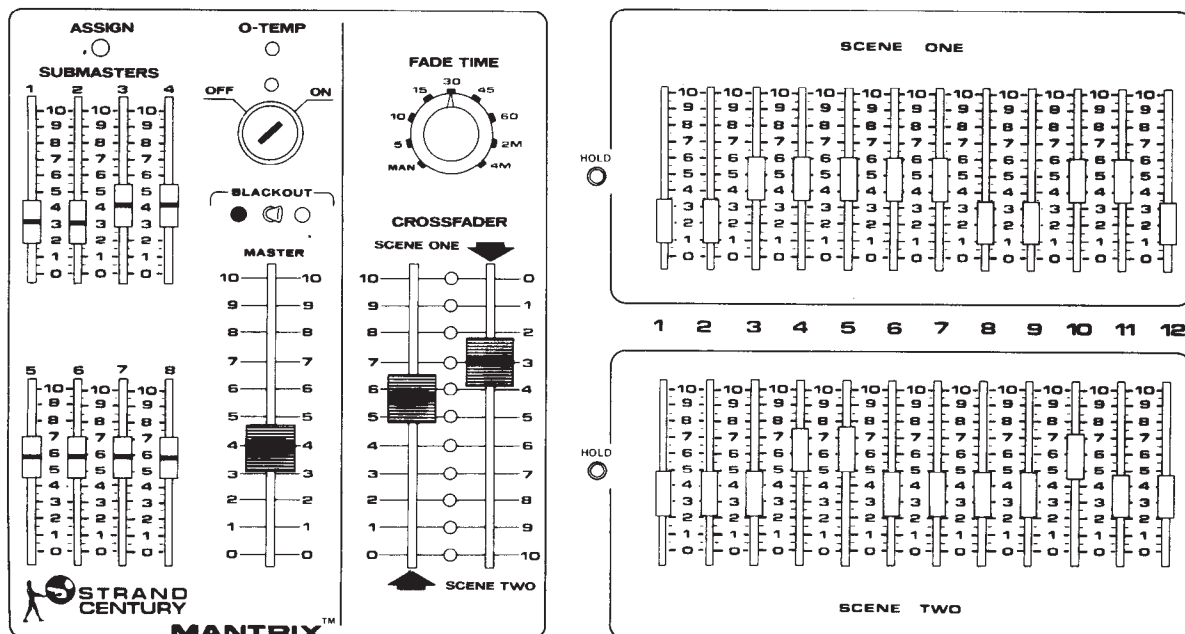


Figure 1-1. MANTRIX Control Module

## **CROSSFADER**

The CROSSFADER is a split, dipless, crossfader, with a Fade Progress indicator to indicate the progress of the fade. The split fader permits individual manual control of the fade in and out of each scene, and when used with the FADE TIME control, permits automatic fade time control with manual interrupt at any time desired during the fade. The CROSSFADER provides the operator with smooth, dipless crossfades, lead-lag fades, and scene pile-on fades. Stage blackout can also be performed with the CROSSFADER (both scenes faded completely down).

### **FADE TIME Control**

The FADE TIME control permits manual (MAN) control of the fade under direct control of the CROSSFADER, or at selected fade times of up to 4 minutes in continuously variable increments (5, 10, 15, 30, 45 second, and 2 and 4 minute increments marked on the control). The FADE TIME control allows timed lead-lag and pile-on fades, as well as timed crossfades.

### **SCENE ONE/SCENE TWO Channel Level Controls**

The standard Control Module includes two rows of twelve level controls for setting the lighting levels desired for Presets One and Two. The knobs on the fader handles are color-coded to identify the two different scenes. Transition between the two scenes is under control of the CROSSFADER.

### **HOLD Buttons**

These buttons provide a means to “hold” the levels of a preset scene, so that new levels may be set for two more scenes. Thus, Presets One and Two may be set, “held” with the HOLD buttons, and Presets Three and Four set. The HOLD buttons are self-illuminated when a preset is being “held”.

## **SUBMASTERS**

The eight SUBMASTERS are used to add sub-scenes to the stage on a highest-takes precedence basis, and can function as submasters, scene masters, or independents. Each channel and an associated level can be assigned to any one of the SUBMASTERS. The position of the SUBMASTER handle controls the proportion of the channel levels assigned to the submaster that will pile on to the output of the CROSSFADER.

### **O-TEMP Indicator**

This red indicator illuminates if an over-temperature condition occurs in the external dimmer racks.

### **ASSIGN Button**

The ASSIGN button is used when assigning current lighting levels on-stage to a selected submaster. The ASSIGN button is illuminated when in the activated condition. A channel may be assigned to only one submaster.

## **REAR PANEL**

The rear panel (figure 1-2) of the Control Module contains the AC power receptacle for the power cable, a replaceable line fuse, an OVERTEMP connector, DIMMER I connector, and a BATTERY ON-OFF switch.

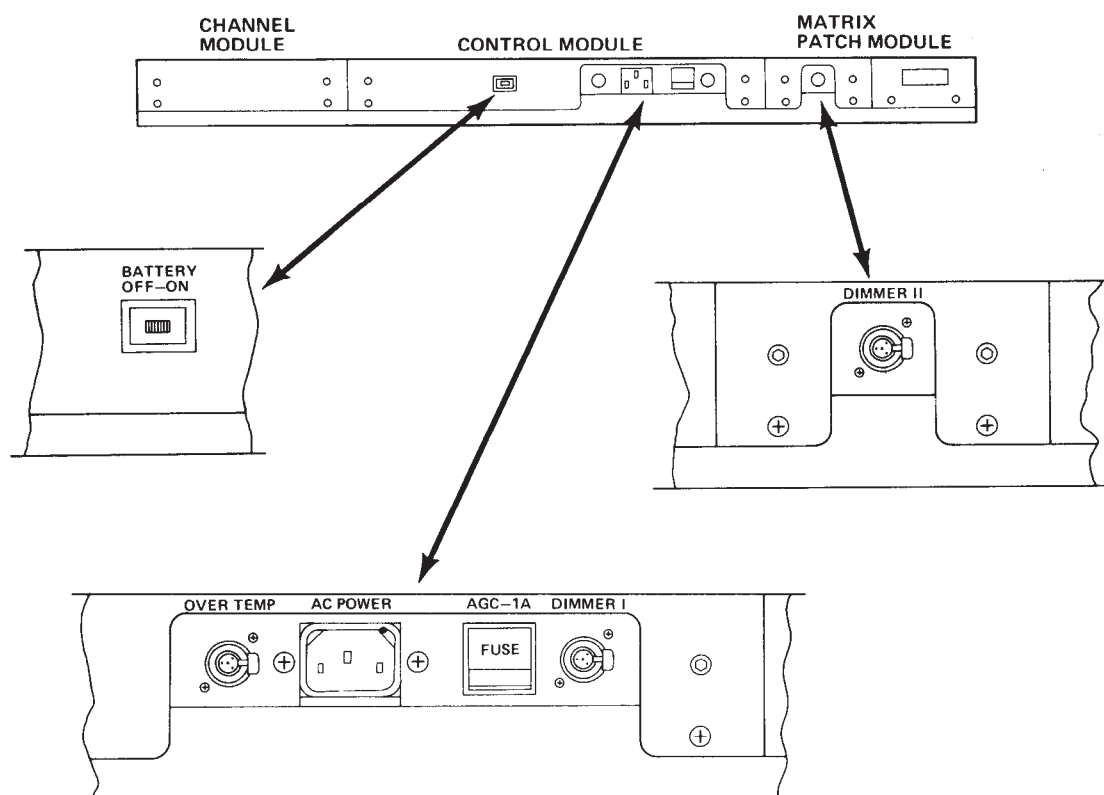


Figure 1-2. Rear Panel Controls and Connectors

### CHANNEL MODULE

The Channel Module (figure 1-3) adds twelve channels per module to the four-scene preset capacity of the MANTRIX, permitting expansion to a total of 84 channels. Each Channel Module is mounted on a 9-1/2 inch high panel, and is 8 inches wide. Paint and trim match the basic Control Module. The module is connected to the Control Module by a ribbon cable, and does not change the operation of the other components of the MANTRIX except to add twelve additional channels.

### MATRIX PATCH MODULE

The Matrix Patch Module (figure 1-4) expands the capability of the MANTRIX beyond a simple one-to-one correspondence between dimmers and channels. The Matrix Patch Module gives the MANTRIX operator the facilities to set and display the dimmer to channel patch assignments and the dimmer type (2.4KW or 6KW) when used with CD80 dimmers.

The Matrix Patch Module keyboard (figure 1-4) is used to enter the dimmer and channel numbers, which are then displayed in the DIMMER and CHANNEL windows. ENTER indicators in each window indicate what information is to be entered (either dimmer or channel), and the **6K** indicator indicates when the displayed dimmer is a 6K dimmer type. The operator can make the 6K and 2.4K assignments through the Matrix Patch Module keyboard.

The Matrix Patch Module is mounted on a 9-1/2 inch high panel, and is 4 inches wide. Paint and trim of the module match the Control Module. The module is electrically connected to the Control Module by a ribbon cable, and is controlled by the ON/OFF keyswitch on the Control Module. A DIMMER II connector is located on the rear of the Matrix Patch Module (figure 1-2).

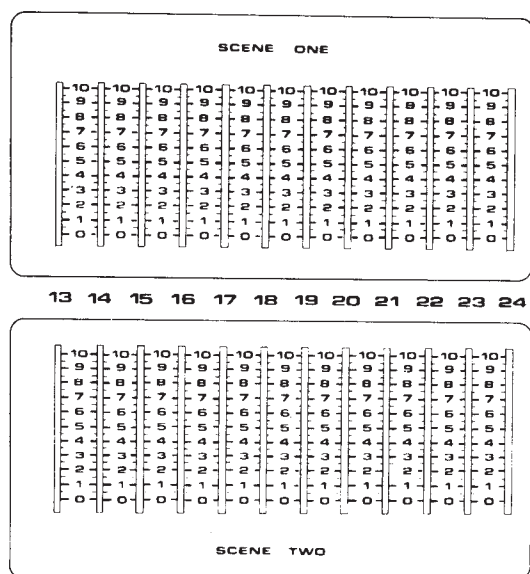


Figure 1-3. Channel Module

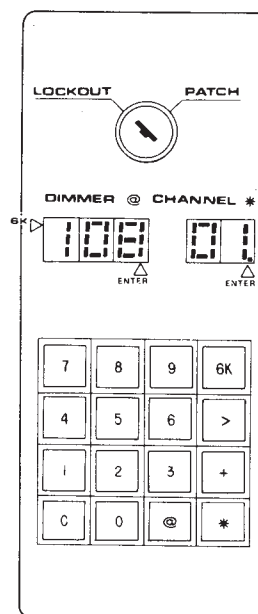


Figure 1-4. Patch Module

### PATCH/LOCKOUT Keyswitch

This switch provides a means of protecting the patch assignment from accidental or unauthorized change. It is placed at PATCH when making patch assignments, and in the LOCKOUT position when no further changes are to be made.

### PATCH Keyboard

The patch keyboard is used to enter patch assignments. The keyboard may be used to make initial assignments of dimmers to channels, to change assignments at any time, to preview the patch assignments, and to identify the 6K dimmers.

### DIMMER Display

During patch assignment or preview, the number of the dimmer being assigned or the number of the dimmer being previewed is shown in the DIMMER display. If the dimmer assignment includes a group of dimmers (more than one), only the last dimmer number is shown, and this number will flash to remind the operator that more than one dimmer is being assigned to a particular channel. There is room for three digits on the DIMMER display. (MANTRIX maximum dimmer control is 288.)

### CHANNEL Display

During patch assignment when dimmers are being assigned to particular channels, the CHANNEL display shows the channel number entered into the Patch Keyboard. There is room for two digits on the CHANNEL display. (MANTRIX channel capacity is a maximum of 84.)

## OPERATION

### PREPARATION FOR OPERATION

1. Plug the electrical power cable (furnished with the MANTRIX) into the AC POWER connector on the back of the Control Module. Plug the other end of the power cable into a 120-volt 60 Hz power source used **exclusively** for the MANTRIX control system.
2. Check that dimmer control extension cables between the MANTRIX and dimmer packs/racks are connected.
3. Check that the BATTERY ON-OFF switch on the back of the Control Module is ON. During system storage, the BATTERY switch should be OFF. In double-tiered consoles, the BATTERY switch on the Cue Sheet Module should be ON and the BATTERY switch on the Control Module should be OFF. During system storage both BATTERY switches should be OFF.
4. Turn the ON/OFF keyswitch on the Control Module (figure 1-1) to ON. The green power-on indicator above the keyswitch will illuminate to indicate that power is turned on. The CROSSFADER fade progress indicators come on corresponding to the position of the CROSSFADER handles. If the Matrix Patch Panel is installed, DIMMER and CHANNEL numbers will appear.
5. Set the MASTER control at **10**, the BLACKOUT switch to **O**, the FADE TIME control to MAN, and all eight of the SUBMASTERS at **0**. The MANTRIX is now ready for use.

### OPERATION OF MANTRIX – TWO-SCENE PRESET

The transition between presets is controlled by the CROSSFADER. The channel levels set for Preset One will be on stage when the CROSSFADER SCENE ONE handle is in the SCENE ONE **10** position; the channel levels for Preset Two will be on stage when the CROSSFADER SCENE TWO handle is in the SCENE TWO **10** position. When the SCENE ONE control is at SCENE ONE **10** and the SCENE TWO control is at SCENE TWO **0** (both handles brought up together), only the Preset One channel levels will be on stage. When the SCENE TWO control is at SCENE TWO **10** and the SCENE ONE control is at SCENE ONE **0** (both controls brought down together), only the Preset Two channel levels will be on stage.

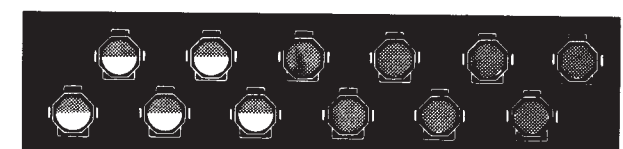
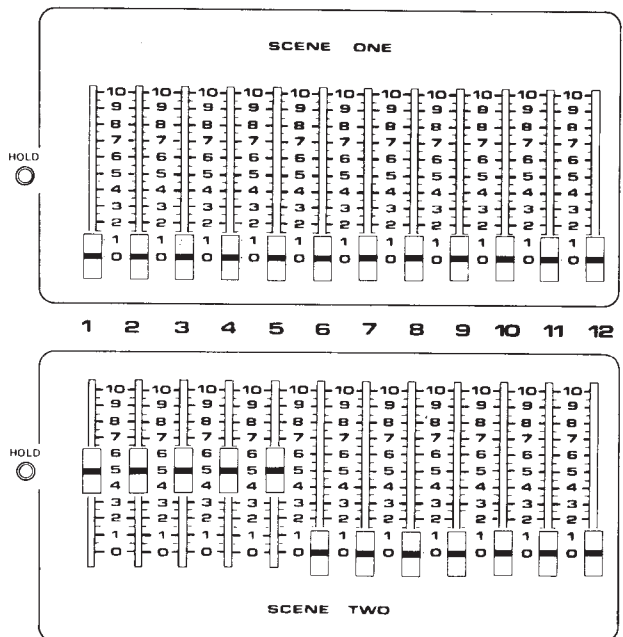
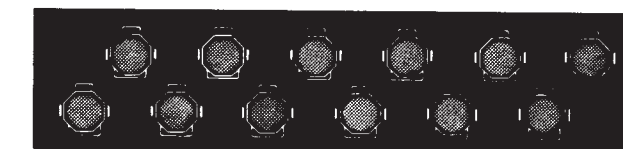
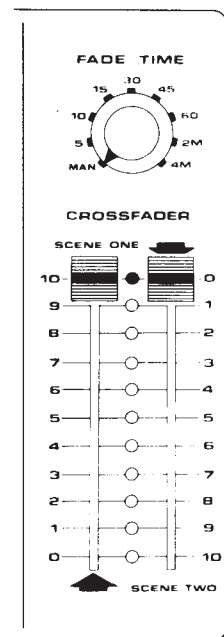
The **0** through **10** markings on the CROSSFADER indicate the percentage of the particular fade completed to that point. The LED indicators on the markings illuminate to indicate the position of the fade at any given instant. If the SCENE ONE and SCENE TWO controls are brought up and down together and the FADE TIME control is set to MAN, the indicator will stay with the position of the CROSSFADER controls. If the SCENE ONE and SCENE TWO controls are operated independently of each other, the positions of each fade control will be shown by the indicators, at reduced intensity.

With the channel levels set for Preset One, moving the CROSSFADER controls to SCENE ONE will put the level settings of Preset One on stage. Now, setting the next preset channel levels for SCENE TWO can be accomplished without affecting the Preset One levels on stage. When the cue for the next preset is given, moving the CROSSFADER handles to SCENE TWO will fade down the Preset One level settings, and the Preset Two levels will be brought onto stage in a smooth, dipless crossfade.

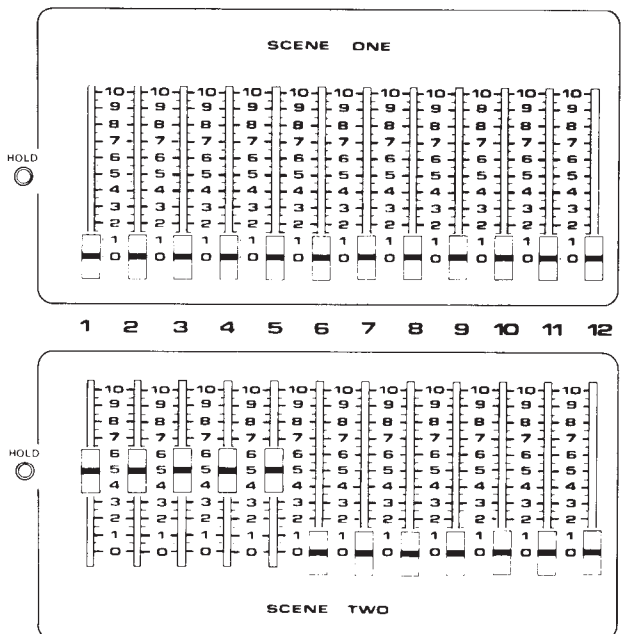
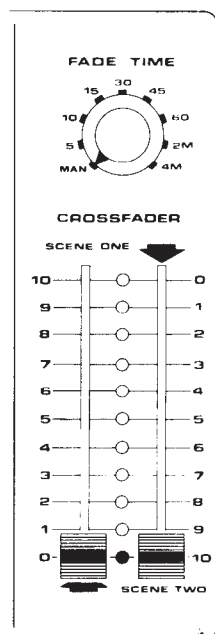
While a preset is on stage, the channel level controls for that preset can be adjusted to new levels, and additional channels brought into the active cue.

**EXAMPLES OF MANTRIX TWO-SCENE  
PRESET OPERATION**

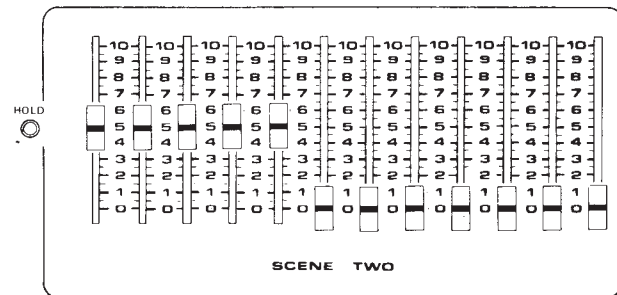
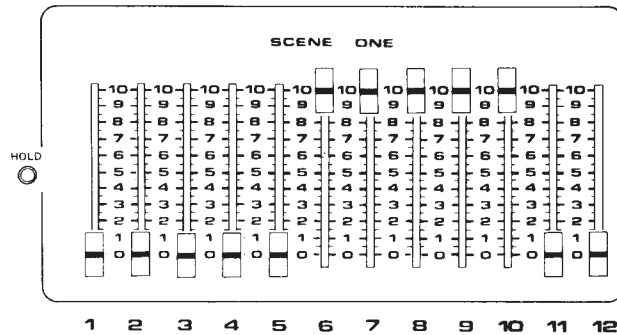
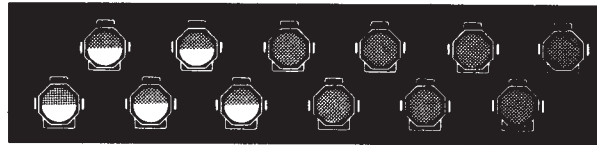
1. Set SCENE TWO (Preset Two) channel levels as shown below.



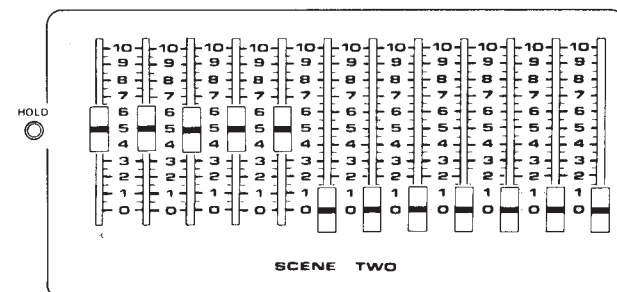
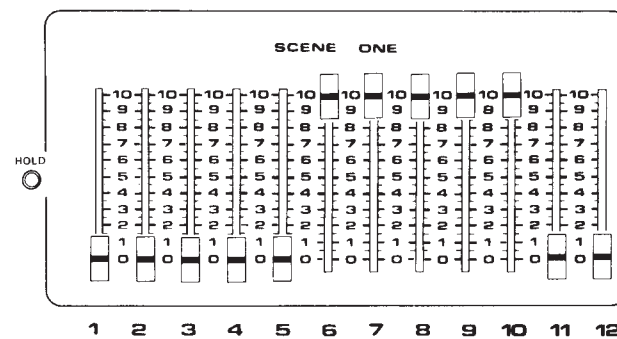
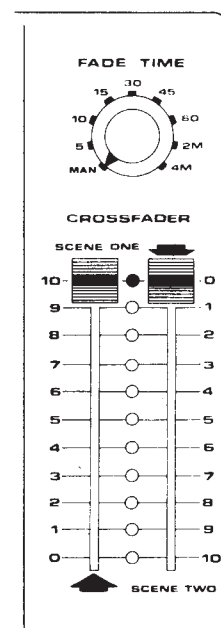
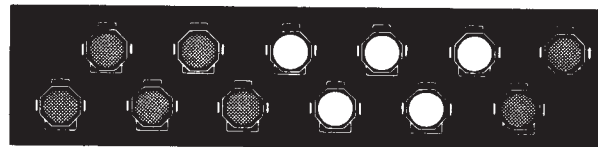
2. Move CROSSFADER controls to SCENE TWO. The channel levels selected for Preset Two will appear on stage as shown below. Note that the channel levels come up as the CROSSFADER handles are moved.



3. Set SCENE ONE (Preset One) levels as shown below.



4. Fade from Preset Two into Preset One by moving CROSSFADER from SCENE TWO to SCENE ONE. The Preset Two levels will fade into the Preset One levels as shown below.



- When moving the CROSSFADER controls, note that the fade progress indicator follows the CROSSFADER handle (FADE TIME control at MAN).

### SPLIT CROSSFADE

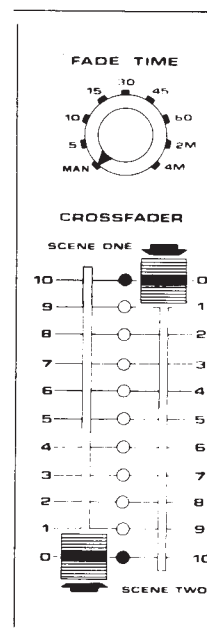
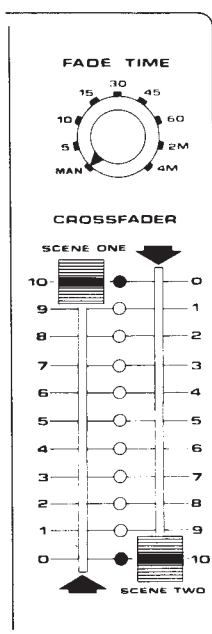
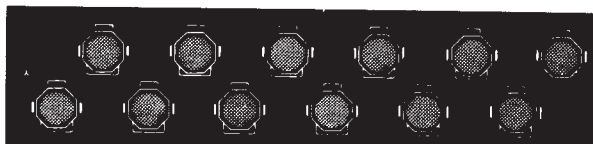
The two handles of the split CROSSFADER permit independent up-fade and down-fade control of the two preset scenes. When moved together as previously described, the preset on-stage will fade down and the next preset will fade up in unison. However, if it is desired to bring in the up-coming preset sooner (lead-fade), start moving the up-coming preset CROSSFADER handle, leaving the on-stage preset CROSSFADER handle at its **10** position. If it is desired to bring the down-coming preset sooner (lag-fade), move the on-stage preset CROSSFADER handle towards **0** while holding the up-coming preset CROSSFADER handle at its **10** position.

When lead-fade and lag-fade operations are performed, the fade progress indicators will show the position of both handles of the CROSSFADER, but at half-intensity until the two are again aligned.

### PILE ON OR BLACK OUT WITH CROSSFADER

The CROSSFADER may be used to pile Preset One on to Preset Two or to black out the stage.

- To pile Preset Two on to Preset One, move SCENE TWO control down to **10** as shown below.
- To blackout the stage with the CROSSFADER, move the SCENE ONE control down to **0**, and move the SCENE TWO control up to **0**. Since both scenes are faded out by this action, the stage will black out as shown.



## TIMED CROSSFADES

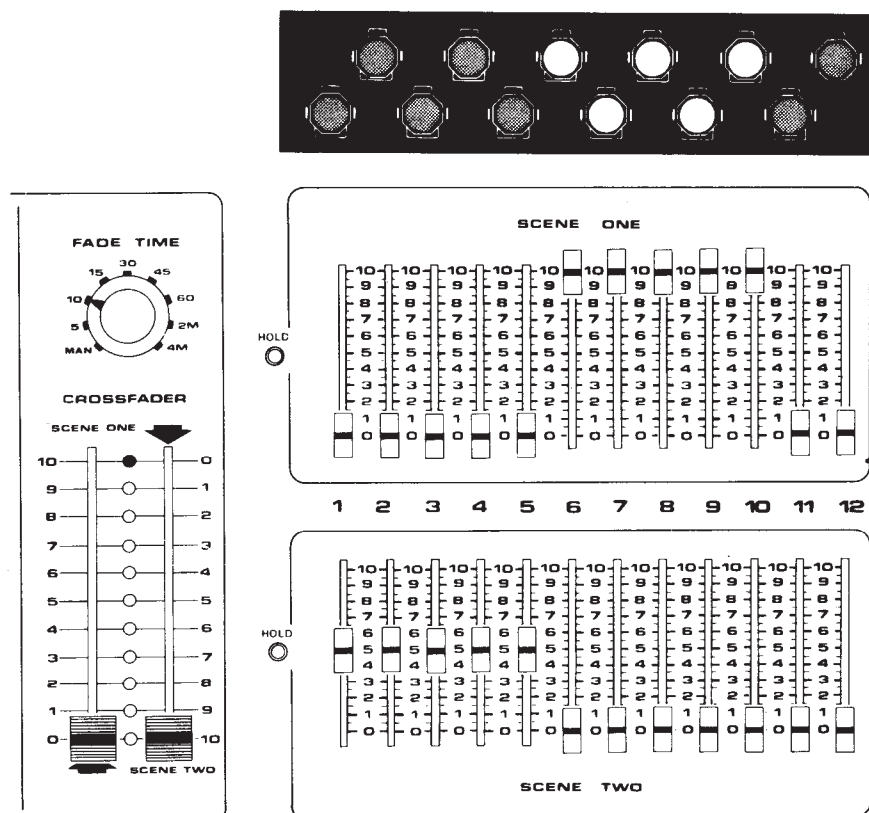
The FADE TIME control (figure 1-1) provides a means for making very smooth timed fades, and is especially useful for very long fades which are very difficult to produce manually.

The control has a MAN (manual fade) position and eight marked time positions, running from 5 seconds (5) to 4 minutes (4M). The time positions are not indexed or notched so that times between the marked positions may be selected. The time may be changed during a fade, the fade will complete instantaneously. If the control is moved to MAN during a timed fade, the fade will complete instantaneously.

The timed fade starts from the instant that the CROSSFADER is moved off of the 0 position towards 10, and proceeds at the fade time selected.

For example, set a 10-second crossfade from Preset One to Preset Two:

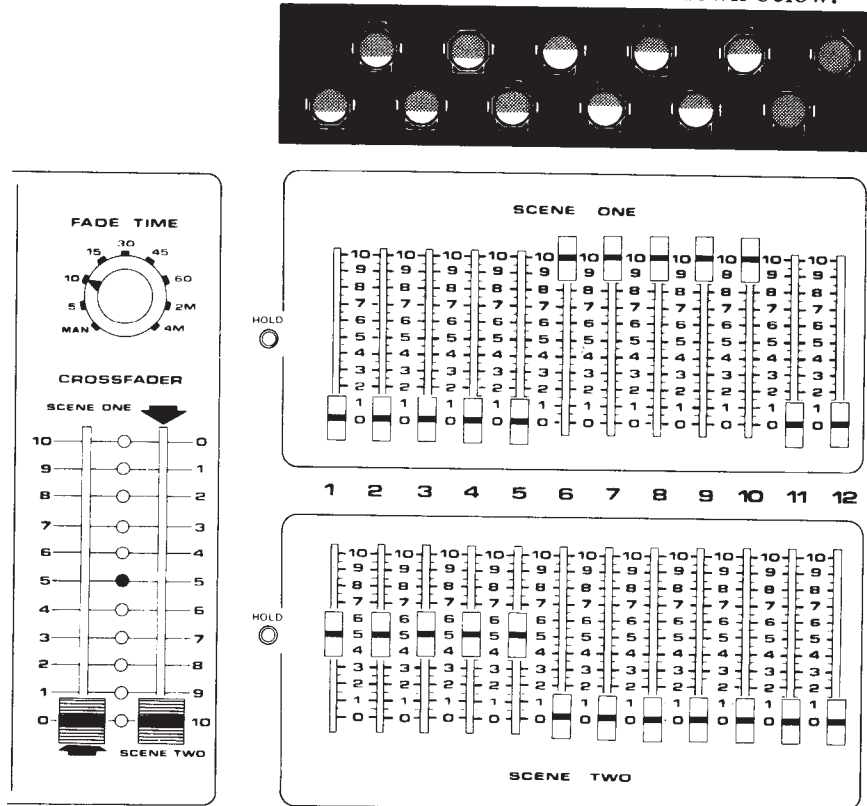
1. Set the FADE TIME control to 10 (ten seconds).
2. Initiate the fade by moving the CROSSFADER controls to SCENE TWO as shown below.



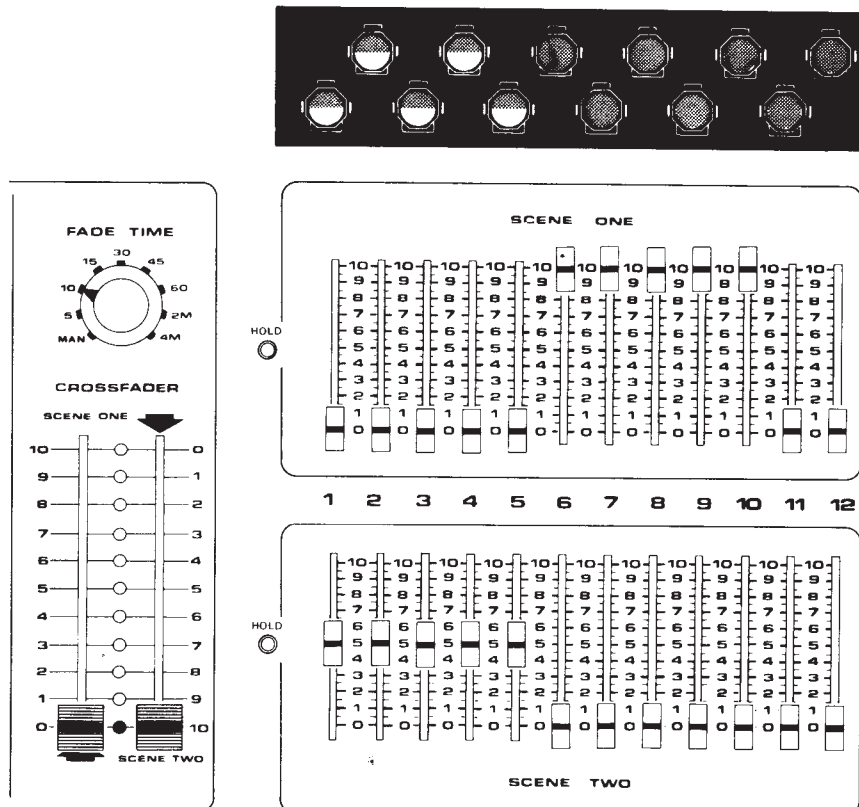
## Section II Operation

MANTRIX

The Fade Progress indicator will start moving after about one second, and in approximately five seconds will reach the half-way position on the CROSSFADER as shown below.



In ten seconds the fade will be complete as shown below.



Whenever a timed fade coincides with the position of a CROSSFADER handle (Fade Progress indicator reaches the handle position), the fade on that crossfader will stop until the crossfader is again moved. If the crossfader is moved towards the beginning position of the fade, the fade will follow the CROSSFADER. When the crossfader is again moved towards the ending position for that fade, the fade will resume at the timed rate selected on the FADE TIME control.

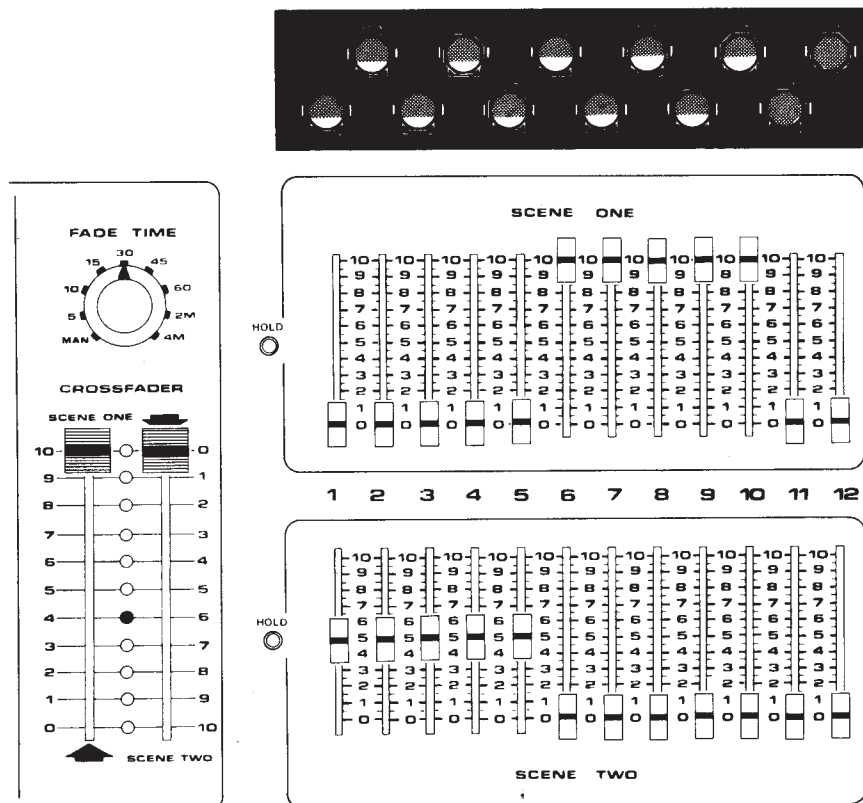
### MANUAL TAKEOVER OF TIMED FADES

A timed fade may be stopped and taken back under manual control at any time during the fade. This is accomplished by moving the CROSSFADER handles to the position of the Fade Progress indicator, stopping the fade, and then setting the FADE TIME control to MAN. The fade is then completed manually with the CROSSFADER.

**NOTE:** Moving the FADE TIME control to MAN during an active timed fade will not stop the fade, but will instantaneously complete the fade. The CROSSFADER handles must be used to stop the fade before transferring to manual control to make a smooth transition.

In the following example, a timed fade is established, and then interrupted to complete the fade manually:

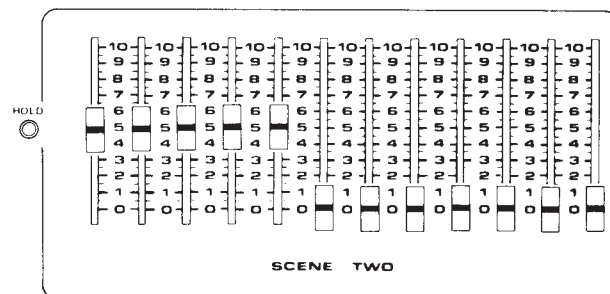
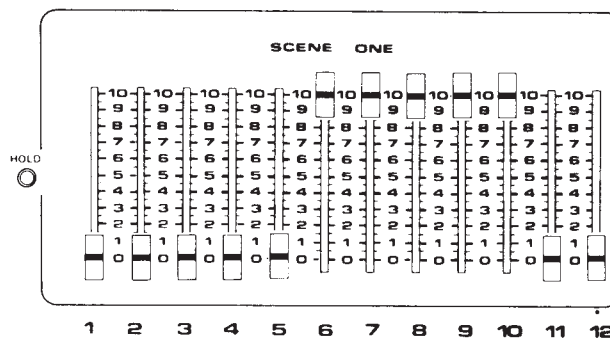
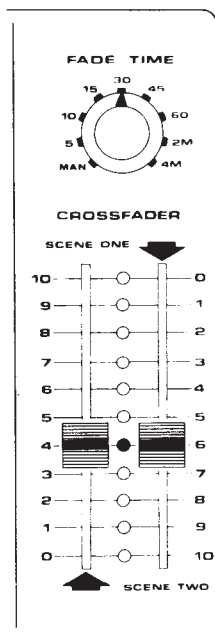
1. Set FADE TIME control to **30** (30 seconds).
2. Move CROSSFADER handles to SCENE ONE to initiate fade. The crossfade will start. After approximately 12 seconds, the Fade Progress indicator will have moved to the position shown below.



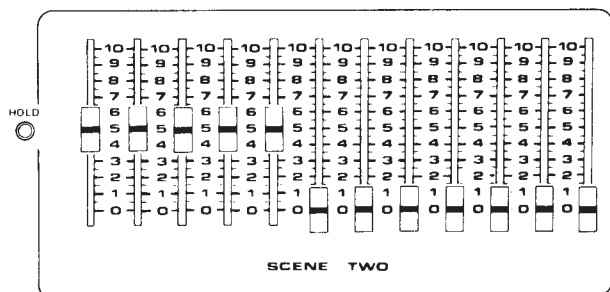
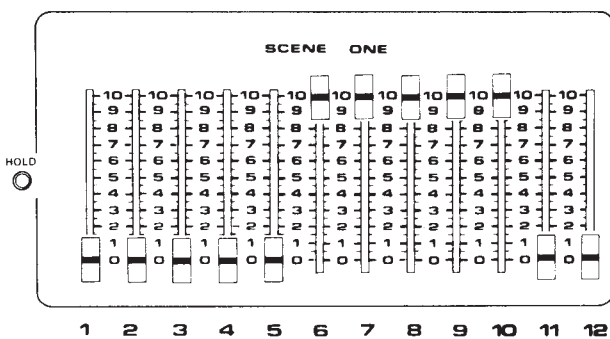
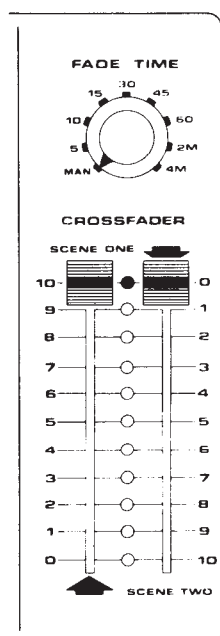
## Section II Operation

MANTRIX

3. Move the CROSSFADER handles to the same point as the Fade Progress indicator, stopping the fade as shown below.



4. Move FADE TIME control to MAN.
5. Return CROSSFADER to SCENE ONE manually as shown below.



A timed fade may be stopped, and then continued as a timed fade by bringing the CROSS-FADER handles back to the Fade Progress indicator, stopping the fade, and then resuming the timed fade by simply advancing the CROSSFADER back to the upcoming preset. When this feature is used, either the up-fade or down-fade, or both together, may be stopped, and then continued as a timed fade if desired.

## MASTER AND BLACKOUT SWITCH

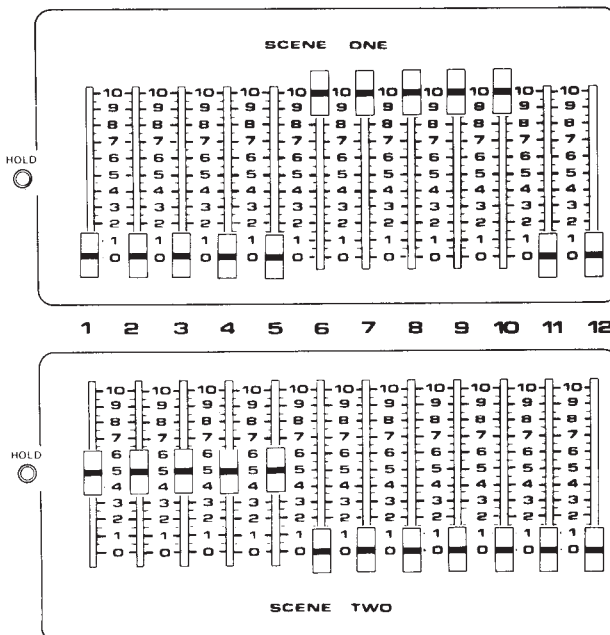
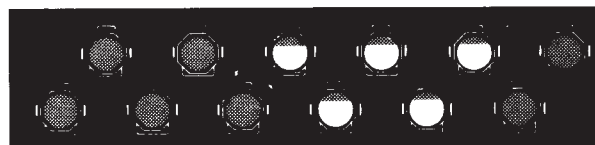
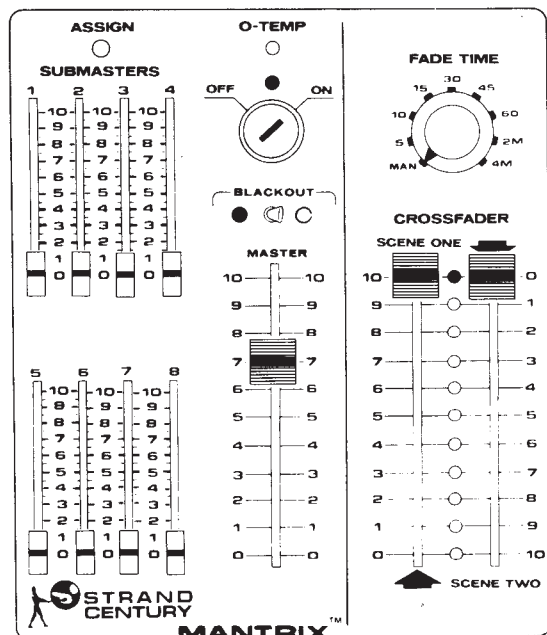
The MASTER control is a proportional grand master over all stage lighting levels. It can be used to trim the overall lighting on stage, to fade up the first scene in a sequence after a blackout, or to fade the last scene to a blackout.

The BLACKOUT switch is an on-off control of the stage levels, and can be used for quick blackouts, and to cut in the first scene in a sequence quickly.

To use the MASTER control, move towards **0** to lower the on-stage levels, and move towards **10** to bring up the on-stage levels. The **0** through **10** settings are proportional settings, indicating the percentage of the channel level settings on the Control and Channel Modules reaching the stage. When the MASTER control is not being used, it should be left in the **10** position.

Example: Fade the stage settings in Preset One (scene on-stage) to approximately 70% of their on-stage levels:

1. Move MASTER to **7** as shown below.

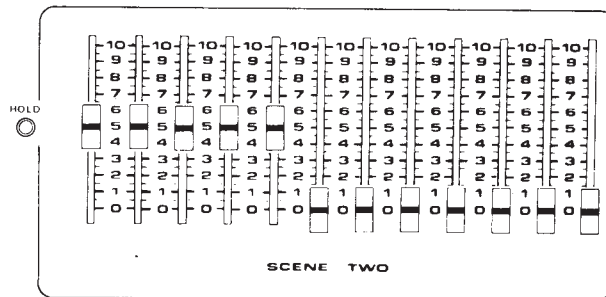
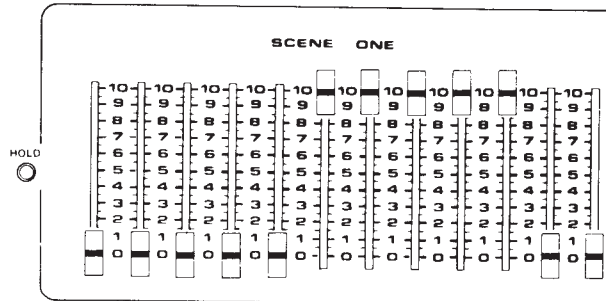
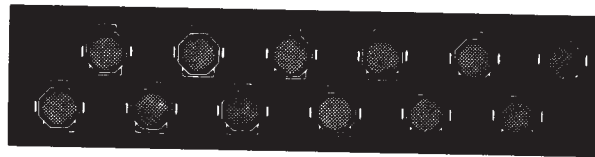
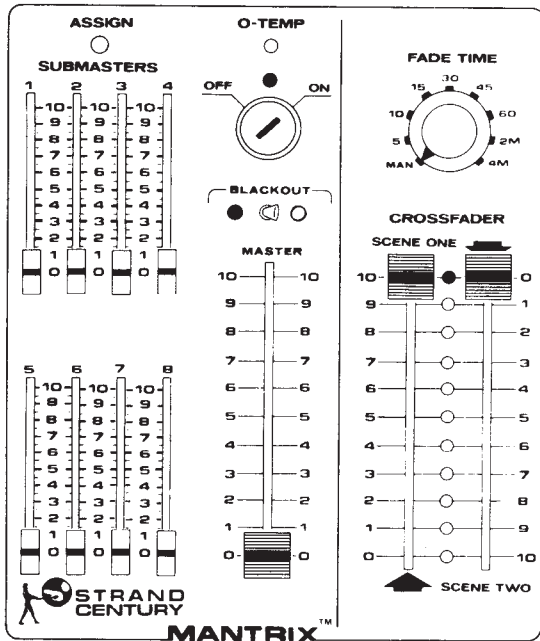


## Section II Operation

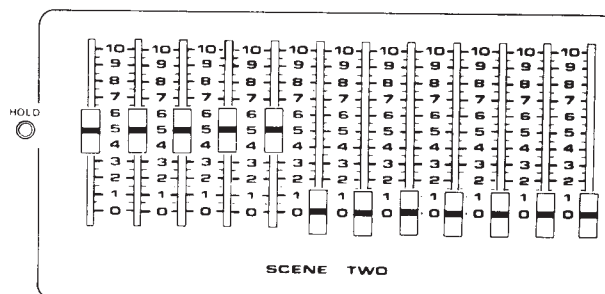
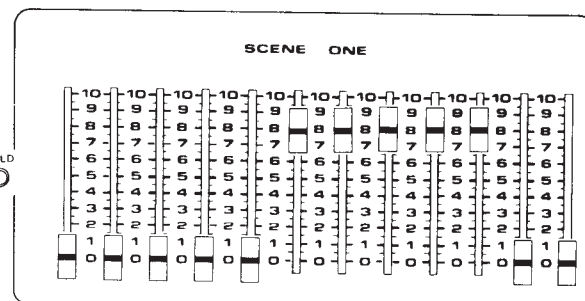
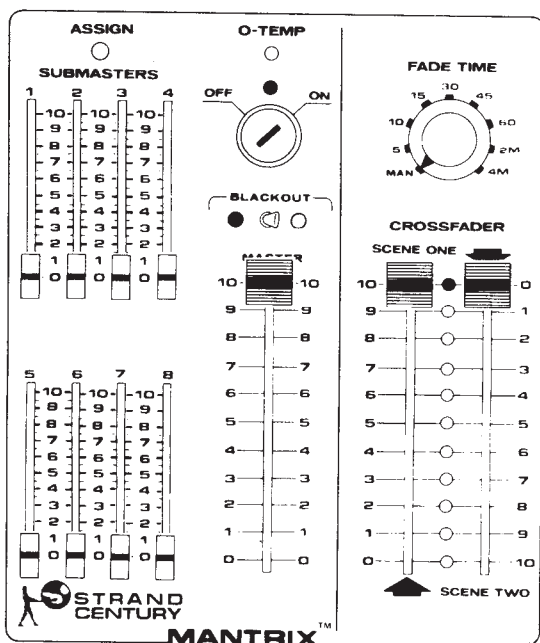
MANTRIX

Example: Blackout stage with MASTER Control.

1. Move MASTER control to **0** as shown below.  
All levels on stage will fade to zero.



2. Change channel level settings on Preset One from 100% to 80%. The level settings on-stage will not change.
3. Move MASTER control to **10** to fade in the new scene as shown here.



**BLACKOUT**

The BLACKOUT switch is set to ○ for normal operation, and to ● to blackout the stage.

Example: Blackout Preset One

1. Set BLACKOUT switch to ●.

All outputs to the stage drop to zero.

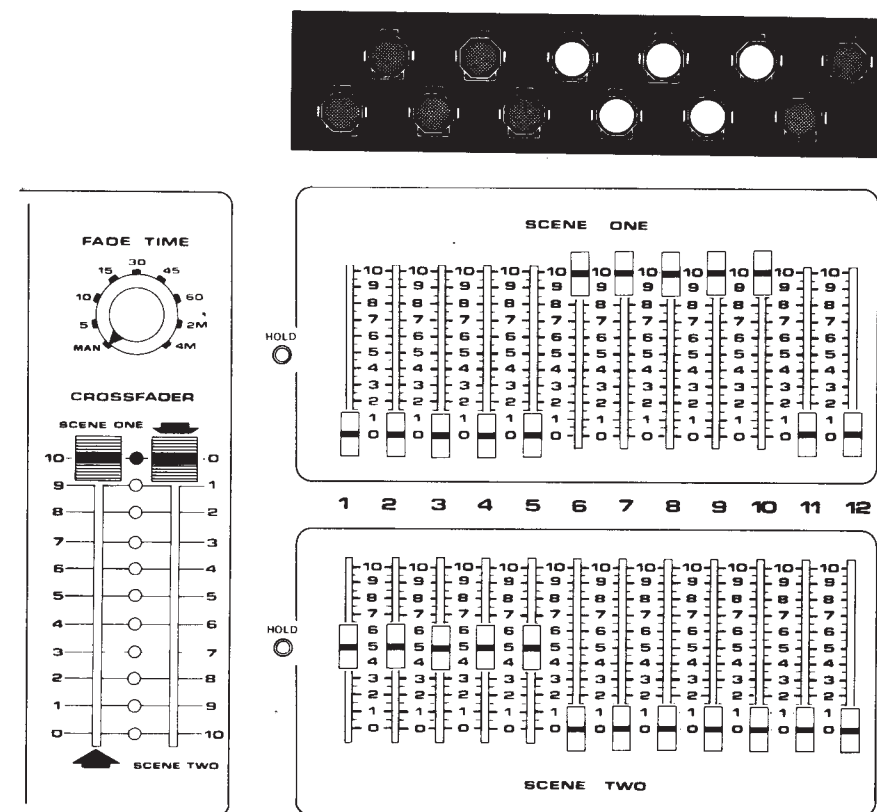
2. Change Preset One level settings on SCENE ONE Control Module to 100% (from 80%). The level settings on stage (blackout) will not change.
3. Position BLACKOUT switch to ○.

Channels 6 through 10 will come up on stage at the new (100%) level settings. Fade time will be zero.

**HOLD FUNCTION**

The Hold Function permits up to four presets to be set into the MANTRIX, permitting fast lighting changes where there is insufficient time between fades to set the next preset. There are two HOLD buttons: one for the SCENE ONE Control Module, and one for the SCENE TWO Control Module. Depressing either HOLD button holds the preset levels as set, and permits pre-setting new levels without loss of the levels in HOLD. The HOLD buttons illuminate when holding a preset.

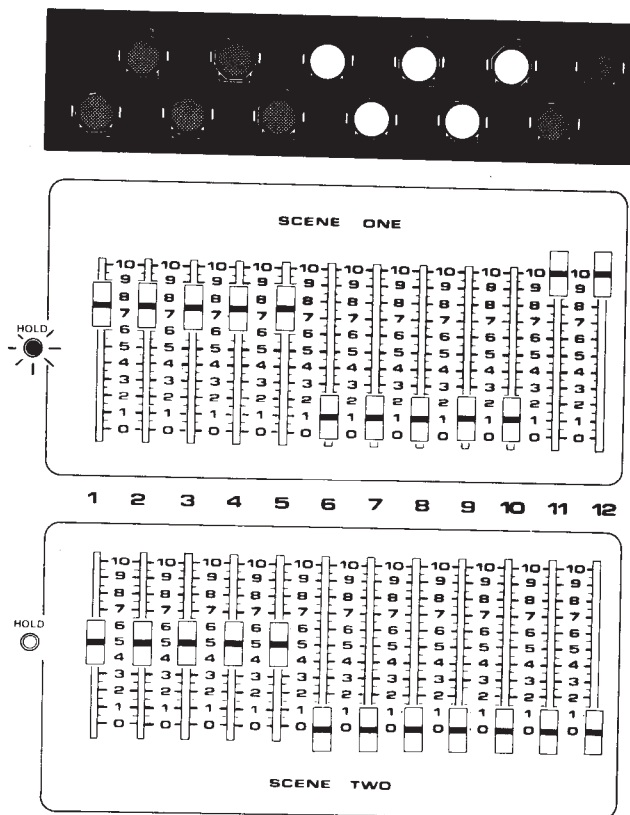
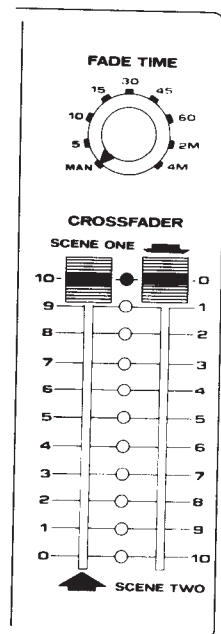
Example: A series of three quick preset changes are required. The preset on-stage is currently SCENE ONE (as shown below).



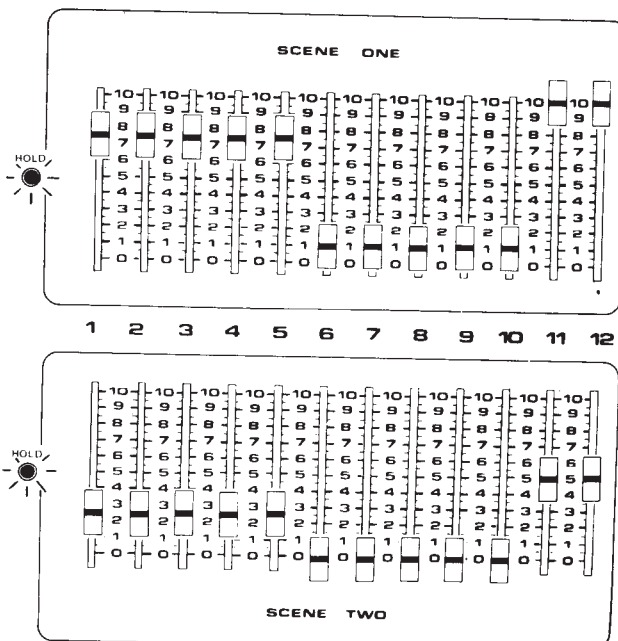
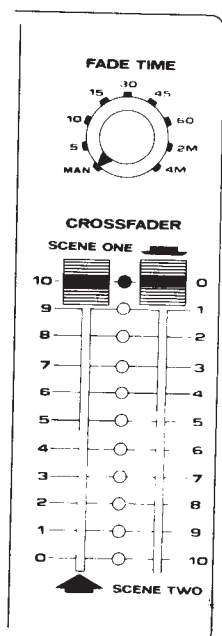
## Section II Operation

## MANTRIX

1. Press SCENE ONE HOLD button. The SCENE ONE HOLD button light will illuminate. Preset One (on SCENE ONE) is held on-stage.
2. Set Preset Three (on SCENE ONE) as shown.

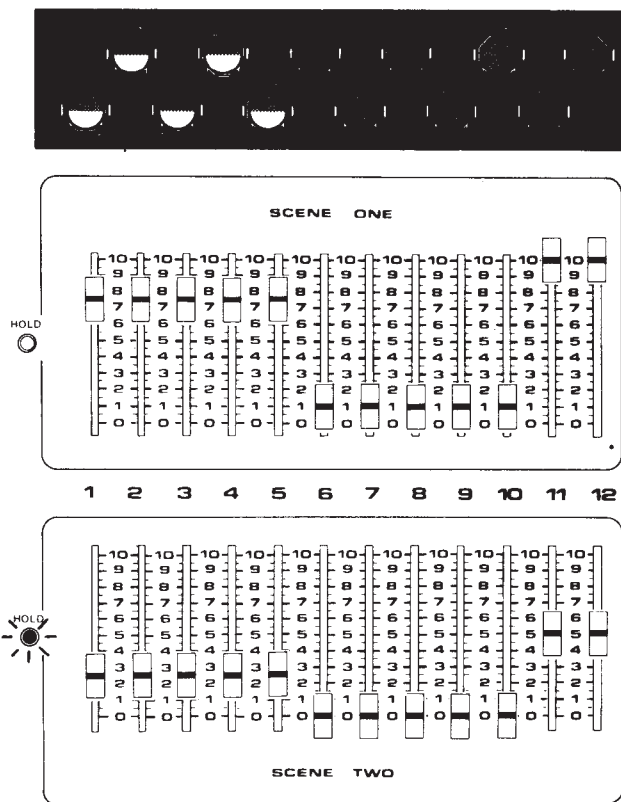
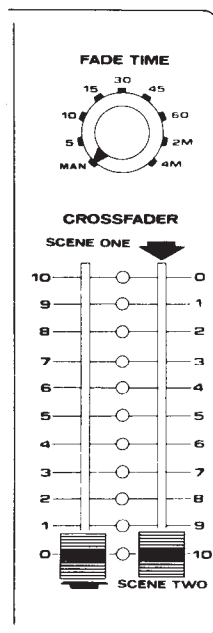


3. Press SCENE TWO HOLD button. Preset Two (on SCENE TWO) is held in the MANTRIX.
4. Set Preset Four (on SCENE TWO) as shown.

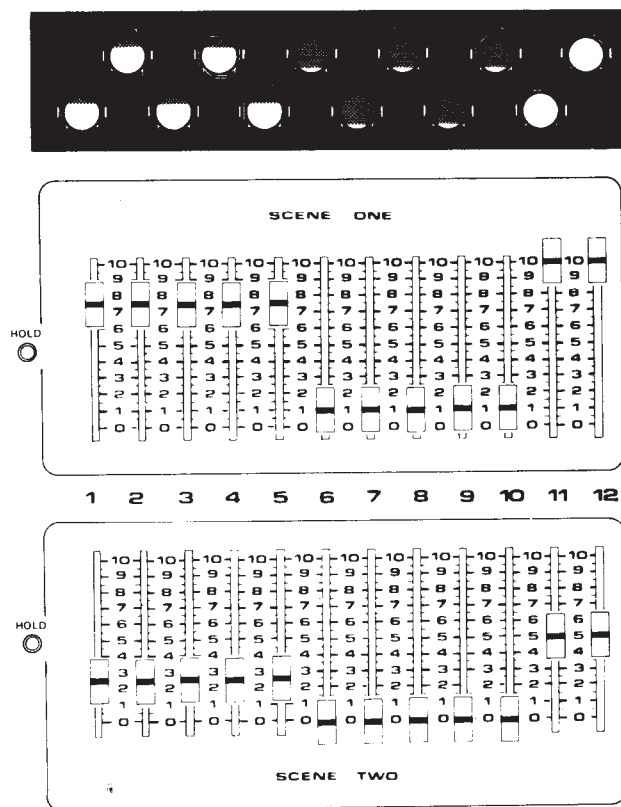
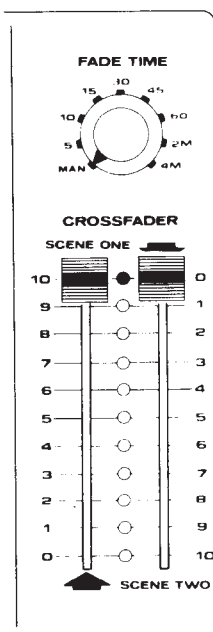


5. To play back the four scenes in rapid progression:

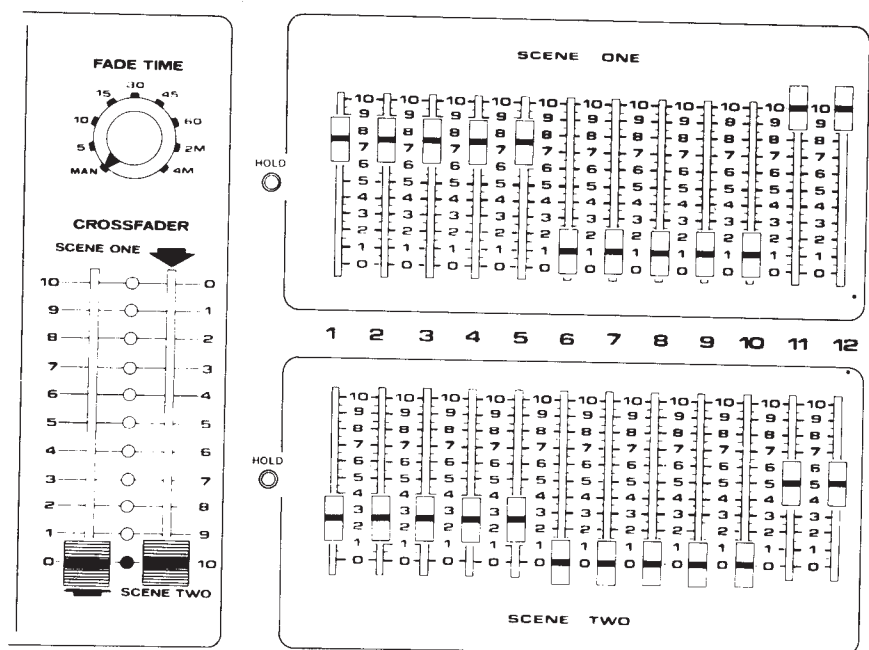
- a. Move CROSSFADER to SCENE TWO. Preset Two held by the SCENE TWO HOLD button will appear on stage. The HOLD button on SCENE ONE will go out, indicating that Preset One has been played, and that Preset Three as now set on the SCENE ONE Control Module is ready.



- b. Move CROSSFADER to SCENE ONE. Preset Three held in the SCENE ONE HOLD position will appear on stage. The HOLD button on SCENE TWO will go out, indicating that Preset Two has been played, and that Preset Four as now set on the SCENE TWO Control Module is ready.



- c. Move **CROSSFADER** to **SCENE TWO**. Pre-set Four will now appear on stage (as shown below).



The **HOLD** function can be cancelled by pressing the illuminated **HOLD** button. However, this should not be done while a hold cue is live on-stage as the lighting levels will cut to the preset levels appearing on the Control and Channel Modules.

## SUBMASTERS

The eight **SUBMASTERS** provide a means for adding up to eight preset groups of channels to the stage lighting, under quickly accessible manual control. The Submasters can be used as conventional submasters, scene masters, or independent controls.

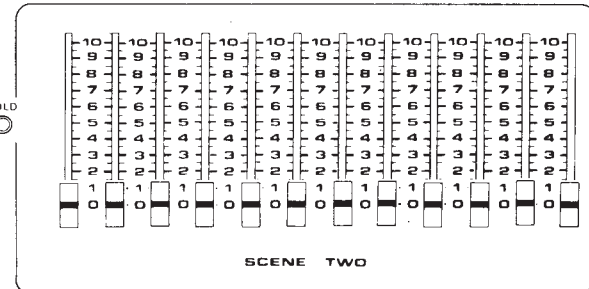
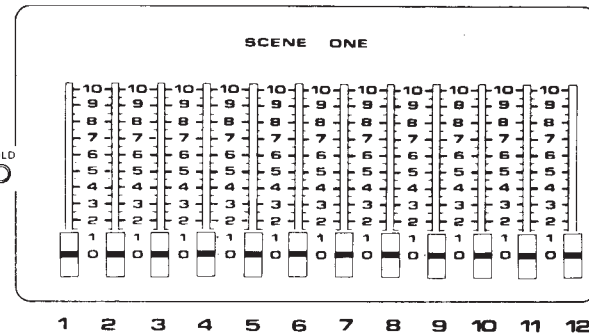
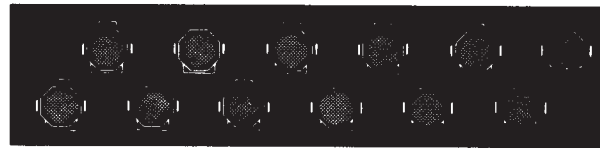
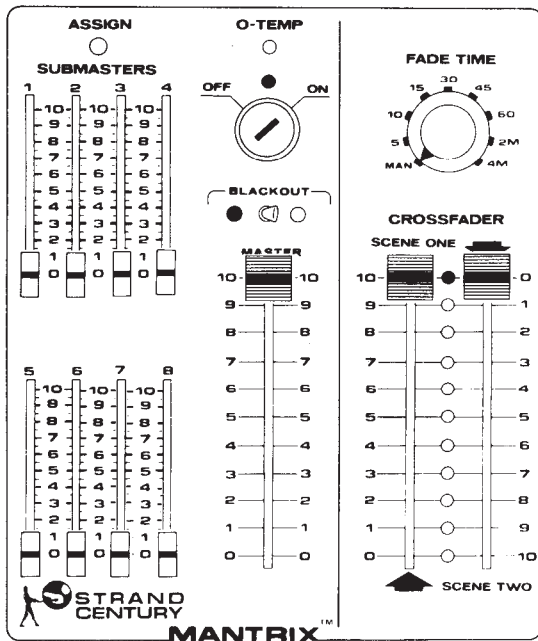
Any number of channels can be assigned to a Submaster; however, any one channel can be assigned to only one Submaster at a time. If a channel is assigned to a Submaster, and then later assigned to another Submaster, it will be deleted from the first Submaster.

Typically, a group of channels will be set to selected levels and assigned to one of the Submasters. Then, those channels may be brought onto stage at any time by raising the Submaster. At position **10**, the channels assigned to the Submaster will be at 100% of their assigned levels. At position **0**, the channels will be at 0%.

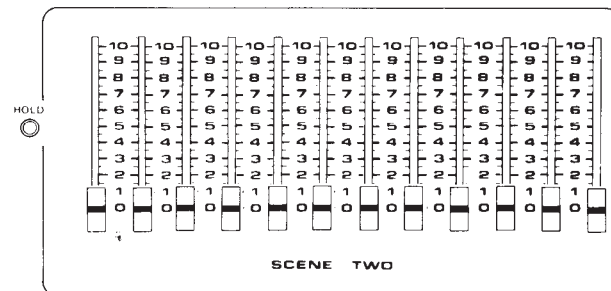
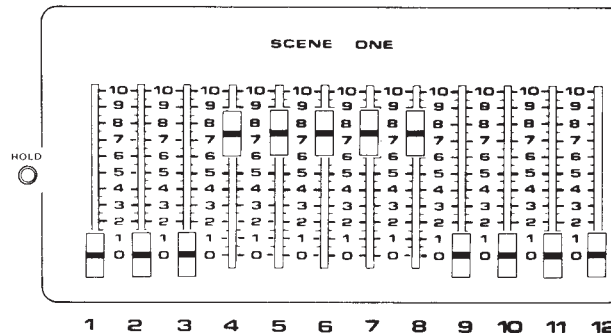
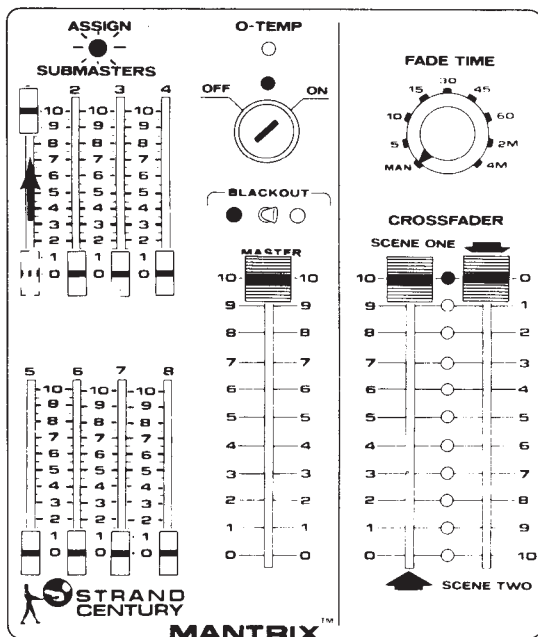
If a Preset is on stage that uses any or all of the channels assigned to the Submaster, the level on stage will be the higher of either the Preset level or the Submaster level.

Channels and levels are assigned to submasters as follows:

1. Set all **SUBMASTERS** and channels on **SCENE ONE** and **SCENE TWO** at **0**.
2. Move **CROSSFADER** to either **SCENE ONE** or **SCENE TWO**, depending upon where it is desired to set the submaster channel levels (**SCENE ONE** shown in the following example).

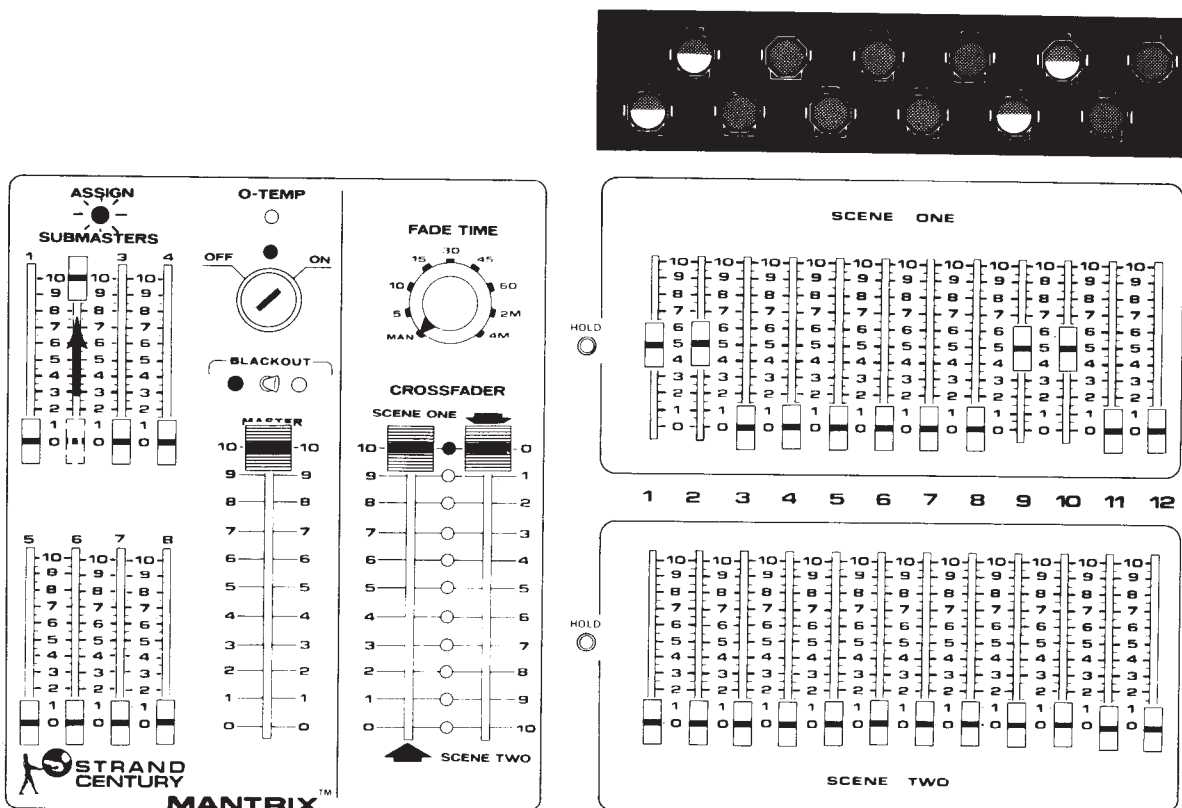


3. Press ASSIGN button (above SUBMASTER controls). The ASSIGN light will come on, indicating that the MANTRIX is ready for a Submaster assignment. For example, to assign channels 4 through 8 to SUBMASTER 1, at a 75% level, raise SUBMASTER 1 handle to 10 and set SCENE ONE channel levels as desired (as shown below). Then, press ASSIGN



button. The ASSIGN light will blink a few times, and then go off, indicating that the submaster assignment has been completed. Finally, lower SUBMASTER 1 handle to **0**. Channels 4 through 8 have been assigned to SUBMASTER 1, and any time the SUBMASTER 1 handle is moved up, channels 4 through 8 will come up on stage, to a maximum of 75%.

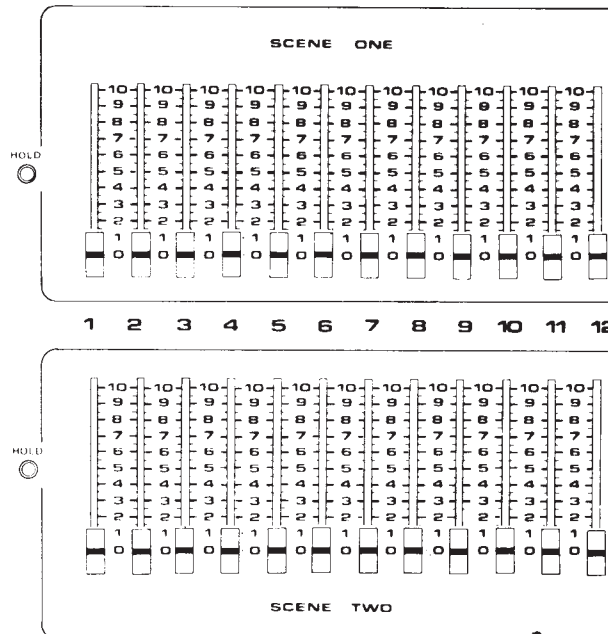
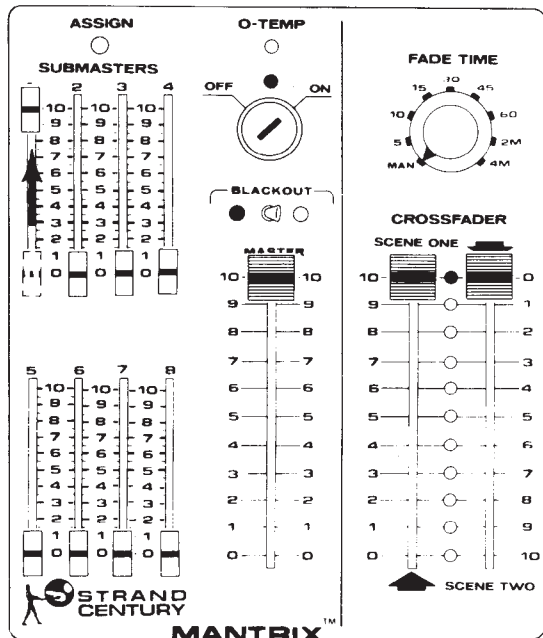
4. After a submaster assignment has been made, press the ASSIGN button again to reactivate the submaster for the next assignment operation. For example, to assign channels 1, 2, 9, and 10 to SUBMASTER 2 at a 50% level, raise SUBMASTER 2 to **10**, and set SCENE ONE channel levels as desired (shown below). Then, press ASSIGN button. The ASSIGN light will blink a few times, and then go off, indicating that the assignment to SUBMASTER 2 has been completed. Finally, lower SUBMASTER 2 to **0**. Channels 1, 2, 9, and 10 have been assigned to SUBMASTER 2, and any time the SUBMASTER 2 handle is moved up, channels 1, 2, 9, and 10 will come up on stage, to a maximum level of 50%.



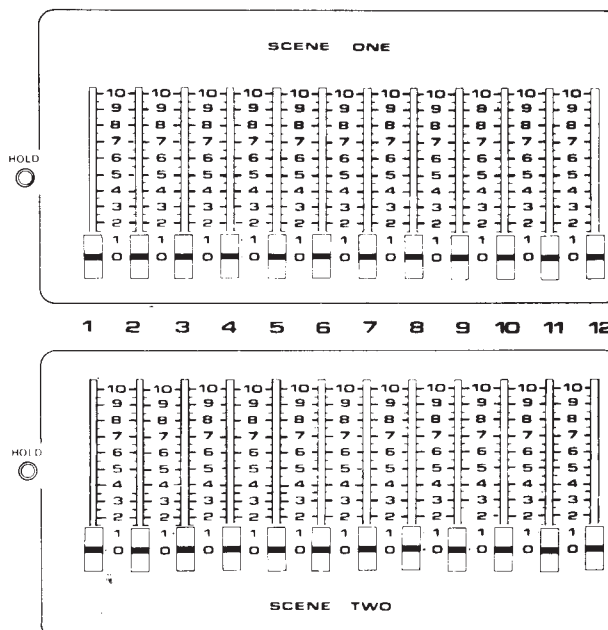
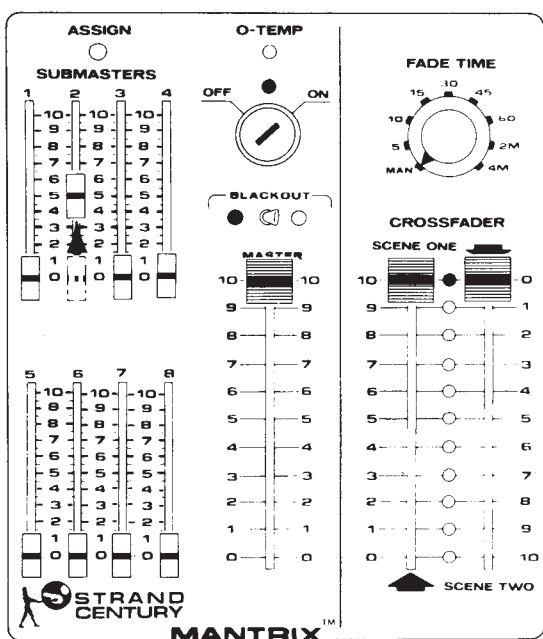
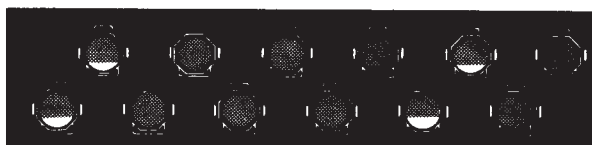
The Submaster assignments can continue until channels are assigned to each of the eight Submasters if desired, noting that if a channel already assigned to a Submaster is assigned to a new submaster, the channel will be deleted from the Submaster to which it was previously assigned. For example, if channel 6 were to be assigned to SUBMASTER 3 after the above examples, channel 6 would be removed from control to SUBMASTER 1, and reassigned to SUBMASTER 3. For this reason, a log should be made of Submaster assignments to keep a record of what channels (and levels) have been assigned to each Submaster.

Example: To check out Submaster assignments, return all channel level controls on SCENE ONE to **0**, and use the SUBMASTER handles to bring up the assigned channels.

1. To check out assignments to SUBMASTER 1, raise SUBMASTER 1 handle to **10**: Channels 4 through 8 will come up to a 75% level on stage (as shown below).



2. Move SUBMASTER 1 back down to **0**. The on-stage levels will drop proportionally from 75% to blackout as the SUBMASTER 1 handle reduces the output to the stage.
3. Raise SUBMASTER 2 handle to **5** (as shown below). Channels 1, 2, 9, and 10 will come up to approximately 25% on stage (half of their preset 50% assigned level).



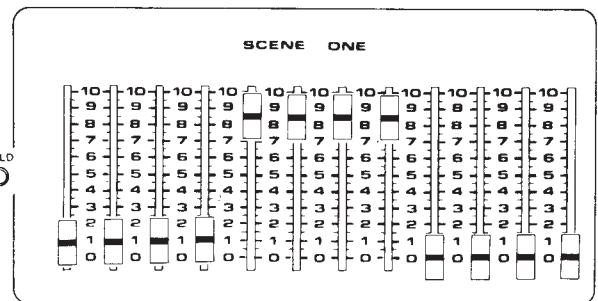
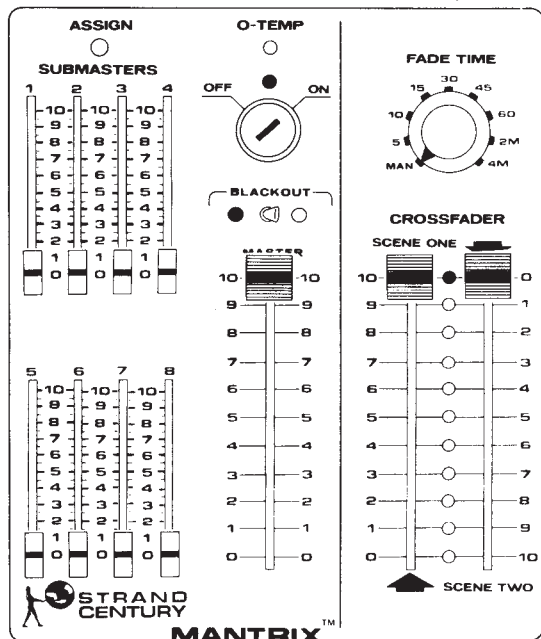
## Section II Operation

## MANTRIX

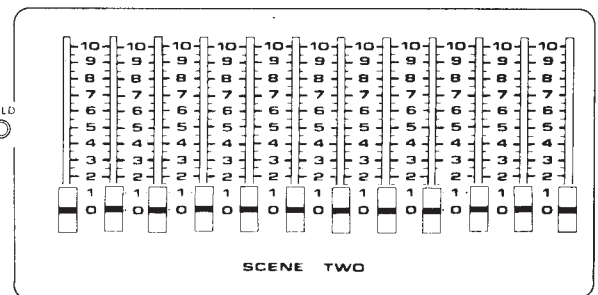
- Raise SUBMASTER 2 handle to **10**, and then back to **0**. Channels 1, 2, 9, and 10 will come up to 50% when SUBMASTER 2 reaches **10**, and fade out when the Submaster is returned to **0**.

Example: To use the SUBMASTERS with preset stage levels:

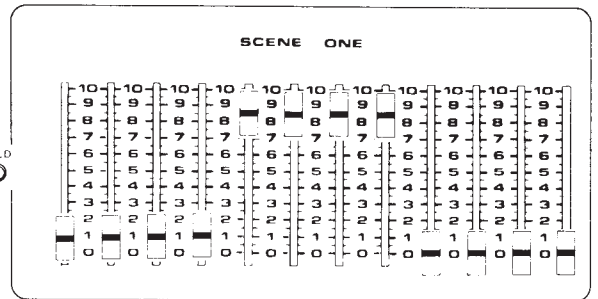
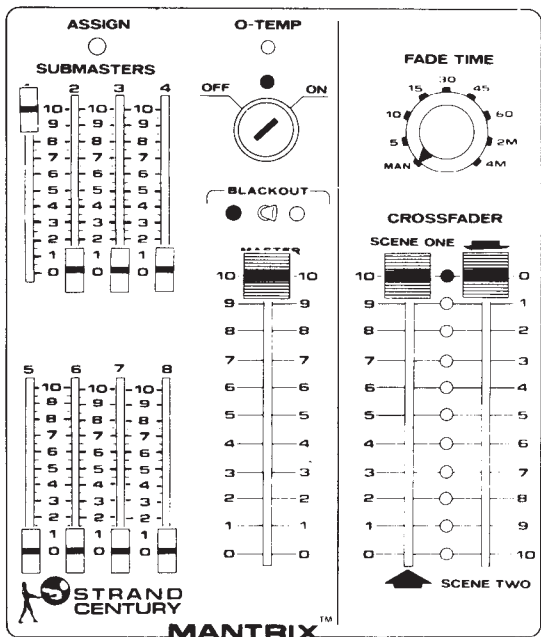
- Set **SCENE ONE** as shown below.



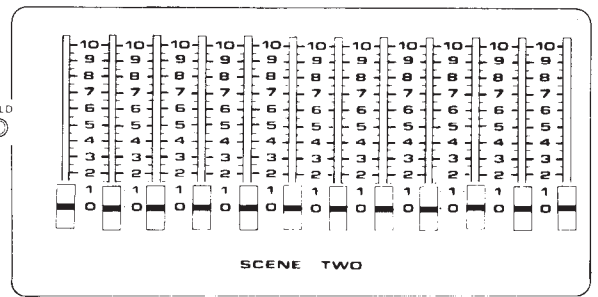
1 2 3 4 5 6 7 8 9 10 11 12



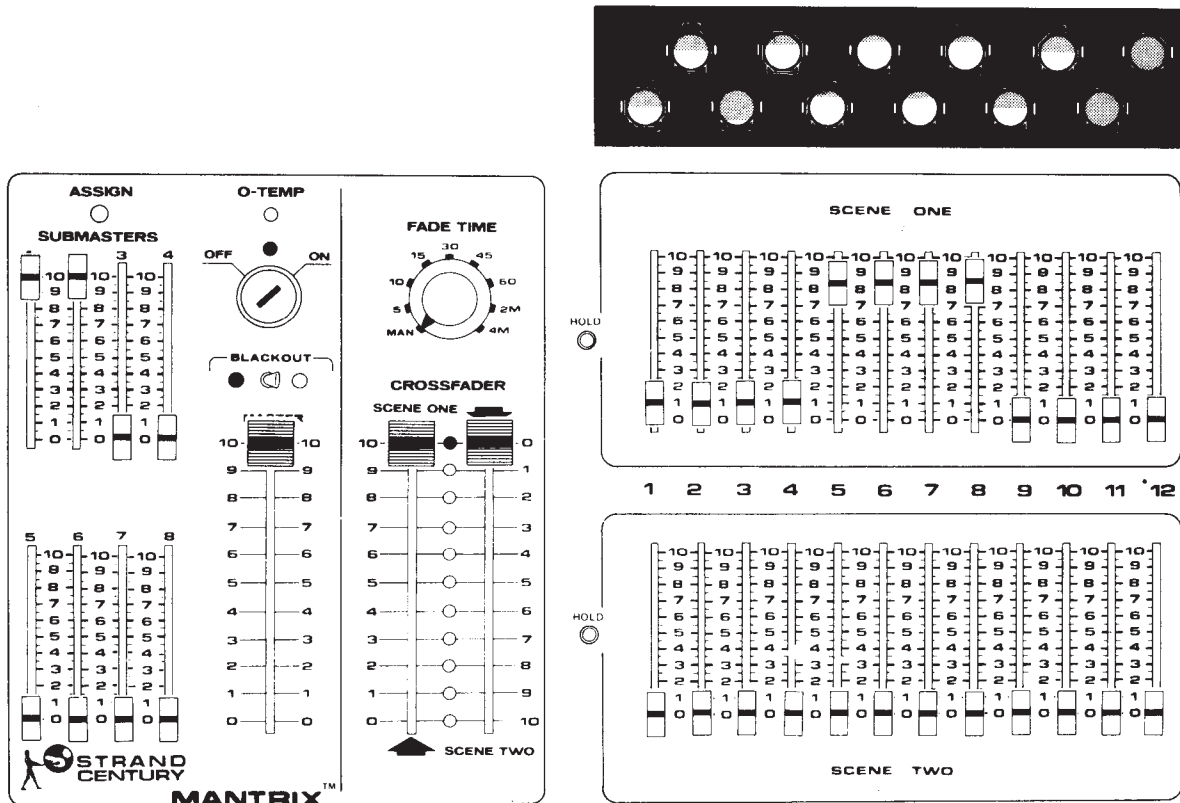
- Raise SUBMASTER 1 to **10**. Since this Submaster controls channels 4 through 8 (to a maximum level of 75%), the Submaster is attempting to set the on-stage channels 4 through 8 at 75%. Channel 4 is set at 10% by Preset One, so the Submaster will bring this channel up to 75%. But channels 5, 6, 7, and 8 are already preset by the scene at 85%, so the Submaster will have no effect on these channels.



1 2 3 4 5 6 7 8 9 10 11 12



- Raise SUBMASTER 2 to **10** as shown below. Since this Submaster controls channels 1, 2, 9, and 10 (to a maximum level of 50%), the Submaster will bring on-stage channels 1, 2, 9, and 10 up to 50%.



If the preset is changed while the submasters are up, the levels on-stage will be a function of the channels assigned to the new preset, and the submaster levels.

To clear a submaster:

- Set all SUBMASTERS and channels on SCENE ONE and SCENE TWO to **0**.
- Depress ASSIGN button (ASSIGN light will come on).
- Advance SUBMASTER to be cleared to **10**, and press ASSIGN button. ASSIGN light will flash to indicate that selected SUBMASTER has been cleared.
- Return SUBMASTER to **0**.

To clear all submasters simultaneously:

- Press ASSIGN button, and hold.
- Turn system power keyswitch OFF, and then return to ON (while still pressing the ASSIGN button). All submasters will have been cleared.

## PATCH

The optional Matrix Patch Module is used to patch dimmers to MANTRIX channels in other than a one-to-one correspondence. The Matrix Patch Module is also used to preview patch assignments and to set 6K dimmer assignments. (NOTE: Systems with 6K CD80 type dimmers require a Matrix Patch Module.)

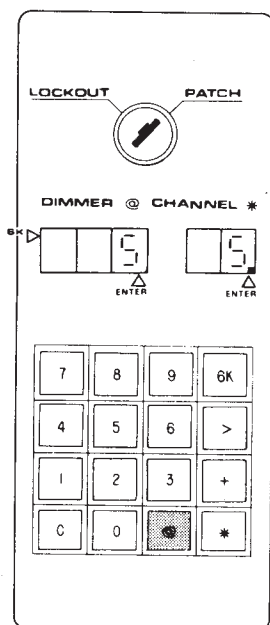
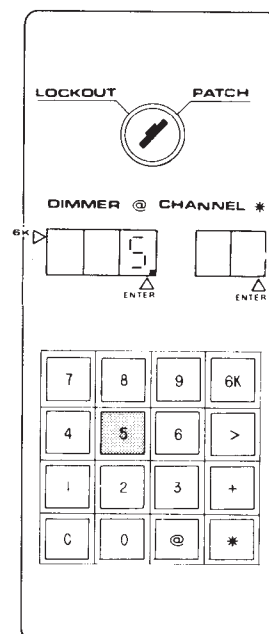
When the MANTRIX is first turned on, the dimmer patch assignments are on a one-to-one assignment basis, with dimmer 1 assigned to channel 1, dimmer 2 assigned to channel 2, etc. If there are 24 channels on the MANTRIX, the first 24 dimmers will be assigned to the 24 channels of the MANTRIX. If there are more dimmers than MANTRIX channels, the extra dimmers will be unassigned.

The keyboard of the Matrix Patch Module is used to assign and/or change dimmer assignments with the following basic command:

DIMMER NO. @ CHANNEL NO. \*

For example (as shown at right):

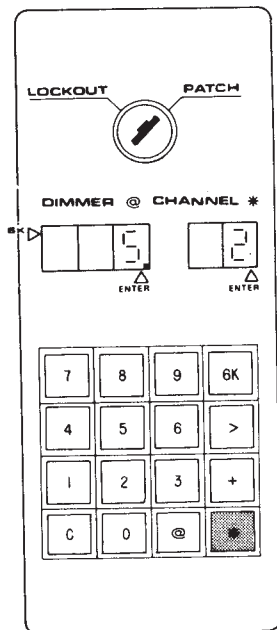
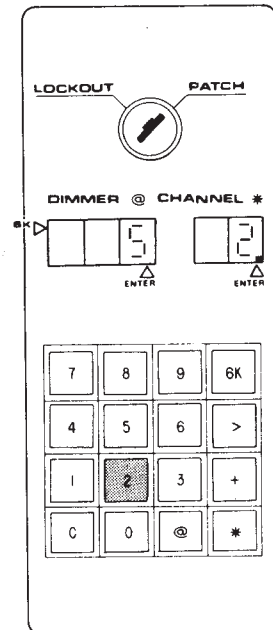
1. Position LOCKOUT/PATCH keyswitch to PATCH.
2. Check that ENTER indicator in the DIMMER display is on. If not, depress C (clear) key to clear Matrix Patch Module for the next entry.
3. Depress the numerical key(s) corresponding to the desired dimmer number, and the dimmer number will show up on the DIMMER display. In this example, dimmer number 5 has been entered.



4. Depress the @ key. The ENTER indicator moves to the CHANNEL display, indicating that the MANTRIX is now ready for entry of the channel number to which the dimmer is to be assigned (as shown at left). The number 5 appearing in the CHANNEL display indicates that dimmer 5 is currently assigned to channel 5.

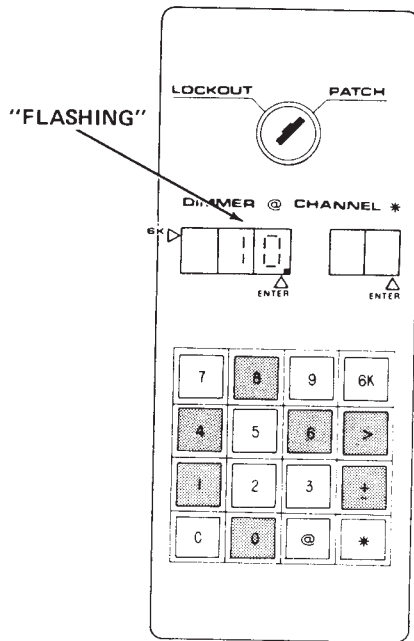
5. Depress the numerical key(s) corresponding to the desired channel number to which the dimmer is to be assigned, and the channel number will show up in the CHANNEL display.

In this example, channel number **2** has been entered (as shown at right).



6. To complete the dimmer-channel assignment, and store the assignment in the MANTRIX, depress the **\*** key. The ENTER indicator moves back to the DIMMER display, indicating that the Patch Module is ready for another dimmer-channel assignment (as shown at left).

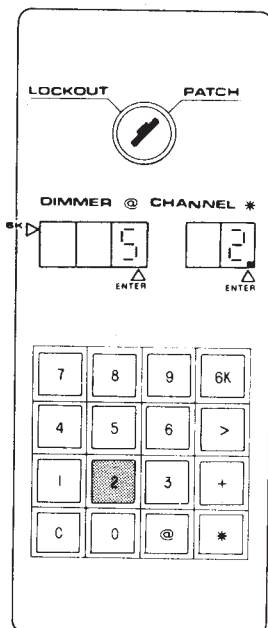
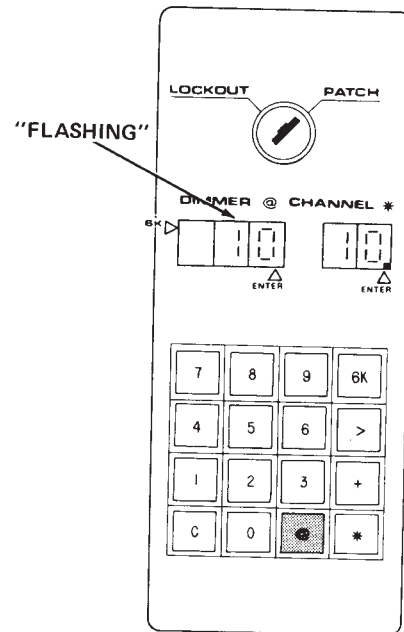
Groups of dimmers can also be assigned to a channel in the same manner. A dimmer group is a series of up to 16 dimmer numbers joined by the **[+]** (and) or **[>]** (through) symbols. When a group of dimmers is assigned, only the last dimmer number will appear in the DIMMER display. This number will flash to indicate that it is the end of a series of dimmer numbers. For example, assign dimmers 1 through 4, 6, 8, and 10 to channel 2:



1. Enter dimmer numbers for this example as follows (as shown at left):

1 > 4 + 6 + 8 + 1 0

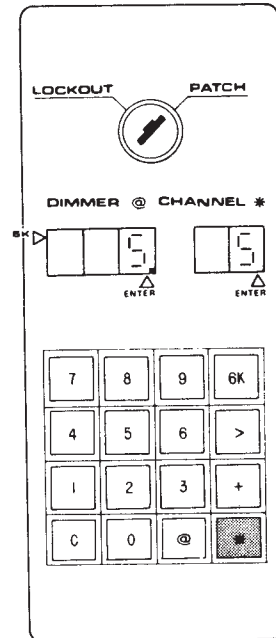
2. Depress **[@]** key. The ENTER indicator will move to CHANNEL display, indicating that dimmer entries have been made, and the Matrix Patch Module is ready for the channel assignment to be made (as shown at right).



3. Enter channel number **[2]** for this example (as shown at left).

4. Depress the **[\*]** key on the Matrix Patch Module to complete the dimmer assignment. The ENTER indicator returns to the DIMMER display to indicate that the Matrix Patch Module is ready for another dimmer-channel assignment (as shown at right).

**NOTE:** To repeat the same list specified in the previous command, enter **[@]**, channel number, and **[\*]**. No dimmer number entry automatically defaults to the previous dimmer list.



During the entry of dimmer and channel assignment information, the **[C]** key may be used to clear any errors before the **[\*]** key is pushed. The **[C]** key clears the last entry. If pushed twice, it will clear both the CHANNEL and DIMMER entries and displays. For example, dimmer 20 is to be assigned to channel 24, but during the entry, the first number of the channel is accidentally pushed before the **[@]** key, resulting in:

**[2] [0] [2] [@] [4]**

1. Depress the **[C]** key twice to delete the channel and dimmer entries.
2. Now, enter the data correctly:

**[2] [0] [@] [2] [4]**

3. Depress the **[\*]** key to store the assignment in the MANTRIX. The ENTER indicator will move to the DIMMER display.

The **[C]** key can only be used to correct or change a dimmer-channel assignment prior to use of the **[\*]** key. If the command execution key **[\*]** is depressed, then the dimmer-channel assignment can only be changed by going through a complete assignment. For example, in the previous example, if the **[\*]** key had been pushed before the error was noticed, dimmer 202 would have been assigned to channel 4.

If a dimmer number is to be deleted from a channel, and not reassigned, enter:

**DIMMER NO. [0] [\*]**

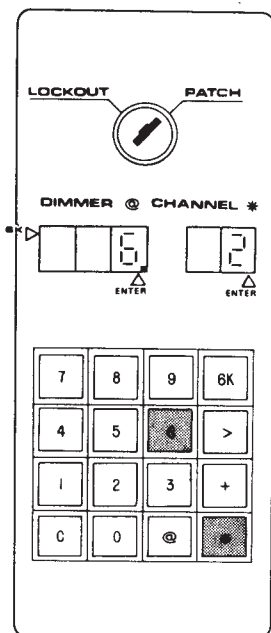
In the above error example, this would be accomplished as follows:

**[2] [0] [2] [@] [0] [\*]**

Dimmer 202 would be deleted from channel 4, and assigned to inactive channel 0.

Patch assignments are previewed (to determine the channels to which the dimmers are assigned) by entering:

**DIMMER NO. [\*]**



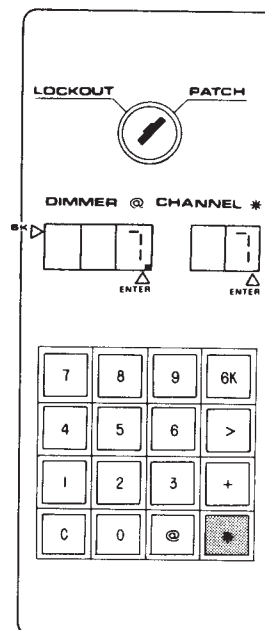
For example, to determine to what channel dimmer 6 is assigned, enter:

**6** **\*** (as shown at left)

The dimmer assignments may be previewed in increasing numerical order by simply pressing the **\*** key.

For example, preview the next dimmer by depressing **\*** key (as shown at right).

A dimmer number larger than 288 or a channel number larger than the number of available MANTRIX channels installed cannot be entered.



## 2.4KW and 6KW Dimmer Type Assignments

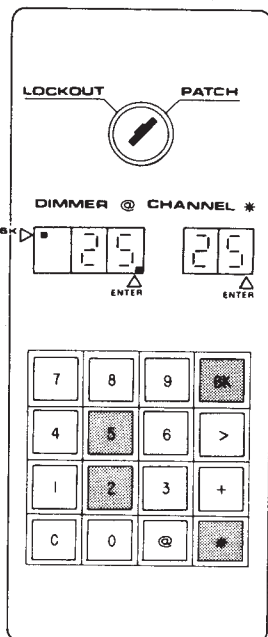
If the MANTRIX is being used in a system utilizing the CD80 Dimmer, all 6K dimmers must be designated. To designate a 6K dimmer, enter:

**[DIMMER NO.]** **6K** **\***

The **6K** indicator above the DIMMER display will illuminate, showing that the dimmer in the display is of the 6K type.

In the following example, dimmer 25 is to be designated as a 6K dimmer:

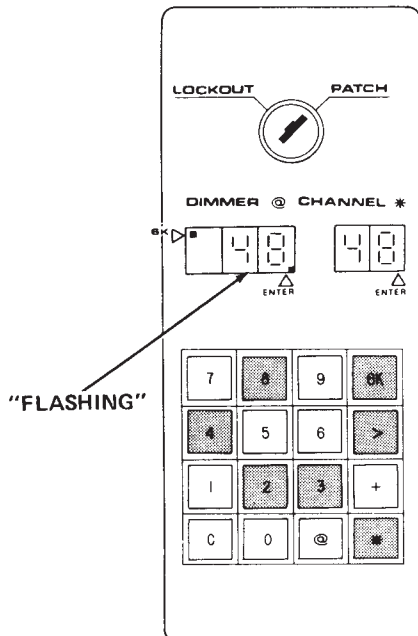
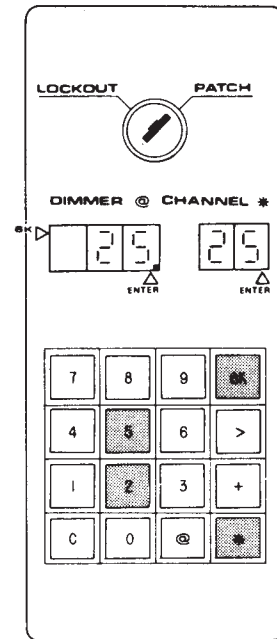
Enter: **2** **5** **6K** **\*** (as shown at left)



To return a dimmer to a 2.4K (normal) type, repeat the above (the second 6K entry deletes the previous 6K entry):

Enter: 2 5 6K \* (as shown at right)

The 6K indicator has gone out, indicating that dimmer 25 is a 2.4K dimmer.



A dimmer group may also be assigned as 6K types in the same manner. In this example, dimmers 32 through 48 are designated as 6K types (as shown at left):

Enter: 3 2 > 4 8 6K \*

Any one or more of a group of dimmers designated as 6K dimmers may be returned to 2.4K types on an individual basis, or in a group. If some dimmers in a group are 2.4K and some 6K, all dimmers in the group will be changed to 6K type.

### PATCH/LOCKOUT Keyswitch

The PATCH position of the keyswitch is used when making Dimmer-Channel patch assignments. After the assignments have been made, turn the keyswitch to LOCKOUT to prevent any accidental changes to the assignments.

Dimmer assignments may be previewed when the keyswitch is in the LOCKOUT position; however, all dimmer-channel assignments will be ignored by the MANTRIX.

When the MANTRIX is first turned on, all patch assignments are automatically set up in a one-to-one correspondence up to the highest number of channels available on the particular MANTRIX channel configuration. All other dimmers remain unassigned. The Patch assignments may be reset to the one-to-one state at any time by pressing the C (clear) key, and turning the keyswitch from LOCKOUT to PATCH, while holding the C key depressed.

## AUXILIARY EQUIPMENT

## CABLES

The following table lists the various cables that are available for the MANTRIX system:

CATALOG NO.	DESCRIPTION	LENGTH	CONNECTOR
8030	Dimmer Control Cable	25' (7.5 m)	TA4ML
8031	Dimmer Control Cable	50' (15 m)	TA4ML
8032	Dimmer Control Cable	100' (30 m)	TA4ML
8033	Dimmer Control Jumper Cable	1.5' (0.46 m)	TA4ML
8035	Power Cable	6' (1.83 m)	International

The dimmer control cables may be used as either main or extension cables for the DIMMER I & II, or OVERTEMP connections to the MANTRIX. One 25-foot long control cable is included with each MANTRIX console. Additional cables must be ordered separately. The 1.5-foot dimmer control jumper cable is used to interconnect CD80 Packs in portable installations with the MANTRIX.

## DUST COVER

The following dust covers are available for MANTRIX consoles to protect the consoles when not in use:

DUST COVER CATALOG NO.	USE WITH CONSOLE	CONSOLE DESCRIPTION
8021/01	8000, 8001	12 channel with or without Patch
8021/03	8002, 8003	24 channel with or without Patch
8021/05	8004, 8005	36 or 48 channel with Patch
8021/07	8006, 8007	36 or 48 channel with Patch
8021/09	8008–8010	60, 72, or 84 channel with Patch
8021/11	8011	24 channel with Patch (Q-Master)

Dust covers are heavy gauge beige vinyl, and are provided with a flap in the rear to allow control, power, and auxiliary cables to remain attached with the cover installed.

## STANDS

A castered stand is available for double-tiered MANTRIX system. The stands are aesthetically designed, off-white data desks with black comfort edge and chrome casters. One stand is 36 inches wide for medium double-tiered consoles, and the other is 48 inches wide for large double-tiered consoles. Both stands are 26 inches high.

STAND CATALOG NO.	USE WITH CONSOLE	CONSOLE DESCRIPTION
8019	8006, 8007	36 and 48 channel with Matrix Patch Module
8020	8008–8010	60, 72, and 84 channel with Matrix Patch Module

### **WORK LIGHT**

A designer type worklight fixture (Catalog No. 8022) is available for MANTRIX consoles with casted stand. The worklight has a double-pivot arm for complete flexibility in positioning and table edge clamp for mounting. It is black semi-gloss enamel.

### **AUXILIARY MODULES**

Custom designed auxiliary modules are available in 4 inch and 8 inch widths. These modules are layed out to customer specifications, and may be used for house light controllers, non-dim switches, panic-reset switches, transfer switches, time clocks, and other auxiliary controls. The maximum depth of controls to be mounted in these modules is 2-3/8 inches.

## INSTALLATION AND MAINTENANCE

INSPECTION AFTER UNPACKING

As soon as possible after receipt of the MANTRIX, the console should be unpacked and checked for shipping damage. Save the shipping cartons for storing the system, or for use when transporting the system.

CABLE CONNECTORS

Cable connections to the MANTRIX are made as shown in figures 4-1 and 4-2. Note that the DIMMER I connector and cable should be used for the first 96 dimmers, and the DIMMER II connector and cable for the next 97 to 192 dimmers (for a total of 288 dimmers maximum). Dimmer Control Cables in 25, 50, and 100 foot (7.5, 15, and 30 meter) lengths are available as listed in Section III of this manual. 1.5-foot (0.457 meter) Dimmer "daisy-chain" Dimmer Control Jumper Cables are available to interconnect between dimmer packs as shown in figure 4-1.

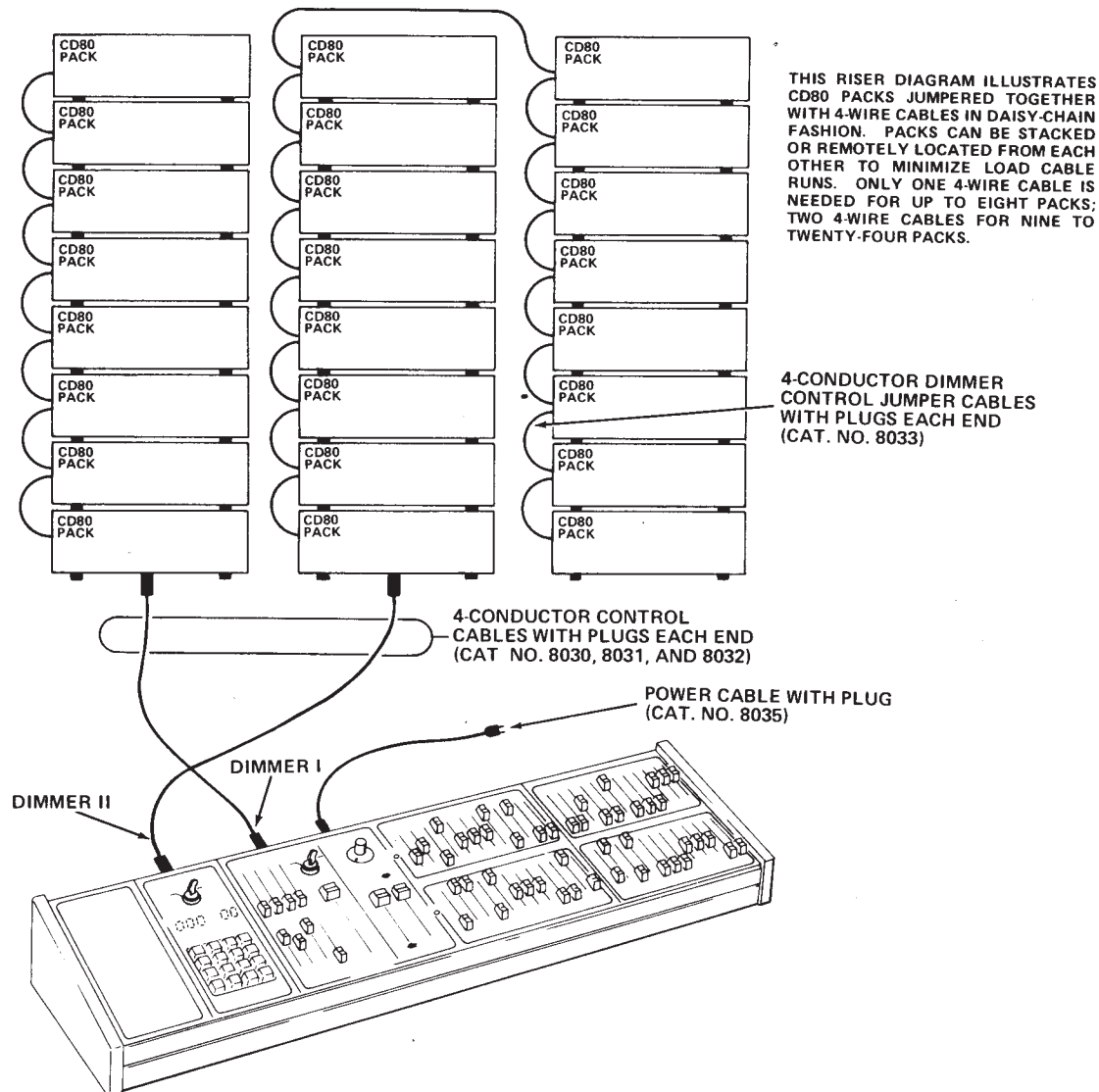


Figure 4-1. MANTRIX Riser Diagram – CD80 Dimmer Packs

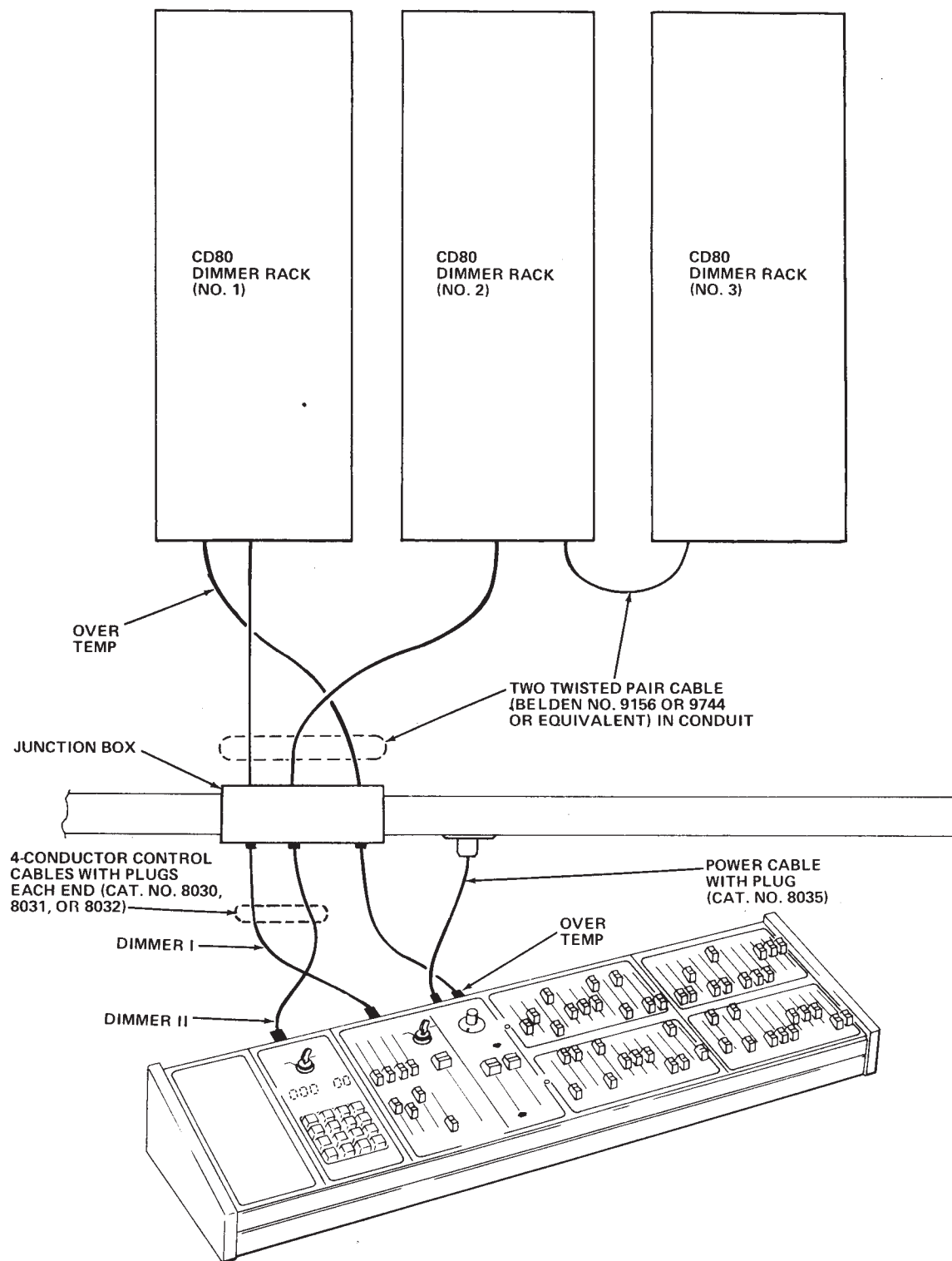


Figure 4-2. MANTRIX Riser Diagram – CD80 Dimmer Racks

The 6-foot (1.83 meter) Power Cable furnished with the MANTRIX is to be connected to a 120-volt, 60 Hz source. The MANTRIX is also available for operation on 240 volt 50 Hz electrical power.

### **USER SELF-TEST DIAGNOSTIC PROCEDURE**

The user self-test diagnostic procedure can be used to determine if any problems exist in the MANTRIX electronics, in the dimmer outputs, in the Matrix Patch Module indicators, or in the connections between the Control Module and Channel Module(s). The diagnostic procedure also provides a means for automatically stepping through the dimmer outputs for focusing or dimmer/lamp checkouts. No submaster assignment or patch information is destroyed by operation of the User Self-Test Diagnostic.

#### **Access to Diagnostic**

To turn on the diagnostic procedure, depress the HOLD button for SCENE One, and while holding the button depressed, turn MANTRIX system keyswitch OFF and ON. The electronic tests will begin.

#### **Electronics Tests**

When the diagnostic program is accessed as described above, the electronics of the MANTRIX will be automatically tested. The results of these tests are indicated by the Fade Progress indicators for the CROSSFADER.

If the tests are successful, the CROSSFADER indicators will illuminate, one after the other, starting from the bottom of the display (at SCENE TWO position), cycling from bottom to top and return at a rate of about one cycle every three seconds.

If the tests fail, the indicator cycle rate will be much faster (at approximately 5 cycles per second). The Control Module should be removed and replaced if the test fails.

#### **Dimmer Check**

After the above electronic tests have been completed, any dimmer(s) assigned to channel 1 will fade up and turn off in a cycle which corresponds to the CROSSFADER Fade Progress indicator position. All other dimmers will be off.

To check the other dimmers, move the FADE TIME control out of the MAN position. When this is done, the diagnostic program will begin an auto-sequence function at the rate selected by the FADE TIME control. This function of the diagnostic procedure fades the dimmers assigned to a channel up to full at the selected rate, then cuts the dimmers to zero before going on to the next channel in sequence. The number of the channel being checked is indicated on the DIMMER display of the Patch Module (if installed). The diagnostic will sequence through all channels installed in the system in numerical order, and then repeat the sequence, starting at channel 1.

Returning the FADE TIME control to MAN will halt the auto-sequencing through all the channels, and will hold on the last channel shown on the DIMMER display. The diagnostic will then cycle the held channel at a constant three-second rate.

The BLACKOUT switch and the GRAND MASTER can be used to prevent the dimmer output from being displayed on stage. If a Matrix Patch Module is installed, then any patching which has been done before the diagnostic begins will affect the dimmer outputs just as it does for normal MANTRIX operation.

### **Checking Channel Module Interconnection**

This test checks the interconnections between the Control Module and Channel Modules. To make this check, access the diagnostic procedure as described above, and then press the HOLD button for SCENE ONE. One of the indicators on the CROSSFADER display will come on, next to the numbers on the lefthand scale (**0** through **10**) that indicates the number of Channel Modules correctly installed. For instance, if only one Channel Module is installed, the number **1** indicator should illuminate; if four Channel Modules are installed, the number **4** indicator should illuminate. If the number **3** LED illuminates, then the fourth Channel Module is faulty or disconnected. In a MANTRIX system with no Channel Modules installed, the indicator at the **0** position should illuminate. If the number indicated on the CROSSFADER display does not agree with the number of Channel Modules installed, check the Channel Module cables and connectors; replace any faulty Channel Module and re-run the diagnostic procedures.

### **Matrix Patch Module Test**

If a Matrix Patch Module is installed in the MANTRIX system, the **6K** and two **ENTER** indicators will illuminate, and the **DIMMER** and **CHANNEL** displays will be **888** and **88** (all segments illuminated) during the Channel Module Interconnection test above.

### **Turning Off the Diagnostic**

To turn off the diagnostic procedure and return the MANTRIX system to normal operation, turn the system keyswitch OFF and ON again.

## **MODULE REPLACEMENT**

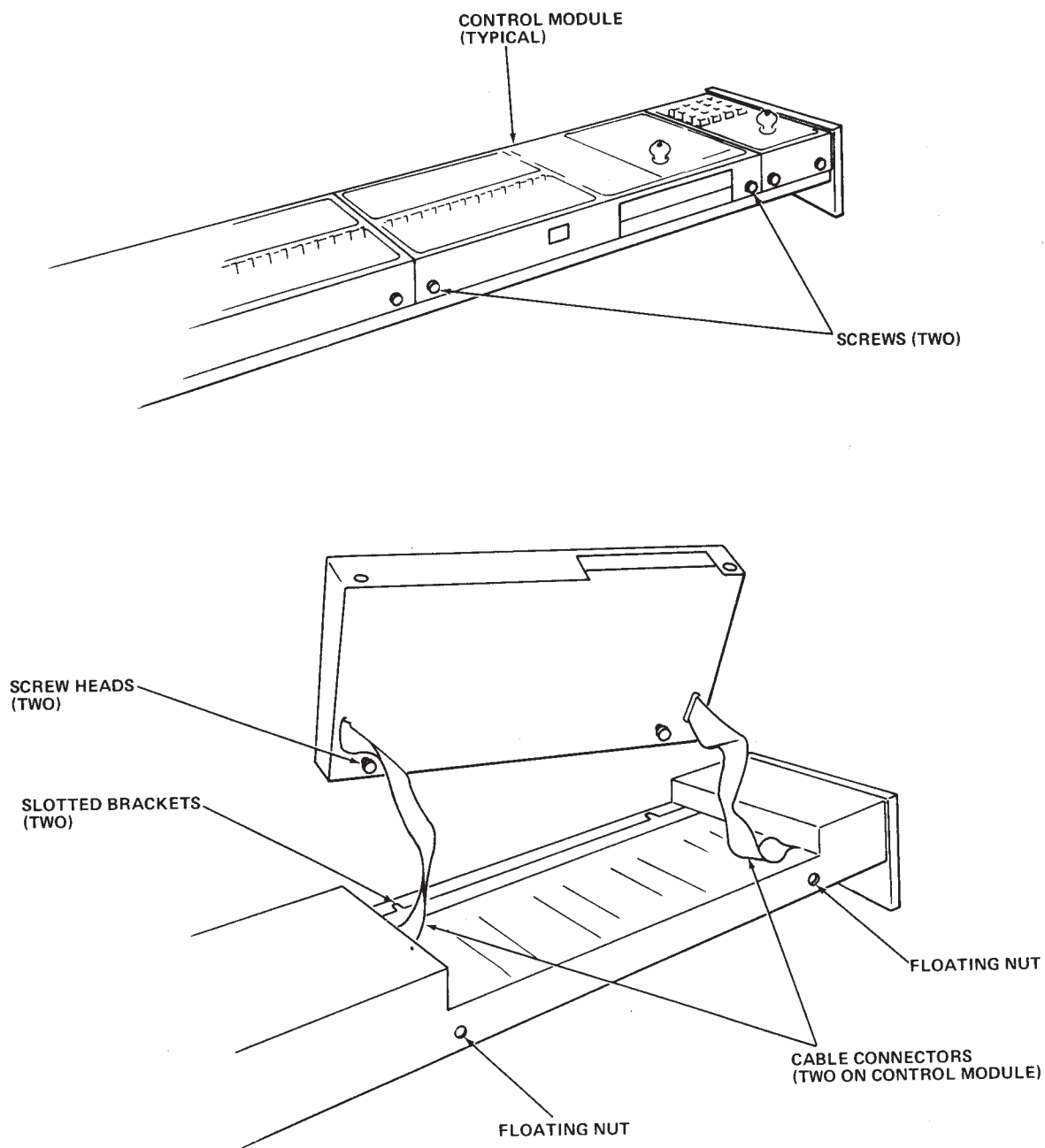
Each module is held in place on the console by two screws at the rear, and a pair of screws at the front bottom that engage a pair of slotted brackets on the console. On two-tier consoles, the rear screws are not used on the front modules; the bar across the middle of the console holds the rear of the front modules against the console.

### **Removing and Replacing Modules – Single-Tier Consoles**

1. Remove two screws at rear of module (figure 4-3).
2. Carefully lift up on rear of module, and slide towards the rear to disengage module from brackets on the console.
3. Carefully disconnect cable connector from the module (there are two cable connectors on the Control Module).
4. Position replacement module over console, and connect cable connector(s) to module.
5. Lower module into console, and engage two screw heads at bottom front end of module with slotted brackets in console (figure 4-3).
6. Push module forward to fully engage screw heads and slots, and lower rear of module to align screw holes in back of module with nuts in rear of console.
7. Install two screws to secure module.

### **Removing and Replacing Modules – Two-Tier Consoles**

Removal and replacement of modules in the two-tier console is similar to that described above for single-tier consoles, except that a bar between the tiers secures the front modules in the console. Remove the three screws holding this bar in place and lift off the bar to release the front modules. The front modules are then removed by lifting up the rear, and sliding back to disengage from the slotted brackets in the front of the console. The rear modules in the two-tier consoles are removed as described above for single-tier consoles.



*Figure 4-3. Module Replacement*

### Shipping Modules

When returning modules for repair or replacement, use shipping containers or boxes that will withstand the usual handling associated with the particular method of transport to be used. Place the module in a plastic bag or wrapper to keep out moisture and any contaminants, and use adequate padding to prevent physical damage. Replacement modules are available from the factory for use while modules are being repaired or replaced.

## WARRANTY AND RETURN AUTHORIZATION

### Warranty Registration

Please fill out and return the attached Warranty Registration Card immediately in order to validate your warranty. Your Mantrix Control Console's serial number can be found by turning the unit over and looking for a small silver tag on the bottom pan. Removal of the serial number invalidates your warranty!

### Warranty

Strand Century products are carefully tested and inspected at the factory and are warranted to be free of material and workmanship defects for a period of twelve months from date of shipment from our factory. Warranty is limited to 90 days if you rent or lease the Mantrix Console to others. Strand Century is not responsible for damage arising from misuse, improper installation, physical damage or unauthorized repairs; nor can we be held responsible for loss of profits or consequential damage resulting from failure. For complete warranty information, refer to the terms and conditions published in our price list.

### Return Information

Should you have problems with your console which require factory repair, an R.G.A. (Returned Goods Authorization) must be obtained. To obtain an R.G.A., contact our nearest office in writing or by phone as follows:

Customer Service Department  
Strand Century Inc.  
200 Bushes Lane  
Elmwood Park, NJ 07407  
201/791-7000

Customer Service Department  
Strand Century Inc.  
5432 W. 102nd Street  
Los Angeles, CA 90045  
213/776-4600

**OBsolete INFORMATION**

(collect calls not accepted)

Customer Service will need to know the serial number and from whom you purchased the console. If your request is made in writing, please be sure to indicate your name and a telephone number where you can be reached. You will be given an R.G.A. number and instructed where to send your console. Please note that without an R.G.A. number, repairs cannot be processed.

After an R.G.A. is obtained, the unit should be packed securely with a detailed written description of the problem taped to the console. The name and telephone number of a person capable of answering questions regarding the failure would also be helpful. Please be sure to include the control cable and A.C. power cable when returning a control console for repair. Send the Mantrix freight prepaid and insured to the appropriate repair center. The unit will be repaired and returned freight prepaid as soon as possible. Shipping and out of warranty repair costs will be invoiced. Any claims for loss or damage in shipping must be made directly to the carrier.

Returning your warranty card and registering your serial number with us will expedite future inquiries regarding your Mantrix.

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Please retain this information for future warranty reference:

Product Description \_\_\_\_\_

Serial Number \_\_\_\_\_

Purchased From \_\_\_\_\_

Date Purchased \_\_\_\_\_