Chapter 3
emulator Controller Set Up and Review

In Section 3 you:

❑ set the controller's voltage and frequency (if required)
❑ review the controller's LCD window, front panel, and rear panel. This includes descriptions of all the controller's programming Constructs
❑ set configuration switches

Setting *emulator* Controller Voltage and Frequency

The *emulator* controller is factory set to the 230 volt setting for 180 to 270 volt operation. The frequency is factory set to 50 Hertz. The typical U.S. voltage setting is 120 volts and in some environments, 208/240 volt; the frequency is always 60Hz in the U.S. unless operated from special equipment, for example, a 50Hz motor generator. International installations are typically 240 volts at 50Hz and 100 volts at 50/60 Hz. If you need to change the controller's input voltage and frequency refer to the procedures in this section. Otherwise, proceed to the *Review of the emulator Controller* section.

Setting *emulator* Controller Voltage

You can easily set the input voltage to either the 115 or 230 volt setting. Use the 115 volt setting if your voltage range is 90 to 135 volts. Use the 230 volt setting if your voltage range is 180 to 270 volts. Table 3.1 lists the voltage and approximate current requirements for each controller setting:

Table 3.1 emulator Controller Current Requirements	
For voltage set at:	Current is:
115 VAC (90 - 135)	300 milliamperes
230 VAC (180 - 270)	150 milliamperes

To change or verify the controller's input voltage setting, locate the voltage selection switch on the rear panel; it is under the AC input power cord as Figure 3.1 shows.

Then, set 115 or 230 volts as follows:

115 volts (90-135 volts) – slide the switch to the left position with the tip of a small screwdriver or similar device; notice that 115 appears inside the switch opening.

230 volts (180-270 volts) – slide the switch to the right position with a small screwdriver; notice that 230 appears inside the switch opening.

Caution: Do not plug a controller set to 115 volts into a 230 voltage source. Permanent damage will occur.
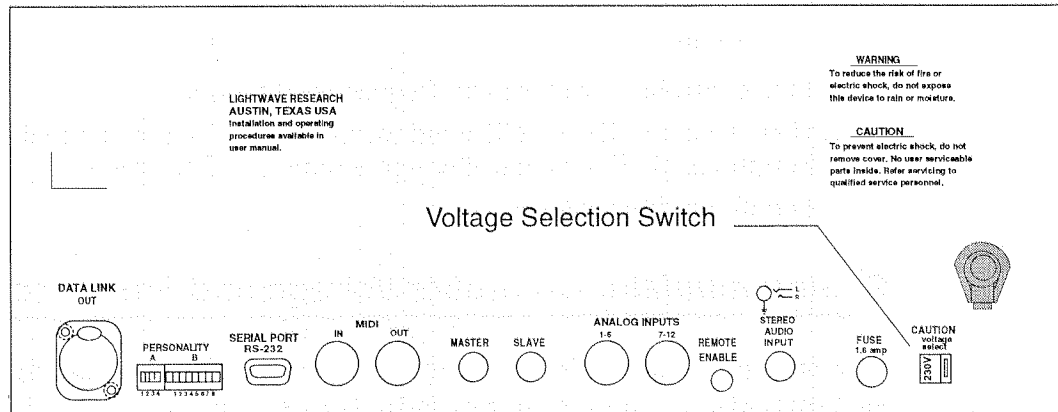

Figure 3.1. Setting Controller Voltage

This completes setting or verifying the *emulator* Controller's voltage.

Setting *emulator* Controller Frequency

You easily set or verify the frequency for the controller's input voltage to either 50 or 60 Hertz by setting a DIP switch on the rear panel. There are two Personality DIP switches on the rear panel labeled A (4 switches) and B (8 switches). DIP Switch A is currently not used. On Switch B: set Switch 2 to the "Up" (On) position for 50 Hz, or set Switch 2 to the "Down" (Off) position for 60 Hz. Refer to Figure 3.2.
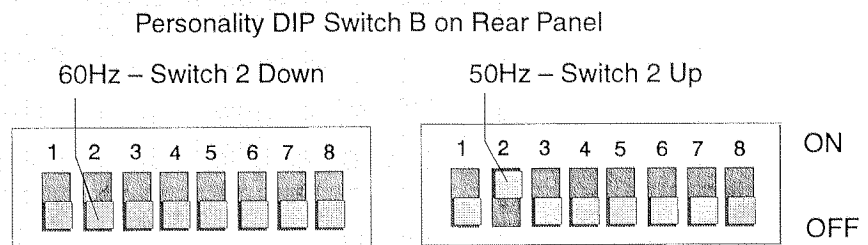

Figure 3.2. Setting Controller Frequency

This completes setting or verifying the controller's frequency.

Review of the *emulator* Controller

This section describes:

❑ the front panel components. Components include: keys, indicators, joystick, LCD window menu items, and switches. This includes the nine primary Construct keys and the eight User programmable keys.

❑ the LCD window selectable Constructs. These are the 16 menu selectable Constructs that include the nine primary Constructs assigned to keys.

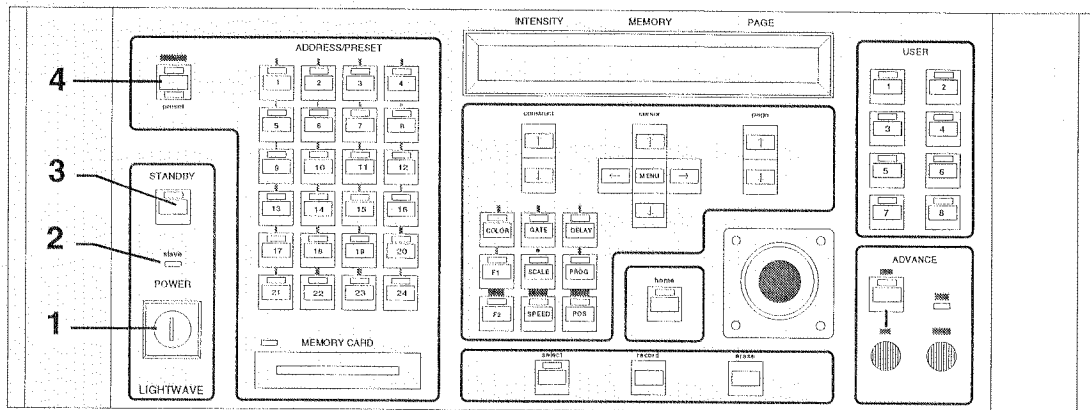❑ the rear panel components. That is, DIP switches and input/output connectors

Figure 3.3. emulator Controller Front Panel

Front Panel Descriptions

1. Power Keyswitch
This switch activates the controller's power and enables any connected fixtures. The key-type switch provides protection from unauthorized users.

2. Slave Mode Indicator LED
This Light Emitting Diode (LED) indicates the Master/Slave state of the controller as determined by Personality DIP Switch B (located on the rear panel). When Switch 1 is "On" (up) the controller is in Slave mode and the LED lights. You can only use the front panel of a Slave controller for programming; play back functions are disabled. When Switch 1 is "Off" (down) the controller is in Master mode and the LED is off. A controller designated as a Master controls the playback of all connected Slaved controllers.

3. Standby Key
Press this key to close the light Gates of all connected fixtures. The controller defaults to Standby Mode when it is initially powered up.

4. Address/Preset Select Key
Press this key to toggle the Address/Preset keypad between the Address and Preset modes. The corresponding LED (Address or Preset) lights to indicate the currently selected mode.
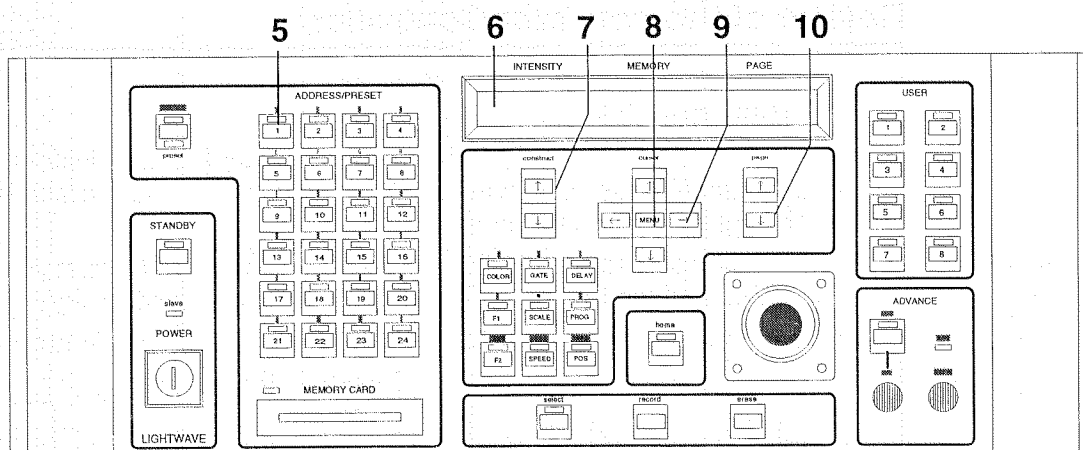
Figure 3.4. emulator Controller Front Panel (continued)

5. Address/Preset Keypad and LEDs

Each of the keypad's 24 keys has an LED that provide visual confirmation of active Addresses and Presets.

- In **Address mode** (the default mode), these keys correspond to the 24 fixture Addresses. You use the 24 Address keys to select an Address or range of Addresses for programming, editing, or viewing parameters. In Address mode you directly program the selected fixtures. However, you can save (record the programming steps) the program as a Preset (Preset mode) for later recall.

- In **Preset mode**, these keys correspond to 24 user programmed Presets. Each Preset is capable of storing a single Page or a loop of Pages (up to 99 consecutive Pages) within a memory for instant recall.

6. LCD (Liquid Crystal Display) Window

This window displays information about the current mode of the controller. That is, the controller is in either IMP (Intensity, Memory, Page) mode or in Menu mode. The default controller mode is the IMP mode.

IMP Mode: This is the main system operations mode. You do everything in this mode except the configuration and utility operations performed in MENU mode. In IMP mode, the LCD window shows the current level of the Master Dim setting, the current Memory number, and the current Page number. You program, playback programs, and monitor the system in this mode. You also perform Address and Preset mode operations under IMP mode. The MENU key toggles the controller between the IMP mode and the Menu mode.

- **Intensity Display**: indicates the current intensity setting for all Addresses. In IMP mode Intensity is used as a master dimming function. Pressing the CONSTRUCT Up and Down Arrow keys below the Intensity Display, you simultaneously adjust the brightness of all the fixtures. Value "0" represents full dim and value "99" represents full brightness.

- **Memory Display**: indicates the current Memory (1-6). Press the CURSOR Up and Down Arrow keys below this display to change the Memory number. Memory items 1-all and 6-all are used for the Automatic All-Memory Playback feature.
- **Page Display**: indicates the current Page number (1-99). Press the PAGE Up and Down Arrow keys below this display to change the Page number.

When you program pages in IMP mode, you select from the 16 Constructs. Nine of the 16 Constructs are assigned to keys; all 16 are available through the LCD window. Some Construct examples are: Color, Gate, Rotation, Position, and so on. In practice, all Constructs are selectable from the menu. The menu Constructs are described in this section following the front panel descriptions. The 16 Constructs are: Gate, Dim, Color, Position, Speed, Delay, Xfade, Program, Rotate, Scale, X-scale, Y-scale, Scan, X-function, Y-function, and XY-sync.

Menu Mode: Use Menu mode to define many characteristics of the controller and to provide shortcut methods for some controller functions. The MENU key toggles the controller between the IMP mode and the Menu mode. When the controller is in Menu mode, the LCD Window shows the available menu selections: HELP, BACKUP, SUBMASTERS, and SETUP.

7. Construct Up/Down Arrow Keys

All fixture Constructs, color, gate, speed, and so on, are edited in IMP mode. First, you press the SELECT key, then one or more Address keys. Then use the Construct Up/Down Arrow keys to change the value of the selected Address parameter. Press and hold either arrow key to accelerate to the limits of each parameter. Let up momentarily at end of limit to enter special function. All settings "wrap-around" in either direction.

8. Menu Key

This key toggles the controller between IMP mode and Menu mode. When the controller is in IMP mode, the LCD window shows the Intensity of the current Master dim setting, the current Memory, and the current Page number. When the controller is in the Menu mode, the LCD Window shows the available menu selections: HELP, COPY, BACKUP, SUBMASTERS, SETUP, and EFFECTS.

9. Cursor Up/Down Left/Right Arrow Keys

In the Menu mode, use the CURSOR Left and Right Arrow keys: to make a selection from the Main Menu and submenu items, to access the possible choices available for each submenu item, and to make a selection from the menu items when programming Address/Preset parameters. In IMP mode use the CURSOR Up and Down keys to change the number of the current Memory.

10. Page Up/Down Arrow Keys

In IMP mode, these keys change the current Page number (from 1 to 99). Press and hold either PAGE Arrow key to wrap the Page numbers around in both directions.
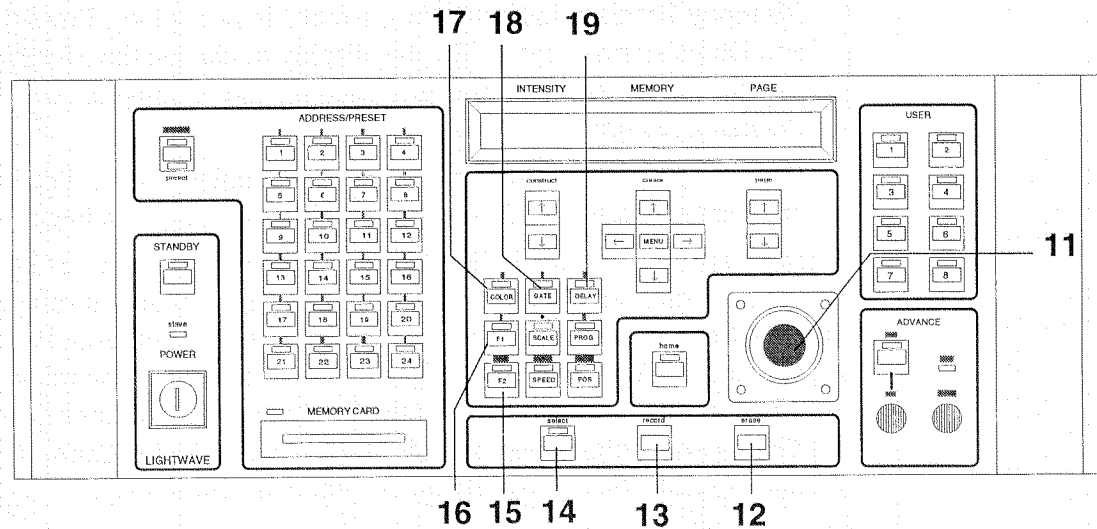
Figure 3.5. emulator Controller Front Panel (continued)

11. Joystick
Use the joystick to position the beams of selected fixtures during beam programming. The farther the joystick is moved off its center axis, the farther and faster the beam moves. A slight tap on the joystick produces a similar small movement of the beam. If you move it a small amount in any direction, the beam moves slowly until you release the joystick.

12. Erase Key
Use this key to edit Page or Preset Memory. In Address mode, press the ERASE key once to reset all parameters in the current Page to their default values. Press the ERASE key twice in succession to mark the current Page number as a Non-Initialized Page. This signals the beginning or end of a loop or sequence (explained in Chapter 5). It is also used to upload Memory from a personal computer, from another *emulator* Controller, and for other special functions (explained in Section 7). The ERASE key is used in conjunction with other keys, such as, SELECT and RECORD keys for certain operations.

13. Record Key
In Address mode, press the RECORD key to record the current Pages (scenes) for the selected Addresses (fixtures). In Preset mode, press the RECORD key to assign a program to any of 24 Preset keys. You also use the RECORD key to download Memory from a controller to a personal computer or to another *emulator* Controller.

14. Select Key
Use this key with the Address/Preset Keys to select fixtures for programming, editing, and manual control. Press this key and then the desired Address keys whose parameters you want to modify and/or store. Also use this key to select a Page or a loop of Pages in a Memory that you want to store as a Preset. For information on programming the controller refer to *Chapter 5, Operating the System.*

15. F2 (Rotation)

Use the F2 key to define the static rotation of a scan pattern (F1key) counterclockwise (viewing from behind fixture) from 0° to 356° in 4° increments, with the axis being the center of the scan. In addition to the static rotation, there are eight forward spin pattern rotation speeds (0 to 7), and eight reverse spin speeds (0 to 7). For example, select a static horizontal line pattern and then spin it at any of 8 speeds. Press the CONSTRUCT Up/Down Arrow keys to change values.

16. F1 (Scan)

Use the F1 key to specify a scanning speed, 1 through 12, for a selected pattern. The default value is 1 (slowest). Changing the scan speed can affect the pattern shape for certain patterns. Practice to determine to the desired look. Press the CONSTRUCT Up/Down Arrow keys to change values.

17. Color Key

Use this key to set color the values and color effects for the selected Addresses. Press this key to display the current color number which is shown on the second line of the Construct menu of the LCD window. Press the CONSTRUCT Up/Down Arrow keys to select the desired color or spin speed. There are 12 colors (11 plus white), eight forward color spin speeds, and eight reverse color spin speeds. See the Cspeed Construct.

18. Gate Key

Use this key to open or close the gates of selected Addresses. When selected, the current gate status is shown on the second line of the Construct menu as OPEN or CLOSED. In addition to either opening or closing the gate, there are eight strobe speeds available. Press the CONSTRUCT Up/Down Arrow keys to select the gate setting that you want to program.

19. Delay Key

Use this key to set the amount of time that you want the controller to pause on the current Page before it advances to the next Page. The delay time is added to the normal advance time set by the RATE knob. For example, if the advance rate is set to advance a Page every two seconds, and the delay time is five seconds, then it will pause on the current Page for seven seconds. If the controller is in the Audio Advance mode, it ignores the Delay setting. There is a hold function located after 99 seconds. If you select "Delay: hold", the sequence or loop runs once and then holds until you press the PAGE Up Arrow key. Delay and Xfade are Page wide parameters; that is, the delay times affect all addresses on one Page. The current delay time is shown in the second line of the LCD window. The delay setting can range from one tenth of a second to 99 seconds or infinite hold.
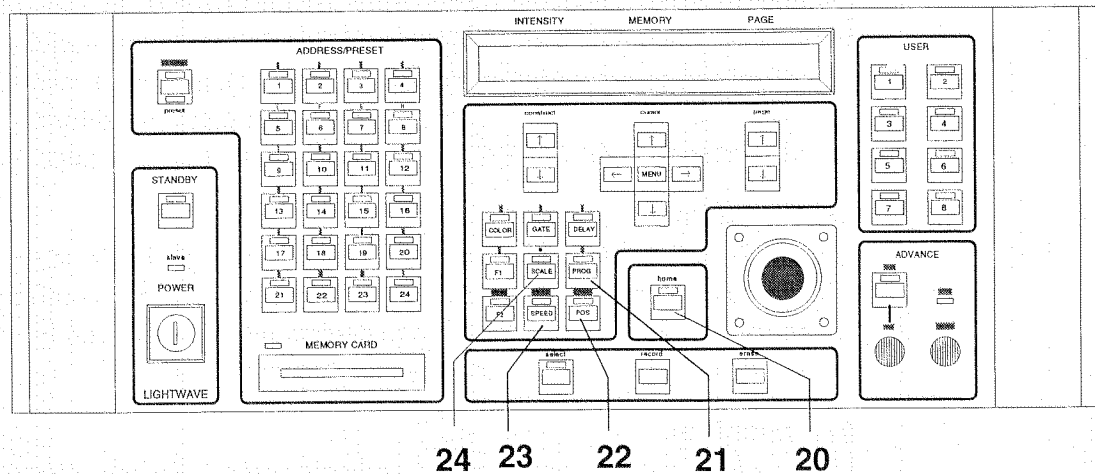
Figure 3.6. emulator Controller Front Panel (continued)

20. Home Key

Use this key in IMP mode to close the dark shutter and reset the selected fixtures. Resetting the fixture consists of striking the lamp (if it is not already on); and initializing the X and Y positions, Gate, and Color wheel to their home position. If a fixture fails to strike upon initial power up, or if it douses itself during operation, it should be homed (Chapter 8 provides details about lamp aging). Each time the controller is powered up, all fixtures receive a homing signal.

When you press the HOME key, its LED flashes for 10 seconds. The LCD window prompts you to select the Addresses of the fixtures that you want to home; press the Address keys of the Addresses to home. The Home and Address LEDs flash for 10 seconds during the homing procedure and then turn off. Once Homed, the fixtures join the sequence that is running and open their light Gates.

21. Program Key

Use the PROGRAM key to select any of 99 different scan patterns assignable to one or more Addresses. You might relate the concept of patterns to gobos on other types of fixtures. You position the fixture's pattern anywhere with the joystick and specify the Constructs as desired, such as, Color, Scale, Angle, Gate, and Speed to create a wide variety of different looks from each program setting. Program patterns range from 1 to 99; 1 is the default. Patterns include many shapes and effects. Some basic patterns are circles, lines, triangles, stars, and motion effects. The letters A to Z and numbers 1 to 9 are also included as patterns.

22. Position Key

Use this key to position the pattern for the selected Addresses. You can set the position manually using the joystick or by selecting one of 99 user programmable position Presets. Refer to the *Position Memory* section in Chapter 5.

Position with Joystick: Press the SELECT key and one or more ADDRESS keys. Move the joystick to the desired position. If the beam does not follow the joystick the Address is assigned to a Position Preset. If the current Page is assigned to a Position Preset (the second line in the LCD window shows: Position Preset #), then: 1) Press the POSITION key. 2) Use the CONSTRUCT Up and Down Arrow keys and select "JOYSTICK" from the LCD window. 3) Press the RECORD key. 4) Now, move the joystick to position the fixture as desired.

Position with Presets: You program Position Presets in Memory 6 (Position Memory), Pages 1 to 99. Select any Page from 1 to 99, then position the pattern with the joystick and press the RECORD key. For example, when you record a position in Page 1, in Memory 6, it becomes Position Preset 1, Page 2 is Preset 2, and so on through Page 99. Chapter 5 provides details on all these operations.

To program a Position Preset: 1.) Select an unused Position Preset Page (1-99, Memory 6). 2.) Select Addresses to position. 3.) Then, use the joystick to position the fixtures. 4.) Press the RECORD key to record the Page.

To assign a Position Preset to an Address: 1.) Select the Addresses that you want to assign to a Position Preset in the same fashion as when programming any Constructs for an Address. 2.) Press the POS (Position) key. 3.) Use the CONSTRUCT Up and Down Arrow keys to select the number of the desired Position Preset. The selected fixtures move to the position previously programmed for the Preset. 4.) Press the RECORD key.

23. Speed Key

Use this key to set the X and Y speed for selected Addresses as the controller advances from one Page to the next. The Speed setting determines how long it takes for a fixture (Address) to reach its programmed position on a Page. When the Speed LED is illuminated, the current speed setting of the selected fixture is shown on the second line of the LCD window. There are 99 speed settings. Value "1" is the slowest movement, and value "99" is the fastest movement.

The speed setting is a function of time to destination. That is, all fixtures that have the same speed values move together, regardless of the distance traveled. For example, if one fixture is only moving one foot and another is moving ten feet, they start and stop at the same time, provided they are programmed with the same speed setting. The fixture with the longest distance to travel moves faster than the other, but they arrive at their respective positions at the same time.

24. Scale Key

Use this key to adjust the size and shape of the Scan pattern for all selected Addresses on a Page. You do this in either of two methods. In the first method you select the SCALE key and select a value from 1 to 99 to change the scale proportionally, that is, you change the X and Y values the same amount. One is the smallest, tightest scan, and 99 the largest.

In the second method, you individually set an X-scale value (from menu) and a Y-scale (from menu) value for the pattern. For example, to create a perfectly round

circle for pattern 3, set the X-scale and Y-scale to the same value. To make an ellipse or oval, offset the X and Y values. Use the CONSTRUCT key to select an X-scale value from 1 to 99, with 1 the smallest, tightest scan, and 99 the largest. The default is 99. To select the Y-scale field from the X-scale field press the right CURSOR key one time. From any other menu field, use the CURSOR Left and Right keys until the Y-scale appears in the LCD. You can select any Construct field this way.
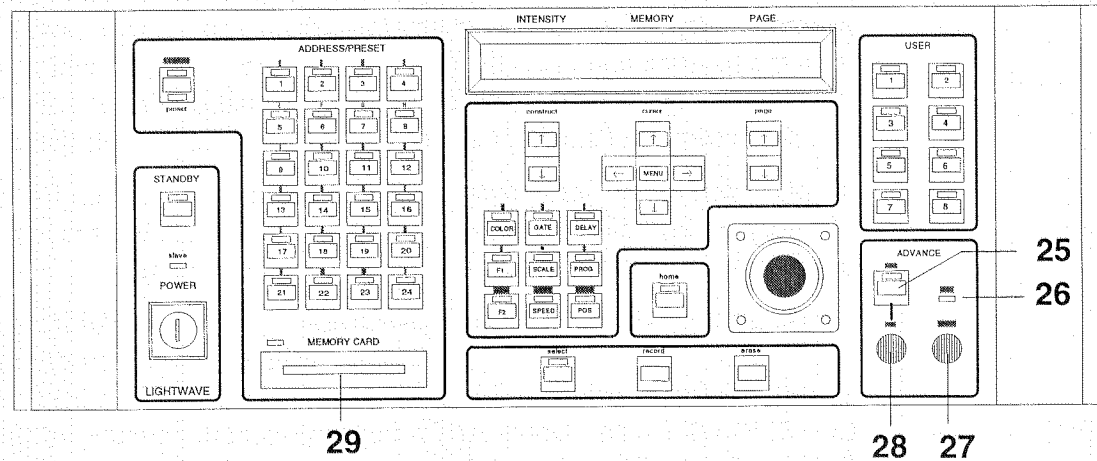

Figure 3.7. emulator Controller Front Panel (continued)

25. Auto Advance Key
Press this key to have the controller automatically advance Pages at a rate set by the RATE knob. When the Auto function is engaged, the LED indicator illuminates and disengages the Audio 1 and Audio 2 functions. In the Auto mode, the delay time programmed into a Page is added to rate of advancement set by the RATE knob. Programmed delay times are completed before Page advancement regardless of the RATE knob setting.

26. Audio Level Indicator LED
Displays the presence and relative strength of the audio input signal.

27. Audio Knob
Use this knob to adjust the controller's sensitivity to the musical information for Audio Advance functions and Effects functions. When the knob is turned all the way to the right it is most sensitive.

28. Rate Knob
Use this knob to regulate the speed of Page changes in the Auto Advance mode. It also regulates Page advance rate in Audio 1 and 2 modes. If the knob is turned completely clockwise, Page change is the quickest, provided that no delays have been programmed. When a delay is encountered, the knob's time setting is added to the delay time. The maximum advance rate is 0.1 seconds per Page when the knob is turned completely clockwise.

29. Memory Card Slot

Insert a Memory Card (PCMCIA RAM Card) into this slot to: store a copy of the controller's operating system, to install an updated version of the operating system, or to store the User RAM (programmable memory - light show).

User Programmable Keys

The *emulator* Controller includes eight user programmable keys that you can custom program as "macros". A macro is a recording of the key presses that you assign to one of these eight User keys. Then, when you press that User key the sequence is played back in exactly the same order that you recorded it. For example, you may want to use a macro to override the currently running program to change certain colors or to randomize certain fixtures. The factory programs USER keys 1 through 6 as described in this section. USER keys 7 and 8 are undefined. However, you can custom program any or all of the eight keys to perform other functions that better suit your needs or

8 USER Keys

purposes. Refer to the *Programming User Keys* section in Chapter 5 to program these eight keys. USER keys 1 to 8 are factory programmed as explained in the following.
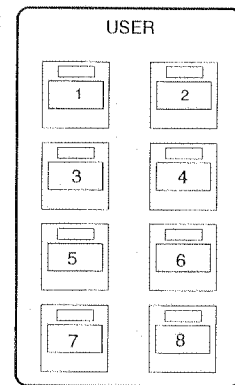
Advanced Keys

Use pre-programmed USER keys 1 to 3 to select the method of sequencing Memory Pages.

User 1 – Random Advance Key

Random Advance is a mode that modifies the other Advance modes by sequencing the Pages randomly. Every method of advancing Pages is affected by using the RANDOM ADVANCE key, including Manual Advance, Audio Advance, and Auto Advance. In the Random Advance mode, only initialized Pages are played back; the Pages that are played back are not selected from non-initialized Pages.

User 2 – Audio 1 Advance Key (Change with Beat)

Press this key to put the controller in Audio1 mode.When the controller is in Audio 1 Mode, the Pages of the current sequence or Preset change with the beat of the audio input and ignores any programmed Delay settings. When the Audio 1 mode is engaged, the LED indicator above the AUDIO 1 key illuminates and disengages the Audio 2 and Auto functions. Sensitivity to the audio input is regulated by the AUDIO knob. When the knob is turned all the way to the right it is most sensitive to the audio input; all the way to the left it is the least sensitive to the audio input.

User 3 – Audio 2 Advance Key (Halt with Beat)

Press this key to put the controller in Audio 2 mode. When the controller is in Audio 2 Mode, the Pages of the current sequence or Preset halt with every beat of the audio input. The controller ignores any programmed Delay settings. When the Audio 2 mode is engaged, the LED indicator above the AUDIO 2 key illuminates and disengages the Audio 1 and Auto functions. The sensitivity to the audio input is regulated by the AUDIO knob. When the knob is turned all the way to the right it is most sensitive to the audio input; all the way to the left it is the least sensitive to the audio input.

Effect Section

Use pre-programmed USER keys 4 to 6 to override and change the parameter settings of all active fixtures with the audio signal.

User 4 – Effect 1 Key (Color Modulate)

The default effect setting for this key is Color Modulate. Select this key to change the color of all active fixtures when the controller detects a low frequency audio signal with an amplitude above the threshold set by the AUDIO (sensitivity) knob. Each time the strength of the audio signal exceeds the threshold, the color is bumped to the next position. Color modulation overrides the Color position information except when a Color spin has been programmed. When you deselect this key, the color returns to program control.

User 5 – Effect 2 Key (Size Modulate)

The default effect setting for this key is Size Modulate. Select this key to change the size of the pattern for all active fixtures when it detects a low frequency audio signal with an amplitude above the threshold set by the AUDIO (sensitivity) knob. Each time the strength of the audio signal exceeds the threshold, the Size pattern is bumped to the next position. When you deselect this key, the size returns to program control.

User 6 – Effect 3 Key (Light Modulate)

The default effect setting for this key is Light Modulate which changes, the intensity of all active fixtures according to the level of the audio input. When the Light Modulate function is engaged, all fixtures are dimmed to their minimum intensity level until it senses an audio input. When you deselect this key, the dimming returns to program control.

User 7 – Undefined Key

This key is not defined.

User 8 – Undefined Key

This key is not defined.

Selecting Constructs from the LCD Window.

Nine of the 16 most often used Constructs are assigned to front panel keys, they are: Color, Gate, Delay, F1 (scan), F2 (rotate), Scale, Prog (program), Speed, and Pos (position). Although these Constructs are assigned to keys, you can also select them from LCD menu items. The remaining Constructs not assigned to keys are only available through LCD menu items.

The menu items appear in the LCD window after you press the SELECT key and one or more ADDRESS keys. The name of the active item is capitalized with GATE the first item. Notice that the GATE key is also active. To scroll through the menu items use the CURSOR Left and Right keys. From GATE, you can only go to the right. Notice as you scroll through the menu items that the active item is capitalized. Also notice that when you select a menu item that is assigned to a key, the key also illuminates. You can select any Construct key and proceed from there with the Cursor keys as a convenience. The 16 menu items are: Gate, Dim, Color, Position, Speed, Delay, Xfade, Program, Rotate, Scale, X-scale, Y-scale, Scan, X-function, Y-function, and XY-sync. The menu items that are not assigned to keys are explained in this section. Refer to the nine Construct keys in the previous front panel section for their descriptions.

The second line of the LCD window displays the current value for the selected menu item. Use the CONSTRUCT Up/Down Arrow keys to select parameters for the active Construct. For example, GATE displays CLOSED. To open the gate, press the CONSTRUCT Up Arrow key and the second line now displays OPEN. Press the RECORD key to make the change permanent.

Dim

Use this Construct to set the intensity level for the selected Addresses. When this item is active, the current intensity value is shown on the second line. You can vary the intensity from 0 to 99%, with 0 off and 99 maximum brightness. Use this key in conjunction with Xfade to set the time it takes a fixture to crossfade.

Xfade

Use this Construct to set the intensity (dimming) crossfade time as the controller advances from the previous Page into the current Page. Xfade and Delay are Page wide Constructs, that is, the crossfade and delay time affect all the Addresses on one Page. The second line in the LCD displays the current Xfade value, ranging from 0.1 second to 99 seconds. If the crossfade time is longer than the Advance rate of the controller, it will not complete the crossfade before it advances to the next page.

X-Scale/Y-Scale

Use these Constructs to adjust the size and shape of the scan pattern for all selected Addresses on a Page. You do this by setting an X-scale value and a Y-scale value for the pattern. For example, to create a perfectly round circle for pattern 3, set the X-scale and Y-scale to the same value. To make an ellipse or oval, offset the X

Use these Constructs to adjust the size and shape of the scan pattern for all selected Addresses on a Page. You do this by setting an X-scale value and a Y-scale value for the pattern. For example, to create a perfectly round circle for pattern 3, set the X-scale and Y-scale to the same value. To make an ellipse or oval, offset the X andY values. For example, X=99 and Y=50. Use the Construct key to select a Y-scale value from 1 to 99, with 1 the smallest, tightest scan, and 99 the largest. The default is 99. To select the X-scale Construct from the active Y-scale Construct, press the Cursor Left Arrow key one time or press the SCALE key.

X-Function

Use this Construct to apply any of three X axis (vertical) special effects to a scan pattern. These effects are "ramp up speed", "ramp down speed", "ramp up/down speed", or "flip". The "ramp up speed" effect pulses the pattern at an accelerating change rate followed by an instant return to the starting point as Figure 3.9 shows. For example, you can add an expanding effect to a circle or other scan pattern. Ramp down speed has the opposite effect. It pulses the pattern at a decelerating rate and has a collapsing effect. Ramp up/down speed combines the "ramp up speed" and "ramp down speed". You might use this for a rubber band stretching/collapsing effect. Flip allows you to "flip" or invert the pattern from a positive direction through zero to a negative direction. You can specify a value from 1 to 12 with 1 the faster change rate and 12 the slowest and smoothest. The shorter the ramp the faster the accelerating/decelerating change. Select X-function from the LCD menu items using the CURSOR Left/Right Arrow keys, or press the F1 (SCAN) key and then press the CURSOR Right Arrow key once.
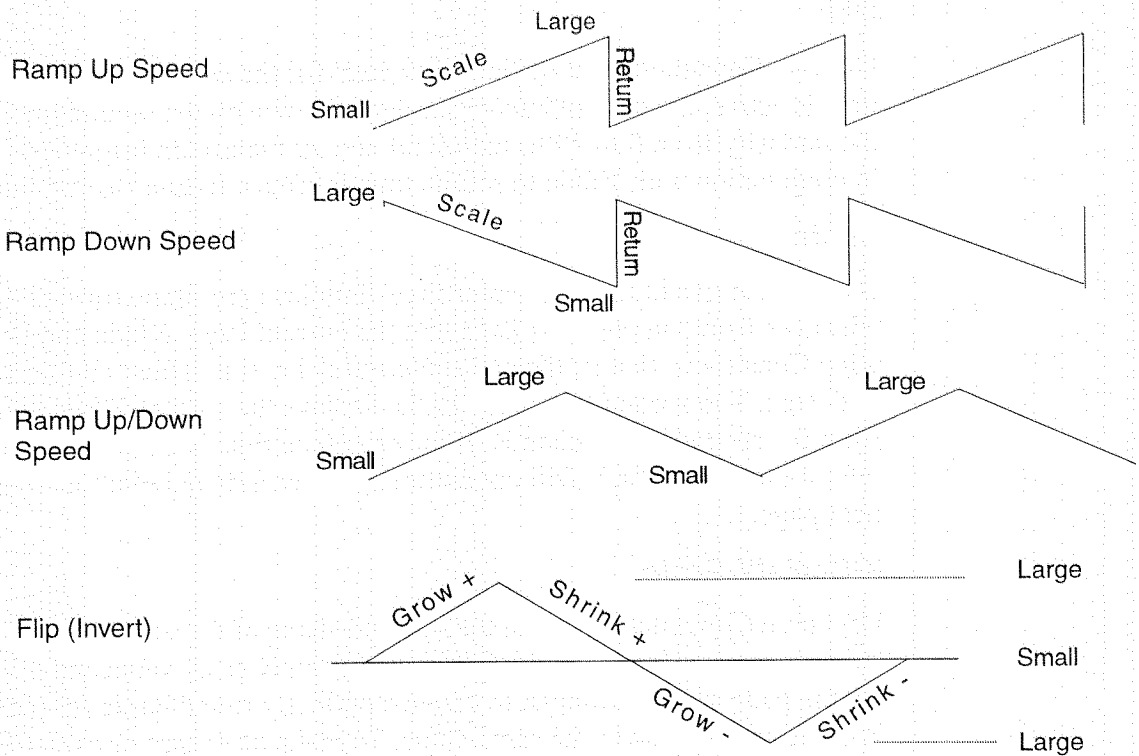
Y-function

This Construct is identical to X-function accept it affects the Y or horizontal axis. Refer to the previous X-function description.

XY-sync

This Construct allows you to modulate the X-function and Y-function effects with various X and Y inverting and synchronous functions. XY-sync follows the X-function LCD menu item. Press the CURSOR Right Arrow key once from the Y-function item. The default value is XY-sync: no sync, otherwise select one of the following parameters to apply to the scan pattern:

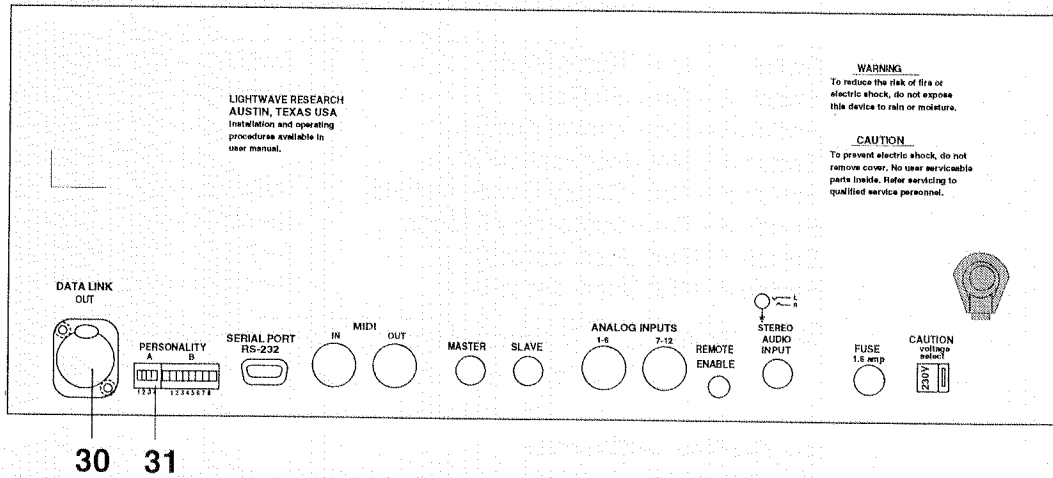|	
XY-sync: no sync	XY-sync: invert y, no sync
XY-sync: sync 1 to 16	XY-sync: invert y, x--y sync 1 to 16
XY-sync: invert x, no sync	XY-sync: x and y, no sync
XY-sync: invert x, x-y sync 1 to 16	XY-sync: x and y, x-y sync 1 to 16

Rear Panel Descriptions

Figure 3.9. emulator Controller rear Panel

30. Data Link Out
The data link out is an XLR female jack that sends control signals to all connected fixtures. The data cables that carry the control signals must be three pin XLR male to female. Pin 1 is shield, Pin 2 is negative (Data Complement), and Pin 3 is positive (Data True).

31. Personality DIP Switch A
DIP Switch A is reserved for future use. Keep all switches set to the off position. This will prevent any possible conflicts in the event that any future software updates may assign functions for DIP switch A's switches.
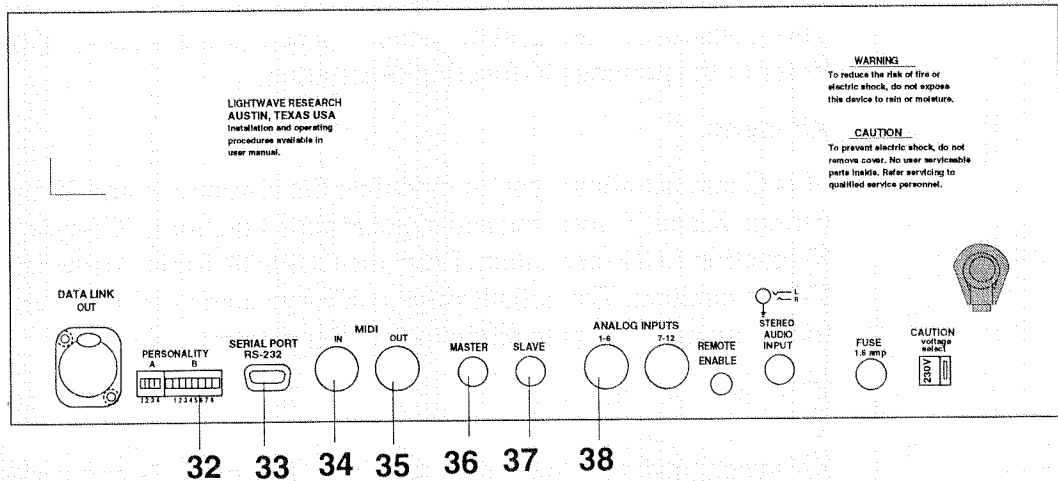
32 33 34 35 36 37 38

Figure 3.10. emulator Controller rear Panel (continued)

32. Personality DIP Switch B

DIP Switch B defines the controller's mode of operation. To turn a switch "on", put it in the up position. To turn a switch "off", put it in the down position.

Table 3.2 Personality DIP Switch B Settings	
Switch 1 – On = Slave Mode	Switch 1 – Off = Master Mode
Switch 2 – On = 50 Hertz	Switch 2 – Off = 60 Hertz
Switch 3 – On = Preset Access	Switch 3 – Off = Page Access
Switch 4 – Not Used, set to Off	Switch 4 – Not Used, set to Off
Switch 5 – On = Binary Preset Access	Switch 5 – Off = 12 Level Preset Access
Switch 6 – On = Independent Mode	Switch 6 – Off = Dependent Mode
Switch 7 – Not Used, set to Off	Switch 7 – Not Used, set to Off
Switch 8 – Not Used, set to Off	Switch 8 – Not Used, set to Off

Note: To use Binary Preset Access, Switches 3 and 5 must both be On.
To use 12 Level Preset Access only, Switch 3 must be On.

33. RS-232 Serial Port

The RS-232 Serial Port on the *emulator* Controller is a standard PC/AT 9 pin serial port. Use this serial port to transfer Memory data in and out of the controller. The primary purpose of data transfer is to backup program data to a computer floppy diskette for safe keeping or to load a controller's Memory from a backup disk or from another controller. The controller is capable of communicating through the serial port with any computer that can run a communications package, however, a software program for IBM PC's and compatibles is provided with this manual for convenience. You can also use this port for the transfer of data with computers when using Lightwave Show Control (or a similar program) to arrange and playback controller Presets from a computer. The port operates at 9600 BAUD, 8 data bits, no Parity, 1 stop bit. Refer to *Chapter 7, External Memory Storage and Transfer*, for more information about data transfer and storage.

34. MIDI In Port

This is where the MIDI input signal enters the controller. The *emulator* Controller features standard MIDI connections. The controller supports MIDI Show Control "GO" command (Protocol) and MIDI System Exclusive Backup. The MIDI Cue numbers are one-for-one with the *emulator* Controller's Preset numbers. The *emulator* Controller will only accept whole Cue numbers. For example, if you have a Cue numbered 101.5, the *emulator* Controller will call up Cue (Preset) number 101. The *emulator* Controller supports Cue (Preset) numbers 1-1024.

35. MIDI Out Port

This is where the MIDI output signal exits the controller. The MIDI OUT port is switchable between OUT and THRU. OUT is the default. When you are using the RS-232 port, MIDI OUT functions as a MIDI THRU.

36. Master Out Port

The Master Out port is a 6 mm (1/4 in) stereo jack that you use to link a Master controller to a Slave controller. Use this feature to expand the system to more than 24 Addresses. By properly setting the Personality DIP switches on the rear panel of the controllers you can designate one controller as the Master and one or more as the Slaves. Then by linking the controllers together with a shielded, two conductor data cable made with two 6 mm (1/4 in) stereo jack connectors (male to male), you can operate all Slave controllers from the Master controller. Personality DIP Switch 1 Off = Master Mode.

37. Slave In Port

The slave in port is a 6 mm (1/4 in) stereo jack that you use to link a Slave controller to a Master controller or to other Slave controllers. Use it to expand the system to more than 24 Addresses. By properly setting the Personality DIP switches on the rear panel of the controllers you can designate one as the Master and one or more as the Slave. Then by linking them together with a shielded, two conductor data cable made with two 6 mm (1/4") stereo jack connectors (male to male), you can operate all Slave controllers from the Master. Personality DIP Switch 1 On = Slave Mode.

38. Analog Input Connector (Channels 1-6)

The Analog Input connector is a locking 8-pin DIN connector (Channels 1-6) that enables the remote recall of Memory's Pages or Presets using an analog control device, such as, a dimmer console or touch panel. Refer to *Chapter 6, Remote Access and Control*, for more information.
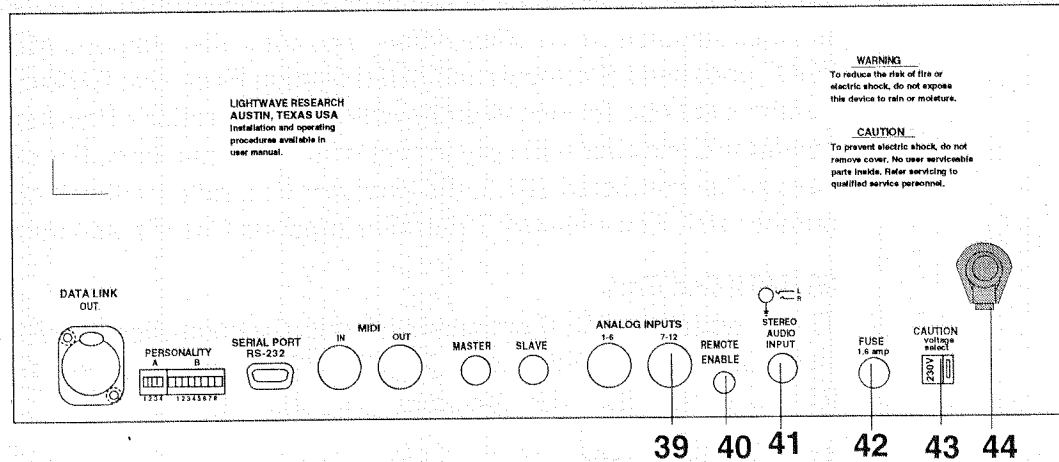
Figure 3.11. emulator Controller rear Panel (continued)

39. Analog Input Connector (Channels 7-12)

The Analog Input connector is a locking 8-pin DIN connector (Channels 7-12) that enables the remote recall of Memory Pages or Presets using an analog control device, such as, a dimmer console or touch panel. Refer to *Chapter 6, Remote Access and Control,* for more information.

40. Remote Enable

Use the Remote Enable signal to control (enable/disable) the Standby mode from a remote location. The 3.5 mm (1/8 in) mini phone jack input requires 0 volts dc input for Standby mode and 5 volts dc (minimum) to 16 volts dc (maximum) to enable the controller. Refer to *Chapter 6* for operation.

41. Stereo Audio Input

The 6mm (1/4 in) Stereo Audio Input jack accepts a line level audio signal to trigger audio effects, such as, Audio Advance, Color, and Light Modulate. The sensitivity of the audio effects is controlled from the front panel of the controller using the AUDIO knob.

42. Fuse

This fuse is a 5 mm (.195 in) x 20 mm (.78 in), 1.5 amp slow blow fuse.

43. Voltage Select

Use this switch to select between 115 volts ac and 230 volts ac. When the line voltage is changed, the fuse size remains the same for the controller. However, the fixtures require different fuse sizes for different voltage sources. Refer to *Chapter 2, Set Up and Assembly,* for information about changing the fixture voltage.

44. AC Line Cord

The ac line cord is the main input power supply for the controller.

This completes the *emulator* Controller description. The next section explains how to configure controller switches. Setting the switches will complete the installation.

Configuring *the emulator* Controller DIP Switches

To complete the controller installation, you configure the Personality DIP switches as required, although the normal operating mode is all switches set to Off. Then, depending on your installation, you mount the controller. For some installations, it may be easier to first connect the cables to the rear panel and then mount the controller in a console.

After you set the switches mount the controller away from any sources of heat or moisture. If you are using audio effects, connect a suitable line-level stereo audio feed to the Stereo Audio Input jack on the rear panel. Connect all the data cables between the controller and all fixtures; refer to *Chapter 4* for information on connecting data cables.

Located on the rear panel of the controller are two DIP (dual in-line package) switches labeled Personality A and B. Switch A is currently not used, ensure all switches are Off or down on this switch.

The eight switches on DIP Switch B are used for testing, set up, and control. You must set them properly, as explained in this section, before powering up the system. Normal operation is all switches set to Off.
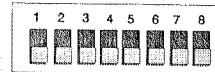
Configuring Personality DIP Switch B

The purpose of Personality DIP Switch B on the rear panel of the controller is to configure the controller for specific requirements. By setting particular switches On or Off, the controller responds in different ways. For example, with all switches in the "OFF" position, the controller operates in a normal manner as a Master controller. The purpose of each of the switches is outlined below.

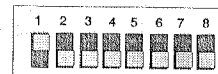**Note:** A switch is **"On"** in the **up** position and **"Off"** in the **down** position.

No Switches On: Normal Mode

Personality DIP Switch B

All switches in the "OFF" position, the controller operates in a normal manner.

Switch 1: Master/Slave Mode

Personality DIP Switch B

Use Switch 1 to configure the Master/Slave capability. The system is expandable beyond the first 24 addresses by linking multiple controllers together via the Master/Slave ports.
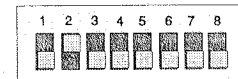
Switch 1 On – the controller operates in **Slave mode**. You can then connect the controller to and run by another controller (set as Master) via the 6mm (1/4 in) Slave plug located on the rear panel of the controller. The Slave LED indicator located above the Power key switch is lit when in Slave mode.

The slaved controller retains its programming and editing functions, but can not play back any programs. All Standby, Advance, and Modulate settings of the slaved controller are determined by the Master controller. The accessible function keys on the Slaved controllers are POWER, HOME, SELECT, RECORD, ERASE, and Construct keys.

Switch 1 Off – the controller functions as a **Master controller**. The SLAVE LED will be "Off" indicating Master mode. All front panel keys function normally. When a controller is in Master mode, it dictates the mode of playback for all controllers that are slaved to it.

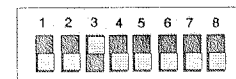Personality DIP Switch B

Switch 2: Time Base

Switch 2 sets the controller's frequency to 50 or 60 Hertz. It is important to properly set this switch. The controller senses this frequency as part of its internal timing circuits.

Switch 2 On – the controller operates at 50 Hertz.

Switch 2 Off – the controller operates at 60 Hertz.

Personality DIP Switch B

Switch 3: Page or Preset Access

Switch 3 sets up how the controller responds to the Analog Inputs port. Refer to *Chapter 6* for details. It responds to either Pages or Presets as follows:
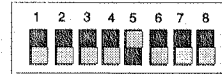
Switch 3 On – the controller is in Preset Level Mode. In Preset Level Mode, the Analog Inputs port shift the controller to different **Preset levels**.

Switch 3 Off – the controller is in the Page Access Mode. In Page Access Mode, the Analog Inputs port access the **Pages** in memory (default setting).

Switch 4: No Effect

Switch 4 is not used and should be set to Off.

Switch 5: Binary Preset Access

Switch 5 On – the controller accesses Preset numbers in a binary fashion (the controller must first be in Preset Access Mode, therefore, DIP Switch 3 must also be in the "ON" position.). It uses the first 10 of the 12 Analog Input channels in binary combinations to provide remote access to 1024 different Presets. The remaining two Analog Input channels control Blackout and Standby respectively. Channel 11 puts the controller in Blackout mode. Blackout closes the fixtures' shutters, but leaves everything else running. Channel 12 functions just like the STANDBY key on the controller. If the controller is in Standby, Channel 12 takes it out of Standby. The fixtures go back to whatever they were doing before the controller was put in Standby mode. Chapter 6 provides additional information on using this feature.

Switch 5 Off – the controller accesses Preset numbers on 12 levels. In the Twelve Level Preset Access mode, each channel can activate one of 12 levels of 24 Presets. When a level has been selected using a remote access device, the Presets are called up from the Address/Preset key pad on the controller.

Switch 6: Independent/Dependent Presets Mode
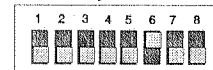
Switch 6 sets the mode of the Presets as they relate to the Master Dimmer. The two modes offer you a choice based on personal preference.

Switch 6 On – the controller is in Independent Presets mode. In Independent Presets mode, the Presets are independent of the master dim. When Presets are called, intensity remains unchanged from the last setting. Although the intensity setting is not recalled, intensity is recorded with Presets for compatibility with Dependent Presets mode. Slaved controllers' modulation effects respond to the audio input of each individual controller. Sequencing (Auto, Audio 1 and 2) is controlled by the Master controller. Slaved controllers' intensities are independent of the Master, and may be controlled by any RS-232 show control program.

Switch 6 Off – the controller is in Dependent Presets mode. In Dependent Presets mode, the Presets store and recall master intensity as part of the Preset. Slaved controllers' modulation effects respond to audio input at the Master controller. Slaved controllers follow the master dim of the Master controller.

Switches 7 and 8: No Effect

Switch 7 and 8 are not used and should be set to "Off."

This completes setting the Personality switches. Chapter 4 explains how to connect the *emulator* Controller to one or more fixtures.