

---

# Table of Contents

<b>TABLE OF CONTENTS</b>	<b>1</b>
About the MC 24/28 and this Manual	6
How to Use This Manual	7
Text Conventions Used in this Manual	7
About the User Guide	8
About the Appendices	8
About the Reference Section	9
<b>PART I: GETTING STARTED</b>	<b>11</b>
<b>CHAPTER 1: Setting Up Your Console</b>	<b>13</b>
Step 1: Unpacking the console	13
Step 2: Setup	13
Step 3: Power Connections	13
Step 4: Control Connections	15
Step 5: Worklights	16
Step 6: Power On	17
Step 7: Operating the Console	17
<b>PART II: FUNDAMENTALS OF OPERATION</b>	<b>19</b>
<b>CHAPTER 2: Basic Console Conventions</b>	<b>21</b>
Terminology Definitions	21
Console Controls	22
Display Keys	23
Macro Keys	23
Hard-keys vs. Soft-keys	23
Data Keypad	24
Command Line and Its Syntax	25
Command Line History	25
Captured Channels / Trackball Control	26
Selecting and Changing Channels / Trackball Control	26
Cursor Keys	27
Grand Master Fader	27
Blackout Switch	27
Console Memory	27
Record Disk / Load Disk	28
<b>CHAPTER 3: Displays</b>	<b>29</b>
The Primary Displays	29
Changing Displays	30
Moving Within Displays / Position Keypad	31
The LCD Display (a live or blind display)	32
The Stage Display (a live display)	33
The Preview Display (a blind display)	38
The Group Display (a Sub Display of Preview)	40
The Submaster Display (a Sub Display of Preview)	42

---

The Device Display (a live display)	44
The Cuesheet Display (a blind display)	46
The Tracksheet Display (a blind display)	48
The Playback Display (a live display)	50
The Patch Display (a blind display)	52
The Setup Display (a blind configuration display)	55
Macro Sub Display (a Sub Display of Setup)	56
Device Sub Display (a Sub Display of Setup)	57
Profile Editor Display (a Sub Display of Setup)	58
Real Time Event Display (a Sub Display of Setup)	59
<b>CHAPTER 4: Console System Setup</b>	<b>63</b>
Using the Setup Display	63
System Setup	63
1. Show Name	64
2. File Name	64
3. - 5. Number of Dimmers	65
6. Number of Playback Cue Rows	65
7. Number of Channels	65
8. Number of Submaster pages	66
9. Number of Macros	66
10. Number of Effect Steps	67
11. Number of Groups	67
12. Worklight Level	68
13. - 15. Dimmer Protocol	68
16. Printer type	69
17. Midi Control	69
18. Reference by name	69
19. Channel Bump Toggle	69
20. Network Remote	70
21. Single Scene/Two Scene	70
22. Secondary Video	70
<b>CHAPTER 5: Setting Up the Soft Patch</b>	<b>71</b>
What is a Soft Patch?	71
The Five Patch Parameters	72
Patch Displays	73
Patching Channels to Dimmers	74
Patch 1 To 1	74
Automated Device Channels	74
Dimmer Profiles	75
Proportional Levels	75
Non-Dim Dimmers (Virtual Non-Dims)	76
Automated Devices	76
<b>CHAPTER 6: Setting Channel Levels</b>	<b>77</b>
Two-Scene Preset Mode	77
Channel Faders vs. Keypad in Multi-Scene Mode	77
Crossfader Time	77
Keypad Commands	78
Channel Lists	78
Captured Channels	79
Trackball Control	80
Proportional Control with the Trackball	80

---

---

Restoring Channel Levels (“Undo”)	81
Advanced Channel Lists	82
Channel Lists Made with Ranges	82
<b>CHAPTER 7: Basic Submaster Operation</b>	<b>83</b>
Submasters	83
Normal Submaster	83
Record Sub Command	84
Bump Buttons	85
Timed Submasters	85
Delay or Dwell Time	86
Effect Submaster	86
<b>CHAPTER 8: Creating and Recording Cues</b>	<b>87</b>
Cues	87
Manual Cues	87
Cue Time	88
Cue Numbering	88
Record Cue Command	89
Creating Cues Blind	90
Additional Cue Features	91
Cue Follow	91
Delay Time	92
Split Fades	93
Cue Macros	93
Cue Names	93
<b>Cue Links</b>	94
Link Loops	94
Tracking Levels in Link Commands	95
Assigning Effects to Cues	95
<b>CHAPTER 9: Playing Back Cues</b>	<b>97</b>
Cuesheet Display	97
Playback Display	97
GO Button	98
HOLD and BACK Keys	98
Playback Faders	99
Playback Fader Boxes	99
Grandmaster Fader	99
Manual Fades	100
Taking Manual Control of Timed Cues	100
Clearing Fades From the Playback Faders	100
Load Cue with Time Command	101
Controlling Fade Rates with the Trackball and Wheels	101
Changing Cue Fade Rates	101
<b>CHAPTER 10: Editing Cues and Using Track Modes</b>	<b>103</b>
Overview of Tracking	103
What is the Preview Cue?	103
Cue Recording/Editing Modes (Track Modes)	104
Selecting the Track Mode	104
Tracking Levels	105
Hard and Soft Zeros	105
Creating Cues in Tracking Mode	106

---

Creating Cues in Cue Only Mode	106
Creating Cues in Clean Up Mode	107
Example, Creating Cues Blind in Different Q Modes	107
Clean Up Cues	108
Editing Existing Cue Levels in Different Q Modes	108
Editing Existing Cue Levels in Tracking Mode	108
Editing Existing Cue Levels in Cue Only Mode	109
Editing Existing Cue Levels in Clean Up Mode	109
Changing Soft Levels to Hard Levels	109
Changing Hard Levels to Soft Levels (Restoring Tracking Levels)	109
Copying Cues in Different Track Modes	110
Deleting Cues in Different Track Modes	111
Moving (Renumbering) Cues in Different Track Modes	111
<b>CHAPTER 11: Names</b>	<b>113</b>
OVERVIEW	113
Alpha or Name Mode	113
Cue, Effect, Group, and Submaster Names	113
Show and Disk File Names	115
<b>CHAPTER 12: Utilities, Warnings, Printing, and Default Settings</b>	<b>117</b>
Dimmer Check Utility	117
Warnings and Error Messages	117
Printers	118
Printing	119
<b>CHAPTER 13: Memory</b>	<b>121</b>
Console Memory vs. Floppy Disk Storage	121
Performing a "Hard Clear"	121
Recording to a Floppy Disk	122
Retrieving from a Floppy Disk	123
Upgrading Software	124
<b>PART III: ADVANCED TOPICS</b>	<b>125</b>
<b>CHAPTER 14: Groups</b>	<b>127</b>
Overview of Groups	127
Recording Groups	127
Recalling Groups	128
Copying Groups	128
Renumbering Groups	129
Deleting Groups	129
<b>CHAPTER 15: Effects</b>	<b>131</b>
Overview of Effects	131
The Effect Sub-display	131
Creating Effects	132
Navigating the Effects Display	132
Creating Effect Steps	132
Effect Patterns	135
Testing an Effect	135
Assigning Effects to Cues	136
Assigning Effects to Submasters	136

---

Editing Steps	136
Deleting Steps	136
Inserting Steps	136
<b>CHAPTER 16: Profiles</b>	<b>137</b>
OVERVIEW	137
Profile Editor Sub-display	137
<b>CHAPTER 17: Macros</b>	<b>141</b>
OVERVIEW	141
Recording Macros	141
Macro Paging	142
Real-time Macro Recording	142
Real-time Macro Playback	143
Viewing Macros	143
Editing Macros	144
<b>CHAPTER 18: Moving Lights</b>	<b>145</b>
Overview	145
Device Personality Traits and DMX-512	145
Initial Assignment	146
Assign Devices	147
Clearing a Device Assignment	148
Device Console Controls	149
Device Definition Language	149
Adding Device Definitions	150
Editing Devices	152
Beginning to use your Automated Devices	153
<b>CHAPTER 19: Programming with Moving Lights</b>	<b>155</b>
Device Display	155
Submasters	155
Groups	156
Effects	157
Cues Live on Stage	157
<b>APPENDIX A: Maintenance and Customer Service</b>	
<b>APPENDIX B: Hand Held Remote</b>	
<b>APPENDIX C: MC 24/48 Console Specifications</b>	
<b>APPENDIX D: Listing of Moving Light Definitions</b>	

---

## About the MC 24/28 and this Manual

---

Congratulations on the purchase of your new MC 24/48 lighting control console!

The MC 24/48 lighting control console has been designed to be both simple and intuitive to operate, yet sophisticated and powerful in its programming. You'll discover that the MC 24/48 has a "multi-level user" operating approach. With a wide variety of manual and programmed controls, running lights with the MC 24/48 can be as basic or as comprehensive as your needs require. For example:

- ❑ The MC 24/48 may be operated as either completely manual 2-Scene Preset console or as a fully programmed Memory console.
- ❑ The first 48 channels on the MC 24/48 have dedicated channel faders for quick, live control.
- ❑ Advanced cue parameters such as level tracking, cue macros, cue names and multiple timing options.
- ❑ Advanced cue sequencing features such as links, follows and subroutines.
- ❑ 512 dedicated moving light channels.
- ❑ Optional Hand Held Remote to allow programing away from main console.
- ❑ Optional Auxiliary and Remote Monitors provide additional information where you need it.
- ❑ System Software upgrades from floppy disk.
- ❑ User defined effects that may contain Cues, Channels, Groups, Submasters or moving lights.
- ❑ Menu Selection Memory Loading from standard 3.5" High-Density 1.44 MB floppy disk.
- ❑ Help Feature provides instant on-line answers to your questions.

In addition, the monitor display -- your most important interface with the MC 24/48 -- has been carefully laid out and color-coded, providing concise, at-a-glance feedback for all control functions. Programming is simplified by a command syntax that doesn't require parameters to be entered in any specific sequence. And don't be afraid to take your show on the road -- the MC 24/48's rugged physical design will stand up to a wide variety of abuses.

---

## How to Use This Manual

---

The MC 24/48 Manual is designed for both the first time user and the advanced professional user. The **User Guide** is the first half of this manual. The User Guide is designed so the novice user can start at the beginning, with the most basic topics discussed first. It is arranged in chapters in order of increasing complexity. The User Guide covers all topics in depth.

The **Reference Section** is the second half of this manual. The Reference Section is a complete documentation of soft keys, hard keys, and operational topics, arranged alphabetically. The Reference section is intended to provide quick answers to specific questions without making you read through an entire chapter.

---

## Text Conventions Used in this Manual

---

In this manual, actual key names and keystroke entries appear in capital letters. Soft keys appear inside parentheses: **(SOFT KEY)**. Hard keys appear inside brackets: **[HARD KEY]**.

The key name and keystroke conventions are as follows:

- ❑ Soft Keys appear as: **(UPPERCASE PARENTHESES)**  
(Soft keys are S1 - S8 on console.)
- ❑ Hard Keys appear as: **[UPPERCASE BRACKETS]**  
(Hard keys are all other console keys.)
- ❑ A number entry appears as: **[#]**
- ❑ Single or multiple number lists appear as: **[# list]**



### **EXAMPLES:**

- ❑ The soft key, "Q Mode", appears as: **(Q MODE)**
- ❑ The hard key, "Group", appears as: **[GROUP]**
- ❑ The number entry, "253", appears as: **[253]**
- ❑ "[# list]" is used as a generic example of a list of numbers created using the **[THRU]**, **[AND]**, and **[MINUS]** keys.

---

## About the User Guide

---

The User Guide is the first half of this manual. The User Guide has four Parts:

PART I: GETTING STARTED  
PART II: FUNDAMENTALS OF OPERATION  
PART III: ADVANCED TOPICS  
PART IV: APPENDICES

The User Guide is organized with comprehensive chapters that discuss various topics in depth. The most basic topics start with Chapter 1. The following chapters get progressively more advanced. Topics always provide a description, and may also provide any or all of the following:



**EXAMPLE:** A sequence of keystrokes that executes a practical example.



**BASIC RULE:** A description of a basic rule that you should know. Basic Rules usually apply to more areas of operation than the topic you are reading.



**HINT:** *Good tips that will help you operate the console more effectively.*



**NOTE:** *Important information about console operation specifics. Notes usually point out exceptions to rules.*



**ADVANCED TOPIC:** A reference to a related advanced topic, typically in a later chapter.

---

## About the Appendices

---

The following appendices are included as part of this manual:

- Appendix A: Maintenance and Customer Service
- Appendix B: Hand Held Remote Operation Instructions
- Appendix C: MC 24/48 Console Specifications
- Appendix D: List of Device Definitions



---

## About the Reference Section

---

The Reference Section is the last part of this manual. The Reference Section is an alphabetical listing of soft keys, hard keys, and operational topics. The Reference Section is designed so the experienced user can answer specific questions quickly.

A description of each console key is provided in the Reference Section. The topic describes where the key is located, and how it functions. A keystroke procedure that uses the key is also provided. Other keystroke combinations will become apparent as you gain more experience with MC 24/48 commands. Related topics are also listed at the end of each topic entry.

---

---

# **MC 24/48 USER GUIDE**

## **PART I: GETTING STARTED**

### **CHAPTER 1: Setting Up Your Console**

---

---

# CHAPTER 1: Setting Up Your Console

## Step 1: Unpacking the console

---

Carefully unpack your console from its carton. Underneath the console, you will find:

- ❑ This manual
- ❑ A 7' AC power cable
- ❑ One 3.5", 1.44MB floppy show storage disk
- ❑ 1 or more gooseneck Worklight fixtures (if the option was ordered)

In a separate shipping container, (if ordered) you will find the console monitor. Carefully inspect all items for evidence of shipping damage. If any damage is noted, call the shipping company for an inspection. It is recommended that you keep the shipping containers or purchase a touring case in the event you need to transport your console.

## Step 2: Setup

---

Place your console on a sturdy horizontal surface with at least 6" (152mm) of clearance behind the console for cables and for proper ventilation. The environment should be dust-free with an ambient temperature of 40°F (4°C) to 90°F (32°C) and a relative humidity between 8% and 80% without condensation.



**WARNING!** *Do not run the console while it is in a road case, or damage may occur.  
Do not expose console to rain or moisture, or damage may occur.*

Place your monitor(s) on a sturdy surface near the console in accordance with the instructions provided by the monitor manufacturer.

## Step 3: Power Connections

---

**Power Supply Specifications:** The console has a dual-range power supply designed to operate on AC power at any nominal voltage within the two ranges, 100 to 120V, or 220 to 240V, 50/60 Hz. The power supply requires a maximum of 4A. The console is shipped set for operation at 120V, and with a power supply cord containing a North American NEMA 5-15P plug (Edison, parallel-blade type). In other localities with different connector systems and/or operating voltages, the user must obtain and use a H05VV-F or better grade power supply cord with the plug rated for at least 4A, and for at least the nominal operating voltage of that location. The mating connector to the console is a female IEC 320, Sheet C13 connector rated 10A, 250V.

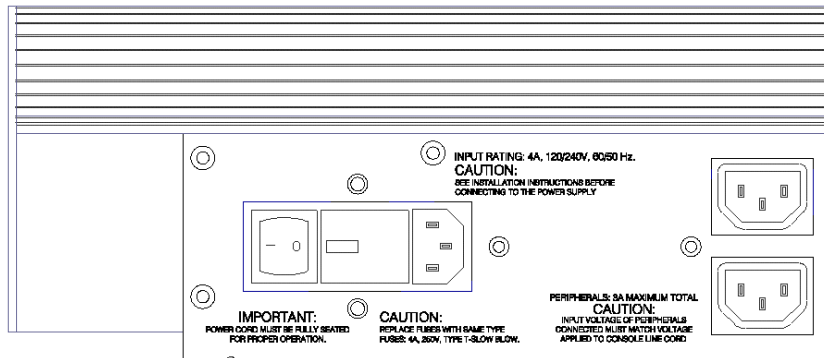


Figure 1.1 MC 24/48 Power Connections

**Power Supply Voltage Selection:** The console contains a power supply designed to operate on AC power at a nominal voltage range of 120V or 240V, 50/60Hz. The voltage selected is indicated in the window on the console inlet connector on the back of the console. To change that selection proceed as follows:

1. Remove the power supply cable.
2. Insert a screwdriver in the slot exposed by removing the cable, and pry out the fuse block.
3. Slide the printed-circuit board out of the fuse block and reverse it.
4. Re-insert the fuse block with its arrow up.



**CAUTION!** *Verify that the nominal input voltage selection as indicated in the window on the console inlet is compatible with the nominal voltage of the available power, or damage may occur. Localities with nominal voltages of 240V will have to change the standard 120V selection made at the factory.*

**Console Power Connection:** First, make sure the switch adjacent to the power inlet connector on the back of the console is in the OFF (0) position; and then plug the AC power cable into the console. Plug the other end into an AC power source with a rating in compliance with the above requirements, and with a computer-grade ground (earthing conductor). (A computer-grade ground is an insulated, isolated ground preferably connected to the point where the AC power source is grounded in the building.)

**Back Panel Power Outlets:** On the back panel of the console are two switched female IEC 320-style power outlet connectors for connecting the monitor(s), or other peripheral devices. The connectors are rated voltage-wise and frequency-wise at the same voltage and frequency being supplied to the console via the console power supply cord, and collectively at 3A total for the two switched outlets.



**CAUTION!** *Input voltage of peripherals connected must match voltage applied to console line cord, or damage may occur.*

**Monitor Power Connection:** The monitor(s) is typically an auto-ranging unit, operating on AC power anywhere from 100V to 250V, 50/60 Hz at a current of 1A maximum. The monitor is provided with a mating “reverse” IEC 320-style plug. Refer to the instructions provided with the monitor to find out whether

the monitor is suitable for operation with the above-specified connector. If so, plug the power cord of the monitor into one of the console power connectors.

## Step 4: Control Connections

A label on the back panel of the console identifies all control connections. They are all Class 2 low voltage circuits (extra-low voltage in some parts of the world). Figure 1.2 Shows the back panel of an MC24/48.

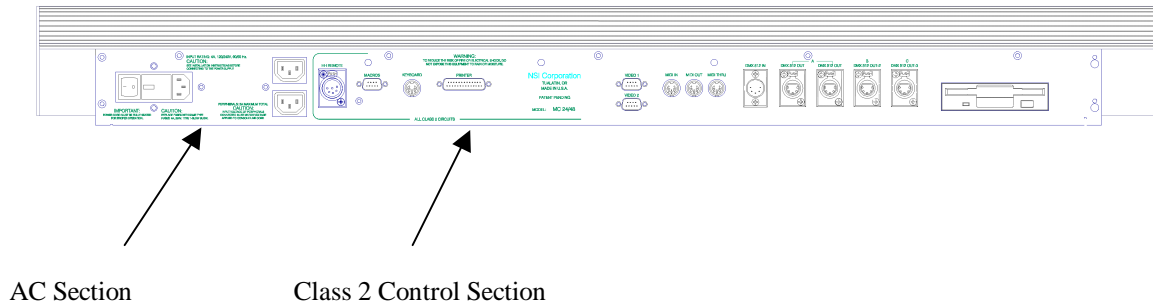


Figure 1.2 - MC 24/48 Back Panel

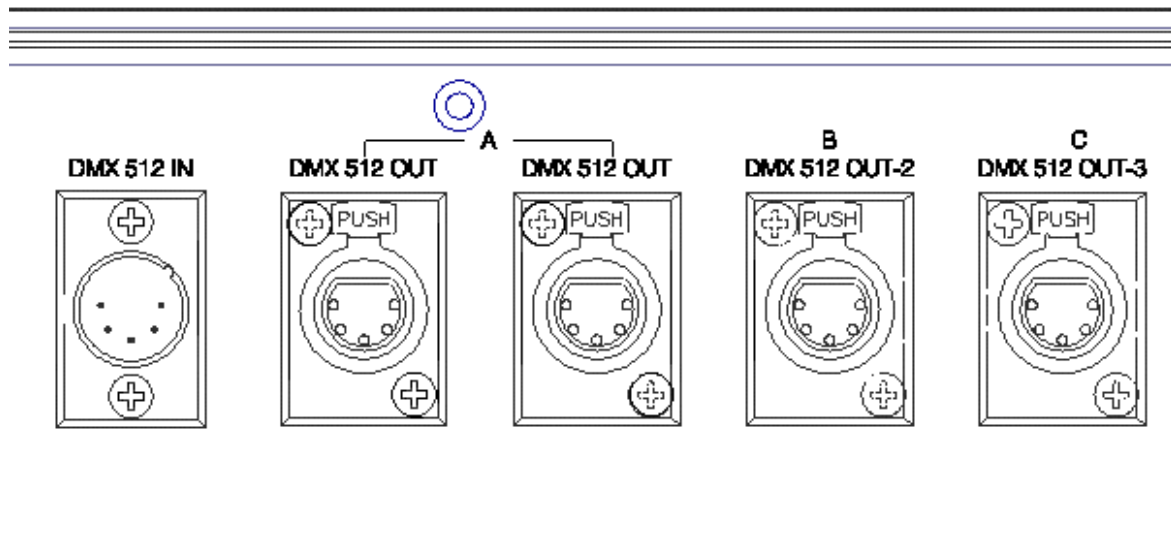


Figure 1.3 - MC 24/48 Dimmer Connections

**Dimmer Rack Connection:** The purpose of the console is to control dimmers or automated devices and must connect the console to the dimmer rack via the DMX connector(s) on the back panel (standard 5 pin XLR type female connectors). The DMX signals comply with the USITT DMX 512-1990 standard except that pins #4 and #5 are not used for a second RS485 data transmission channel. Instead pin 4 is not connected and pin 5 is used for an analog over-temp signal. The DMX A connector contains data for DMX 1 through 512, the second connection DMX B, contains data for 513 through 1024. The third connection DMX C contains 1025 through 1536.

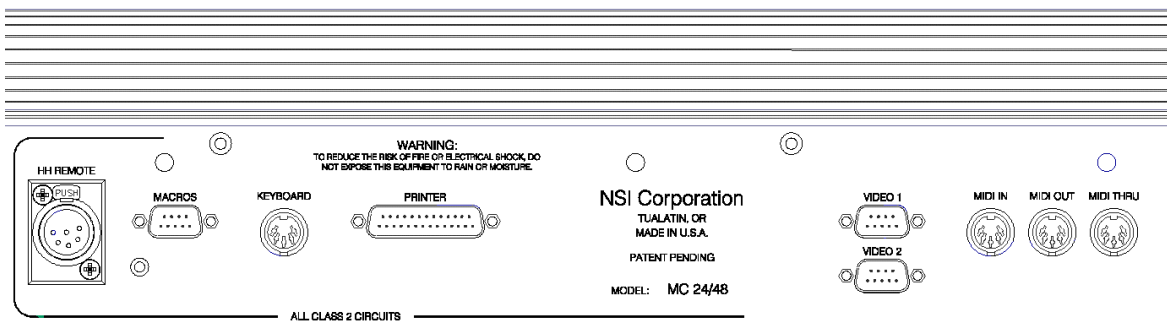


Figure 1.4 Monitor and Peripheral Device Connections

**Monitor Connection:** The monitor is supplied with a control cable terminated in a high-density 15-pin "D" connector. Connect the monitor control cable to the console connector marked VIDEO 1. The VIDEO 1 connector is a computer industry standard SVGA control connector. You can secure the connector with a small, flat blade screwdriver, or in some cases, with built-in hand-screws. If you purchased the second video option and second monitor, attach it to the connector labeled VIDEO 2.

**Peripheral Devices:** If desired, peripheral devices may be connected to the console back panel connectors as follows:

- |   |  |
|---|--|
| <input type="checkbox"/> Printer          | = Computer industry standard parallel printer connector. |
| <input type="checkbox"/> Keyboard         | = Computer industry standard 101 style keyboard.         |
| <input type="checkbox"/> Hand Held Remote | = Hand Held Remote.                                      |
| <input type="checkbox"/> MIDI             | = Industry standard Musical Instrument Digital Interface |
| <input type="checkbox"/> Remote Macros    | = Accepts Remote Macro keyboard                          |



**ADVANCED TOPICS:** For information on Hand Held Remote, see *Appendix C*.

## Step 5: Worklights

Worklights are optional console accessories. The worklight(s) plug into the 3-pin XLR style connector(s) on the right rear of the console. The intensity of the worklights is set as option #12 on the setup menu. Refer to *Chapter 4: Console System Setup for instructions*.



---

## Step 6: Power On

---



**WARNING!** *Do not consume food or beverages while operating the console, because lethal voltages (120V or 220V) exist inside the console. Spills may cause a hazardous condition, or may cause damage to the console.*



**CAUTION!** *When the console has been stored in a cold environment (below 40°F), do not turn the power on until the console warms up, or else damage to the console may occur. You should avoid situations that could cause condensation to occur inside the console.*

**Turning on the Monitor:** Once the console and monitor have come to room temperature (about 25°C or 75°F), the console is ready to be turned on. Refer to the instructions provided with the monitor and turn on its power switch. If the monitor is plugged into a convenience outlet on the rear of the console, you can leave the monitor power switch turned. The convenience outlet on the console is a "switched" outlet (it turns off when the console is turned off).

**Turning on the Console:** Turn on the console switch located on the right rear corner of the back of the console. The "STATUS" LCD on the front panel should illuminate. Within about ten seconds, the monitor should warm up and show the stage displays. Refer to the instructions provided with the monitor to adjust its display.

---

## Step 7: Operating the Console

---

Use this manual when you have questions about how to operate the console. The User Guide Part II covers Fundamentals of Operation. The User Guide Part III covers Advanced Topics. The User Guide Appendices cover special topics in depth such as MC 24/48 options and specifications. The Reference Section in the back of this manual contains a comprehensive alphabetical listing of all hard-keys, soft-keys and related topics. If you are not able to find the answer in the User Guide or the Reference Section of this manual, call NSI Field Service. Please have the following information available when you call:

- Console model number, configuration number (if any), and serial number as found on the labels on the back panel of the console.
- Console software version number as shown at the top of the Setup display.
- Any accessories or peripherals attached to your system.
- Dimmer types that the console is operating.

The NSI Field Service number is (800) 864-2502

---

---

# **MC 24/48 USER GUIDE**

## **PART II: Fundamentals of Operation**

**CHAPTER 2: Basic Console Conventions**

**CHAPTER 3: Displays**

**CHAPTER 4: Console System Setup**

**CHAPTER 5: Setting Up the Soft Patch**

**CHAPTER 6: Setting Channel Levels**

**CHAPTER 7: Submaster Operation**

**CHAPTER 8: Creating and Recording Cues**

**CHAPTER 9: Playing Back Cues**

**CHAPTER 10: Editing Cues and Using Track Modes**

**CHAPTER 11: Names**

**CHAPTER 12: Utilities, Warnings, Printing, and Default Settings**

**CHAPTER 13: Memory**

---

---

## CHAPTER 2: Basic Console Conventions

### Terminology Definitions

---

**Lighting Console:** A lighting console is a tool that creates lighting patterns & effects, and records them so they may be reproduced later.

**Show:** A show is the largest unit of memory. Only one show is ever active in the console at any given time. Shows can be stored on standard 3.5" computer floppy diskette as **show files**. These files can be retrieved from floppy disks and loaded back into the console's active memory in whole or in part. Shows are composed of devices, cues, effects, groups, Submasters, macros, the soft patch assignment and the system setup.

**Cue:** Cues are recorded lighting changes or "looks" that can be reproduced with specific timing. Cues are numbered and are usually "played back" in a numbered sequential order. Cues can be recorded and edited.

**Effect:** Effects are continuous repeating patterns of lighting changes that can be assigned to cues or played back independently. The rate and pattern of an effect can be recorded and edited.

**Channels:** Cues, effects, groups, and Submasters are composed of selected **control channels**, simply referred to as channels. Channels are used for setting lights to various intensity levels.

**Moving Light Channels:** Moving light channels are separate from stage control channels. There are 512 moving light channels that are used for control of up to 256 automated devices.



**ADVANCED TOPICS:** See Chapter 18, *Moving Lights for additional terminology about Automated Lighting devices*.

**Level:** A level refers to the intensity of any lighting instrument that is controlled by a given channel. A level is indicated by a percentage of the maximum output of a given channel, from zero (00) to full (FL). The level number indicates the percentage of the maximum output, i.e. a channel level of 55 indicates that instruments controlled by the channel are at 55% of their maximum intensity.

**Assignment of Channels to Dimmers:** Channels are assigned to control specific dimmers. Dimmers are the actual hardware devices that feed electricity into the circuits that feed your lighting instruments. In some venues, different circuits can be physically plugged into specific dimmer outputs, providing what is called a "hard patch." With the MC 24/48, you can assign any channel to control one or more dimmers through what is called a "soft patch."



**ADVANCED TOPICS:** See Chapter 5, *Setting Up The Soft Patch*.

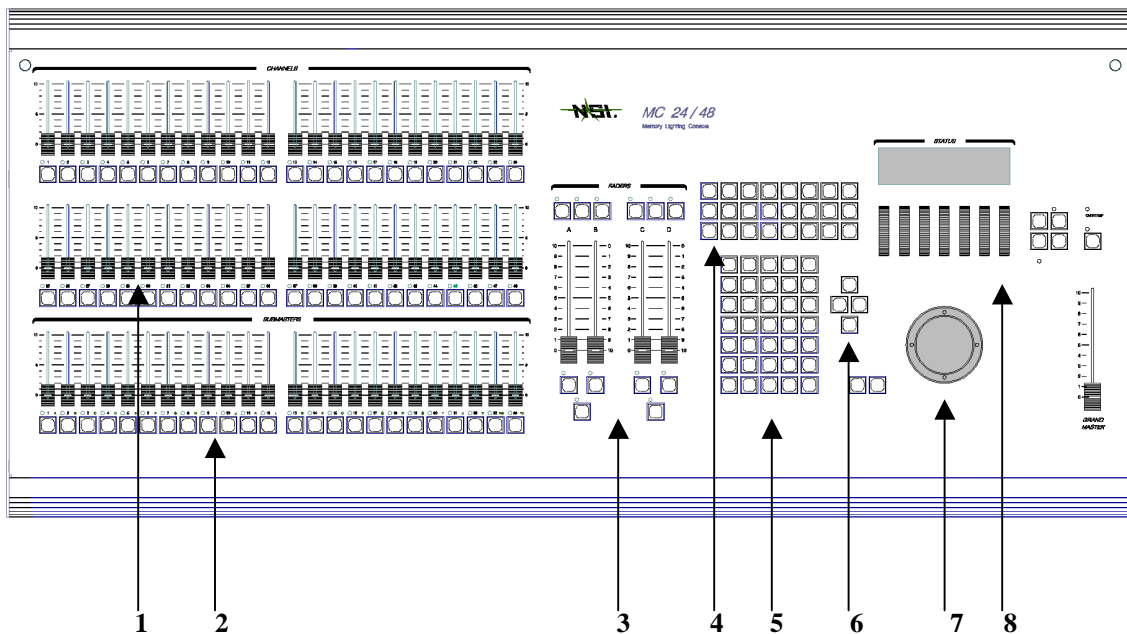
**Dimmer Control Channel:** A dimmer control channel is a logical address in the dimmer control signal transmitted from the console. This dimmer control signal is a digital signal that contains information about many dimmer control channels. The dimmer control signal can be used to control actual dimmers or it can control other devices, such as automated fixtures and color scrollers. Since the majority of applications

have actual dimmers controlled by the dimmer control signal, we use the term "**dimmer**" to refer to a dimmer control channel. When you see the word "**dimmer**" in this manual, or on the display monitor, it really means dimmer control channel.

**Dimmer Protocols:** There are different types of dimmer control signals, also known as *dimmer protocols*. The current standard for dimmer protocols is known as DMX-512. This was developed by the United States Institute for Theater Technology. The MC 24/48 can transmit DMX-512 which contains up to 512 dimmer control channels, that may address either actual dimmers or other automated devices.

## Console Controls

The main functional groups of console controls are as follows:



1. **Channel Fader w/Bump Buttons.**
2. **Submaster Faders W/Bump Buttons .**
3. **Playback Controls.**
4. **Display Keys.**
5. **Data Entry Keypad.**
6. **Position Keypad.**
7. **Trackball.**
8. **Moving Light Control Wheels.**

Figure 2.1 Console Controls

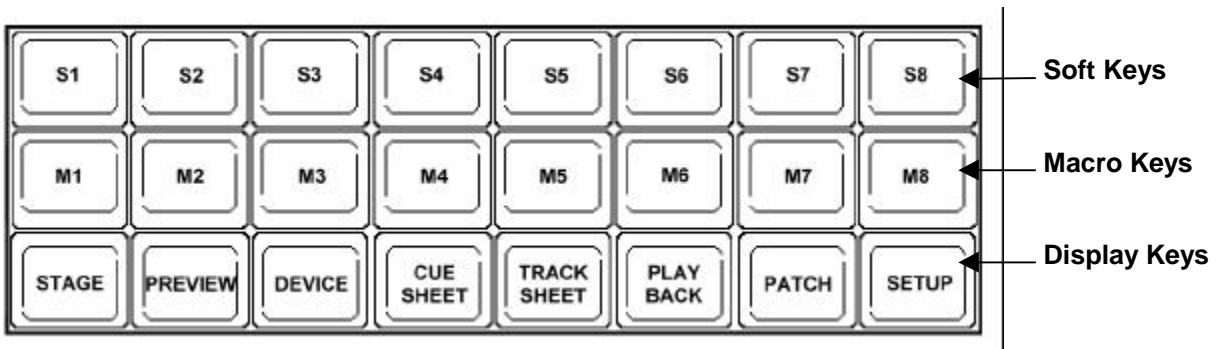


Figure 2.2, Soft, Macro, and Display Keys

## Display Keys

The Display keys are used to select the display on the video monitor screen. There is one row of Display keys. Each key is labeled with the name of the display that appears when the key is pressed. There are more than eight displays available, but some of these are actually sub-displays of the eight main displays. Sub-displays are available through soft-keys in the main displays.



**ADVANCED TOPIC:** For a complete listing of all displays, see Chapter 3, *Displays*.

## Macro Keys

The Macro keys are a time and effort-saving feature. They are used to play back a 24/48 of recorded keystrokes. Each Macro key can record a sequence of up to 128 keystrokes. The sequence can then be re-executed later by simply pressing the assigned Macro key.




**ADVANCED TOPIC:** See Chapter 17, *Macros*.


## Hard-keys vs. Soft-keys


**Hard-keys:** Hard-keys are the keys on the console that always have the same function. Hard-keys are labeled with the name of the function that the key performs.

**Soft-keys:** Soft-keys are eight keys on the console that do not always have the same function. (See Figure 2.2.) The soft-key functions are different for each display; their functions depend upon the display you are currently working in. At the bottom of the screen (in all displays except Playback), there is a row of eight squares that represent the eight soft-keys for the current display. (See Figure 2.3.) Each of the eight squares is labeled with its soft-key function name. The eight squares are numbered 1 – 8, to correspond just like the eight soft-keys on the console.

Whenever you change displays, you will notice that some or all of the soft-key labels change function names. Sometimes the soft-keys will change when you press a hard-key or a soft-key. As you use your MC 24/48, you will find that you have the right soft-key available when you need it. The labels names are designed to communicate the function of the soft-key, without having to refer to this manual. The main idea behind the soft-keys is to provide you with only the functions needed in a particular display, without cluttering the top panel with too many keys.

 **NOTE:** *In this manual, actual button names and keystroke entries appear in all capital letters. Soft-keys appear inside parentheses: (SOFT-KEY). Hard-keys appear inside brackets: [HARD-KEY].*

 **EXAMPLE:** The Record Submaster hard-key appears like this:       **[RECORD SUB]**  
 The Q Mode soft-key appears like this:                               **(Q MODE)**  
 The Decimal Point hard-key appears like this:                       **[.]**  
 The AND hard-key appears like this:                                   **[AND]**

 **NOTE:** *The [AND] key on your console is labeled "AND" on the key itself. In the Command Line, this keystroke always appears as "+".*

## Data Keypad



Figure 2.3 Data Entry Keypad

The Data Entry keypad is located just beneath the Display keypad. The buttons and functions of the keypad are explained in their various details throughout this manual.

It is especially important to note the difference between similar keys, such as, CUE and RECORD CUE or GROUP and RECORD GROUP as these keys have vastly different functions.



---

## Command Line and Its Syntax

---

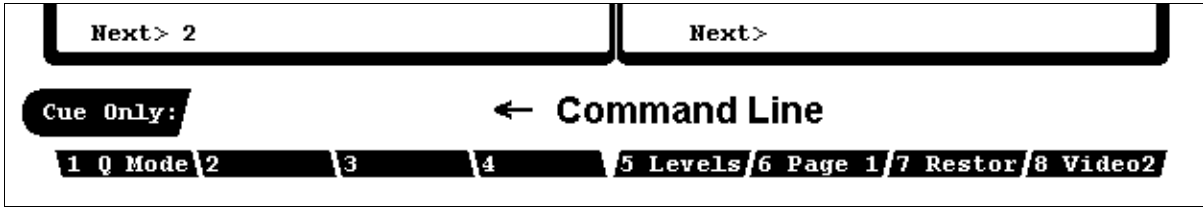


Figure 2.4 Location of Command Line

The commands you enter into the console appear in the Command Line. The Command Line is visible near the bottom of the monitor screen, just above the soft-keys (See Figure 2.4 above). A command is entered by pressing a sequence of different soft-keys and hard-keys. Every keystroke you make appears on the Command Line, creating a "sentence" that becomes a command for the console. Normally your command is then completed by pressing the [ENTER] key, at which time the console executes the command. However, for simple entering of channel levels, it is not necessary to use the [ENTER] key.



**EXAMPLE:** A command to set channel 7 at a level of 75 percent is:

[7] [AT] [75] (Command Line History shows "Channel 7 AT 75")



**BASIC RULE:** *There is no channel key, therefore anytime a number is entered at the beginning of the Command Line, "Channel" is automatically entered onto the Command Line. Use the [AT] key to signify a channel level or patching assignment. The [AT] key can be roughly translated as "at the level of" or "patched to."*



**BASIC RULE:** *Before you execute a command by pressing the [ENTER] key, you can use the [CLEAR] key to erase keystrokes in the Command Line. The keystroke immediately to the left of the cursor is erased from the Command Line when the [CLEAR] key is pressed.*

---

## Command Line History

---

After pressing the [ENTER] key in the Example above, you will notice that your command turns from white text to gray text. The entered command is now called the Command Line History. The Command Line History provides you with a copy of the last command that was entered. You cannot manipulate the information in the Command Line History, it just shows what command you last entered.

---

## Captured Channels / Trackball Control

---

When you have set channel levels on the Command Line, the channels are "captured," and are shown in amber boxed video. Captured channels are under control of the trackball. Use the trackball to increase or decrease the levels of captured channels in a continuous proportional manner. This means that captured channels at different levels still maintain their proportions with respect to each other. Captured channels remain on the trackball" until you select other channels or press the **[CLEAR]** key.

The captured channel levels can also be set by entering a new level value with the Data Entry Keypad. In this case, there is no need to enter channel numbers because the console automatically assigns the new levels to the **captured** channels.



**EXAMPLE:** To assign a level of 50% to channels 1 - 10, then change to 80%:

1. **[1] [THRU] [10] [AT] [50]**
2. **[AT] [80]** - or - Move the trackball until the channels read 80%.



**ADVANCED TOPICS:** See Chapter 6, *Setting Channel Levels*.

You can also use the trackball to control the rates of fades on the playback faders, as well as the rates of effects on Submasters or playback faders.

---

## Selecting and Changing Channels / Trackball Control

---

It is also possible to select and change channels and levels with the trackball. This is done by using the cursor, which is under the control of the trackball. First, locate the cursor by moving the trackball. If you have been selecting channels with the keypad or performing edits to levels, you may find it necessary to push the **[CLEAR]** button in order to regain control of the cursor with the trackball.

To select a channel, place the cursor directly beneath the channel to be selected. Next, change or enter the level by pressing the **[CHANGE]** button located to the left of the trackball, and moving the trackball while continuing to hold down the **[CHANGE]** button.

It is also possible to select a number of channels by locating the cursor directly beneath the first channel to be selected, pressing the **[SELECT]** button located to the left of the trackball, and moving the cursor to the left or right of the first channel selected, while continuing to hold down the **[SELECT]** button. The cursor may be moved in a straight line to select channels on the same line, or moved up or down to select channels in lines above or below.

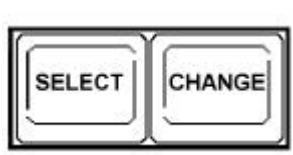
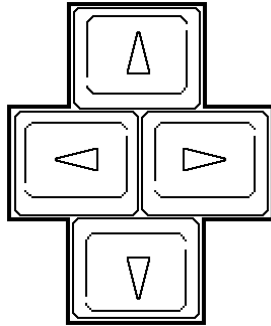


Figure 2.5: Select/Change Buttons

---

## Cursor Keys

---



To the right of the Data Entry keypad are the cursor control or "arrow" keys. These keys are used in many different modes to move the screen display, toggle through menu items or scroll certain functions.

Figure 2.6: Cursor Control Arrow Keys

---

## Grand Master Fader

---

You can use the Grand Master fader to proportionally control the output of all the channels. The slider "masters" all of the channel levels that are live on stage. When the Grand Master is restored to its original position, all channels return to their previous levels. Moving light channels will not be affected unless the definition of the device has been programmed to include control by the Grand Master. When the Grand Master is set to a level less than Full, the level of the Grand Master appears in the upper right corner of the Stage display.

---

## Blackout Switch

---



You can use the Blackout switch to control the output to all the channels with an on/off toggle function. Set the switch to BLACKOUT to immediately take out all the lights on stage. Push the Blackout switch again to return to the previous levels. The Blackout switch function is the same as instantly moving the Grandmaster slider between full and zero.



**HINT:** *The upper right hand corner of the Playback and the Stage displays will display a level indicator whenever the Grand Master level drops below full. The indicator also appears when the [Blackout] switch is in the Blackout position.*

---

## Console Memory

---

When you turn off your console, the console "remembers" the cues and all other show information, so that when you turn the console back on, all the show information from the previous session is still there. The show information is stored in RAM (Random Access Memory) which remains active by an internal backup battery when the console is turned off. If the console does not remember the previous show, the battery may need to be replaced.



**ADVANCED TOPIC:** To change the internal battery, see Appendix A, *Maintenance And Customer Service*.

## Record Disk / Load Disk

---

The current show data can be recorded from RAM onto a standard 3.5" 1.44MB High Density floppy disk for storage. You can then retrieve show data from the floppy disk. The disk drive is located on the side end of the rear panel of the console.



**ADVANCED TOPICS:** To record and retrieve show data, see Chapter 13, *Memory*.

---

## CHAPTER 3: Displays

### The Primary Displays

---

The Display key pad of the MC 24/48 has 8 dedicated display buttons to access the primary displays. There are three "live" displays where edits are seen live on stage as they are made. There are five "blind" displays where edits are not seen live on stage. The primary displays are:

#### Live Displays

- Stage Display
- Playback Display
- Device Display

#### Blind Displays

- Preview Display
- Cuesheet Display
- Tracksheet Display
- Patch Display
- Setup Display

Many of the primary displays have Sub Displays accessible via the soft keys. In this chapter, we will examine the basic elements common to all displays and then look at each of the displays on the MC 24/48. This chapter is intended to give an overview of the functions but not the detail. References are made for each display of where to find the detailed operation instructions.

**Title Bar:** The Title Bar is located across the top of the display. The Title Bar contains the name of the display you are currently viewing. It is possible to change displays by moving the cursor into the title bar area, holding down the [CHANGE] button and moving the cursor to the desired display from the display list.

**Command Line / Command Line History:** The Command Line shows the command currently being entered. If the information is in white letters this is the **Current Active Command**. If the information is in gray, this is the **Command Line History** that shows the last command that was executed.

**Q Mode:** The current Q mode appears in the field at the far left of the Command Line. One of the three Track modes will appear in the Track mode field:

- Tracking
- Cue Only
- Clean Up

**Soft Key Labels:** The Soft Key Labels, numbered 1 – 8, appear at the bottom of the display, and change function according to the current display. The functions of these soft-keys are executed by pressing the respective console keys labeled [S1] - [S8]. Some of the soft-keys reveal another level of soft-keys. To return to the top level of soft-keys in any display, press the display key for the current display.

	Level	S1	S2	S3	S4	S5	S6	S7	S8
<b>STAGE</b> <sup>1</sup>	I	Q Mode	MP 1		Levels	SelEff	SubP 1	Restor	Video2
<b>PREVIEW</b> <sup>2</sup>	I	Q Mode	SelCue	SelGrp	SelSub	SelEff	SubP 1	Restor	More
	II	Q Mode		Renum	Copy	Delete	Name	Restor	More
	III	Q Mode	MP 1	Macro			Toggle	Restor	More
<b>DEVICE</b>	I	Q Mode	SelAll	RelAll					Video2
<b>CUE SHEET</b>	I	Q Mode	SelCue	Renum	Copy	Delete	Name		More
	II	Q Mode	MP 1	Macro					More
	III			Minute					More
<b>TRACK SHEET</b>	I	Q Mode	SelCue	Renum	Copy	Delete	Device	Restor	
	II	Q Mode	SelCue	Renum	Copy	Delete	Channl	Restor	
	III			Minute					More
<b>PLAY BACK</b>	I	Q Mode	MP 1	A/B			SubP 1		Video2
	II			Minute					
<b>PATCH</b> <sup>3</sup>	I	PORT A	Linear Port	Uncomp Comprs	Levels Profil	Check	1 to 1	Clear	Video2
<b>SETUP</b> <sup>4</sup>	I	System	Print	Display	Disk	Macro	Device	Profile	More
	II	Video2	Clear	RT Clk					More
<b>Effect Sub Display</b> <sup>5</sup>	I	ClrVal	ClrLn	InsLn	DelLn	AddLn	DelAll		

<sup>1</sup> applies to both Stage Channel and Stage Dimmer Displays.

<sup>2</sup> applies to Preview Cue, Preview Sub, and Preview Group.

<sup>3</sup> applies to Patch Levels and Patch Profiles toggled by [S4].

<sup>4</sup> applies to Macro, Device and Profile Sub Displays.

<sup>5</sup> applies to Effects Sub Display in either Stage or Preview mode.

Table: 3.1 CHART OF SOFT KEY FUNCTIONS

## Changing Displays

To change to a different display, press one of the eight display keys on the console. The hard display keys are listed below:

- |                                     |                                       |
|-------------------------------------|---------------------------------------|
| <input type="checkbox"/> [STAGE]    | <input type="checkbox"/> [TRACKSHEET] |
| <input type="checkbox"/> [PREVIEW]  | <input type="checkbox"/> [PLAYBACK]   |
| <input type="checkbox"/> [DEVICE]   | <input type="checkbox"/> [PATCH]      |
| <input type="checkbox"/> [CUESHEET] | <input type="checkbox"/> [SETUP]      |

Stage					Display					
12	13	14	15		Stage				0	21
23					Preview					
36	37	38	39		Device					
FL	FL		50		Cue Sheet				4	45
60	61	62	63		Track Sheet					
50	50	50			Playback				8	69
84	85	86	87		Patch					
					Setup				2	93
08	09	10	11	12	13	14	15	16	17	

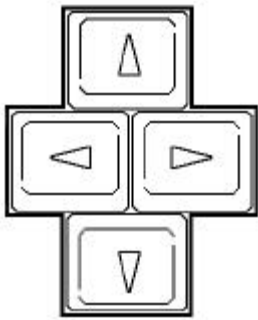
Displays may also be changed by using the trackball and moving the cursor into the title bar in any display and holding down the [CHANGE] key. Then the user selects which display is desired by continuing to hold down the [CHANGE] key. Figure 3.0 show a portion of the Stage Display with the Display drop-down menu activated.

Figure 3.0 Display Select Drop-down Menu

## Moving Within Displays / Position Keypad

To move within a display, or to change the contents of the display, use the Position Keypad, which is the four directional keys located next to the main keypad.

The UP arrow and DOWN arrow keys generally change the display to select the next or last item as the "current" item, such as the Cue number that is displayed in the Cue display.



The Up and Down arrow keys generally scroll (move) the contents of the display vertically one line at a time.

The Left and Right arrow keys move the Tracksheet display left or right 12 channels at a time to reveal other channels for viewing. They can also be used in the Preview display to display the next Recorded cue, Submaster, Group or Effect. In addition, they will also move the Device Screen left or right to reveal more attributes for a selected device.

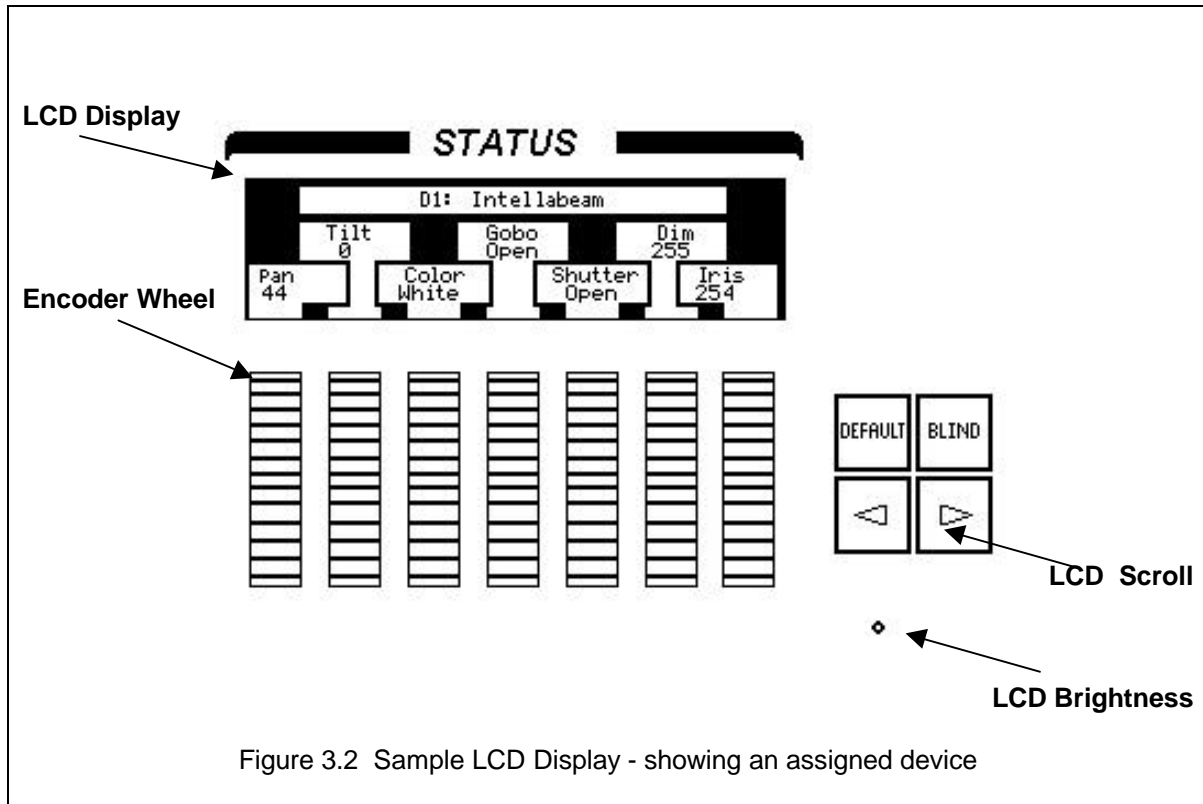
Figure 3.1 - Arrow Keys

---

## The LCD Display (a live or blind display)

---

In addition to the video displays there is also one dedicated LCD display. The LCD display has 7 encoder wheels that are used to change the settings of the traits for automated devices. The LCD display can be accessed while in any video display except Setup. Access the display by pressing [DEVICE] [#] [ENTER]. The screen will now display the traits of the selected device and the encoder wheels will adjust the settings. To view additional traits, the left and right arrow buttons to the right of the encoder wheels are used.





## The Stage Display (a live display)

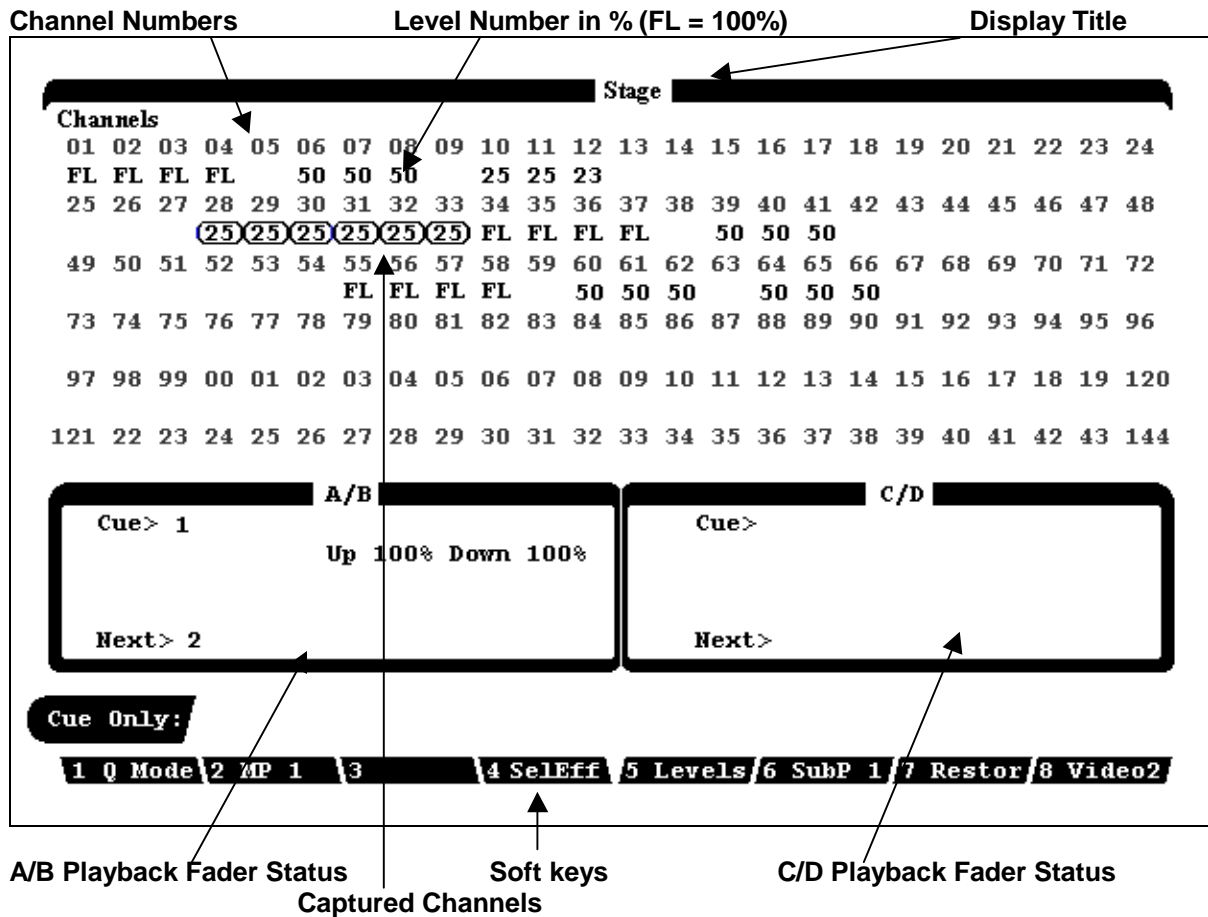


Figure 3.3 Sample Stage Display

**Purpose of the Stage Display:** The Stage Display is a representation of the current lighting levels being output live on stage to the dimmer rack. Changes made to the levels directly affect the lights on stage, so you can see what the changes look like. Changes to light levels are monitored and updated instantly on the Stage Display as the changes are made. A Record command takes a "snapshot" of all channel levels that appear in the Stage Display. The Stage Display also indicates the status of any fading cues.

**Live Channels "on Stage":** In the main area of the display are the channel numbers and their levels as seen "live on stage". The level number of each channel is located below its respective channel number. The lack of a level number indicates a level of zero.

The levels appear in different colors according to the following code:

- 
- Red** = **Higher level** in current cue than last executed cue
  - Blue** = **Lower level** in current cue than last executed cue
  - White** = **Same level** as last executed cue and not tracking.
  - Gray** = **Tracking same level** as last executed cue.
- or - = **Channel fader** controls the level directly.
- or - = **Channel control was released** from keypad or wheel control.
- Yellow** = **Effect** controls the channel.
  - Green** = **Submaster** controls the channel.
  - Amber** = **Wheel controls** the channel level directly

**Playback Fader Boxes:** The two Playback Fader Boxes A/B, C/D are located above the Command line on the Stage Display screen. The Playback Fader Boxes indicate the current status of any cues actively fading, or any running cue effects. When a cue is executed by pressing the [GO] button after using the [LOAD] [#] keys, it is automatically loaded onto the fader from which the [LOAD] key was selected.

The Playback Fader Boxes contain the following information:

- Cue:** shows the number of the current displayed cue.
- Next:** shows the number of the next cue to execute when the [GO] button is pressed.
- Up ##%:** indicates the up fade percent complete of a cue.
- Down ##%:** indicates the down fade percent complete of a cue.
- Delay ##%:** will appear in the position that is normally occupied by the "Down" on the playback fader. ("DELAY" appears when the fade is in the process of counting down its delay time.) When the delay is complete, the "Down" time will appear and progress.
- Follow ##%:** indicates the percent complete of the time before the next cue will automatically follow the current fade



**NOTE:** *For manual cues, the word "MANUAL" appears on the Cue Sheet and Playback Displays for cues with no pre-recorded fade times.*

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

**Q Mode:** The current Q mode (Tracking, Cue Only, or Clean Up) is shown at the far left of the Command Line. Refer to Chapter 10 for explanation of the use of Q modes for channel tracking.

**Soft Key Labels:** The soft key labels are located directly below the Command Line in all displays. The soft key labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, [S1] - [S8], on the console. The functions of the soft keys change for each display.

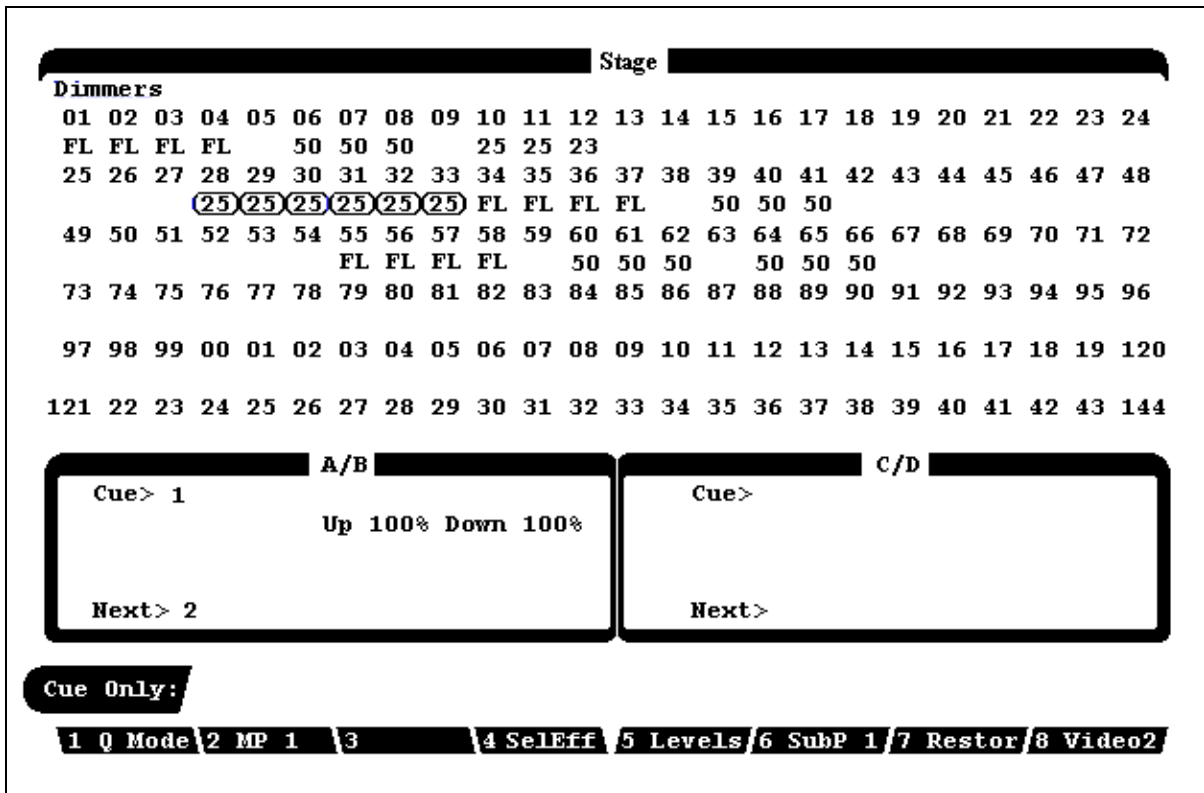


Figure 3.4 - Stage Dimmer Output Display

Pressing the [S5] soft key toggles the stage display showing instead of channels the actual dimmer output levels. Individual dimmers can be given levels that will hold until cleared. This is especially useful for setting minimum levels that are not recorded or doing a fast dimmer check.

## The Effect Display (a Sub Display of STAGE and PREVIEW)

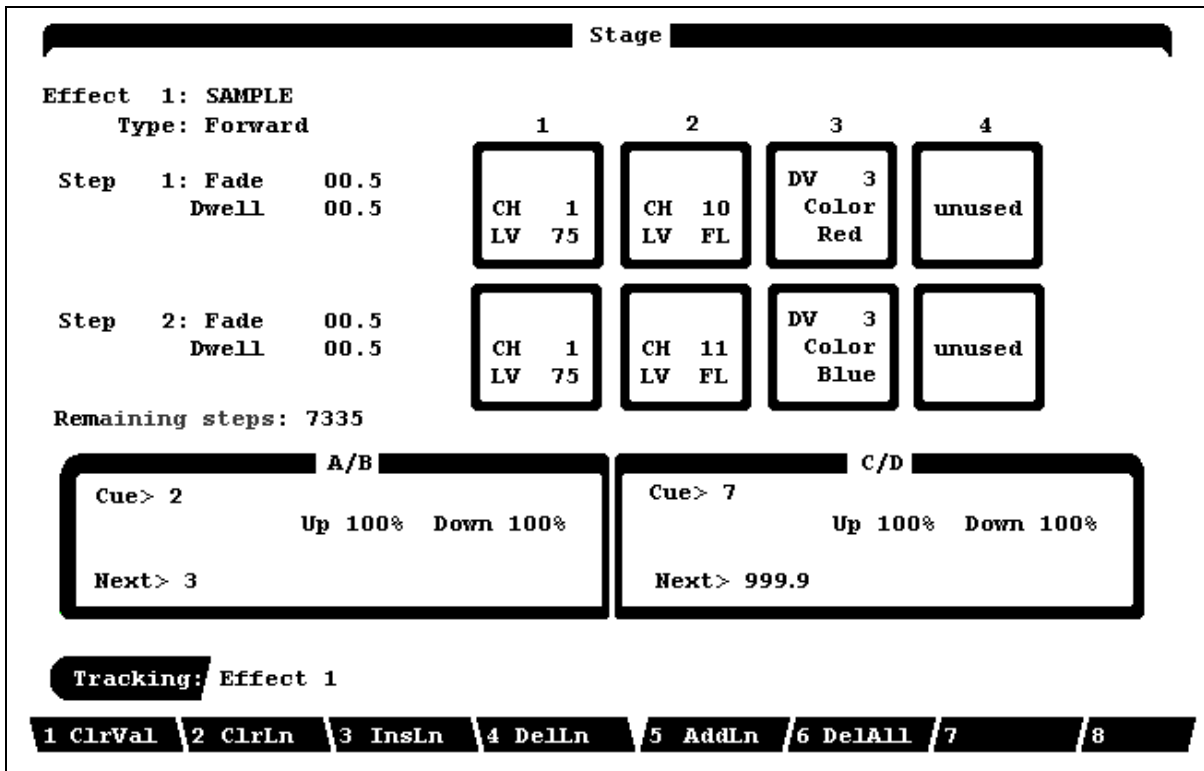


Figure 3.5 Effect Display

**Purpose of the Effect Display:** The Effect Display creates, edits, and tests effects. The Effect Display shows a list of all channels used in each step of the effect, as well as the timing and level information.

**Contents of the Effect Display:** The main part of the Effect Display consists of columns of information about the current effect as follows:

- Effect number and or name** Lists the number and the name (if assigned) for the effect.
- Type** Shows the type of effect from the following choices:
  - Forward
  - Reverse
  - Random
  - Bounce
- Fade Time** shows the fade time for each step. *Valid values are 00.0 through 9:59.9*
- Dwell Time** shows the length of time each step is active. *Valid values are 00.0 through 9:59.9*
- Step** shows the step numbers (up to 99) of an effect. When an effect is executed, each step executes one after another. After the last step, the sequence repeats again from first to last, for as long as the effect continues to run.
- Elements List** shows the Channels, traits (for Automated Devices), groups, cues, and Submasters assigned to each step.

- 
- **Remaining steps** shows the remaining available number of effect steps based on current configuration. System maximum for all effects combined is 9,999 steps.



**HINT:** *Use the Up/Down and Left/Right arrow keys to move from around the Effect Display.*

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft-keys change for each display.

## The Preview Display (a blind display)

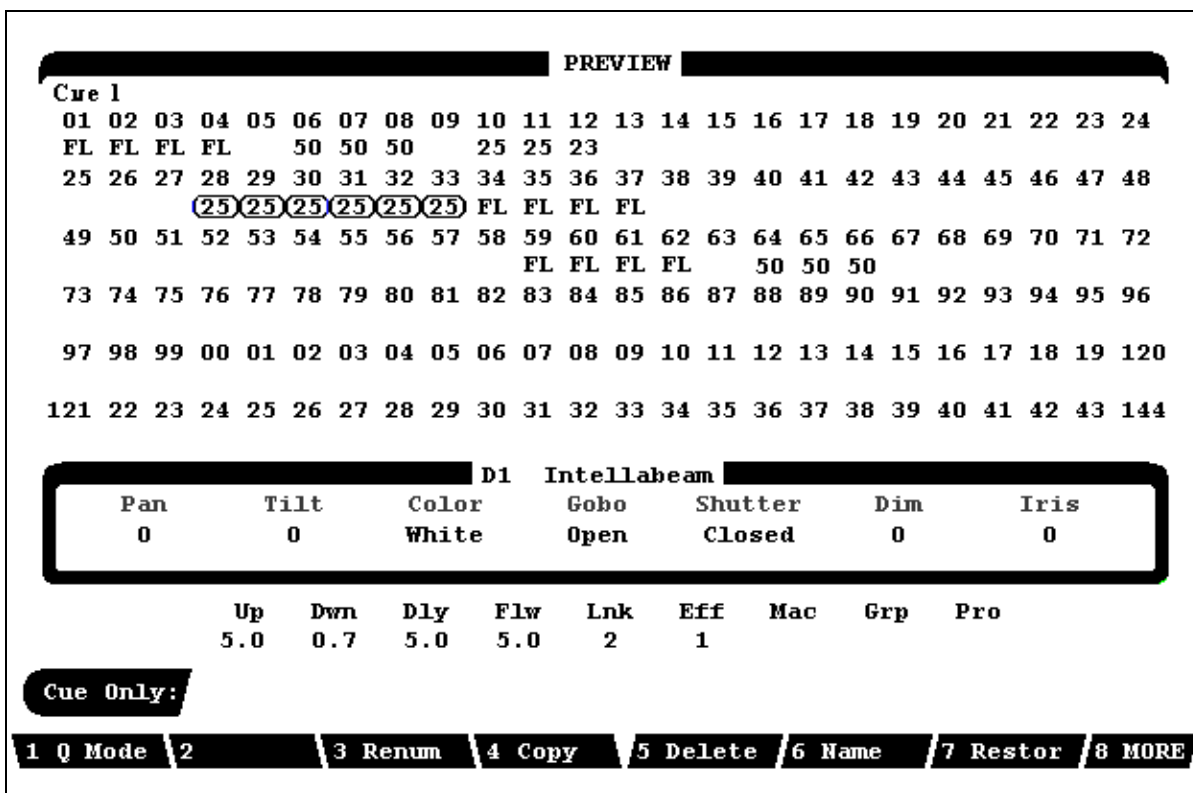


Figure 3.6 Preview Display - Cue Selected

**Purpose of the Preview Display:** The Preview display shows the recorded channel levels of a cue, Group, or Submaster. Each may be created and edited in the Preview display. This is referred to as working in the "blind," because none of the channel levels shown in this display can be seen as light output on the stage while in the Preview display. Any edits to channel levels or cue attributes are **automatically recorded** as they are entered (the Record Cue command is not necessary to create or edit cues in the Preview display).

**Contents of the Preview Display:** The Preview display normally shows the channel levels of any selected cue, Submaster, or group. The upper part of the display shows channels and their respective levels. The channel numbers are located above the levels. The channels and level rows display channels and their respective levels. The numbers below each channel number is the level of that channel in the cue being previewed. If no level is listed, the level is zero. The levels are shown in different colors according to the code described below:

- Red** = **Higher** level than the previous cue.
- Blue** = **Lower** level than the previous cue.
- White** = **Non-tracking** (or "hard" level), same level as last cue.
- Gray** = **Tracking** (or "soft" level), same level as last cue.

---

**Automated Device Box:** The middle area of the display is the Automated Device Display where the current settings for any selected Moving Light or Automated Device can be displayed.

**Fade Parameters Line:** Below the Automated Device box is the list of current fade parameters as they are set for the a given cue or Submaster. The following items are listed:

- |  |  |
|--|--|
| <input type="checkbox"/> <b>Up</b> = assigned UP fade time         | <input type="checkbox"/> <b>Eff</b> = assigned EFFECT executed     |
| <input type="checkbox"/> <b>Dwn</b> = assigned DOWN fade time      | <input type="checkbox"/> <b>Mac</b> = assigned MACRO executed      |
| <input type="checkbox"/> <b>Dly</b> = assigned DELAY or DWELL time | <input type="checkbox"/> <b>Grp</b> = assigned GROUP               |
| <input type="checkbox"/> <b>Flw</b> = assigned FOLLOW time         | <input type="checkbox"/> <b>Pro</b> = assigned custom fade PROFILE |
| <input type="checkbox"/> <b>Lnk</b> = assigned LINK (cue only)     |  |

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft keys change for each display.

---

## The Group Display (a Sub Display of Preview)

---

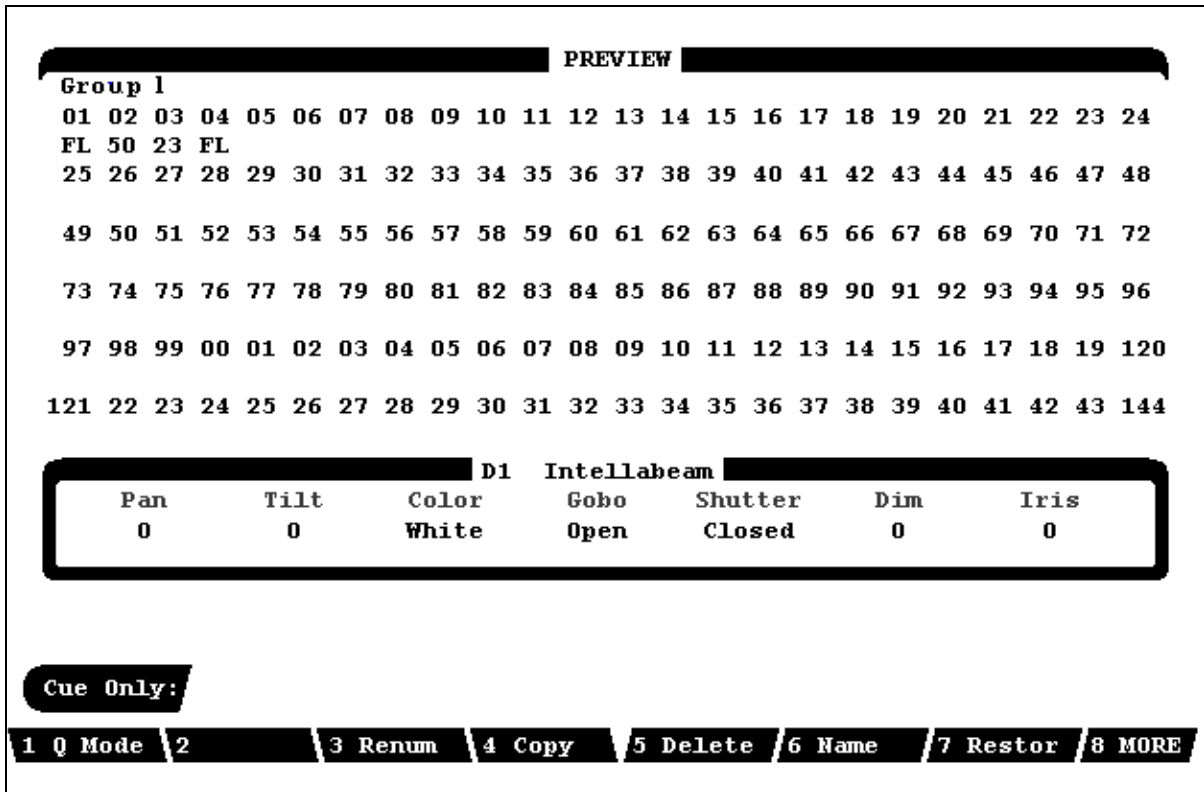


Figure 3.7 Preview Display - Group Selected

**Accessing the Group Display:** Pressing (SELGRP) which is the [S3] soft key followed by the desired number of the group will access the group display. A sub menu of soft keys will appear.

**Purpose of the Group Display:** The Group display shows the channel levels assigned to all existing groups. A group is a collection of channels set at levels that may be created or edited in this display. A group is just like a Submaster but without the slider control. Groups are "building blocks" used to create cues, effects or Submasters. All edits to channel levels are recorded as they are made (the Record Group command is not necessary to create or edit groups while in the Group display).

**Contents of the Group Display:** The Group display shows the channel levels of any recorded Group. The upper right part of the display shows the group number. Levels that are assigned to a group are shown in Aqua.

**Automated Device Box:** The middle area of the display is the Automated Device Display where the current settings for any selected Moving Light or Automated Device can be displayed.



---

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft-keys change for each display.

## The Submaster Display (a Sub Display of Preview)

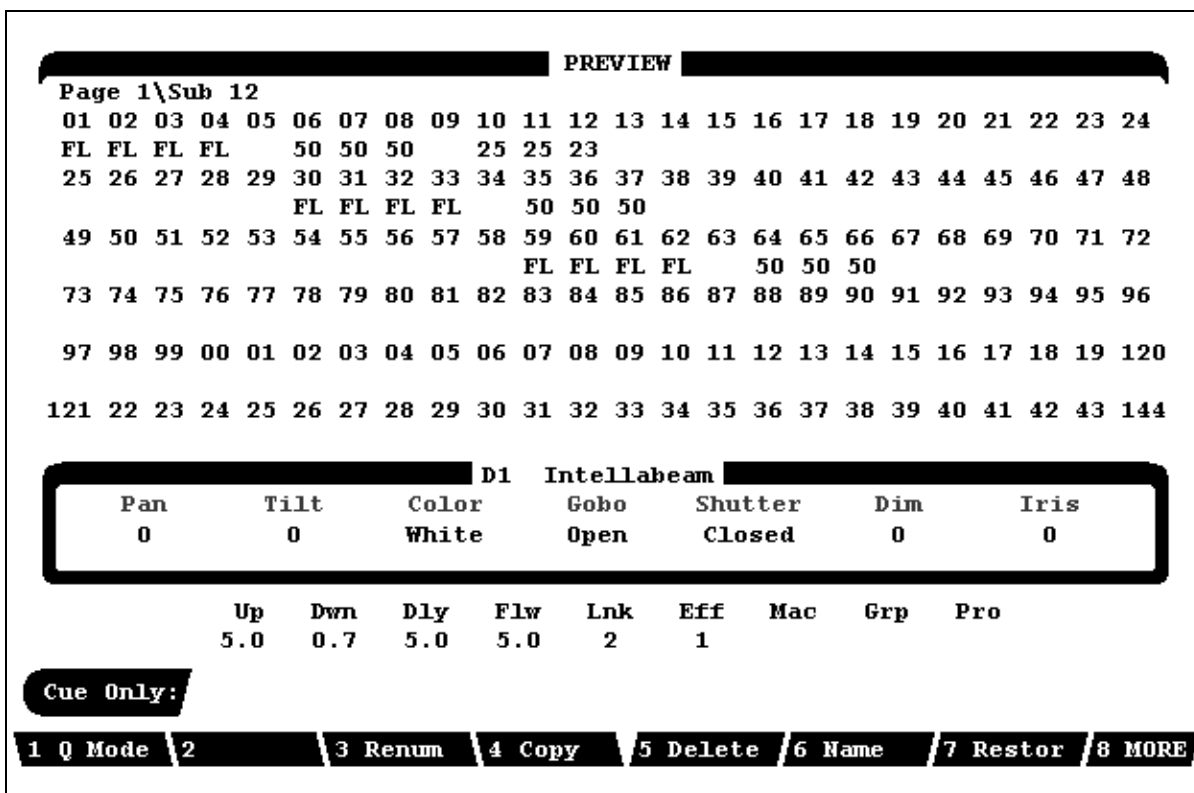


Figure 3.8 Preview Display - Submaster Selected

**Accessing the Submaster Display:** Pressing (SELSUB) which is the [S4] key, then the number of the Submaster will access the Submaster Sub Display. A sub menu of soft keys will appear.

**Purpose of the Submaster Display:** The Submaster display shows the channel levels assigned to each Submaster. The Submaster display can be used to create and edit Submasters. Any edits to channel levels or Submaster attributes in the Submaster display are recorded as they are entered (the Record Sub command is not necessary to create or edit subs in the Submaster display). There are two different types of Submasters:

**Contents of the Submaster Display:** The upper left part of the Submaster display contains the Submaster number, and the Submaster page number. There is a maximum of eight Submaster pages. The upper right contains the name. The channels and level rows display channels and their respective levels. The numbers below each channel number is the level of each channel. If no level is listed, the level is zero.

**Automated Device Box:** The middle area of the display is the Automated Device Display where the current settings for any selected Moving Light or Automated Device can be displayed.

---

**Fade Parameters Line:** Below the Automated Device box is the list of current fade parameters as they are set for current Submaster. The following items are listed:

- |  |  |
|--|--|
| <input type="checkbox"/> <b>Up</b> = assigned UP fade time         | <input type="checkbox"/> <b>Eff</b> = assigned EFFECT executed     |
| <input type="checkbox"/> <b>Dwn</b> = assigned DOWN fade time      | <input type="checkbox"/> <b>Mac</b> = assigned MACRO executed      |
| <input type="checkbox"/> <b>Dly</b> = assigned DELAY or DWELL time | <input type="checkbox"/> <b>Grp</b> = assigned GROUP               |
| <input type="checkbox"/> <b>Flw</b> = assigned FOLLOW time         | <input type="checkbox"/> <b>Pro</b> = assigned custom fade PROFILE |
| <input type="checkbox"/> <b>Lnk</b> = assigned LINK (cue only)     |  |



**NOTE:** *Level III of the soft keys allow individual Submaster bump button to be set to "ON/OFF" toggle mode. When set this way, the word "Tog" appears under the Dly parameter.*

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft-keys change for each display.

---

## The Device Display (a live display)

---

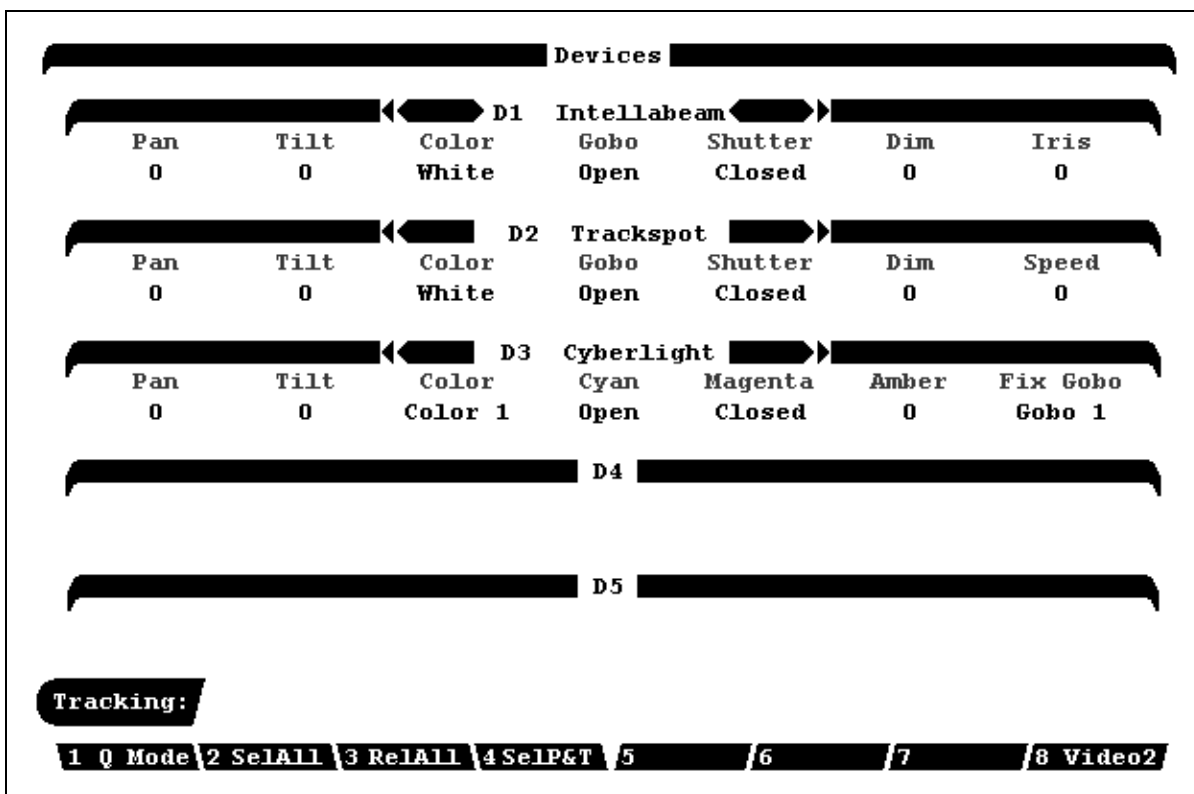


Figure 3.9 Device Display

**Purpose of the Device Display:** The purpose of the Device Display is to display the list of devices being used and the current setting of the traits of the devices. Changes may be made to the device settings by use of one of the seven encoder wheels located under the “STATUS” LCD display on the surface of the console.

**Live Devices “on Stage”:** In the main area of the Device display are the device numbers and their settings as seen “live on stage”.

**Contents of the Device Display:** Up to 5 devices are displayed at one time. Below the title bar of each of the individual device are listed up to seven traits. Immediately below each trait the current position or setting of the trait is displayed. In the case of a device whose traits exceed the seven displayed, additional traits may be viewed by using the trackball to move the cursor (it may be necessary to press clear to gain control of the cursor) to the portion of the title bar of the individual device, which is away from the amber arrow. Depending on the side of the title bar the cursor is on, each press of the [CHANGE] button will move the display to the right or the left, one attribute at a time. The left and right arrow keys will also move the selected device attribute to the right or left one attribute at a time.

---

**Device Display Paging Rules:** The rules for paging through the Device display are as follows:

Up and Down Arrow keys [-] and [^] scroll through the device list one device at a time.

- or -

Press [DEVICE] [#] [ENTER]

Left and Right Arrow keys [←] and [→] scroll horizontally for devices with more than seven traits.

**Command Line and Command Line History:** Directly below the last device listed is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

**Q Mode:** The current Track mode (Tracking, Cue Only, or Clean Up) is shown at the far left of the Command Line.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft-keys change for each display.



**NOTE:** *When you press [CUE] [#] [ENTER], a new cue is created if the cue does not already exist.*

## The Cuesheet Display (a blind display)

Cue										
Cue	Up	Dwn	Dly	Flw	Lnk	Eff	Mac	Grp	Pro	Name
1	5.0	1.0	5.0	5.0	3	1				PRESHOW
A/B 2	5.0	6.0								MUSIC
3	4.0	6.0								ACT1..SCENE1
4	5.0				999.9					DOOR
5	7.0	4.0								FIRST..DANCE
5.2	4.0	0.6	10.0							ACT1..SCENE2
C/D 7	Manual									WATCH..HERO
999.9	3.0									BLACKOUT

**Tracking:**

1 Q Mode	2 SelCue	3 Renum	4 Copy	5 Delete	6 Name	7	8 MORE
----------	----------	---------	--------	----------	--------	---	--------

Figure 3.10 - Cue Sheet Display

**Purpose of the Cuesheet Display:** The Cuesheet display is used to view the cue order and cue attributes. Cues may be Deleted, Copied, or Renumbered. Cue attributes may also be edited.

**Contents of the Cuesheet Display:** The main area of the Cuesheet display contains ten columns listing cue data and attributes. The information in each column is described below:

- |  |  |
|--|--|
| <input type="checkbox"/> <b>Up</b> = assigned UP fade time         | <input type="checkbox"/> <b>Eff</b> = assigned EFFECT executed     |
| <input type="checkbox"/> <b>Dwn</b> = assigned DOWN fade time      | <input type="checkbox"/> <b>Mac</b> = assigned MACRO executed      |
| <input type="checkbox"/> <b>Dly</b> = assigned DELAY or DWELL time | <input type="checkbox"/> <b>Grp</b> = assigned GROUP               |
| <input type="checkbox"/> <b>Flw</b> = assigned FOLLOW time         | <input type="checkbox"/> <b>Pro</b> = assigned custom fade PROFILE |
| <input type="checkbox"/> <b>Lnk</b> = assigned LINK (cue only)     |  |



**NOTE:** An A/B or a C/D (depending on the fader used) will appear ahead of the number of the current stage cue (last cue to be executed).

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

---

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft-keys change for each display.

**Cuesheet Display Paging Rules:** The rules for paging through the Cuesheet display are as follows:

Up and Down Arrow keys ([↑] and [↓]) scroll through the cue list one cue at a time.

- or -

Press [CUE] [#] [ENTER]

## The Tracksheet Display (a blind display)

		Track																																					
		< <<																		>> >																			
Chan		00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
1		00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
2																																							
3																																							
4		FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	FL	
5		00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
5.2		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
7		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
8		50	50	50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
999.9		00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	

Tracking:

1 Q Mode 2 SelCue 3 Renum 4 Copy 5 Delete 6 Device 7 Restor 8 MORE

Figure 3.11 - Track Sheet Display

**Purpose of the Tracksheet Display:** The Tracksheet display is a spreadsheet that shows all channel levels of all cues, side by side, so that channel levels of cues may be compared. In the Tracksheet display, all edits are recorded as you make them. Cues may be created or edited in this display. Cue attributes may also be added or edited in the Tracksheet display, although they are not shown.

**Contents of the Tracksheet Display:** The top row of the display lists the channels currently selected for viewing. The cue and any part number appear in the far left column of this display, with the channel levels in the cue shown in the same row. When a cue is currently selected for editing, its cue number will appear in white.

Below each channel number is a column of levels, representing the level of that channel in each cue (if no level is visible, then the level is zero). Non-tracking (hard) levels are shown in white. Tracking (soft) levels are shown in gray. If the track mode is Clean Up, then all hard zeros disappear, and all levels appear white. If the track mode is Cue Only or Tracking then the channels levels are shown in the following two colors:

- White = Hard (non tracking) levels
- Gray = Soft (tracking) levels

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.



---

**Track Mode:** The current Track mode (Cue Only, Tracking, or Clean Up) appears at the far left of the Command Line.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft-keys change for each display.

**Tracksheet Display Paging Rules:** The rules for paging through the Tracksheet display are as follows:

1. To scroll the list of cues up or down one line at a time, press the Up and Down Arrow keys.  
- or -  
Press [CUE] [#] [ENTER].
2. To show a different range of channels across the top of the display, press the Left and Right Arrow keys.



**NOTE:** *When you press [CUE] [#] [ENTER], a new cue is created if the cue does not already exist.*



**HINT:** *If you enter a channel number in the currently selected edit cue, the display will automatically page to the channel location in the Tracksheet display.*

## The Playback Display (a live display)

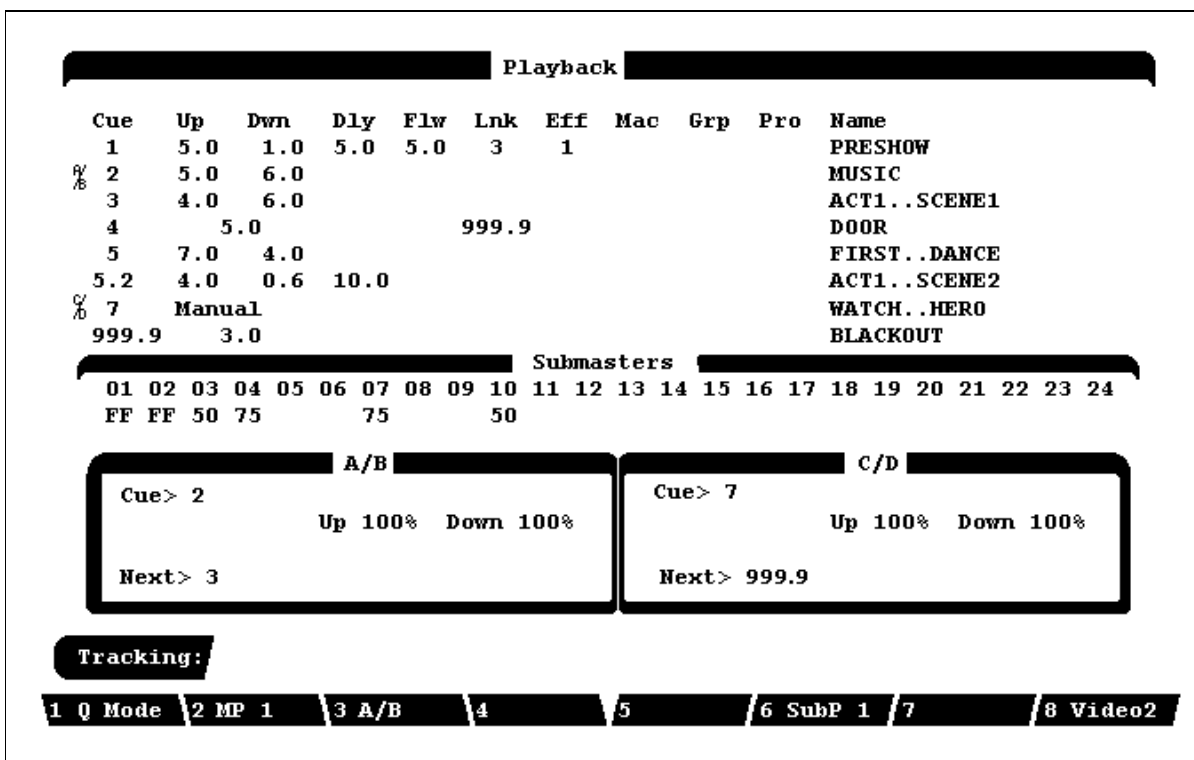


Figure 3.12 - Playback Display

**Purpose of the Playback Display:** The Playback Display is used to view the current status of any running cues and active Submasters. The Playback Display shows current and upcoming cue numbers, while the Stage Display shows the channel levels of fading cues.

**Contents of the Cuesheet Area:** The upper area of the Playback Display is the Cuesheet Area, which consists of ten columns listing each cue and its attributes. This information is identical to the Cuesheet display, except that in the Playback Display:

- An A/B or a C/D (depending upon the fader being used) will automatically appear beside the current stage cue of the Cuesheet Area.
- You can select and modify cues, as in the Cuesheet display.

**Submaster Fader Window:** The Submaster Fader numbers are listed sequentially in a row, below the Cuesheet area. Below the Submaster Fader numbers are their current level readings. If no level is present, the Submaster fader is all the way down at zero.

---

The Submaster Fader **numbers** are shown in different colors according to the following code:

- Gray** = **Normal** (pile-on) Submaster
- Yellow** = **Effect** loaded on Submaster
- Amber Reverse** = Submaster page has changed, the Submaster will "re-load" when it next is moved to zero.

**Playback Fader Boxes:** The two Playback Fader Boxes A/B, C/D are located above the Command line on the Stage Display screen. The Playback Fader Boxes indicate the current status of any cues actively fading, or any running cue effects. When a cue is executed by pressing the **[GO]** button after using the **[LOAD] [#]** keys, it is automatically loaded onto the fader from which the **[LOAD]** key was selected. The Playback Fader Boxes work exactly the same as in the Stage Display. (See the Stage Display section, earlier in this chapter.)

**Grandmaster Fader Indicator:** In the upper right of the Playback Display is the Grandmaster Fader Box. It indicates the level of the Grandmaster, anytime it is below full.

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

**Q Mode:** The current tracking mode (Cue Only, Tracking, or Clean Up) appears at the far left of the Command Line.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, **(S1) - (S8)**, on the console. The functions of the soft-keys change for each display.

**Playback Display Paging Rules:** The rules for paging through the Playback Display are as follows:

To scroll the list of **Cues** up or down **one line** at a time, press the Up and Down Arrow keys.

## The Patch Display (a blind display)

		Patch																	
		< <<						>> >											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1a	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2a	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3a	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4a	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5a	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6a	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	.
7a	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	.
8a	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	.
9a	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	.
10a	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	.
11a	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	.
12a	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	.
13a	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	.
14a	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	.
15a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	.
16a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	.
17a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	.
18a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	.

**Cue Only:**

1 Port A	2 Linear	3 Compr	4 Levels	5 Check	6 1 to 1	7 Clear	8 Video2
----------	----------	---------	----------	---------	----------	---------	----------

Figure 3.13 - Patch Display

**Purpose of the Patch Display:** The Patch Display shows and allows editing of channel-to-dimmer assignments. One channel can control any number of dimmers. However a dimmer may only be assigned to one stage channel.

**Contents of the Patch Display:** The Patch Display consists of 3 tables, one for each of the three DMX outputs. The outputs (dimmer or automated device control) are shown on the left side of the display. The channels are listed at the top of the display. The current proportional level, or % level of the dimmer is shown in a matrix corresponding to the intersection of the channel column and output row on the matrix.

**Patching Automated Devices:** Automated Devices are assigned DMX output addresses in the Setup Display. See Setup Display for details



**NOTE:** When a dimmer number in the left column is RED that means it is part of the address range of an automated device.

**Command Line / Command Line History:** Directly below the Fader Box is the Command Line. The Command Line shows the command currently being entered. If the Command Line is gray, this indicates the Command Line History, which shows the last command executed.

**Track Mode:** The current Track mode (Cue Only, Tracking, or Clean Up) is shown at the far left of the Command Line.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft-keys change for each display.

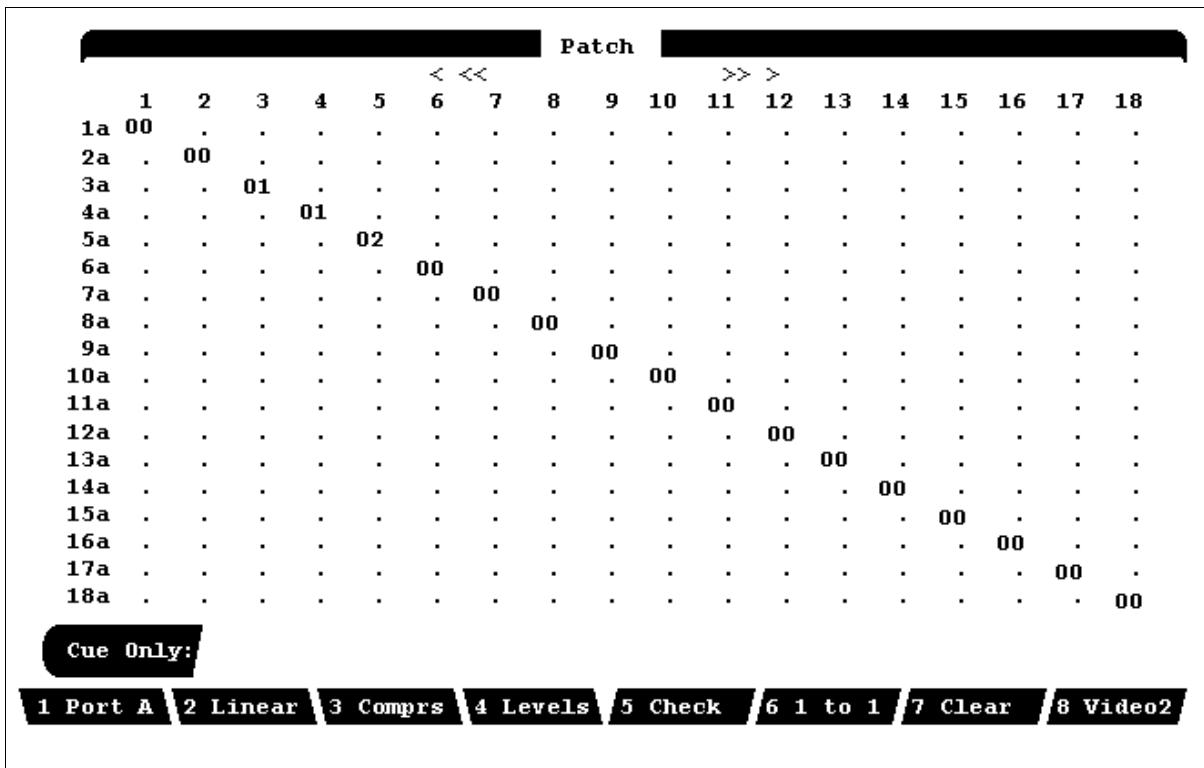
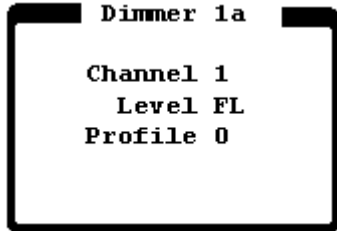


Figure 3.14 - Patch Display - Profile Assignments

Pressing the [S4] soft key, (**LEVELS**) changes the Patch Display to show the fade profile assigned to each dimmer. The standard default profile is "00" for regular incandescent and quartz lights. Up to 15 custom Profiles may be create to accommodate special lighting sources such as neon, cold cathode and fluorescent lights as well as being able to create Non-Dim effects.

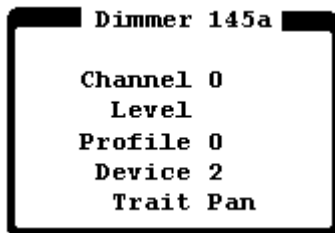
---

**Dimmer Check Pop-up:** The MC 24/48 provides the ability to look at the setting of any individual dimmer without scrolling through the Patch Display. To view the Patch assignment of a dimmer, press the [DIMMER] key followed by the dimmer number and [ENTER]. When [ENTER] is pressed one of the following pop-ups will appear.



If the selected dimmer is a stage dimmer/channel assignment the pop-up will look like Figure 3.15 showing the Dimmer Number, Output Port, the assigned Stage Channel, and the Proportional Level.

Figure 3.15 Dimmer Check Pop-up #1



If the selected dimmer is assigned to an Automated Lighting Device dimmer/channel assignment the pop-up will look like Figure 3.16 showing the Dimmer Number, Output Port, the assigned Stage Channel (if any), the Proportional Level (if any), the Device Channel number, and the assigned Device trait.

Figure 3.16 Dimmer Check Pop-up #2

---

## The Setup Display (a blind configuration display)

---

```

      Setup

      System Release 1.00
      Boot Release 0.13

1. Show name:
2. File name:
Unused cues/groups/subs :1053
  Number of dimmers
3.          port 1 : 512
4.          port 2 : 48
5.          port 3 : 48
6. Playback cue rows : 5
7. Number of channels : 144
8. Number of subms pages: 1
9. Number of macros : 1
10. Number of efx steps :7398
11. Number of groups : 10
12. Worklight level : 50

      Dimmer protocol
13.          port 1 : DMX 512
14.          port 2 : DMX 512
15.          port 3 : DMX 512
16. Printer type : HP Laser
17. MIDI control : Device#0
18. Reference by name : Off
19. Channel Bump Toggle : Off
20. Net Remote : Off
21. TwoScene/SingleScene : Single
22. Second Video : Off

Number:

1 System 2 Print 3 Display 4 Disk 5 Macro 6 Device 7 Profil 8 MORE
```

Figure 3.17 Setup Display

**Purpose of the Setup Display:** The Setup Display is used to customize show parameters to suit your specific needs. Most editable parameters shown in the Setup Display are edited by selecting the number of the item in display then pressing the enter button. Other parameters may be edited by selecting the appropriate soft-key, such as Macros, Devices, or Profiles. The Setup Display shows all the current setup parameters for a show. Printing and Disk functions are also performed in the Setup Display.

**Contents of the Setup Display:** Your MC 24/48 software version numbers are shown at the top of the Setup Display. Below this are the Show Name and File Name of the currently loaded show. The information fields in the Setup Display are summarized in *Chapter 4: Console System Setup*.

---

## Macro Sub Display (a Sub Display of Setup)

---

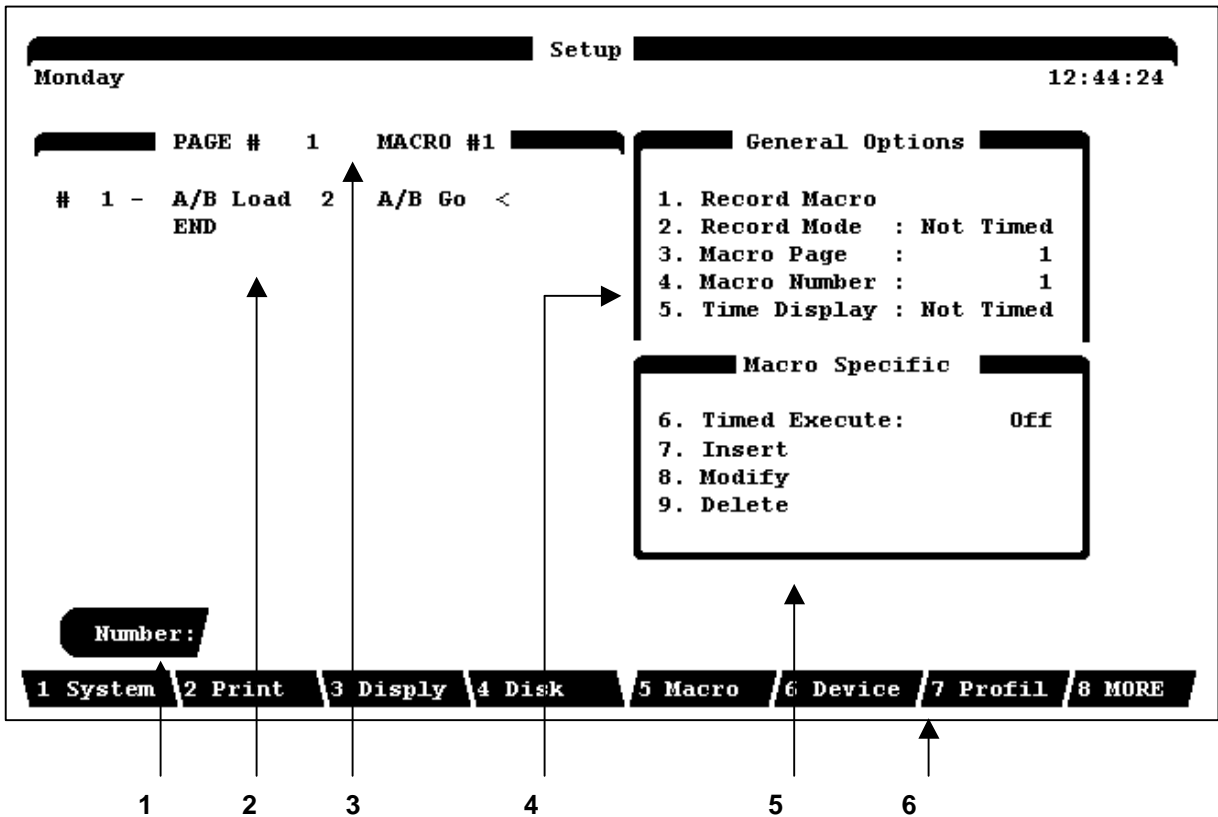


Figure 3.18 Macro Display

**Purpose of the Macro Sub Display:** Macros are recorded, configured and edited in this Sub Display which is available under the (Macro) or [S5] soft key. A Macro is a recorded sequence of keystrokes meant to serve as a time saving technique for executing a repeated 24/48 of commands.

**Contents of the Macro Sub Display:** There are six key parts to the Macro Sub Display. They are:

1. Command Line
2. Current Macro as recorded showing the step number at the beginning of the line followed by the recorded keystrokes.
3. Current Macro being edited. Each page contains 8 macros and the active the current page of Macros are assigned to the [M1] through [M8] buttons respectively.
4. General Macro Options, menu items 1 to 4 for creation of a Macro.
5. Macro Specific options, menu items 6 to 9 for editing the current Macro.
6. Setup Display Soft Keys.



---

## Device Sub Display (a Sub Display of Setup)

---

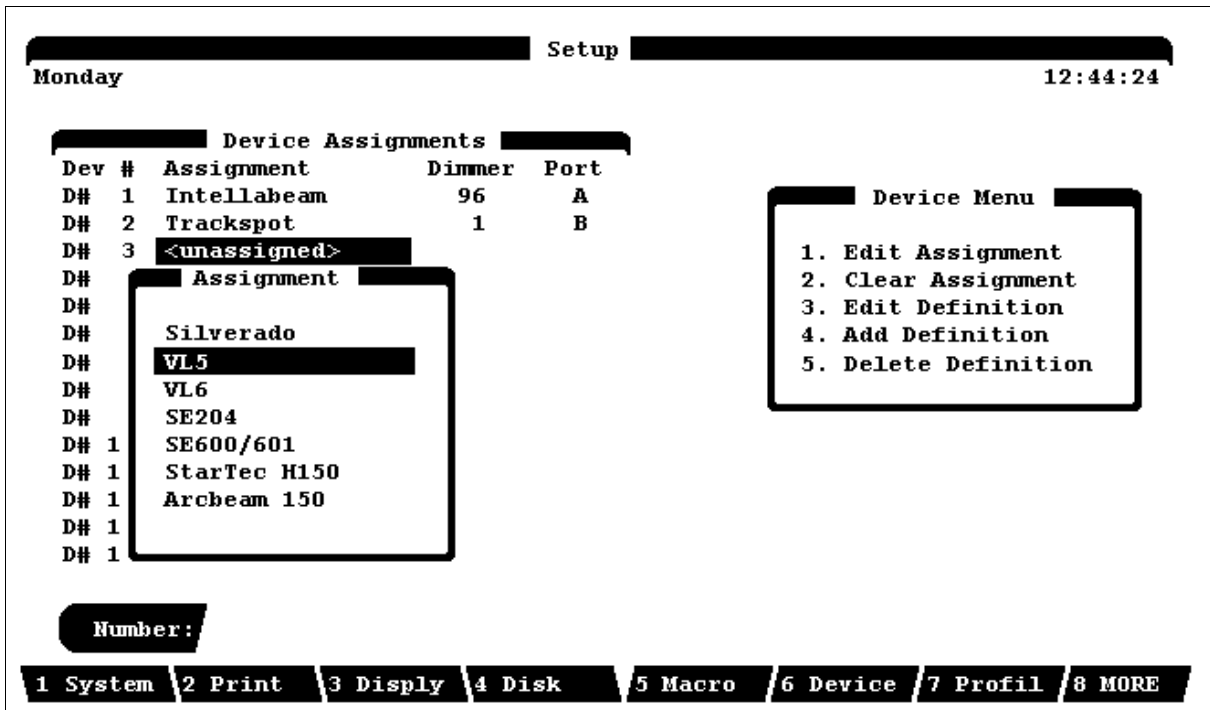


Figure 3.19 Device Assignment Display

**Purpose of Device Sub Display:** Automated devices are configured in this display. Device start positions as well as selection of one of the available three DMX outputs is selected in this Sub Display. The Device Sub Display is available under the (DEVICE) soft key in the Setup Display. Refer to *Chapter 18: Moving Lights* for details on the use of this display.



---

## Real Time Event Display (a Sub Display of Setup)

---

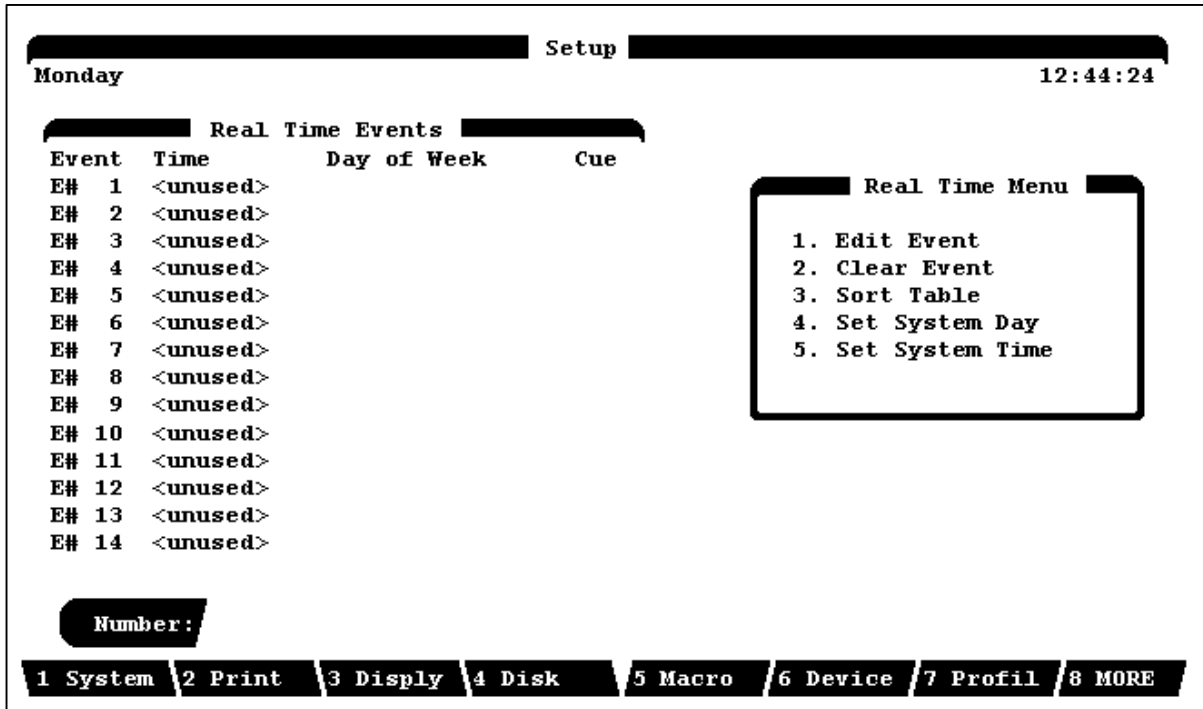


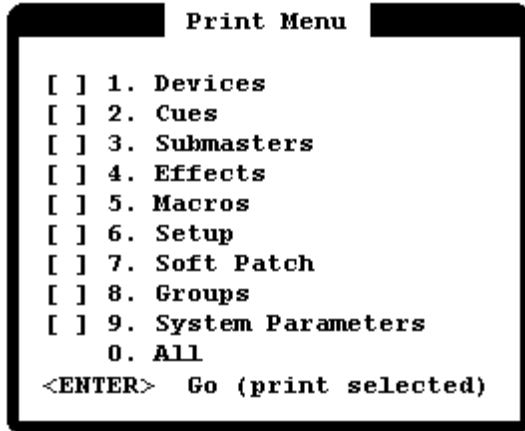
Figure 3.21 Real Time Event Display

**Purpose of the Real Time Event Display:** The MC 24/48 allows cues to be executed based on a real time clock. This display is used to set the system clock and make assignments of cues to day and time for execution.

**Soft Key Labels:** The Soft Key Labels are located directly below the Command Line. The Soft Key Labels describe the function of each soft-key. The function commands are executed by pressing one of the soft-keys, (S1) - (S8), on the console. The functions of the soft-keys change for each display.

---

**Print Sub-Display:** When in the Setup Display, soft key [S2] is labeled "Print". When pressed the following menu will pop up. Provided the user has a properly configured printer connected to the console. The user may print out the information stored in the unit for archive and or back up purposes.



The user may enter any or all digits from [1] through [9] to select the printing of individual elements of show data.

Pressing [0] will select to print everything.

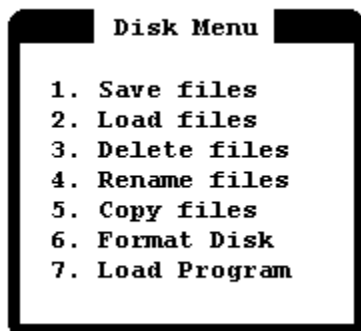
After making desired selection(s) press the [ENTER] key to begin printing.

Figure 3.22 - Print Menu

**Disk Sub-Display:** When in the set-up display, soft-key [S4] is labeled "Disk". When pressed, the following menu will pop up. Be sure to have a 3.5" Double Sided High Density Floppy Diskette handy for this process.



**NOTE:** *This is the same type of floppy diskette used by standard PC Computers. Commonly referred to as a 3.5" 1.44 meg floppy disk.*



- 1 = Save currently loaded show to the floppy disk.
- 2 = Load file already saved on disk into MC 24/48.
- 3 = Delete existing file saved on disk.
- 4 = Change the name of a file already on the floppy disk.
- 5 = Copy an existing file and give copy a new name.
- 6 = Initialize a floppy disk for first time use.
- 7 = Re-read the existing operating system from a back-up diskette or load a new updated system software.

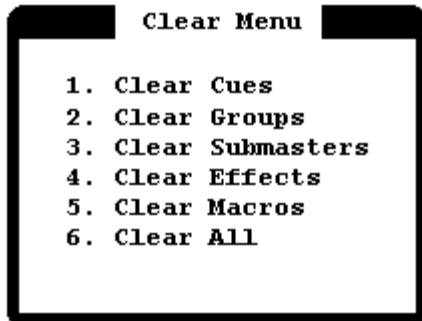
Figure 3.23 Disk Menu

---

**Clear Sub-Display:** When in the set-up display, soft-key [S8] is labeled "MORE". When pressed, the second level of soft keys appears. Soft key [S2] is now labeled (**CLEAR**). Selecting this key will cause the following menu to pop up. The Clear Menu is used to clear some or all of the current contents of memory.



**CAUTION!** *When in doubt save contents of memory to disk before clearing. Once erased data is lost unless it has been stored on a diskette.*



- 1 = Clears all cues saved in memory.
- 2 = Clears all Group assignments saved in memory.
- 3 = Clears all Submaster assignments saved in memory.
- 4 = Clears all Effects saved in memory.
- 5 = Clears all Macros saved in memory.
- 6 = Clears all saved contents.

Pressing any number will cause a confirmation box to appear. Press [ENTER] to confirm or [CLEAR] to cancel action.

Figure 3.24 Clear Menu

---

---

## CHAPTER 4: Console System Setup

### Using the Setup Display

---

The Setup display gives you a way to configure the console to match your overall system. In the Setup display you can also change fundamental control settings, make key system assignments and execute printing and file management tasks. Each of the 22 menu items will be addressed in this section. Some menu items, along with the soft keys are explained in greater detail in later chapters.

- ❑ Modify display parameters  
(See Playback and Setup Display topics in Chapter 3, *Displays*.)
- ❑ Execute printing commands  
(See Chapter 12, *Utilities, Warnings, Printing, and Default Settings*.)
- ❑ Save, view, copy, delete, and retrieve show files from floppy disks  
(See Chapter 13, *Memory*.)
- ❑ Assign automated devices, and create and edit definitions  
(See Chapters 18 and 19, *Automated Lighting Devices and Programming Moving Lights*.)
- ❑ Create profiles and view profiles  
(See Chapter 16, *Profiles*.)
- ❑ Record macros, select the current Macro Page, and view macro contents  
(See Chapter 17, *Macros*.)

### System Setup

---

In the Setup Display, you can use the appropriate numbered item on the display to define the number of dimmers and channels used in a show, as well as enable or disable peripheral devices such as the Hand Held Remote or the MIDI interface. Setup assignments remain in memory even after the console is turned off and then turned back on again. When console memory is cleared, the System Setup assignments are reset to the factory defaults.



**ADVANCED TOPIC:** For more information about how Setup assignments are held in memory, see the System Settings in Memory topic in Chapter 13, *Memory*.

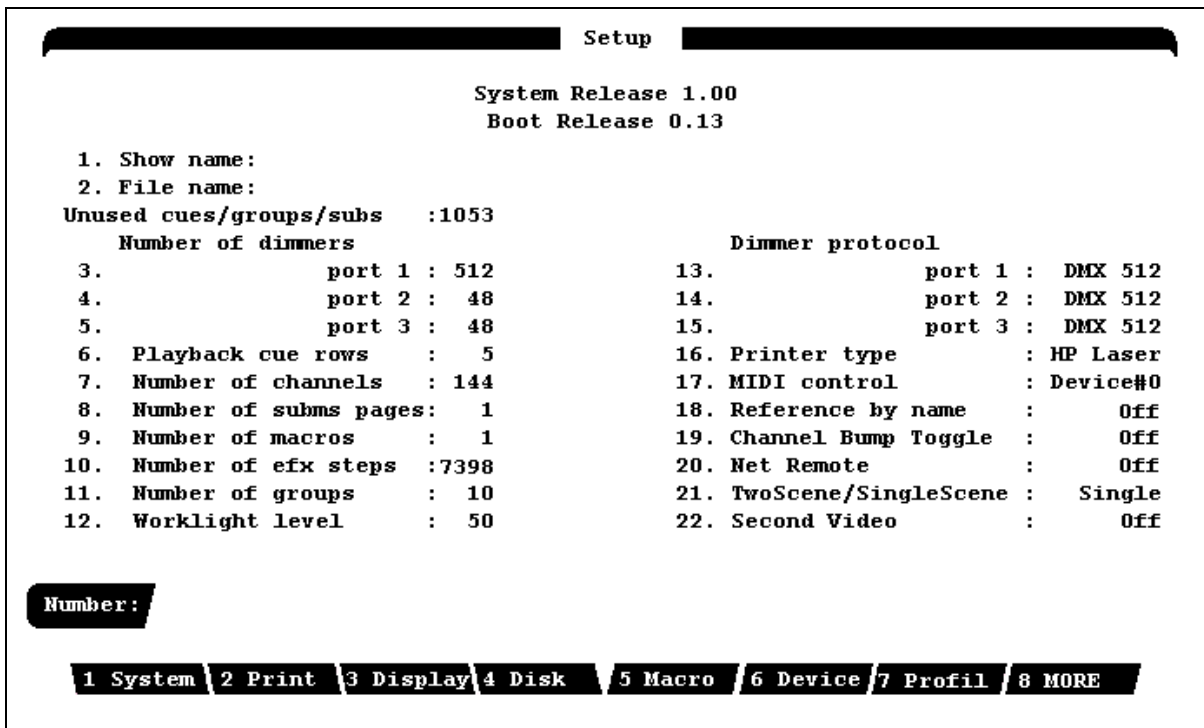


Figure 4.1 Sample Setup Display

## 1.Show Name

Setup menu item 1 provides a way to add an alphanumeric label to a show file. The Show Name is different than the show File Name. The Show Name only appears in the Setup display, and can only be viewed when the show is in active memory.



**EXAMPLE:** To assign a Show Name to a show in the Setup display:

1. Press [1] on the data keypad.
2. Using the Submaster bump buttons or an optional ASCII keyboard enter alphanumeric show name or any number from the channel keypad, press [ENTER].

## 2.File Name

Setup menu item 2 provides a way to specify a DOS style disk file name for the show in current memory. This name is different from that of the "Show Name" and must follow MS-DOS naming conventions of a maximum of 8 letters. These will appear as "xxxxxxx.INN" if the disk directory were viewed on a PC.





**EXAMPLE:** To assign a Show Name to a show in the Setup display:

1. Press [2] on the data keypad.
2. Using the Submaster bump buttons or an optional ASCII keyboard enter alphanumeric show name or any number from the channel keypad, press [ENTER].



**NOTE:** *The current release of MC 24/48 software does not allow for off-line editing of Show information.*

---

### 3. - 5. Number of Dimmers

---

The MC 24/48 control console is provided with 3 multiplexed dimmer data output ports. The maximum capacity of each port is 512 dimmers. The minimum number is 48.



**EXAMPLE:** To assign the quantity of dimmers addressed by each of the 3 data ports:

1. Press [3] [ENTER] *Selects port A.*
2. Press [#] [ENTER] *Enter number of dimmers on this port. Valid 48 to 512*
3. Repeat for menu items 4 and 5 to make assignment for port B and port C.



**NOTE:** *Refer to menu items 13 - 15 in this chapter for dimmer data protocol assignment.*

---

### 6. Number of Playback Cue Rows

---

This item reserve for future software feature.

---

### 7. Number of Channels

---

The maximum number of control channels on the MC 24/48 control console is 384. This number should not be confused with the number of manual channel faders. The valid number range for this menu item is 48 to 384 depending on the requirement of your show.



**EXAMPLE:** To assign the quantity of channels available for a given show:

1. Press [7] [ENTER] *Selects Number of Channels menu item.*
2. Press [#] [ENTER] *Enter number of channels. Valid 48 to 384.*



**EXAMPLE:** To set up a show with 200 channels:

1. Press [7] [ENTER]
2. [200] [ENTER]



**NOTE:** *The number of channels may be changed without clearing memory. If you reduce the number of channels or dimmers, and restore them later, the previous patch assignments will be remembered. If you increase the number of channels or dimmers in a show that was read **from disk**, but patch assignments will not be remembered. See Chapter 5, Setting Up The Soft Patch.*



**NOTE:** *Increasing the number of channels will affect the remaining number of Cues, Groups, Submasters, and Macros.*

## 8. Number of Submaster pages

The MC 24/48 control console is capable of holding up to 8 pages of Submaster assignments depending on the specific settings selected by the user. Each "page" can contain up to 24 Submaster assignments corresponding to the 24 Submaster sliders and their associated bump buttons. In the maximum configuration this would allow a total of 192 assignments.



**EXAMPLE:** To assign the quantity of Submaster pages for a given show:

1. Press **[8] [ENTER]** *selects Number of Submaster Pages menu item*
2. Press **[#] [ENTER]** *enter number of pages. Valid 1 to 8*



**NOTE:** *Increasing the number of Submaster pages will affect the remaining number of Cues, Groups, and Macros.*



**ADVANCED TOPICS:** Refer to *Chapter 7 Basic Submaster Operation and Chapter 14 Advanced Submaster Operation* for addition information on the operation of Submasters and Submaster pages.

## 9. Number of Macros

The MC 24/48 control console is capable of holding up to 1000 Macros. A Macro is a recorded sequence of commands that may be played back with the touch of one of the 8 Macro keys in the Display keypad.



**EXAMPLE:** To assign the quantity of macros available for a given show:

1. Press **[9] [ENTER]** *Selects Number of Macros menu item.*
2. Press **[#] [ENTER]** *Enter number of Macros. Valid 0 to 500\*  
\*depending on configuration*



**NOTE:** *Increasing the number of Macros will affect the remaining number of Cues, Groups, and Submaster pages.*



**ADVANCED TOPICS:** Refer to *Chapter 17 Macros* for addition information on the operation of and programming of Macros.

---

## 10. Number of Effect Steps

---

The MC 24/48 control console is capable of holding up to 600 recorded Effects. Individually and Effect can have up to 100 steps. The total number of steps for all Effects combined is 9,999. An Effect may be a simple sequential chase of channels or a complex 24/48 of Cues and groups.



**EXAMPLE:** To assign the quantity of Effects available for a given show:

1. Press [10] [ENTER] *Selects Number of Effects menu item.*
2. Press [#] [ENTER] *Enter number of Effects. Valid 0 to 9,999\*  
\*depending on configuration*



**NOTE:** *Increasing the number of Effects will affect the remaining number of Cues, Groups, and Submaster pages.*



**ADVANCED TOPICS:** Refer to *Chapter 15 Effects* for additional information on the operation of and programming of Effects.

---

## 11. Number of Groups

---

The MC 24/48 control console is capable of holding up to 500 Groups. A Group is a recorded sequence of channels and levels, similar to a cue but without timing information. The primary purpose for a group is fast recall of a series of related channels and their proportionate levels for easy setting of levels in the creation of cues.



**EXAMPLE:** To assign the quantity of groups available for a given show:

1. Press [11] [ENTER] *Selects Number of Groups menu item.*
2. Press [#] [ENTER] *Enter number of Groups. Valid 0 to 500\*  
\*depending on configuration*



**NOTE:** *Increasing the number of Groups will affect the remaining number of Cues, Macros, Effects, and Submaster pages.*



**ADVANCED TOPICS:** Refer to *Chapter 14 Groups* for additional information on the operation of and programming of groups.

---

## 12. Worklight Level

---

The MC 24/48 control console has 2 BNC connectors on the front panel for the optional gooseneck worklights. If this option was purchased, the number set here is the output level. This menu item is used to set the intensity level of the console worklights.



**EXAMPLE:** To assign an intensity level for the console worklights:

1. Press [12] [ENTER] *selects Worklight Level menu item*
2. Press [#] [ENTER] *enter the desired level. Valid 0 to 100*

---

## 13. - 15. Dimmer Protocol

---

The MC 24/48 control console can output DMX512 (USITT 1990 standard). Most new systems will utilize DMX. If your system is a retrofit to existing product, you may need a special "translator" or decoder.

The console remembers the dimmer protocol setting when you turn the console off, but not when you do a "hard clear" by holding the [CLEAR] key down while the console boots. Other conditions under which protocol may need to be reset include:

- When you update the console to new software.
- When the RAM battery is dead.



**EXAMPLE:** To assign a protocol for the dimmer output ports:

1. Press [13] [ENTER] *selects port A menu item*
2. Press [- ] or [ ] *using the up arrow or down arrow cursor keys select either DMX-512.*
3. [ENTER] *press to confirm selection.*



**NOTE:** *If you need to use a dimmer protocol other than DMX512 (such as AMX or analog control) there are a number of commercially available protocol converters. These can be rented or purchased from theatrical equipment suppliers or from NSI. For more information, call NSI at (800) 864-2502.*

---

## 16. Printer type

---

The MC 24/48 control console is capable of sending information to one of two types of printers. This feature will allow users to print show information to hard copy. The two printer types are HP Laser Jet and Epson LX series. Consult your printer manual for compatibility requirements.



**EXAMPLE:** To define the printer output:

1. Press [16] [ENTER] *selects Printer type menu item*
2. Press [ ] or [ ] *using the up arrow or down arrow cursor keys select either HP LaserJet or Epson LX series*
3. Press [ENTER] *to confirm selection.*



**NOTE:** Refer to Chapter 12 Utilities, Warnings, Printing, and Default Settings for additional information on printing.

---

## 17. Midi Control

---

This menu item reserved for future feature.

---

## 18. Reference by name

---

This menu item reserved for future feature.

---

## 19. Channel Bump Toggle

---

The MC 24/48 control console has bump buttons associated with the individual channel sliders. This menu item allows the user to change the operation of the channel bump buttons from momentary on/off to maintained on/off. When set to "off" the bump buttons are normal momentary flash to full. When set to "on" the channel bump button change and function as push on push off maintained contact.



**EXAMPLE:** To enable or disable the Hand Held Remote:

1. Press [19] [ENTER] *selects Channel Bump Toggle menu item*
2. Press [ ] or [ ] *using the up arrow or down arrow cursor keys select either On or Off*
3. [ENTER] *press to confirm selection.*

---

## 20. Network Remote

---

This menu item reserved for future feature.

## 21. Single Scene/Two Scene

---

The MC 24/48 control console has manual channel sliders. These sliders are arranged in two row of 24 sliders each. In Single Scene mode each slider represents a control channel. In two scene mode. The channel of the top row are duplicated on the second row and the A/B playback fader served as a split-fader to operate the scenes. The chart below shows the different channel capacities of manual channel sliders.

MODEL	Total Faders	Single Scene		Two Scene	
		Top Row	Second Row	Top Row	Second Row
MC 24/48	48	1 - 24	25 - 48	1 - 24	1 - 24



**EXAMPLE:** To switch between Single Scene and Two Scene mode for the manual channel sliders:

1. Press **[21]** **[ENTER]** *selects single Scene/Two Scene item*
2. Press **[ ]** or **[ ]** *using the up arrow or down arrow cursor keys select either Single or Two*
3. **[ENTER]** *press to confirm selection.*

## 22. Secondary Video

---

This menu item reserved for future feature.

---

## CHAPTER 5: Setting Up the Soft Patch

### What is a Soft Patch?

---

The term "patch" refers to a table that shows which dimmer numbers are controlled by which control channels. The dimmers in turn feed electrical current into the circuits that connect to lighting instruments. In some older lighting systems, the assignments of instruments to dimmers are altered through a "hard" patch. A hard patch is a hard-wire method such as the "telephone patch" or a "slider patch" used to connect a circuit to a dimmer. Older lighting consoles have each dimmer controlled by its own slider.

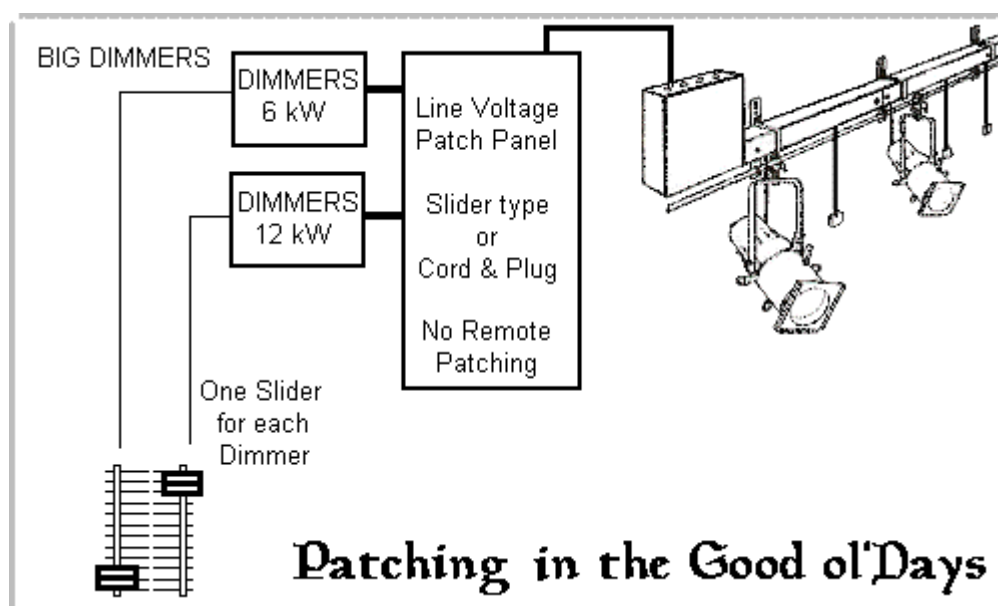


Figure 5.1a Lighting Control Functional Diagram - Old style patch

Newer control consoles such as the MC 24/48, allow you to control a number of dimmers with one control channel (a "soft" patch). If a theater uses a hard patch from the circuits to the dimmers, and a console with a soft patch, there may be an association of up to three numbers for each lighting instrument: a circuit number, a dimmer number, and a control channel number.

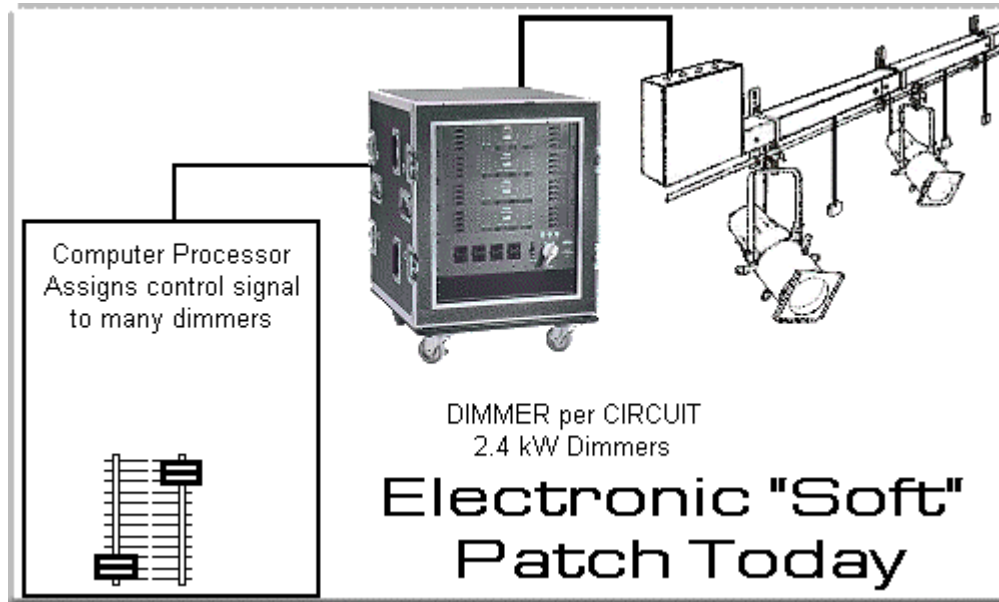


Figure 5.1b Lighting Control Functional Diagram - New Style Patch

The Patch display is a way to connect or "patch" a control channel to a dimmer channel. The dimmer number may be connected to an actual dimmer, or the connection may be to an automated device such as a color scroller or a moving fixture. A control channel may be patched to a single dimmer or multiple dimmers.

When a dimmer is currently patched to a channel and then re-patched to a new channel, the dimmer is "robbed" from the previous assignment. The previous channel assignment is deleted without warning and the dimmer is given to the new channel assignment.



**BASIC RULE:** *Remember that a dimmer can be controlled by only one channel, but a channel can control any number of dimmers.*


## The Five Patch Parameters

On the MC 24/48 control console, there are five possible elements of a patch assignment. They are as follows:


- Dimmer Number:** This is the DMX Dimmer data number.
- Channel Number:** This is the control channel the dimmer responds to.
- Level:** This is a level modifier and is in essence the percentage is multiplied against the channel level producing a "proportional" output. The default is "FL" (full) or 100%.
- Profile:** This is the output curve. Standard dimmers produce a curve called "Square Law" which to the eye appears as a smooth graduated fade. However other



light sources, some automated devices and Non dims need to dimmer to output differently to obtain the desired results.

 **ADVANCED TOPICS:** Refer to *Chapter 16 Profiles* for additional information on the creation and assigning of Profiles.

**Device:** This is the Automated device channel that a given dimmer output address may respond to. Note that a dimmer address may assign to both a Stage channel and a Device Channel. When a Dimmer is assign to a device channel it can also display the "trait name" for that device.

 **ADVANCED TOPICS:** Refer to *Chapter 18 Moving Lights* for additional information on the operation of and programming of Moving Light and Device channels.

## Patch Displays

The Patch display consists of 3 tables, one for each of three DMX outputs. The outputs (dimmer or automated device control) are shown on the left side of the display. The channels are listed at the top of the display. The current proportional level, or % level of the dimmer is shown in a matrix corresponding to the intersection of the channel column and output row on the matrix.

Patch																		
< <<						>> >												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1a	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
2a	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3a	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
4a	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	.	
5a	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	.	
6a	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	.	
7a	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	.	
8a	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	.	
9a	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	.	
10a	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	.	
11a	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	.	
12a	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	.	
13a	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	.	
14a	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	.	
15a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	.	
16a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	.	
17a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	FL	
18a	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	FL

**Cue Only:**

1 Port A	2 Linear	3 Compr	4 Levels	5 Check	6 1 to 1	7 Clear	8 Video2
----------	----------	---------	----------	---------	----------	---------	----------

Figure 5.2 Sample Patch Display

---

## Patching Channels to Dimmers

---

In the Patch display, you begin a patch command by pressing the number of the channel that you want to assign, followed by the **[DIMMER]** key. At this point, you can enter dimmer number assignment(s). To assign more than one dimmer, enter a dimmer list, which can contain a range of dimmers joined with the **[AND]**, **[MINUS]**, and **[THRU]** keys. Execute the command by pressing the **[ENTER]** key.



**EXAMPLE:** To patch channel 2 to dimmer 51 in the Patch display:

**[2] [DIMMER] [51] [ENTER]**

The console command line will respond as follows : *Channel 2 To Dimmer 51 At Full*



**BASIC RULE:** *In all patching commands, it is not necessary to specify channel numbers with a channel key. The console automatically assumes that the channel is addressed in the first part of the command and the dimmer in the second part, unless the **[DIMMER]** key is used.*

---

## Patch 1 To 1

---

Use the **(1 TO 1)** soft key in the Patch display to patch each control channel to the dimmer of the same number (i.e. channel 1 at dimmer 1, channel 2 at dimmer 2, etc.). This is the default setting for the patch table. The **(1 TO 1)** soft key is available in the Patch display to return the patch to a one to one channel/dimmer assignment. Parked dimmers, Non-Dim dimmers, proportional dimmer levels, and profiles are retained when you execute this command. The console prompts you to confirm the Patch 1 To 1 command before the command is executed.



**EXAMPLE:** To establish a 1 to 1 patch in the Patch display:

1. **(1 TO 1) [ENTER]** (*"WARNING" confirmation request appears.*)
2. **[1]** (*Executes the command.*)

---

## Automated Device Channels

---

Automated device channels are selected in the Setup Display by using the soft key **(DEVICE)**. Follow the Device Menu in this display to Edit Definition (number 3) to modify the device assignments and select the device dimmer output assignment and port. When making dimmer and channel assignments note that dimmer numbers that appear in red have an Automated Device assigned.



**BASIC RULE:** *Remember that a dimmer output position can be occupied by a dimmer and an automated device at the same time. If dimmers and automated devices are assigned the same dimmer position, both the automated device and the dimmer will also be controlled by the same channel. Thus, it is usually desirable to separate dimmers and automated device output ports.*



**ADVANCED TOPICS:** Refer to *Chapter 18 Moving Lights*, for additional information on the operation of and programming of Automated Device Channels.

---

## Dimmer Profiles

---

When you assign a custom profile to a dimmer, it alters the standard "linear" fade curve characteristic of the dimmer. If you assign profiles to dimmers, the dimmer profiles are in use whenever you control dimmers with channel levels. Direct Dimmer Control always bypasses any dimmer profiles. Dimmer profile assignments are shown in the fourth column of the Patch display.



**EXAMPLE:** To assign a profile to a dimmer in the Patch display:

[DIMMER] [#] [PROFILE] [#] [ENTER]



**ADVANCED TOPIC:** For more information about profiles, see Chapter 16, *Profiles*.

---

## Proportional Levels

---

When you assign a proportional level to a dimmer, it limits the maximum output of the dimmer to the percentage specified. For example, a dimmer assigned a proportional level of 50% never exceeds 50% output level, even when the channel controlling that dimmer is at Full. In this case, a channel level of Full provides 50% dimmer output. The same channel at 50% would provide a dimmer output of 25%. The entire curve assignment of the dimmer is reduced proportionally to the level assigned. Proportional level assignments are shown in the third column of the Patch display.



**EXAMPLE:** To assign a proportional level to a dimmer in the Patch display:

[DIMMER] [#] [AT] [#] [ENTER] (Specifies the proportional dimmer to a level.)

---

## Non-Dim Dimmers (Virtual Non-Dims)

---

In the Patch display, you can make any dimmer behave like a non-dim dimmer by creating a profile that forces the dimmer to full at some point during the fade. This means that the actual dimmer output on stage is zero until the dimmer level in the fade reaches a “trigger level,” at which point the dimmer output immediately goes to Full. This is useful for practical lighting on your set, such as table lamps, or other lights that actors may turn on “on cue.” Remember however, that the dimmer will need to be recorded at FULL in the cue.



**NOTE:** *When you assign a virtual non-dim at the console, it has no effect on the settings at your dimmer rack. In a manner of speaking, the dimmer signal from the console is assigned a profile that “jumps to Full” at the trigger point. The dimmer output continues to be regulated voltage if your dimmer rack regulates the output voltage of your dimmers. For this reason, the virtual non-dim setting is not recommended for use with motors, ballasts, and other inductive loads. A “true non-dim” setting at the dimmer rack should be used for these types of loads. Consult the operation manual for your dimmer rack.*

## Automated Devices

---

Automated Devices and Moving Lights are discussed in chapters 18 and 19 of this manual.

---

## CHAPTER 6: Setting Channel Levels

### Two-Scene Preset Mode

---

When you have the set operating mode to TWO-SCENE, the first thing that you will notice is that the A/B crossfader controls the output of one scene, 1 or 2. The A crossfader controls Scene 1 so that when the crossfader is at the top of its travel, scene 1 is "at full." The B crossfader controls Scene 2 so that when the crossfader is at the bottom of its travel, Scene 2 is at full (backwards to crossfader A). When both crossfaders are moved together, the look on stage fades from the contents of one scene to the other scene. By having separate crossfaders, you can fade one scene in before the other fades out, or vice-versa. This type of crossfader is called a "Split Crossfader".

- ✓ **BASIC RULE:** In Two-Scene Preset mode, the channel fader positions always determine the stage output levels.

### Channel Faders vs. Keypad in Multi-Scene Mode

---

In Multi-Scene mode, you can use the keypad or the channel faders to enter, record and edit the levels in console memory. You can also play the cue back later with the GO button. This is one difference between the Two-Scene Preset mode and the Multi-Scene (memory) mode of operation.

In Two-Scene Preset mode, the channel faders always control live stage levels. You cannot use the channel faders to edit any blind displays. When you are working in Multi-Scene mode, you can control channel levels in any display with either the channel faders or the keypad. If you want to use a channel fader to control a channel level that has been set by the keypad or by a cue, you must first move the channel fader to match the current level of the channel in the display. As soon as the level is matched, the channel level changes color to indicate that the fader now has control. This is referred to as "**match and grab**" operation. You can set the level anytime with the keypad, but the fader must always match and grab if it is not set at the channel's current level.

- ✓ **BASIC RULE:** *The following actions can cause the channel faders to temporarily lose control over their channels when you are working in Multi-Scene mode.*

Setting levels with the keypad.

Executing cues with the GO button.

*You must match and grab in order to regain fader control over these channels.*

### Crossfader Time

---

The crossfade time is the time it takes for the fade to occur when the crossfader handle is moved to the end of its travel. The relative crossfader levels (%) appear in two boxes in the lower part of the display. You can also control the crossfade time manually.

---

## Keypad Commands

---

In the Multi-Scene mode, channel levels are entered and recorded through the Command Line by using the Data Entry Keypad. When a number is entered into the Command Line, the console automatically assumes by default that channels are being addressed (there is no channel key). The [DIMMER] key is available to directly control individual dimmers, and for use in patching commands.

In addition, the (LEVELS) soft key may be used to switch the display to Dimmer mode which directly addresses dimmers. It is not necessary to push the [ENTER] key after the level is entered for a channel.



**BASIC RULE:** *There is no “channel” key; when you enter a number in the Command Line by pressing the key, the console automatically assumes that the number is a channel number.*



**EXAMPLE:** To set channel 2 to a level of 75%:

[2] [AT] [75]                      (“Channel 2 AT 75%” appears in the Command Line.)



**ADVANCED TOPICS:** See the Dimmer Check topic in Chapter 12, *Utilities, Warnings, Printing, and Default Settings*.

You need to enter a zero when you specify a level that is a multiple of ten. If you enter [5], the console assumes you mean 05%; if you enter [8], the console assumes you mean 08%; etc.



**EXAMPLE:** To set channel 2 to a level of 07%:

[2] [AT] [7]                      (“Channel 2 AT 07% ” appears in the Command Line.)

---

## Channel Lists

---

You can use the [AND], [THRU], and [MINUS] keys to make lists of channels and other items. You are not required to enter the list in any particular order. You can generally just enter channel lists in the order in which you might be thinking of them.



**EXAMPLE:** If you enter key strokes as follows:

[12] [THRU] [24] [AND] [36] [MINUS] [23] [AT] [FULL]

"Channels 12 > 24 + 36 - 23 AT Full" appears in the Command Line.



**HINT:** *Items using the [THRU] key may be listed from lowest to highest, or highest to lowest.*



**EXAMPLE:** The basic channel and level Command Line syntax in any channel/level display:

[#] [AT] [#]                      (“Channels # AT # ” appears in the Command Line.)



**EXAMPLE:** Listed below are common examples of channel/level command variations:

[#] [AT] [#]	(Sets single channel to a level.)
[#] [AND] [#] [AT] [#]	(Sets 2 different channels to same level.)
[#] [THRU] [#] [AT] [#]	(Sets a list of consecutive channels to same level.)
[#] [THRU] [#] [MINUS] [#] [AT] [#]	(Sets a list of consecutive channels minus a single channel to the same level.)

## Captured Channels

The term "captured channels" refers to channels with levels that are currently being set. Captured channel levels are shown in boxed amber video in the display. When a level setting command is entered in the Command Line, the channels listed in the command are "captured." All captured channels are under direct control of the trackball (see the next topic, trackball). When levels are captured, any command that begins with [AT] will affect the currently captured channels.



**EXAMPLE:** To set channels 6 - 9 at 100%, then reset at 65%:

1. [6] [THRU] [9] [AT] [FULL] (Channels 6 - 9 set at 100%, remain captured.)
2. [AT] [65] (Channels 6 - 9 set at 65%, remain captured.)
3. Press the [CLEAR] key to release the captured channels.



**BASIC RULE:** *The [CLEAR] key releases captured channels, but the Command Line must be "empty", or else the [CLEAR] key acts like a "backspace" key to clear keystrokes from the Command Line.*

You do not need to set channels to a level in a command to capture them. They can be captured by simply listing them and pressing [ENTER].



**EXAMPLE:** To capture a single channel, without setting a level:

[#] [ENTER]



**EXAMPLE:** To capture channels 5 - 20 and channel 30, without setting a level:

[5] [THRU] [20] [AND] [30] [ENTER]

When the Command Line is "empty" and no channels are currently captured, pressing the [ENTER] key captures all active channels (all non-zero channels). The exception to this is that pressing [ENTER] does not capture any Automated Devices. Automated Devices must be addressed specifically.



**EXAMPLE:** To capture all **active** channels (channels reading above zero):

[ENTER] (All channels reading above zero are now captured on the trackball.)



**BASIC RULE:** *All captured channels are unaffected by executed cues; pressing the [GO] button does not affect them, even if the channels have new level assignments in the new cue. Captured channels remain under active control of the trackball until control is released by pressing the [CLEAR] key.*



**ADVANCED TOPICS:** See Chapter 9, *Playing Back Cues*.

---

## Trackball Control

---

The trackball is used to adjust the levels of individual or multiple channels proportionally up or down. Whenever any channels are captured, their levels are adjustable on the trackball.



**EXAMPLE:** To set channels to 50%, and then use trackball control to adjust the level in the Stage, Preview, and Tracksheet displays:

[# list] [AT] [50]            (Channel list now active on the trackball, even if the level specified is zero.)



**EXAMPLE:** To capture channels at their active levels in the Stage, Preview, Group, and Tracksheet displays:

[# list]            (Channels in list now captured and controlled by the trackball.)



**NOTE:** *If you find that the tracking color of certain channels is not appropriate to the display, you may have moved the trackball accidentally while channels were captured. There is a possibility of the trackball moving so slightly that the movement is noted internally without changing the channel level in the display. If you find that the tracking color has changed, it may be prudent to confirm that levels are still tracking by checking the Tracksheet display.*



**ADVANCED TOPICS:** See Chapter 10, *Editing Cues and Using Track Modes*.

---

## Proportional Control with the Trackball

---

All captured channels are affected proportionally when you use the trackball. Proportional control operates such that a given rotation of the trackball may cause a greater change to a higher level than to a lower level. For example, if a channel is captured at 10% and the trackball spins 1/2 a rotation, the level may increase to 20% (10 points). If the same channel is captured at 40%, and the trackball spins 1/2 a rotation, it may increase the level to 80% (40 points).





**EXAMPLE:** Channel 1 is at 25%, and channel 2 is at 50%. Channels 1 and 2 are both then captured and thus "captured on the trackball." If the trackball is used to move channel 1 to 50%, channel 2 will be brought to full. If the trackball is moved further, channel 1 will increase until it reaches full also. This is known as "overranging". As the trackball is used to lower the levels, channel 1 will start to come down from full first. When it reaches 50%, channel 2 will begin to come down. Eventually you can return all channels under control of the trackball to their original levels, provided that you maintain trackball control over them.

Because you can control levels proportionally with the trackball, you can increase the intensity of a lighting look on stage without changing the feel of the look or the mix of the colors. And because of the ability to overrange with the trackball, you have the opportunity to "run all channels up to full" and still be able to return to your original look.

## Restoring Channel Levels ("Undo")

You can use the **(RESTOR)** soft key command to return channel levels to their level prior to the last level setting command. The **(RESTOR)** soft key is available in the Stage, Preview, and Tracksheet displays. Although the previous level command may not be present in the Command Line history, it remains available to the Restore command.

Channels may be selectively restored by entering a list of channels which are to return to their previous level.



**EXAMPLE:** To restore channel levels from the Stage, Preview, Group, Submaster and Tracksheet displays:

**(RESTOR) [ENTER]** (Restores all channels.)

- or -

**(RESTOR) [# list] [ENTER]** (Restores only the channels in list.)

Using the **(RESTOR)** soft key repeatedly toggles between the last two consecutive levels that a channel has been assigned.



**EXAMPLE:** To toggle a channel's last two assigned levels in the Stage, Preview, or Tracksheet displays:

1. **[# list] [AT] [#] [ENTER]**
2. **(RESTOR) [ENTER]** (*Displays channel levels set before last level setting command.*)
3. **(RESTOR) [ENTER]** (*Toggles back to the new levels set by the last command.*)

In the Stage display, the Restore command always restores channels to the levels assigned just prior to the last changes that you made. You can switch to another display, edit channel levels, return to the Stage display, and still use the Restore command to return to the previous stage levels.

The Restore command remembers the last level changes you made in an editing display such as Preview, Group (sub display), Submaster (sub display), or Tracksheet. Once you edit in another "blind" display, the Restore command memory is active only for that display (as well as in Stage display).

---

## Advanced Channel Lists

---

Complex channel lists are, by definition, a collection of channels that use groups, Submasters, cues, or to construct the list. A complex channel list can therefore be as complicated as several channel ranges, plus or minus individual channels within or outside those ranges. Many types of channel lists may be addressed in all channel level-using displays (Stage, Preview, Group, Submaster and Tracksheet).

You can build complex channel lists using many different resources, instead of just keying in every channel individually. These resources may be thought of as "building blocks". Channel ranges as well as channels that make up any group, Submaster, cue, can be considered building blocks. Groups, Submasters, and cues are referred to by their item type and number in a complex channel list. Using an item type and number assigns all channels existing in that specified item the proportional level designated in the complex channel list command.

Items can be used alone in a complex channel list to address their channels, or they can be combined with other individual channels to include all desired channels in the list.



**EXAMPLE:** Assume that group 1 is channels 1 - 10 at Full. To assign a level to channels 1 - 10 and channel 45, use the following command:

**[GROUP] [1] [AND] [45] [AT] [level #]**

In the example above, channels 1 - 10 are addressed by referring to group 1, and channel 45 is individually addressed. Channels may also be excluded from an item.



**EXAMPLE:** Assume that group 1 is channels 1 - 10 at Full. To bring channels 1 - 5, and 7 - 10, to a level, use the following command:

**[GROUP] [1] [MINUS] [6] [AT] [level #]**



**EXAMPLE:** The following is an example of a very complex channel list command:

**[GROUP] [5] [THRU] [8] [MINUS] [CUE] [1] [AND] [35] [THRU] [39] [MINUS]  
[SUB] [1] [THRU] [3] [AND] [7] [AT] [level #]**

---

## Channel Lists Made with Ranges

---

You can use a range of items (cues, subs, groups) to make channel lists. The command syntax is just like the syntax for a range of channels in a channel list.



**EXAMPLE:** To set the channels in cues 1 - 5 proportionally to their levels as assigned in the cues:

**[CUE] [1] [THRU] [5] [AT] [FULL]**

---

# CHAPTER 7: Basic Submaster Operation

## Submasters

---

Submasters are fader controls on the console top panel that can have multiple channels assigned to them at different levels. In this way, you can record stage "looks", and recall them by moving a Submaster fader to restore the look at various intensities. Submasters can also be used to play back different effects.

The Playback display contains the Submaster Fader Window, a section of the screen that lists all the Submaster fader numbers and their current levels. The Submaster operation is also color coded as follows:

### SUBMASTER NUMBERS

- Gray** normal Submaster
- Yellow** Submaster with an effect assigned to it
- Amber Reverse** indicates Submaster page change, (handle must move to zero for change to take effect)

### SUBMASTER LEVELS

- White** manual level
- Red** timed up fade
- Blue** timed down fade

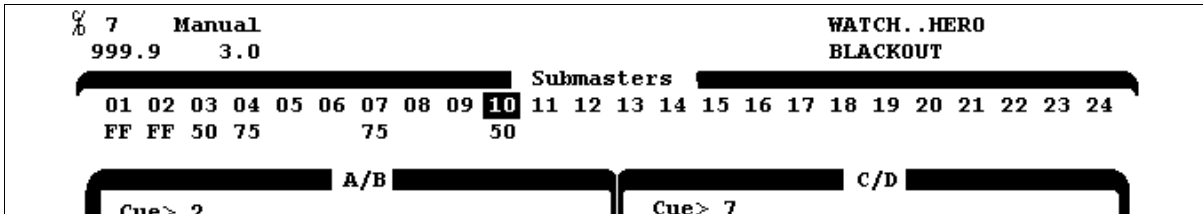


Figure 7.1 Submaster Fader area of Playback Display

## Normal Submaster

---

A normal Submaster has channels at specific levels assigned to it. When these channels are assigned, they are not "robbed" from any of their other assignments. The same channel can be assigned a unique level in any number of Submasters. This is because normal Submasters operate in what is called a "Pile-On" mode; for any given channel, the highest level from any Submaster takes precedence.



**EXAMPLE:** Let's say channel 21 is assigned to Submaster 5 at a level of 40% and to Submaster 6 at a level of 70%. In the Stage display, when Submaster 5 is brought to Full, channel 21 reads at 40%. If Submaster 6 is brought up, channel 21 begins to increase when Submaster 6 brings the level over 40%. When sub 6 finally reaches Full, channel 21 reads at 70%.

---

You can create Submasters in two different ways:

- ❑ "Live" with the **[RECORD SUB]** hard key.
- ❑ "Blind" in Preview in the Submaster sub-display.

## Record Sub Command

---

The **[RECORD SUB]** hard key records the instantaneous "look" of the current Stage display, by recording all channels at their current levels. This includes all levels that may be originating from level setting commands, cues, running effects, or even other subs. The Record Sub command can be executed from any display. When an effect is running, the Record Sub command captures the effect channels at the instant the **[ENTER]** key executes the command.



**BASIC RULE:** *Whenever any of the three "Record" hard keys are used, the channel levels that are currently active in the Stage display are recorded, no matter what display is being viewed when the command is entered.*



**EXAMPLE:** To record the current stage look to Submaster 2, from any display:

**[RECORD SUB] [2] [ENTER]** (Submaster 2 has current stage look recorded to it.)



**NOTE:** *In the example above, if Submaster 2 has already been recorded, a "Warning" message will appear on the screen. The message asks you to confirm the command by pressing the **[ENTER]** key again.*

Submasters can be created "in the blind" by selecting them in Preview with the Submaster sub-display. Only one submaster's channel information is shown at a time. Use the left and right arrow keys to view and page through all the different subs. You can select a specific sub for viewing by pressing the **(SELSUB)** soft key.



**EXAMPLE:** To view Submaster 2's channel level assignments from the Preview Display:

**(SELSUB) [2] [ENTER]** (Sub 2 appears on the display.)

In the Submaster display, you can assign levels to the currently displayed Submaster by assigning channels as you would in the Stage display. When you work with levels in the Submaster display ("in the blind"), your changes are automatically made to the Submaster - **no record command is necessary**. Remember that the Submaster display only shows channel levels that are assigned to the individual sub that is currently being viewed.



**BASIC RULE:** Whenever one of the three "Record" keys are used in any display, the current look of the Stage display is recorded at the moment the command is executed with the [ENTER] key. Remember that no Record command is necessary when editing levels or cue parameters in any blind display (Preview, Group(sub-display), Submaster(sub-display), Effect(sub-display), Cuesheet, or Tracksheet).

---

## Bump Buttons

---

Bump buttons for each Submaster are located directly below the individual Submaster faders. Pressing a normal Bump button drives its Submaster to Full, for as long as the Bump button is held down. In normal mode, the Bump buttons are momentary switches, so when they are released, the Submaster levels return to the current level of the sub fader (zero or otherwise). In Toggle mode, each press of the Bump button turns the sub alternately on and off.



**HINT:** Transitions initiated by pressing a Bump button take place in assigned up and down times. If no time is set a true instantaneous "bump", will occur. See the next topic in this chapter, Timed Submasters.

Each Bump button can be set individually to one of four different modes of operation:

- ON** = **Enables** Bump button to read at its assigned level while button is held down (momentary switch action).
- TOGGLE** = **Toggles** between Full and the current level of sub fader, with each press of the Bump button (maintained switch action).



**Example:** To turn a Bump button from On to Toggle mode for a selected Submaster, in Preview in the Submaster sub-display:

1. **(SELSUB) [#]** *Select desired Submaster in Preview.*
2. **(MORE)** *Change soft keys to next level.*
3. **(TOGGLE)** *Activate or deactivate TOGGLE mode.*

(It is not necessary to press the [ENTER] key.)

---

## Timed Submasters

---

You can assign fade times to Submasters in the Submaster display so that when you press the Bump button, the Submaster level fades up or down in the time that you assign. Each Submaster can be assigned a different time, and each Submaster can be assigned a separate up and down time. The current Submaster fade time is shown in the "Time" information field in the middle of the Status Bar, in the Submaster display.



**EXAMPLE:** To assign an up and down time of ten seconds to sub 5 in Preview in the Submaster sub-display:

1. (SELSUB) [5] [ENTER] *(Selects Sub 5 as current sub.)*
2. [SUB] [5] [TIME] [10] [ENTER]



**EXAMPLE:** To assign a split time with a 10 second up time and a 20 second down time to the current sub in the Submaster display:

[TIME] [10] [+] [20] [ENTER]



**NOTE:** *When a sub fader is at zero, the fade from Full to zero will occur in the assigned sub fade time. When the sub fader is set at a level other than zero, the fade time is proportional to the level. For example, if the fade time is 10 seconds, and the fader level is at 30%, the fade from 30% to Full takes 7 seconds.*

## Delay or Dwell Time

It is possible to give a Submaster a Delay time (also referred to as a Dwell time). This is the amount of time between completing the On action or Up fade and before starting the Off Action or down fade.



**EXAMPLE:** To assign a delay or dwell time to sub 5 in Preview in the Submaster sub-display:

1. (SELSUB) [5] [ENTER]      Selects sub 5 as current sub.
2. [DELAY] [10] [ENTER]      Sets time to 10 seconds.

## Effect Submaster

An Effect Submaster is any Submaster with a specific Effect number assigned to it. In an Effect Submaster, the Effect begins to run when you press the Bump button or move the Submaster fader.

Using the Bump button to activate the Effect allows the Active and Inactive levels to read on stage as they appear in the Effect display for the assigned Effect. The Submaster fader scales the Effect levels. If the Active level of the Effect is set to Full, but the Submaster fader is set at 50%, then the Active level never reads above 50% while the Effect is running on the Submaster.



**EXAMPLE:** To place an Effect Submaster in the Submaster:

[RECORD SUB] [#] [EFFECT] [#] [ENTER]      (Effect is now in the Submaster)

---

## CHAPTER 8: Creating and Recording Cues

### Cues

---

Cues are recorded lighting changes or "looks" that can be reproduced with specific timing. A cue is recorded as a set of channels with specified levels, along with certain other attributes. A cue always has an execution time, but it may also be assigned any of the following additional attributes:

- |   |                                   |
|---|-----------------------------------|
| <input type="checkbox"/> Delay Time           | <input type="checkbox"/> Follow   |
| <input type="checkbox"/> Fade Time (Up /Down) | <input type="checkbox"/> Macro    |
| <input type="checkbox"/> Effect*              | <input type="checkbox"/> Cue Name |
| <input type="checkbox"/> Link                 | <input type="checkbox"/> Group    |

The cue attribute hard keys are located on the main keypad in the right hand column, under the [CUE] hard key.

- You may create or re-record cues "live" in any display, or you may create and edit cues and attributes "blind" in the Preview, or Tracksheet displays. Cue attributes may be edited "blind" in the Cuesheet display, as well.

### Manual Cues

---

A cue may be played back manually on either of the playback faders. This allows you to fade at a rate that matches an event taking place on stage. You can reverse directions of the fade by moving the fader handle backwards at any time before completing the fade. When the playback fader handle reaches the end of its travel (at "10"), the fade is complete and the fade is cleared from the playback fader.



**ADVANCED TOPIC:** See Clearing Fades From The Playback Faders topic in Chapter 9, *Playing Back Cues*.

A Manual time is assigned to a cue by default when no time is specified for the cue.



**EXAMPLE:** To assign a Manual time from any display:

[CUE] [#] [ENTER]



**NOTE:** *In the Stage and Playback displays, starting a command with the [TIME] hard key allows you to change the time of the current stage cue. In Preview, Cuesheet, and Tracksheet displays, the same command changes the time for the current preview cue. In the Cuesheet and Tracksheet displays, the preview cue is indicated by the number of the cue appearing in white..*



**ADVANCED TOPIC:** See Preview Cue topic in Chapter 10, *Editing Cues And Using Track Modes*.

## Cue Time

You must assign an execution time to each cue that is recorded or else it will become a manual cue. The cue time is the time the cue takes to fade to its final readings, after the [GO] button has been pressed. Cue execution time (or "cue time") may be assigned either as a numerically designated fade time or as a manual fade time. A manual fade time indicates that you use a playback fader to manually fade the cue. You can assign a numerical cue time with a value from 0 - 999.9 seconds in 0.1 second increments.

A cue may be assigned a split time, which allows the channels that are going to a higher level to fade in a different time than the channels that are going to a lower level.



**EXAMPLE:** To assign a cue time of 10 seconds to cue 2, in the Stage, Preview, Cuesheet, Tracksheet, and Playback displays:

[CUE] [2] [TIME] [10] [ENTER]



**EXAMPLE:** To assign a cue time of 10 seconds Up fade and 20 seconds down fade to cue 2, in the Stage, Preview, Cuesheet, Tracksheet, and Playback displays:

[CUE] [2] [TIME] [10] [AND] [20] [ENTER]



**NOTE:** *In the Examples above, the command creates the cue if it doesn't already exist. However, unless [RECORD CUE] is used in the stage display, current levels from the stage will not be recorded.*

## Cue Numbering

All cues are numbered as they are created. Cues are usually "played back" in a numerically sequential order by using the [GO] button. Cues may be created in any order, however cues played back with the [GO] button are always executed in numerical order (unless Links have been assigned to cues).





**ADVANCED TOPICS:** To assign Links to cues, see Chapter 19, *Advanced Cues*.

If you want to play back cues out of sequence you can load the desired fader by pressing:

**[LOAD] [#] [ENTER].**



**ADVANCED TOPICS:** See "Go To" topics in Chapter 9, *Playing Back Cues*.

Cue numbers may range from 0.1 to 999.9 in 0.1 increments. This allows you to build your show using cues with whole numbers, and then insert up to 9 cues between existing cues later.



**HINT:** *Some lighting designers like to number cues so that each scene, dance, or event of their show begins at even hundreds. For example, the cues in scene 1 start at cue 101, the cues in scene 2 start at 201, etc.*

---

## Record Cue Command

---



**BASIC RULE:** *You can execute the Record Cue command from any display, but the command always records what is shown in the Stage display. No Record key is ever used when creating or editing in any blind display.*

The **[RECORD CUE]** key records a cue from the instantaneous "look" of the current Stage display. This includes all levels that may be originating from level setting commands, cues, running effects, or active Submasters. The Record Cue command can be executed from any display. If an effect is running, the Record Cue command captures the effect channels at the instant the **[ENTER]** key executes the command.



**HINT:** *For the reason stated above, you should maintain your effects on Submasters while you are recording cues live. This way you can take out the effect levels with the Submaster before you enter the Record Cue command.*

To assign a time other than the default manual fade time, press the **[TIME]** hard key and enter a new value in seconds. Times can be entered in 0.1 second increments. A Manual fade time can be selected simply by not specifying a time, thereby defaulting to a manual fade time.



**EXAMPLE:** To record cue 2 with a specified time of 10 seconds, in the Stage display:

**[RECORD CUE] [2] [TIME] [10] [ENTER]**



**EXAMPLE:** To record cue 2 with a Manual time, in the Stage display:

[RECORD CUE] [2] [ENTER]



**BASIC RULE:** *Whenever any of the three [RECORD] keys are used, they record the channel levels that are currently active in the Stage display, no matter what display is being viewed when the command is entered.*

## Creating Cues Blind

---

Cues can be created "blind" (while they are not being viewed on the stage). This can be done in any of the three blind cue displays: Preview, Cuesheet, or Tracksheet. While in these blind displays, any cue that you enter in the Command Line is created if it does not already exist. The cue can be created blind by pressing either the [CUE] hard key or the (SELECT CUE) soft key.



**EXAMPLE:** To create a cue in any of the blind cue displays:

[CUE] [#] [TIME] [#] [ENTER]

The contents of the cue that is created depends on which tracking mode you are using when the command is executed. If you are in Tracking mode, the cue will be identical to the previous cue, but with **all** soft levels.



**EXAMPLE:** Let's say cues 6, 6.5, and 7 already exist. If the following command is entered in Tracking mode:

[CUE] [6] [.] [8] [ENTER]      (Cue 6.8 is created and is identical to cue 6.5.)

In the Example above, if you are in Cue Only or Clean Up mode, the cue created will be "blank" in the sense that hard zeros are assigned to any channel where a level, hard, or soft, occurred in the previous cue. In Clean Up mode, hard zeros are assigned to all channels.



**ADVANCED TOPICS:** For more on Tracking modes, see Chapter 10, *Editing Cues And Using Track Modes*.

If you are in either Preview or Tracksheet displays, you can begin to make channel level commands to edit the cue that you just created. You cannot make level setting commands in the Cuesheet display since you cannot view any of the levels, even though you can create cues while in the Cuesheet display.

---

## Additional Cue Features

---

Beyond the basics of recording various channels at different levels, the Cues on an MC 24/48 control console can also be assigned a number of other parameters. These include:

- Follow
- Delay Time
- Split Time Fades
- Effects
- Macros
- Names
- Links

---

## Cue Follow

---

A Follow assigned to a cue causes the "next" cue in the cue sequence to **automatically** initiate without pressing the GO button for it. The Follow attribute is actually a delay time assignment with an automatic execution for the next cue. The amount of time that you specify for the Follow attribute determines when the "next" cue automatically begins. The Follow time assigned to a cue begins to count down when you press the GO button. At the completion of the Follow time, the next cue executes.



**BASIC RULE:** *You must assign a Follow to a cue **before** the cue that you want to start automatically. A Follow is essentially a "count down" to automatically initiate the **next** cue in the cue sequence.*

A Follow time may be from 0 - 999.9 seconds in 0.1 second increments. A Follow time of zero seconds allows two consecutive cues to execute simultaneously. There is no limit to the number of consecutive cues to which you may assign the Follow attribute.



**EXAMPLE:** To assign a Follow to a cue:

[RECORD CUE] [#] [FOLLOW] [#] [TIME] [#] etc. [ENTER]

- or -

[CUE] [#] [FOLLOW] [#] [ENTER]

(Assigns Follow to an existing cue.)



**EXAMPLE:** To assign a Follow to the current preview cue:

[FOLLOW] [#] [ENTER]

The Follow time is shown below the Up and Down times in the Playback Fader Box. If you press the Go button during a Follow countdown, the Follow is canceled and the next cue executes **immediately**.



**NOTE:** *Cue Follows are ignored when a cue is assigned to a Submaster.*

---

## Delay Time

---

You can assign a Delay time to a cue to delay the initiation of the fade by the amount of time that you specify. When you assign a Delay to a cue, pressing the Go button will start the Delay time to count down on the lowest available Playback fader. When the Delay time reaches zero, the fade will begin to run on the same Playback fader in its assigned time. The Delay column appears in the Cuesheet and Playback displays, and shows the Delay time assigned to each cue or cue part.



**HINT:** *Split Delays are especially useful when you want to delay lights that are coming up on one side of the stage from lights that are going down on the other side of the stage, or vice-versa.*

You can assign Delay times when you record a cue, or you can add a Delay to an existing cue.



**EXAMPLE:** To assign a Delay in the Stage, Preview, Playback, Cuesheet, or Tracksheet display:

[RECORD CUE] [#] [TIME] [#] [DELAY] [#] [ENTER]

- or -

[CUE] [#] [DELAY] [#] [ENTER] (Adds a Delay to an existing cue.)



**EXAMPLE:** To assign separate Delay times to a split cue:

[CUE] [#] [DELAY] [#] [+] [#] [ENTER]



**EXAMPLE:** To delete an existing Delay, specify a 0 time parameter:

[CUE] [#] [DELAY] [0] [ENTER]

Note that when you assign a Follow to a cue, the Follow time delays the next cue's execution, starting from the last cue's initiation. Instead of using the Follow time as the delay, you could assign a Follow time of zero and then assign a Delay to the next cue.



**BASIC RULE:** *A Delay belongs to the "current" cue, while a Follow belongs to the "next" cue. Technically, the next cue has not begun during a Follow countdown, but the next cue has already begun during a Delay countdown.*

---

## Split Fades

---

Split fades are fades that have separate "up" and "down" times. In the Command Line, the up time and down time are separated by a "+". The up time (the first number in a command) is the fade time for those channels going to a higher level. The down time (the second number in a command) is the fade time for those channels going to a lower level.

Split fades run on separate halves of the fader. In a Playback Fader Box, UP indicates the fader with the up portion of the fade. DOWN indicates the fader with the down portion of the fade. To take manual control of a fade time, "Match and Grab" the playback fader handle.



**EXAMPLE:** To assign a split time to the current cue in the Stage, Preview, Cuesheet or Playback displays:

[TIME] [#] [AND] [#] [ENTER]

---

## Cue Macros

---

You can assign a macro to a cue or a cue part to automatically execute functions when a cue is executed. Use the **(MACRO)** soft key that appears after pressing the **(More)** key in the Preview display. The specified macro will execute when the cue fade begins. This means that the cue macro will execute after all follows and delays are finished. This feature can be very useful for reprogramming Submasters, or for capturing specific channels on the trackball for overriding cue control. Another useful application is to assign rate control in a cue macro for a cue or effect that requires it in every performance. This way the rate will always be ready on the trackball when the cue is initiated.



**EXAMPLE:** To assign a macro to a cue or part using the Preview display:

[CUE] [#] (MACRO) [#] [ENTER] *(Assigns a cue macro to an existing cue.)*



**EXAMPLE:** To delete a macro from a cue:

[CUE] [#] (CUE MACRO) [0] [ENTER] *(Specify 0 number.)*

---

## Cue Names

---

You can assign a 16-character name to any cue. The name appears in the Stage, Preview, Cuesheet, and Playback displays. Use the Bump buttons and numeric keypad to select the characters for the name. The Bump buttons will automatically enter Alpha mode when the **(NAME)** soft key is pressed. It appears every time that the **[RECORD CUE]** or **[CUE]** key is pressed. Each cue can have only one name.



**EXAMPLE:** To assign a name to a cue:

[RECORD CUE] [#] [PART] [#] (NAME CUE) [name] [ENTER]

- or -

[CUE] [#] (NAME CUE) [name] [ENTER] (Assigns a name to an existing cue.)



**EXAMPLE:** To delete a name from a cue:

[CUE] [#] (NAME CUE) [ENTER] (Do not specify a name.)

---

## Cue Links

---

You can execute cues out of their normal numeric sequence by assigning a Link to a cue. When you press the GO button, instead of executing the next higher numbered cue, the cue execution sequence will "jump" to the destination cue that you specify in the Link assignment. The execution sequence continues onward from that destination cue indefinitely, or until another Link is encountered in a later cue.



**EXAMPLE:** To assign a Link to a cue in the Stage, Preview, Cuesheet, Playback, or Tracksheet displays:

1. [CUE] [#] [LINK] [destination cue #] [ENTER] (Assigns the link to an existing cue.)
2. [LINK] [destination cue #] [ENTER] (Assigns the Link to the current cue in the display.)

---

## Link Loops

---

In the preceding Examples, the Links all have destination cues that have a higher number than the cue assigned the Link. But what if you link to an earlier cue? This creates a Link Loop.



**EXAMPLE:** Assign cue 8 as the destination cue:

[CUE] [10] [LINK] [8] [ENTER] (Creates loop that runs indefinitely.)

The cue execution sequence would be: 7, 8, 9, 10(Link), 8, 9, 10(Link repeats), 8, 9, 10(Link repeats), 8, 9, 10(Link repeats), 8, and so on indefinitely.



**HINT:** *Link Loops are normally run on the C/D Faders so as to leave open the A/B Faders. This allows the Link Loops to be initiated at any time and cleared at any time.*

---

## Tracking Levels in Link Commands

---

When you are using a link to a cue that has tracking "soft" levels, a special condition occurs. The stage "look" created by a cue in a sequence is usually made up of a combination of hard levels (those changes assigned in that specific cue) and soft levels (those levels that track in from a previous cue). When the link is executed, only hard (non-tracking) channel levels are affected. The tracking soft level assignments remain at their current levels when a link occurs. This causes the stage "look" to be different when a cue is reached by a link instead of by the normal numeric cue sequence progression.



**EXAMPLE:** In the Tracksheet display:

1. Assign a level of 10 % to channel 1 in cue 1.
2. Take channel 2 in cue 2 to 20%. (*Channel 1 tracks at 10%*)
3. Take channel 3 in cue 3 to 30%. (*Channel 2 tracks at 20%, channel 1 tracks at 10%*)
4. Link cue 1 to cue 3.
5. Starting at cue 0, press Go. (Cue 1 runs.) (*Display shows channel 1 at 10% in red.*)
6. Press Go. (Cue 3 runs) (*Stage display shows channel 1 at 10% in gray, and channel 3 at 30%. Channel 2 does not read on stage.*)

In the previous Example, Channel 2 does not read on stage because the cue in which the level change occurred was never executed. To avoid an alteration of the original stage look of the destination cue, you must make all existing levels hard levels in the destination cue of the link. Based on the Example above, to preserve the stage "look" assign the Clean Up attribute to cue 3. This assigns hard levels to all channels.



**BASIC RULE:** *When you assign a link to a destination cue that has tracking "soft" levels (including tracking zeros) only hard levels are affected. The destination cue "adds" its hard levels to the former stage look. To "replace" the former stage look with the destination cue, assign the Clean Up attribute to the destination cue.*



**NOTE:** *If you use a Link Return to return to the normal cue sequence, the same rules apply (only hard level changes occur). You may need to assign the Clean Up attribute to the "next" cue in order to fully replace the stage look when you return to the original sequence.*

---

## Assigning Effects to Cues

---

The Effect assignments for cues appear in the appropriate column in the Playback and Cuesheet displays. When an Effect is assigned to a cue, the up time of the cue is the time during which the Effect fades in. The Effect remains on stage until the next cue command is executed. The Effect fades out during the down time of the cue.



**EXAMPLE:** To assign an Effect to a cue:

[RECORD CUE] [#] [EFFECT] [#] [ENTER]

- or -

[CUE] [#] [EFFECT] [#] [ENTER]      (*Assigns an Effect to an existing cue.*)

Channel levels may also change with Effect cues. An Effect may be assigned to a cue part if you want to keep the Effect fade time separate from the timing of other channel level changes.

Effects in cues stop running immediately when either the [LOAD] or [HOLD] or [BACK] commands are executed. To reinitiate a cue effect, start in the cue preceding the Effect cue and press the [GO] button.



**BASIC RULE:** *When recording a cue, group or Submaster live from stage with an Effect running, take out the Effect on stage with the playback fader or Submaster before executing the Record command. The live Record commands record an instantaneous stage picture, and therefore record channel levels from the effect if the Effect is left running.*



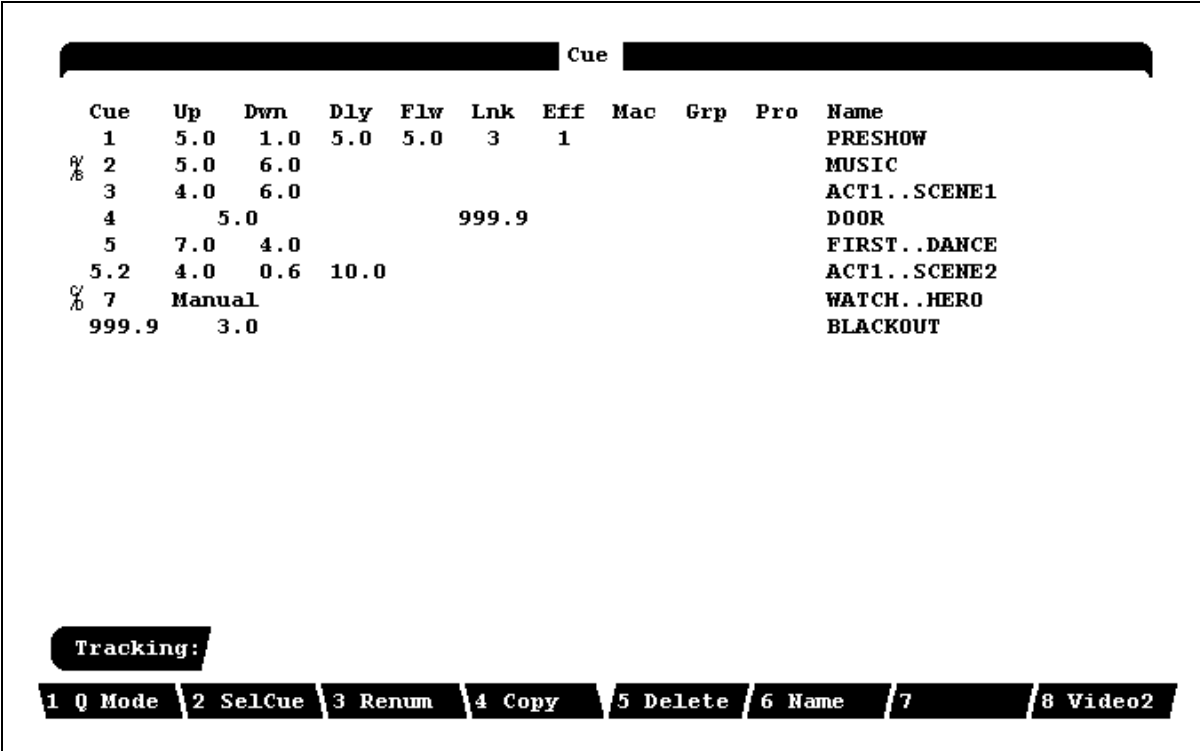
---

## CHAPTER 9: Playing Back Cues

### Cuesheet Display

---

The Cuesheet display is a work space that displays cues for viewing and editing. All cue attributes except channel and level assignments are available for editing. The current cue on stage is shown in a horizontal gray reverse video block. Notice that when you press the [GO] button, an A/B or C/D appears next to the cue, indicating that it is now the current cue. Unlike the Playback display, the Cuesheet display does not keep the current stage cue indicator in a fixed position when a new cue is executed.



The image shows a sample cue sheet display. At the top, there is a header bar with the word "Cue" in the center. Below this is a table with columns for Cue, Up, Dwn, Dly, Flw, Lnk, Eff, Mac, Grp, Pro, and Name. The table contains several rows of data, including cue numbers, timing values, and cue names. At the bottom of the display, there is a "Tracking:" label and a row of eight buttons labeled 1 Q Mode, 2 SelCue, 3 Renum, 4 Copy, 5 Delete, 6 Name, 7, and 8 Video2.

Cue	Up	Dwn	Dly	Flw	Lnk	Eff	Mac	Grp	Pro	Name
1	5.0	1.0	5.0	5.0	3	1				PRESHOW
2	5.0	6.0								MUSIC
3	4.0	6.0								ACT1..SCENE1
4	5.0				999.9					DOOR
5	7.0	4.0								FIRST..DANCE
5.2	4.0	0.6	10.0							ACT1..SCENE2
7	Manual									WATCH..HERO
999.9	3.0									BLACKOUT

Tracking:

1 Q Mode | 2 SelCue | 3 Renum | 4 Copy | 5 Delete | 6 Name | 7 | 8 Video2

Figure 9.1 Sample Cue Sheet Display

### Playback Display

---

The purpose of the Playback display is for playing back cues. The top of the Playback display shows a section of the Cuesheet. The size of the section of Cuesheet is defined by the number of cue rows you specify in the Setup display. The Playback display maintains current stage cue at the top of the page whenever a cue is executed by using the [GO] button. The Playback display is not intended to be used for editing cues as in the Cuesheet display. Notice that the Playback display doesn't have any soft keys visible to use for editing.

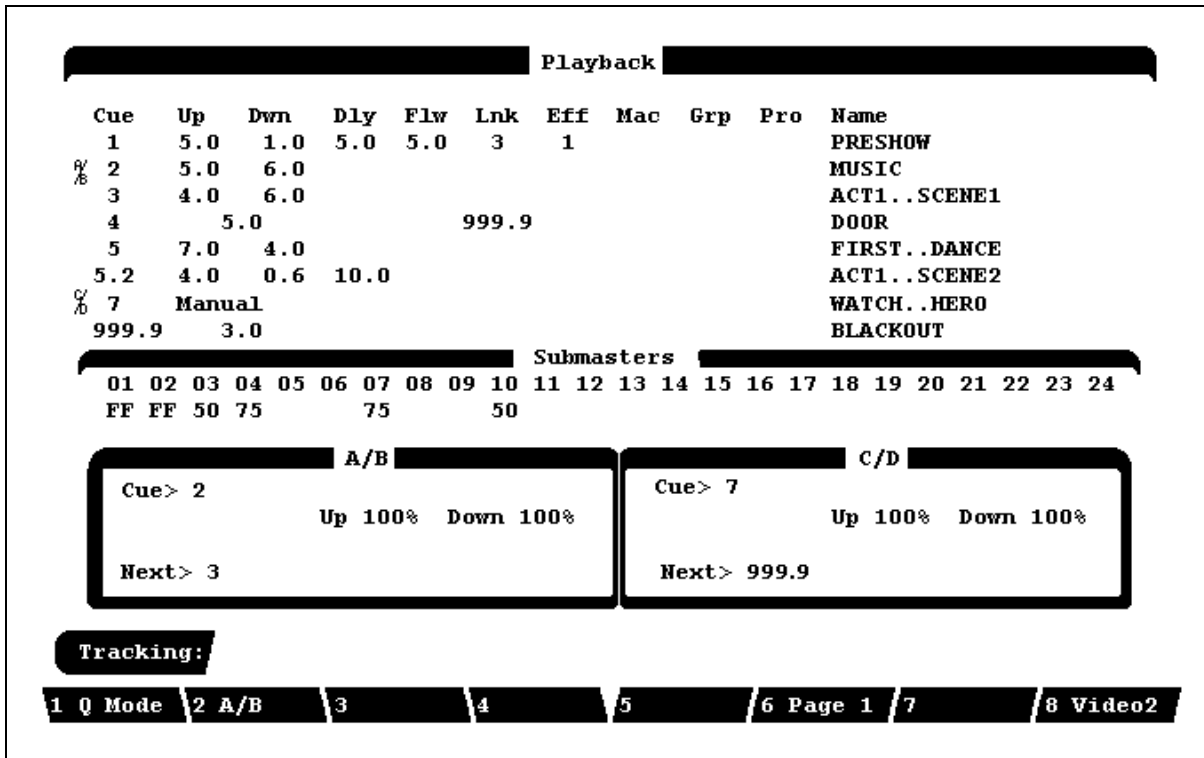


Figure 9.2 Sample Playback Display

## GO Button

The GO button is used to play back cues sequentially with their recorded fade times. Each time you press the GO button on either fade pair, you execute the next sequential cue. The current stage cue is defined as the cue that is currently fading in, or the last cue that faded in.

## HOLD and BACK Keys

If any cues are currently running in assigned fade times, you can press the **[HOLD]** key once to stop all the fades immediately. The LED on the **[HOLD]** key will also light. If you stop fades in this way, the Up and Down % will cease to move. Pressing the **[BACK]** key causes a reverse fade to the previous cue in two seconds. The LED on the **[BACK]** key will also light. Pressing the **[BACK]** key two more times will cause the fader to reverse yet again. The **[HOLD]** and **[BACK]** key functions are summarized below:

- For **running fades** = **[HOLD]** Stops the fade.
- No** running fades = **[BACK]** Reverses (fades to previous cue).
- For **stopped fades** = **[BACK]** Reverses (fades to previous cue).
- For **completed fades** = **[BACK]** **[BACK]** Reverses (fades to previous cue).



**NOTE:** *It is not necessary to press the [ENTER] key with HOLD BACK commands.*



**BASIC RULE:** *If timed cues are running when the [HOLD] key is pressed, it stops all active fades immediately. If no timed cues are running when the [BACK] key is pressed, the console reverses and fades to the previous cue in two seconds.*

## Playback Faders

---

Whenever cues are played back, in or out of sequence, the cue fades are loaded to physical playback faders, lettered A/B or C/D. The playback faders can be thought of as "conduits" through which all cue fades must pass to get to the stage. When you press the [LOAD] button, then the cue [#], the specified cue is loaded on the fader. Pressing the [GO] button will begin the fade. Cues assigned a numerical fade time begin to fade automatically. When the cue fade is complete, the cue is automatically cleared from the fader.

Moving the playback fader handle will affect the execution of a timed cue. This is the method by which manual take over occurs. There is indication in the Fade Box that takeover has occurred. See Taking Manual Control Of Timed Cues topic, later in this chapter.



**NOTE:** *It is necessary for the Playback fader handles to be in the full UP position for automatic timed fades to progress when the [GO] button is pressed.*

## Playback Fader Boxes

---

In the Stage and Playback displays (the two "live" displays), the two Playback Fader Boxes show you the current status of the playback faders. Two fades may be monitored at a time in the Playback Fader Boxes. Additional timed fades run "in the background", and appear on the screen automatically when shorter timed fades run out (this is called fader hierarchy). In each Playback Fader Box, the cue number is shown at the top of the box, and the cue fade % is shown in the right hand portion of the display.



**ADVANCED TOPICS:** See Chapter 15, *Effects*.

## Grandmaster Fader

---

In the right of the Stage and Playback screen is the Grandmaster Fader Indicator that shows you the current level of the Grandmaster Fader if the level is less than full. Whenever the Grandmaster level drops below Full, the level appears in this area.

---

## Manual Fades

---

Cues that are assigned a Manual fade time load when you press the GO button, and **wait to be executed by the movement of the fader handle**. The fade takes place as you move the handle along to the completion of its travel. When the handle reaches the top of the fader (at 10), the fade is complete and is cleared from the fader automatically. You may reverse the direction of the fade anytime before you reach the top of the fader travel, but once you get to 10 the fade is complete and cleared from the playback fader.

---

## Taking Manual Control of Timed Cues

---

As a timed cue is running on a playback fader, you can take manual control of the fade and complete it using the playback fader handle. To change the fade to a manual fade use the fader handle to “match and grab” the fade. When the fader has successfully grabbed a cue, a “manual” indication will appear in the Playback Fader Box. The remaining part of the fade is immediately assigned to the playback fader. The fade actually ceases running until you continue it by moving the playback fader. You can complete the remainder of the fade as though it were a manual fade.



**NOTE:** *You can't reverse the direction of a fade beyond the point where you took manual control of it. If you took control of a ten second fade after five seconds, the entire fade is available to control with the playback fader.*

If you want to simply speed up the rate of a running timed fade without stopping it to take manual control, you can use the [RATE] button which will place control of the rate on the trackball.

---

## Clearing Fades From the Playback Faders

---

When a manual fade is currently loaded to a playback fader, you can clear the fade from the fader by pressing the [CLEAR] button located on top of the Fader. Above each playback fader is a Clear button with a red LED in it. Press the [CLEAR] button followed by [ENTER] to completely clear the fader. **This will clear the fader and the Stage.**



**BASIC RULE:** *“Matching and grabbing” takes manual control of the fade. Pressing the [CLEAR] button followed by the [ENTER] button clears the fade from the fader instantly, and clears the stage as well.*

---

## Load Cue with Time Command

---

The **[LOAD]** hard key is used to load cues and can also be used to access cues out of sequence. This command is especially useful for bringing up cues on stage that you wish to edit or re-record.



**EXAMPLE:** To fade to cue 2 out of sequence:

**[LOAD] [2] [GO]**

The command in the Example above causes a fade to be loaded to a playback fader, and pressing the **[GO]** button will begin the fade. The fade can be switched to a manual fade by “matching and grabbing” the fade with the fader handles. In addition, a fade time can be entered at this point for this particular fade.



**EXAMPLE:** To fade to cue 2 out of sequence in 10 seconds:

**[LOAD] [2] [TIME] [10] [GO]**

---

## Controlling Fade Rates with the Trackball and Wheels

---

When you are playing back cues on playback faders, you can use the **[RATE]** key of a fader pair to assign control of the cue fade rate to the trackball and to the wheels below the LCD display. When you have rate control on the wheels or the trackball, moving the trackball or individual wheel up increases the time of the fade (slows down the rate of the fade or effect). Moving the trackball down decreases the time of the fade (speeds up the rate of the fade or effect). The remaining time of the fade in progress is shown in the LCD display (see figure 22.1 below)



Figure 9.3 LCD Display of Rate Override

---

## Changing Cue Fade Rates

---

While a timed cue fade is occurring on a playback fader, you can adjust the fade time by using the **[RATE]** key for that fader. The wheels will allow for adjustment of the Up and Down time for an individual fader. The Trackball adjusts both.



**EXAMPLE:** To adjust the rate of the cue currently fading on playback fader:

1. **[RATE]**
2. Adjust rate with the trackball or wheels by increasing or decreasing fade time.

- 
3.       **[CLEAR]** or **[RATE]**                   (Releases rate control from the trackball and wheels.)

When you use the trackball as in the Example above, you increase or decrease the fade time of the active fade proportionally. When you release rate control with the **[CLEAR]** or **[RATE]** key, the adjusted fade times remain for the fade. You can readjust the rate by capturing rate control again in the same manner.

---

# CHAPTER 10: Editing Cues and Using Track Modes

---

## Overview of Tracking

---

When you record a cue, you can record the channel levels in two ways: as **tracking** levels, or as **non-tracking** levels. You may want some channels to remain at the same level that they had in the previous cue. These non-changing levels can be tracking levels. Tracking levels have no real assigned value; they take on the same value that the channel had in the previous cue. Tracking levels are called “**soft**” levels for this reason. Changing a channel level in a cue may affect the same channel levels in later cues if they are “soft” levels.

In some old theater lighting systems, a bank of handles connected to resistance dimmers existed for controlling electrical output for selected circuits. These control panels were sometimes called “piano boards” because the original panels were built from upright piano crates. When you wanted to change levels for a cue on a piano board, you moved the handles that you needed to, and left the other handles alone. Those handles that you didn’t move on a piano board are equivalent to channel levels that track through cues in modern consoles that use tracking levels.

Non-tracking levels have a definite value assigned to them; they are unaffected by the channel levels in all other cues. They are referred to as “**hard**” levels for this reason. You can never affect a hard level in a cue by changing a channel level in an earlier cue.

You can determine whether channel levels are recorded as hard or soft levels by selecting different Track Modes when you record and edit cues.

---

## What is the Preview Cue?

---

The Preview cue is the cue that is currently selected in the Preview display. It is the default cue for any “blind” editing commands that you might enter without specifying a cue number. For instance, if you were in the Preview display and entered the command, “[TIME] [5] [ENTER],” it would change the time for the cue that was currently displayed as the Preview cue.

The Cuesheet and Tracksheet displays also allow blind editing of cues. When you enter a cue editing command in either of these displays, it affects the current Preview cue, just like in the Preview display. In these displays, the Preview Cue is indicated by the cue number appearing in white.



**NOTE:** *If you do not specify a cue number in an editing command while in a “Live” display (Stage or Playback), the edit affects the current Stage Cue.*

---

## Cue Recording/Editing Modes (Track Modes)

---

There are three different cue recording/editing modes, called Track modes:

- Tracking
- Cue Only
- Clean Up

Each of these modes affects the relationship of channel levels in a cue to their levels in subsequent cues, in different ways. Before defining the characteristics of each editing mode, it is important to understand how channel level tracking works.

- ✓ **BASIC RULE:** *Tracking and Cue Only modes both work the same way when you record cues live from stage with the [RECORD CUE] key. The difference between them occurs when you edit **existing** channel levels in Preview or Tracksheet.*

---

## Selecting the Track Mode

---

You can select the desired Track mode (Tracking, Cue Only, or Clean Up) with the (**Q MODE**) soft key. In appropriate displays, the current tracking mode appears to the left of the Command Line in the Status Bar.

You can select a different Track mode at any time by pressing the (**Q MODE**) soft key. The change is immediate and does not affect the contents of the Command Line. Editing existing cues and creating new cues may have different results in different Track modes.

- ✓ **BASIC RULE:** *When you are recording cues live in the Stage display (with the [RECORD CUE] key), you should select the track mode before you complete the record command. In the Preview and Tracksheet displays, you should select the desired Track mode before you create or edit any cues.*

- ⇒ **HINT:** *In any display, you can select the Track mode before completing a command.*



---

## Tracking Levels

---

Tracking is a feature that simply allows a level assigned to a channel in one cue to stay at that same level in the next cue. The level is said to “track into” the next cue. The tracking level will continue to appear for that channel in subsequent cues, until a cue assigns a new level to that channel. The tracking levels allow you to edit that channel’s level in a whole 24/48 of cues by editing it in the first cue.



**HINT:** *Tracking is used in theater for basic washes or looks that remain constant throughout a scene from cue to cue. This allows you to quickly edit a basic look for all the cues in the scene by editing levels in the first cue, so that the changes “track into” the following cues.*

There are two kinds of channel level values, depending on the level of the channel in the previous cue. One kind of channel is called a "hard", or non-tracking level. Hard levels occur in cues for channels that have different levels than they had in the previous cue. When you assign new levels and record the cue from stage, those channel levels that change are hard, non-tracking levels. The channel levels that remain the same are tracking, or "soft" levels. Soft levels do not have a definite set value, they take their value from the level of the channel in the previous cue.

Soft levels are shown in light gray in all displays that show cue levels (Stage, Preview, and Tracksheet). All hard levels are shown in white in the Tracksheet display. In the Stage and Preview displays, hard levels are shown in different colors. When a level has become higher in value, it is shown in red. If a level becomes lower in value, it is shown in blue. If a level is hard but stays at the same value (a special case), it is shown in white.

---

## Hard and Soft Zeros

---

"Hard zero" is the term used for zeros that appear as zeros. Although zero is generally considered to be the lack of a level for a channel, you may assign a hard zero to a channel in a cue. This is because some cues (like blackout cues) bring channel levels to zero. Although zeros are never shown in the Stage display, cues that have zero as an assigned level show their hard zeros in blue in the Preview display. Hard zeros are shown in white in the Tracksheet display. Unlike other tracking levels, tracking zeros are never shown in any display.



**BASIC RULE:** *In the Preview and Tracksheet displays, when no channel level is shown, it is actually a tracking (soft) zero.*

---

## Creating Cues in Tracking Mode

---

When you are working in Tracking mode, channel levels automatically track the same values from cue to cue, unless you specify a new level for them. When you record a new cue **live** from the Stage display, all channels that remain at the same level as in the previous cue will be assigned soft levels; all channel levels that have a new value will be assigned hard levels.

- ✓ **BASIC RULE:** *When recording a cue **live** in Tracking mode, only channels that have new levels different from the previous cue will have hard levels; all other channels will have soft tracking levels.*

You can create cues “blind” in the Preview, Cuesheet, Tracksheet and Playback displays by using the [CUE] key followed by the cue number that you want to create. When you create a cue “**blind**” in Tracking mode, its channel levels will be identical to the previous cue, except that all channel levels will be soft levels. You may then edit the cue as necessary.

- ✓ **BASIC RULE:** *When creating a cue **blind** in Tracking mode, the cue will be all soft levels, with values identical to the previous cue.*

---

## Creating Cues in Cue Only Mode

---

In Cue Only mode, **when you record a cue live** on stage using the [RECORD CUE] key, the result is the same as when you are in Tracking mode; only channels with levels that are different from the previous cue are given hard levels, and all other channels are assigned tracking levels. The difference between Tracking and Cue Only modes occurs when you create cues blind or when you edit existing channel levels in Cue Only mode.

- ✓ **BASIC RULE:** *When recording a cue **live** in Cue Only mode, the result is the same as in Tracking mode; only channels with new levels from the previous cue will have hard levels.*

In Cue Only mode, when you create a cue **blind** in the Preview, Cuesheet, Tracksheet and Playback displays with the [CUE] key, it creates a “blank” cue. Any channels that had a non-zero level in the previous cue have hard zeros assigned to them. This creates a cue with all zero levels, hard and soft, that you can use to build a new cue from scratch.

- ✓ **BASIC RULE:** *When creating a cue **blind** in Cue Only mode, a “blank” cue with all levels at zero is created.*

---

## Creating Cues in Clean Up Mode

---

Clean Up mode is the simplest way of recording and editing cues. Tracking levels do not exist for cues created in Clean Up mode. In Clean Up mode, each cue exists as a separate memory of hard channel levels, with no relationship to each other. No zeros are shown while in Clean Up mode since all cue channel levels are hard levels, and all zeros are also hard levels. If a channel is blank for a cue created in Clean Up mode, it is a hard zero. You must be in Tracking or Cue Only mode to view the hard zeros assigned to a cue created in Clean Up mode.



**HINT:** *If you do not want to ever use the tracking feature, always work in Clean Up mode.*

When you recording cues **live** on stage in Clean Up mode, you only affect levels in the cue you are creating. In Clean Up mode, every channel is assigned a hard level. If you don't assign a specific level to a channel in Clean Up mode, a hard zero is automatically assigned to the channel.

When you create a cue “**blind**” in Clean Up mode, every channel has a hard zero assigned to it. Since you cannot see hard zeros in Clean Up mode, the cue appears as a “blank” cue.

If you change to Tracking or Cue Only mode after you have created cues in Clean Up mode, the cues appear as Clean Up cues. They have the Clean Up attribute assigned to them, and they contain all hard levels, including hard zeros. (See The Clean Up Attribute topic, later in this chapter.)



**BASIC RULE:** *Every cue created while in Clean Up mode is a Clean Up cue.*

---

## Example, Creating Cues Blind in Different Q Modes

---

Use the following example to compare the results of creating cues “blind” in the different Q modes, while in the Tracksheet display.



**EXAMPLE:** In the Tracksheet display, repeat the following five steps in Tracking, Cue Only and Clean Up modes:

1. Select the Q mode using (**Q MODE**) soft key.
2. [**CUE**] [**1**] [**ENTER**]
3. [**1**] [**THRU**] [**10**] [**AT**] [**FL**]
4. [**CUE**] [**2**] [**ENTER**]
5. [**CUE**] [**3**] [**ENTER**]

**In Tracking Mode:** Channels 1 - 10 are hard levels at Full in cue 1. In cues 2 and 3, the Full levels for channels 1 - 10 are soft/tracking levels.

---

**In Cue Only Mode:** Channels 1 - 10 are hard levels at Full in cue 1. In cue 2, channels 1 - 10 are all hard zeros. In cue 3, channels 1 - 10 appear blank (soft zeros).

**In Clean Up Mode:** Channels 1 - 10 are hard levels at Full in cue 1. In cues 2 and 3, the channels appear blank while in Clean Up mode. However if you change to Tracking or Cue Only mode, you will see hard zeros assigned to all channels in cues 2 and 3.

---

## Clean Up Cues

---

When you are using tracking levels, you sometimes need to stop the tracking levels from continuing into later cues. Typically, this happens at the end of a scene when the basic stage look changes to the look of the next scene. To prevent tracking levels from continuing into later cues, you can assign the Clean Up attribute to a cue. When you assign the Clean Up attribute to a cue, the cue levels all automatically become hard levels. In this way it works like a “wall” that stops all previous tracking levels from continuing into subsequent cues. In the Tracksheet display, a Clean Up cue can be easily identified by its appearance - it looks like a wall of zeros.



**HINT:** *Some designers make the last cue of each scene a Clean Up cue to insure themselves a fresh start for each new scene, with no unwanted tracking levels from the previous "look".*

---

## Editing Existing Cue Levels in Different Q Modes

---

Each of the editing modes (Tracking, Cue Only, and Clean Up) act differently not only when you create new cues but also when you edit existing cues. The same basic principles apply, but each mode has a few unique characteristics when editing existing cues.

---

## Editing Existing Cue Levels in Tracking Mode

---

Edits made to existing cues while in the Tracking mode will allow any channel(s) assigned a new level to continue to read at that level in subsequent cues until it encounters another hard level. The new level is said to “track through” into later cues. You must be sure you want the new channel level to continue into later cues, because when you change it in Tracking mode it can track through a large number of later cues. Changes made to a soft channel level will always change it to a hard level while in any Track Mode.



**HINT:** *If you edit a cue in the **Preview** display while in Tracking mode, the change may track into subsequent cues, but you will not see the changes to the other cues. If you edit in **Tracksheet**, you can see the other cue levels that change as a result of your edit.*

---

## Editing Existing Cue Levels in Cue Only Mode

---

Edits made to existing cues while in the Cue Only mode maintain the current levels of the following cue by converting soft tracking levels to hard non-tracking levels. Any newly assigned levels do not track into subsequent cues.

- ✓ **BASIC RULE:** *In Cue Only mode, the contents of the cue following the cue being edited are always preserved.*
- ✓ **BASIC RULE:** *Blind editing of channel levels while in Cue Only mode affects levels “in that cue only”.*

---

## Editing Existing Cue Levels in Clean Up Mode

---

When you operate in Clean Up mode exclusively the concept of tracking levels does not exist. Every cue is recorded as a completely different set of channels at hard non-tracking levels. Edits made in this mode only effect the cue in which the edits are made. If tracking levels appear in the subsequent cue, they will be changed to hard levels to preserve the contents of the sequential cues.

- ✓ **BASIC RULE:** *When you edit a level in Clean Up mode, the change has no effect on levels in any other cues.*

---

## Changing Soft Levels to Hard Levels

---

You can change soft levels to hard levels in any Track mode. In the Preview or Tracksheet displays, when **non-zero** tracking levels are captured, they immediately become hard non-tracking levels. If a soft tracking **zero** (which isn't shown on the display) is captured, it remains soft.

- ⇒ **HINT:** *When you are working in the Tracksheet or Preview display, be careful with the way that you use the [ENTER] key. It will change soft levels to hard levels when you use it to capture all active channels in a cue.*

---

## Changing Hard Levels to Soft Levels (Restoring Tracking Levels)

---

You can change a hard non-tracking level to a soft tracking level in any Track mode. This is called restoring tracking. You simply address the channel number and use the [AT] and [ENTER] keys. This effectively removes the hard level and allows that channel to track the level assignment from the previous cue.



**EXAMPLE:** To restore tracking to a channel list in the Preview or Tracksheet display:

1. [CUE] [#] (Selects the cue to be edited.)
2. [# list] [AT] [ENTER] (Specified channels become soft levels.)

If you restore tracking to **any** channel in a Clean Up cue, the cue is no longer designated as a Clean Up cue. The Clean Up attribute is removed from the cue and it is no longer labeled in the Clean Up column in the Cuesheet and Playback displays. All other hard levels (including hard zeros) remain in the cue, so the cue will continue to work like a Clean Up cue to stop tracking.

You may find that a channel level color shows a change when the channel did not actually change levels between cues (the level value remains the same, and the color indicates a change). The wheel may have been moved unintentionally while channels were captured. When channels are active on the wheel, there is a possibility of the wheel moving just enough to change the color of the level in the display, without changing the channel level. This is because the console internally uses 256-step (8-bit) resolution for channel levels. You can eliminate this color change by resetting the level with the keypad.

---

## Copying Cues in Different Track Modes

---

When you copy a cue to another location in your show, tracking levels may take on different values in the new cue location. The two things to consider are:

- How the soft levels in the destination (new) cue will be affected by the levels of its preceding cue.
- How the soft levels in the cue following the destination cue will be affected by the levels in the new cue. You can use different Track modes to alter the result of the copy command.



**BASIC RULE:** *When copying cues, hard levels never change. If you are using Tracking mode, it is important to consider how the new cue's soft levels will be affected by the preceding cue, and how the next cue's soft levels will be affected by the new cue.*

**Copying in Tracking Mode:** The destination (new) cue has the same levels as the original cue for all of the **hard** levels in the original cue. All of the **soft** levels in the original cue copy to the new cue as soft levels, so they will take their values from the levels in the cue that comes before the new cue. Additionally, tracking levels in the cue that follows the destination (new) cue take on the values of the levels in the new cue.



**BASIC RULE:** *Copying cues in Tracking mode may create a new cue that has different levels than the original cue. It may also affect tracking levels in cues that follow the new cue.*

---

**Copying in Cue Only Mode:** The destination (new) cue contains the same levels as the original cue for **all levels, hard and soft**. Soft levels become hard levels in the new cue, where necessary to maintain their same value. The cue that follows the new cue is affected similarly. Tracking soft levels become hard levels if they must do so to maintain their same level. Otherwise soft levels stay soft.



**BASIC RULE:** *Copying cues in Cue Only mode always creates a new cue that has the same levels as in the original cue. Soft levels change to hard levels as necessary to maintain the same levels in the new cue. It does not change levels in cues that follow the new cue, except for changing soft levels to hard levels as necessary to maintain the same levels in all cues.*

**Copying in Clean Up Mode:** Copying cues in Clean Up mode has the same results as copying in Cue Only mode. However, the results are not visible while in Clean Up mode, because no soft levels are shown. Generally, if you are working in Clean Up mode, you are not using Tracking levels anyway, so the copying of cues always results in the exact same cue in two locations.



**HINT:** *To maintain the same “look” of a cue copy and the next cue after the cue copy’s new location, do all Copy commands in Cue Only or Clean Up mode. Although you cannot see the tracking levels while in Clean Up mode, both modes will preserve tracking levels where they can do so (where level values do not change).*

---

## Deleting Cues in Different Track Modes

---

The Delete Cue command completely removes the designated cue from your show. In all Track Modes, the contents of the cue following the deleted cue are preserved by converting all its soft levels to hard levels as necessary. This not only protects the next cue, but it also maintains the tracking pattern for the series of cues following the deleted cue.

---

## Moving (Renumbering) Cues in Different Track Modes

---

The Renumber Cue command allows you to move a cue to another location in your show. When you use a Renumber command it is equivalent to deleting the source cue and creating a new cue. All of the levels and attributes of the source cue are preserved under the new cue number.

Your tracking levels may take on different values in the new cue location depending on the current Track mode when you use the Renumber command.



**BASIC RULE:** *The Renumber command follows all the same rules as the Copy command in the way soft levels are affected by the cue's new location in your show.*

**Renumbering in Tracking Mode:** Every hard level from the source cue remains the same in the new cue location. Soft tracking levels transfer to the new cue to allow hard levels to track into the new cue location.



**BASIC RULE:** *Renumbering cues in Tracking mode does not transfer soft level values to the new cue location. The soft levels stay soft and take on new values based on the new "previous" cue.*

**Renumbering in Cue Only Mode:** All levels, hard or soft, in the renumbered cue maintain their original assigned values when they are moved to a new location. Soft levels convert, as necessary, to hard levels to maintain their values. The cue following the renumbered cue is affected similarly. Tracking soft levels convert to hard levels, as necessary, to maintain their same level, otherwise the soft levels stay soft.

**Renumbering in Clean Up Mode:** Renumbering cues in Clean Up mode follows the same rules as in Cue Only mode. The results are not visible while in Clean Up mode since no soft tracking levels are shown. The "hidden" soft levels are converted to hard levels, as necessary, in the renumbered cue and in the cue that follows the renumbered cue to maintain their assigned level values.



**HINT:** *To maintain the same "look" of a renumbered cue and the next cue after the cue's new location, do all Renumber commands in Cue Only or Clean Up mode. Although you cannot see the tracking levels while in Clean Up mode, both modes will preserve tracking levels where they can do so (where level values do not change).*



---

# CHAPTER 11: Names

## OVERVIEW

---

Naming is a very useful feature available to you in the MC 24/48 consoles. Cues, groups, effects, Submasters, shows and disk files can be assigned names. There are two ways to input alphanumeric names. One option is to purchase the ASCII Keyboard option (note: this is a standard PC Keyboard). The second method is to use the Submaster Bump buttons which are able to act as alphabet characters (letter keys) in order to spell out the desired name labels. You can assign names to items by selecting the appropriate Name soft key, and then using the Bump buttons as letter keys to spell out the desired name. All names can be up to 16 characters long, except for disk file names which can be up to 12 characters in length. The Reference by Name feature in the Setup display allows any named item to be addressed by its assigned name as well as its number.

Bump Button	Alpha Character	Bump Button	Alpha Character	Bump Button	Alpha Character
1	A	9	I	17	Q
2	B	10	J	18	R
3	C	11	K	19	S
4	D	12	L	20	T
5	E	13	M	21	U
6	F	14	N	22	V & Space
7	G	15	O	23	WX
8	H	16	P	24	YZ

Table 11.1, Alpha Character to Bump Button Assignment

## Alpha or Name Mode

---

In Alpha mode, each Bump button represents a letter of the alphabet instead of a Submaster number.

Any time the soft key (**NAME**) is pressed in any eligible display, the Submaster Bump buttons are in Alpha mode, and can only be used for constructing names, not for Submaster functions. Once the naming command is executed with the **[ENTER]** key, the Bump buttons are again available for Submaster functions.

## Cue, Effect, Group, and Submaster Names

---

You can assign names up to 16 characters in length to cues, effects, groups and Submasters. These names can be exclusively numbers, exclusively letters (via Submaster Bump buttons) or a combination of letters and numbers.

Cue names often describe the action on stage to signal the point at which that cue should begin. A cue named "Faust Down Right" may tell the stage manager to call that cue, or may tell the board operator to push

---

the **[GO]** button when Faust reaches his downstage right position. A cue may be named in any display where cues may be addressed.



**EXAMPLE:** To name a cue in the Preview display:

**(SELCUE) [#] (MORE) (NAME) [enter name] [ENTER]**



**EXAMPLE:** To name a cue in the Cuesheet display

**(SELCUE) [#] (NAME) [enter name] [ENTER]**

You can use the **(NAME)** soft key in the Effect sub-display to assign a name to the current effect. Effect names often describe their action, placement in the show, or possibly their location. An effect might be called "Proscenium Chase" or "Act 2 Fire."



**EXAMPLE:** To name an effect in the Effect sub-display:

1. **[STAGE] [EFFECT] [#] [ENTER]**
2. **(NAME)**
3. **[enter name] [ENTER]**

You can use the **(NAME)** soft key in the Group sub-display to assign a name to the current group. Group names often refer to a location on stage, placement in the show or a description of the "look." A group may be called "DR Bench Evening" or "Warm Cyc Tone."



**EXAMPLE:** To name a group in the Group sub-display:

1. **[PREVIEW] (SELGRP) [#] [ENTER]**
2. **(NAME) [enter name] [ENTER]**

You can use the Submaster sub-display to assign a name to a Submaster. This can be especially useful to help clarify "at a glance" a Submaster type and function. An Effect sub name can describe the action of the effect, "Act3 Window Glow". A timed Submaster, Bump button settings or descriptions of "looks" can all be identified quickly by the Submaster name.



**EXAMPLE:** To name a Submaster in the Submaster sub display:

1. **[PREVIEW] (SELSUB)[#] [ENTER]**
2. **(NAME)**
3. **[enter name] [ENTER]**

---

## Show and Disk File Names

---

You can name your show in the Setup display by pressing **[1] [ENTER]**, then type in the name then press **[ENTER]** again. A show name may be up to 16 characters in length. The show name may also consist of a combination of letters and numbers. It is important to remember that a show name is different from a disk file name. The show name labels the show as seen in the Setup display. The show name, as well as the names of any cues, groups etc. appear when show information is printed.

A disk file name is the label the show is given on your disk. Often the disk file name is the same as the show name. The disk file name can be a combination of letters and numbers up to eight characters in length, which sometimes doesn't permit a show name and disk file name to be the same.

A file name is assigned to the show when you press **[2] [ENTER]** in the Setup display. At this point, enter your file name using the Data Entry Keypad and the Bump buttons, and then press the **[ENTER]** key. If you do not specify a name, the console records your show to disk as the default file, which is the current File Name shown in the Setup display. If you have not yet recorded a new show to disk, or did not originally retrieve the show from disk, no current File Name is shown in the Setup display. If you record a "new" show to disk without specifying a name there will be no default file name..



**EXAMPLE:** To assign a file name to a show.

1. **[SETUP] [2] [ENTER]**
2. Enter show name, up to 8 characters.
3. **[ENTER]** *(The assigned disk file name appears in the Setup display in the File Name field.)*

---

---

## CHAPTER 12: Utilities, Warnings, Printing, and Default Settings

### Dimmer Check Utility

---

The Dimmer Check utility lets you test the output of individual dimmers. The main Dimmer Check Utility is found in the PATCH display. To start this check, press the **(CHECK)** soft key. Next, enter a level for the dimmer, then **[ENTER]**. A box will appear in the middle of the display showing the dimmer and the output it is currently assigned to. Using the Up and Down keys you may page through the dimmers to view the entire list if desired.



**EXAMPLE:** To select Direct Dimmer Control in the Patch display:

1. **(CHECK) [#] [AT] [level] [ENTER]**
2. **[CLEAR]** (Dismisses Direct Dimmer Control window.)

To start a dimmer check in the Stage display, use the **(LEVELS)** soft key to view a dimmer display. A dimmer may be brought to a level using the **[DIMMER]** hard key on the Data Entry Keypad. The output level of the dimmer you are currently testing is always under control of the wheel.

To release Direct Dimmer Control from the wheel, press the **[CLEAR]** key, select a new command, or press a display key.



**EXAMPLE:** To select Direct Dimmer Control in the Stage display:

1. **[DIMMER] [#] [AT] [level]**
2. Adjust level with the trackball .
3. **(LEVELS)** (*Dismisses Direct Dimmer Control window.*)

### Warnings and Error Messages

---

**Overwrite Warning:** The Overwrite Warning message alerts you to the fact that the command that you entered will overwrite information that already exists in console memory. The command will delete the previous information from the console memory and replace it with the newly created information. To cancel the overwrite, or to proceed with the overwrite, follow the instructions in the overwrite box. The Overwrite Warning message occurs with the following command types, when the current command would cause pre-existing data to be destroyed:

- 
- Record** commands
  - Copy** commands
  - Renumber** commands
  - Patch 1 to 1** commands
  - Clear Patch** commands

**Error Messages:** A red Error Box containing an error message appears on the display when the command entered cannot be performed. Usually, this type of error occurs when a wrong key or wrong command has been entered. In all cases, the command entered cannot be executed as specified until you correct the problem indicated in the Error Box. The following actions cause an Error Box to appear:

- Command syntax errors (wrong keystrokes)
- Range errors (see next topic)

Press [**CLEAR**] to dismiss an Error box.

**Disk I/O Error Message:** A Disk I/O Error message appears whenever your requested disk function cannot be completed successfully. This message indicates a problem with the disk drive or the floppy disk itself. Some common conditions that cause the Disk I/O Error message are:

- No files found in floppy disk directory
- Cannot read disk directory

Press [**CLEAR**] to dismiss an Error box.

**Record Disk Warning:** An Overwrite Warning message appears whenever you re-record a show onto floppy disk. This warning indicates that the previous file on disk (with the same disk file name) will be replaced with the current show in console memory.

## Printers

---

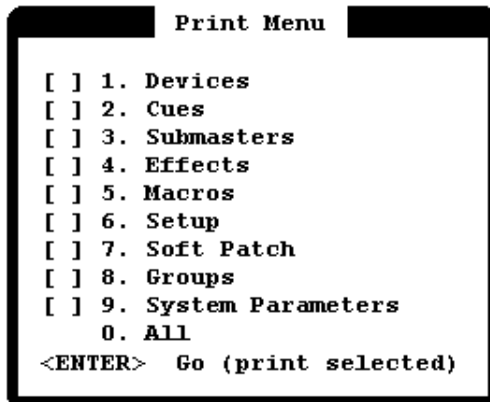
The MC 24/48 console is designed to be compatible with printers that support the IBM® character graphics set. The console sends a transmission to print 62 lines per page, followed by a form feed. The MC 24/48 is also compatible with the LX line of Epson® dot-matrix printers, or with any printer that supports emulation of Epson LX printers. If you use a laser printer, it must be an HP® Laser printer or HP® Laser compatible printer.

---

## Printing

---

You can perform all printing commands through the Setup display. You can print all of the show, or print only specific portions. You can use the following (Print) soft keys to print its corresponding show data:



1. Devices = Prints entire Device Definitions.
2. Cues = Prints entire Cue list.
3. Submasters = Prints entire Submaster list.
4. Effects = Prints entire Effects list
5. Macro = Prints entire Macro list.
6. Setup = Prints all Setup configurations.
7. Soft Patch = Prints entire Patch Table
8. Groups = Prints entire Group list.
9. System Parameters = Prints all System Parameters.
0. All = Prints ALL.

Figure 12.1 – Print Menu



**NOTE:** Printing all the show data with the ALL option takes a long time (and a lot of paper).



**NOTE:** When printing items like Cues, Groups, and Submasters, The Print Menu will offer the option to print with levels. Typing [L] will accomplish this.

---



---

## CHAPTER 13: Memory

### Console Memory vs. Floppy Disk Storage

---

When you record information (such as a cue in the Stage display or edits made in the Preview display) the information is saved in the console's RAM (Random Access Memory). All information remains in memory when the console is turned off because the RAM has a battery to keep the memory active.



**ADVANCED TOPIC:** For more information on the battery, see Appendix A, *Maintenance and Customer Service*.

When you record a show to floppy disk, it is stored on the disk for reloading into the console at a later time. It is always a good idea to keep your show stored on floppy disk as a backup to what is stored in the console.

### Performing a “Hard Clear”

---

You can clear all memory in the console and reset the main processor in the console by performing what is called a “Hard Clear”. This totally clears anything that has been stored in RAM. No show information will remain in memory after you perform a Hard Clear. The System Settings will be reset to their default settings. If the console has experienced a power surge or other anomaly that you think may have caused your console to malfunction, it is recommended that you perform a Hard Clear.



**EXAMPLE:** To perform a Hard Clear:

1. Save your show to disk if you wish to save the show information. This procedure will erase all information in the console RAM.
2. Hold down the [CLEAR] key. **Keep it held down until this procedure is complete.**
3. While continuing to hold down the [CLEAR] key, turn the power switch to OFF.
4. Wait approximately five seconds.
5. Turn the power switch to ON.
6. Wait for the display to fully reappear on the monitor.
7. Release the [CLEAR] key.



**NOTE:** *If you think the show has been corrupted as a result of a malfunction, the disk file may also be corrupted when you save it. If you have an earlier version of the show already saved on disk, it would be preferable to retain that earlier file than to overwrite it and risk corrupting your only good copy. If you have made any edits since that earlier version, you can save the new "suspected corrupted" version as a different file name, and attempt to use it after the Hard Clear.*

## Recording to a Floppy Disk

The MC 24/48 uses **only** 3½" double-sided HD (High Density) 1.44MB disks formatted for IBM® compatible PCs. The disk drive is located below the front edge of the console. Use the write protect tab on the floppy disk when you want to protect the contents of the floppy disk from being erased or overwritten.

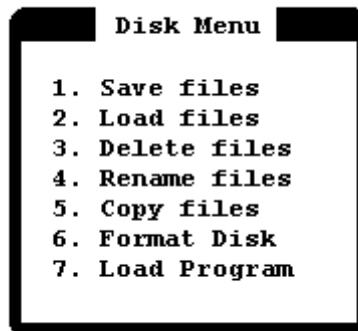


Figure 13.1 Disk sub menu



**EXAMPLE:** To record an entire show to a floppy disk, from the Setup displays

1. (DISK) (Brings up the disk sub menu )
2. [1] [ENTER] (Brings up the Save File menu)
3. [#] [ENTER] (Selects the File to be saved)

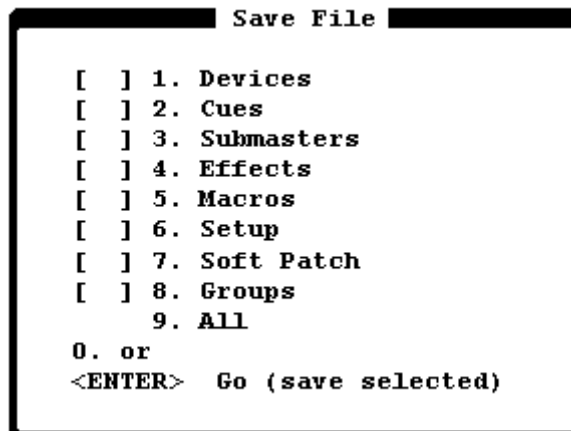


Figure 13.2 Save File sub menu

**Overwrite Warning Message:** Multiple shows may be recorded to a floppy disk. When a show file on the disk already has the same file name as the show you are trying to record, an Overwrite Warning message appears. Press the [ENTER] key to complete the command and replace the pre-existing show file, or press the [CLEAR] key to cancel the command. If the show file name to be recorded is a new name, no files on the disk will be overwritten.

Use the (DISK) soft key in the Setup display to invoke the Disk File Management display, which accesses all files currently on disk.

## Retrieving from a Floppy Disk

To retrieve a show file from a disk and load it into the console RAM, use the (DISK) soft key in the Setup display with the name of the desired file. You can use up to 8 characters in the show file name to specify the file on disk to be retrieved. If no name is specified when using the Disk Menu, the console attempts to retrieve the current show file name.

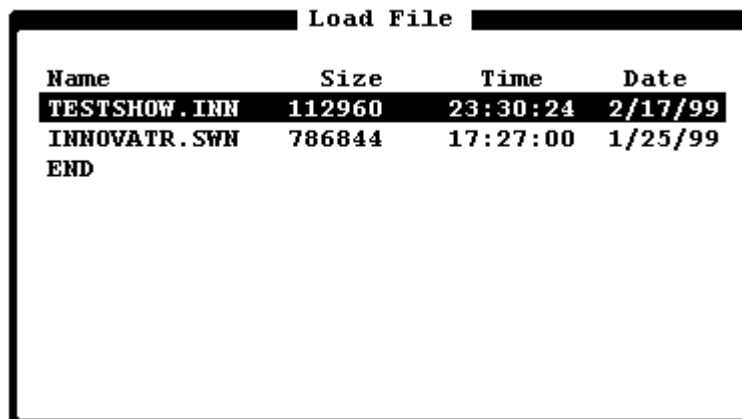


Figure 13.3 - Load File sub menu

---

**Overwrite Warning Message:** An Overwrite Warning message announces that the current show in memory will be replaced by the show data being retrieved. Follow the directions in the warning box to proceed.



**EXAMPLE:** To retrieve an entire show from a disk (and replace show data currently in memory) from the Setup display:

1. **(DISK)** (Opens the Disk Menu)
2. **[2] [ENTER]** (Opens the Disk File Management sub-display.)
3. Use [ ]/[ ] keys (Select the file to be retrieved)

## Upgrading Software

---

The MC 24/48 console has the ability to have new versions of software loaded into it from floppy disk, like upgrading software on a personal computer. The disk must be an MC 24/48 Operating System disk in order for the procedure to function correctly. Your console was shipped with an Operating System disk that has a copy of the original software version that was loaded in it when it was tested at the factory.

---

# **MC 24/48 USER GUIDE**

## **PART III: ADVANCED TOPICS**

**CHAPTER 14: Groups**

**CHAPTER 15: Effects**

**CHAPTER 16: Profiles**

**CHAPTER 17: Macros**

**CHAPTER 18: Moving Lights**

**CHAPTER 19: Programming with Moving Lights**

---

---

## CHAPTER 14: Groups

### Overview of Groups

---

A group is a set of channel and levels that you can recall as a single group number. A group is just like a Normal Submaster, except that a group does not have a fader like a Submaster. Groups often represent "looks" on parts of the stage that can be used as building blocks to create cues, subs, Effect steps, and other groups. There are a maximum of 600 groups available, which may be created in any order.

### Recording Groups

---

Groups are created in two ways: "live" in the Stage display, or "blind" in the Group Sub display of Preview. Groups are created in the Stage display by creating a "look" on stage, and then using the **[RECORD GROUP]** key. Using the **[RECORD GROUP]** key takes an instantaneous picture of the Stage display. Parked dimmers are not recorded.



**EXAMPLE:** To create a group "live" in the Stage display:

1. Set channel levels to obtain the desired "look" on stage.
2. **[RECORD GROUP] [#] [ENTER]** *(If specified group already exists, the Overwrite Warning message appears.)*



**BASIC RULE:** *Whenever any of the three [RECORD] keys are used, they record the channel levels that are currently active in the Stage display, no matter what display is being viewed when the command is entered. Parked dimmer levels are never recorded with any of the live Record commands.*



**EXAMPLE:** To create or edit a group "blind" in the Group sub display which is in Preview:

1. **(SELGRP) [#] [ENTER]**
2. Adjust channels and levels.



**BASIC RULE:** *Whenever you execute a Record command, the console assumes that you want to record live levels for **all** channels, unless you specify a different list of channels.*

---

## Recalling Groups

---

To recall a group, use the **[GROUP]** hard key.



**EXAMPLE:** To recall a group in all but the Cuesheet and Setup displays:

**[GROUP] [12] [AT] [FULL]**

You can assign a level to a group in the Command Line. Levels within the group read proportionally to the level assignment of the group.



**EXAMPLE:** Let's say group 2 contains channels 1 - 4 at 80%. To assign group 2 to a proportional level of 50% in the Stage display:

**[GROUP] [2] [@] [50]**      (*Channels 1 - 4 set at 40% on stage (40%=50% of 80%)*)

You can only edit groups in the Preview Group sub-display. An edit to an existing group affects levels only in the Group display. Edits made to a group are not updated to any other instances where the group was previously used to set channel levels.

---

## Copying Groups

---

You can use the **(COPY)** soft key to copy the contents of one group into another group number in the Preview Group sub-display.



**EXAMPLE:** To copy a group to group 2, in the Group sub-display:

1.      **(SELGRP) [#] [ENTER]**
2.      **(COPY) [2] [ENTER]**



**BASIC RULE:** *The item number being copied from is the "source", and the number being copied to is the "destination" item.*



---

## Renumbering Groups

---

You can renumber groups using the **(RENUM)** soft key in the Group sub-display.



**EXAMPLE:** To renumber the current group in the Group sub-display:

1. **(SELGRP) [#] [ENTER]**
2. **(RENUM) [destination #] [ENTER]**



**NOTE:** *When you renumber a group, the contents of the source group are assigned to the destination group, and the source group is deleted entirely.*

---

## Deleting Groups

---

When you delete a group, both the group number and its contents are deleted. A group may be deleted in the Group sub-display, or it may be cleared in the Setup display.



**EXAMPLE:** To delete a group in the Group sub-display:

**(MORE) (DELETE) [# list] [ENTER]** *(An Overwrite Warning message lists the total number of groups that will be lost.)*

---

# CHAPTER 15: Effects

## Overview of Effects

An Effect is a sequential series of lighting steps to which you can assign levels, times, and patterns. Effects were originally created to achieve "chase patterns" of lights, but Effects can be used in many ways. The sequence and channel content of an Effect is determined by its steps. Each Effect step has a collection of channels assigned to it. All the steps played back in their numerical order defines each Effect (unless the sequence is altered by a specific pattern).

## The Effect Sub-display

You can use the Effect sub-display to create new Effects, or edit existing Effects. The Effect sub-display lists name, the elements and levels of each Effect step, as well as the pattern and Fade and Dwell time for each step.

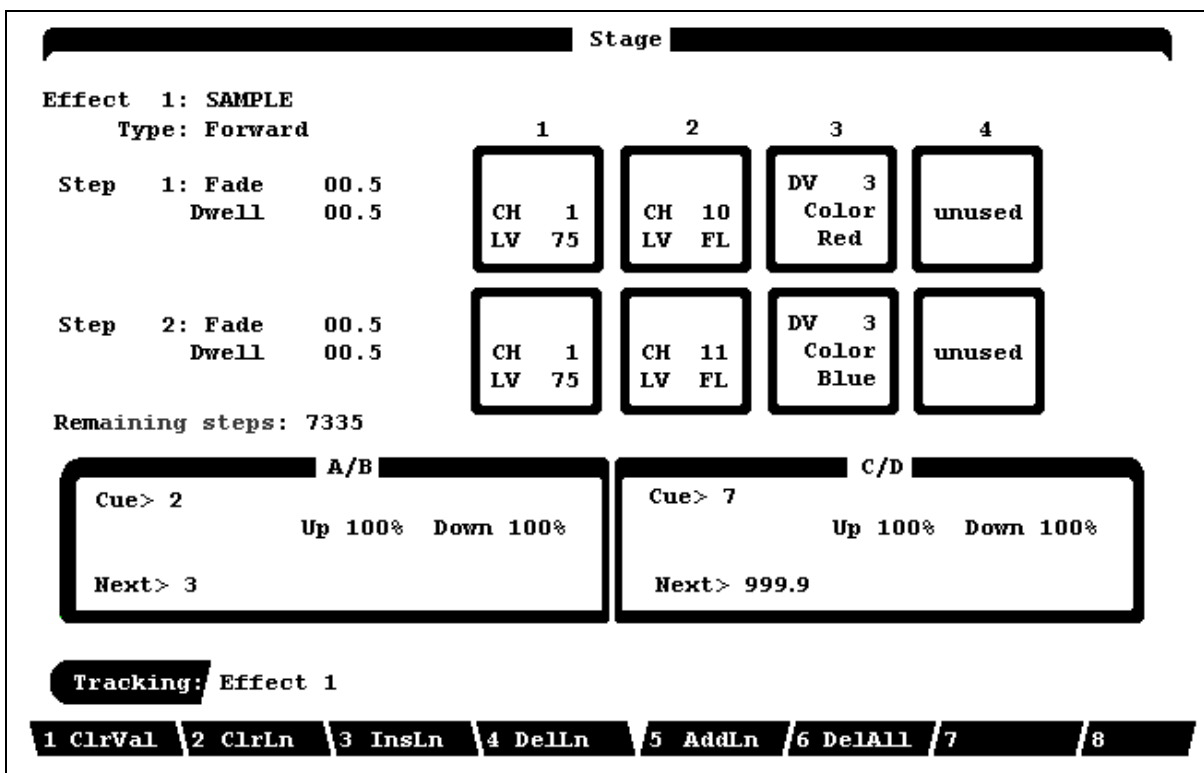


Figure 15.1 Sample Effects Sub-display

---

## Creating Effects

---

To create a new "blank" Effect, you must be in the Effect display. To enter the Effects display, you must first allow for a number of Effect steps in the Setup Display. The maximum number of steps on the MC 24/48 is 9,999. Go the Setup display and enter [10] and enter the number of Effect steps you anticipate you will need for all Effects in your show. Be aware that Effects take a lot of memory, and allowing too many Effects can affect the remaining number of cues, groups, Submasters and channels. After allowing the desired number of Effect steps return to the **Stage** or **Preview** displays to program Effects (the example below assume you are programming in the Stage display).



**EXAMPLE:** To create a new Effect or view an existing Effect in the Effect sub-display of the Stage Display:

(SELEFF) [#] [ENTER]      *(Usually you would start with number 1.)*

---

## Navigating the Effects Display

---

The Effects sub-display has been made very easy to move around in. Any part of an Effect may be added, edited or deleted at any time. To move around the screen to different areas, simple use the Up [↑], Down [↓], Left [←], and Right [→] Cursor control Arrow keys next to the Data Key pad.

The soft key assignments for the Effect Display also allow fast easy changes when creating an Effect. The assignment of the soft keys for the Effects display is as follows:

<u>Key Name</u>	<u>Full Name</u>	<u>Description</u>
1. ClrVal	Clear Value	Use this soft key to clear or delete the value of the current field.
2. ClrLn	Clear Line	Use this soft key to clear or delete the values of the current step.
3. InsLn	Insert Line	Use this soft key to Insert a new step BEFORE your current step position.
4. DelLn	Delete Line	Use this soft key to delete the current step.
5. AddLn	Add Line	Use this soft key to add a new step at the END of the current Effect.
6. DelAll	Delete All	Use this soft key to erase or delete all information for the current Effect and reset the Effect to the default "blank" 2 step Effect..
7.	<i>(not used)</i>	
8.	<i>(not used)</i>	

---

## Creating Effect Steps

---

Effect steps do not have to be created in sequential order. You can create the next step before you assign items to the current step. Any step may be left blank. For any given step you must specify 3 items. The first two are Fade Time and Dwell Time.

---

**Fade time:** Move the cursor to the fade time for the first step. Using the data entry keypad type in the time you wish for the fade of that single step to occur. Valid times are 0 through 59 minutes, 59.9 seconds.

**Dwell time:** Move the cursor to the Dwell time for the first step. Using the data entry keypad type in the time you wish for the step to hold, or "Dwell" before continuing to the next step of the Effect. Valid times are 0 through 59 minutes, 59.9 seconds.

The third item included in an Effect step is what items are responding to the step. The Effects routines built into the MC 24/48 allow you to access the following items:

- Channels
- Submasters
- Groups
- Automated Device Traits
- Cues



**EXAMPLE:** To assign a **channel** to the current Effect step in the Effect display:

1. (Move the cursor to the first available purple box.)
2. **[#] [ENTER]** *(Place the selected channel into the step with a default level of full.)*
3. (If you wish the channel to respond at a level other than full.)
4. **[^]** *(Move down to level field.)*
5. **[#] [ENTER]** *(Enter desired level in percent... note: for this field use 100 for full.)*



**EXAMPLE:** To assign a **group** to the current Effect step in the Effect display:

1. (Move the cursor to the first available purple box.)
2. **[GROUP] [#] [ENTER]** *(Place the selected group into the step with a default level of full.)*
3. (If you wish the group to respond at a level other than full.)
4. **[^]** *(Move down to level field.)*
5. **[#] [ENTER]** *(Enter desired level in percent... note: for this field use 100 for full.)*



**EXAMPLE:** To assign a **Cue** to the current Effect step in the Effect display:

1. (Move the cursor to the first available purple box.)
2. **[CUE] [#] [ENTER]** *(Place the selected cue into the step with a default level of full.)*
3. (If you wish the cue to respond at a level other than full.)
4. **[^]** *(Move down to level field.)*
5. **[#] [ENTER]** *(Enter desired level in percent... note: for this field use 100 for full.)*



**EXAMPLE:** To assign a **Submaster** to the current Effect step in the Effect display:

1. (Move the cursor to the first available purple box.)
2. **[SUB] [#] [ENTER]** *(Place the selected sub into the step with a default level of full.)*
3. (If you wish the cue to respond at a level other than full.)
4. **[^]** *(Move down to level field.)*
5. **[#] [ENTER]** *(Enter desired level in percent. note: for this field use 100 for full.)*



**EXAMPLE:** To assign a **Device Trait** to the current Effect step in the Effect display:

1. (Move the cursor to the first available purple box.)
2. **[DEVICE]** *(This will cause a device list popup to appear.)*
3. **[^]** or **[-]** *(Use the up or down arrow to move to the desired device.)*
4. **[ENTER]** *(Pressing enter will assign the device and then move the cursor to the Trait field.)*
5. Pressing **[ENTER]** again will open the Trait list for the selected device. Again, use the Up **[-]** or Down **[^]** arrow keys to select the desired trait. Followed by pressing **[ENTER]**.
6. Last, select the setting for the selected trait. This may be the level of the light or the color or position.



**ADVANCED TOPICS:** See Chapter 18, *Moving Lights* for additional information on Automated Devices and their associated traits.

---

## Effect Patterns

---

There are four Effect pattern options which used in combination with other options can create many different patterns of light movement. The Effect pattern options are as follows:

- ❑ **FORWARD:** Steps run from step 1 to the highest step number, then begin again with step 1.
- ❑ **REVERSE:** Steps run from the highest step number down to step 1, then begin again with the highest step.
- ❑ **BOUNCE:** Each full cycle of the steps switches between the Forward and Reverse patterns.
- ❑ **RANDOM:** The steps ignore their numerical sequence and execute in a random order until all steps have become active once. Then the sequence begins again.



**EXAMPLE:** To assign Effect patterns in the Effect Sub-display:

1. Use the Arrow key to move into the **Type** field.
2. Once in place, use the Left [←], and Right [→] arrow keys to cycle through the four options.
3. No [ENTER] is necessary for this field.



**HINT:** *Experiment to become familiar with the patterns:*

1. In the Effect display, create a 5-step Effect with channel 1 in step 1, channel 2 in step 2 etc.
2. Assign a pattern or combination of patterns to the Effect.
3. Test the Effect (see next topic). Select the Stage display to view the Effect.
4. Repeat these steps with each pattern and different pattern combinations to see the variety of Effect patterns available.

---

## Testing an Effect

---

There are two ways to test an Effect. If the Effect is being create from the Stage Effect Sub Display, then the [S8] soft key is labled (**GO**). Pressing this soft key will cause the Effect to be displays on stage. The second method to test an Effect is to assign it to a Submaster. Edits can be made "live" to the Effect being tested.



**EXAMPLE:** To test an Effect in the Effect display:

[RECORD SUB] [#] [EFFECT] [#] [ENTER]      *(The Effect loads to the specified Submaster)*

---

## Assigning Effects to Cues

---

An Effect may be assigned to a Cue. When an Effect is assigned to a cue, the Effect fades in during the up time of the cue. The Effect remains running until the next **[GO]** command is executed, at which time the Effect fades out during the down time of that cue.



**EXAMPLE:** To assign an Effect to a cue in the Stage, Preview, Cuesheet or Tracksheet displays:

**[CUE] [#] [EFFECT] [#] [ENTER]**



**NOTE:** A **[Load] fader [#] [GO]** command stops all running cue Effects immediately.

---

## Assigning Effects to Submasters

---

An Effect assigned to a Submaster may be activated anytime you move the Submaster fader up or press the Bump button, depending on the mode of the Bump button. (See Chapter 7, *Basic Submaster Operation*.) An Effect activated on a Submaster with the fader will run at the proportional level set by the fader until the fader is taken to zero. Each time you move the Submaster fader above zero, the Effect begins.



**EXAMPLE:** To assign an Effect to a Submaster from any display:

**[RECORD SUB] [#] [EFFECT] [#] [ENTER]**

---

## Editing Steps

---

You can edit the steps of the currently selected Effect in the Effect Sub-display "blind", in Preview or you can edit "live" in the Effect Sub-display in the Stage display. As in all "blind" displays, edits made in the Preview version of the Effect sub-display are made to the show memory as they are executed. Edits are made exactly the same as the initial assignments. Refer to the previous section. "Creating Effect Steps"

---

## Deleting Steps

---

You can delete a selected step in the Effect sub-display under the **(DELLN)** soft key. All steps following the deleted step are renumbered.

---

## Inserting Steps

---

In the Effect Sub-display you can insert a blank step into an Effect at any location by moving the cursor to the desired location and then pressing the **(INSLN)** soft key. The new step will be inserted BEFORE the current step. All steps following the inserted step will be renumbered.

To insert a step at the end of an Effect, press the **(ADDLN)** soft key.



---

## CHAPTER 16: Profiles

### OVERVIEW

---

A Profile is a method of customizing an output fade curve. You can assign a Profile to dimmers. Profiles assigned to dimmers determine the dimmer output when you control the dimmers with channel levels.

Each Profile is divided into 15 equal sections and numbered in increments of roughly 6.25%. The standard curve is a straight line (linear Profile), from 0 to 255 (though 240 is shown the step beyond which is not displayed is 255 meaning that at the 16 point, 6.25% of the total assigned output of the dimmer has been achieved, at 32 on the output is 12.5%, etc).

You can use a Profile any time you want a fade curve different than a straight linear fade. You can record up to 10 Profiles, and each one may be assigned to any number of dimmers.

You can use Profiles to match output curve assignments between different kinds of dimmers, or different watt capacity dimmers. A 6kW dimmer and 2.4kW dimmer may have different outputs at a level of 50%. You can create a Profile to allow the two different outputs to match. This is a useful tool when it is necessary to create uniform output from dimmers.



**BASIC RULE:** *The default Profile is a straight visually linear Profile. It is Profile 0 and is not programmable. All cues and channels without a Profile assignment will use Profile 0.*

### Profile Editor Sub-display

---

You can open the Profile Editor Sub-display from the Setup display under the **(PROFIL)** soft key. In the Profile Editor sub-display, the column to the far left contains the Profile numbers, 0 - 240. The bottom row of numbers, 0 - 240, represents the fader handle position for a fade Profile, or the channel level for a dimmer Profile. The values below the top row in each Profile represent the fade progress or dimmer output at any given 6.25% interval in a fade curve. Each 6.25% interval is called a fade point. In a standard linear Profile, each fade point is the same as the % number in the top row.

The current Profile for editing is shown at the top of the sub-display. When the Profile is assigned to a cue, the Profile represents the percent of the recorded level that the cue channels reach over the duration of the fade time. When the Profile is assigned to a dimmer, the row of Profile numbers represents the dimmer output for any given stage channel level.



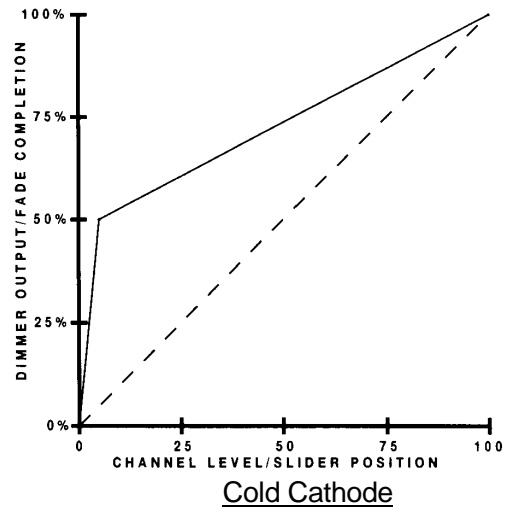
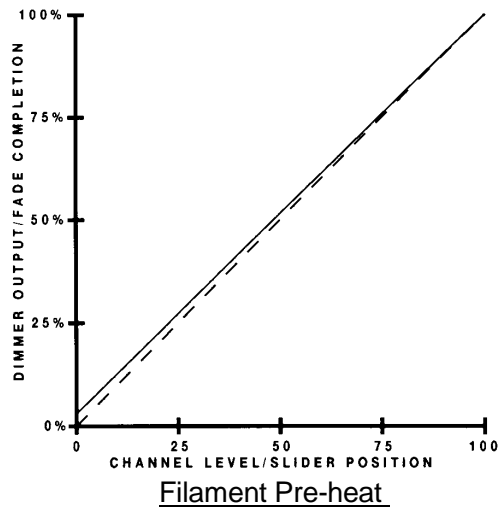
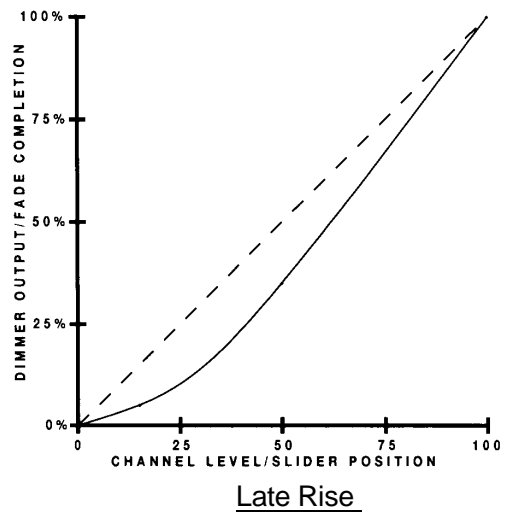
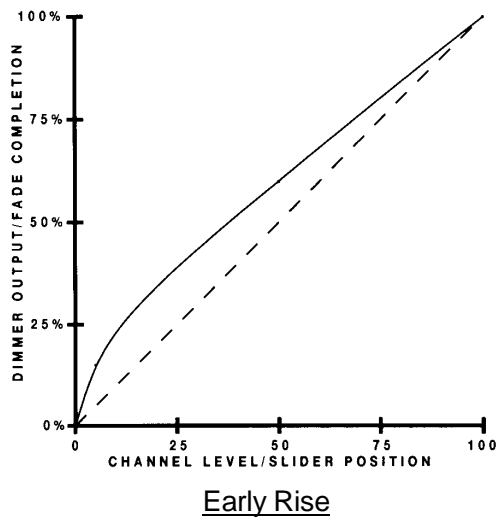


Figure 16.2, Example Profiles

---

---

# CHAPTER 17: Macros

## OVERVIEW

---

A Macro is a series of keystrokes that you record to perform a complex command with the press of a single Macro key. Macros are especially useful for executing command sequences that you repeat often. You can use a Macro to go to cue zero, reload Submasters, or even set a certain "look" on stage.

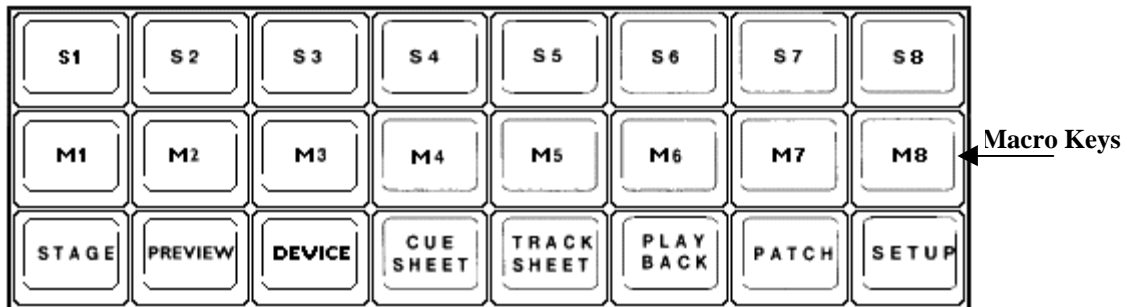


Figure 17.1 - Macro Keys (Center Row of Display Key Pad)

## Recording Macros

---

You can create a Macro by pressing the **(MACRO)** soft key in the Setup display. A Macro may contain both hard key and soft key keystrokes, but cannot record fader, or Trackball functions. A Macro may contain up to 128 keystrokes. You may "nest" macros by using another Macro inside a Macro; both executed with a single keystroke.

Macros are recorded literally as a series of keystrokes. When you record a level setting command such as **[1] [THRU] [10] [AT] [FULL]**, the Macro will work in any display that accepts that command syntax. If you want to have the Macro work only in a designated display, such as Stage, press the display key as the first keystroke in the Macro.

Be aware that different displays can interpret the same keystrokes differently. For example, the command **[12] [AT] [5] [ENTER]** has different results in the Stage and Patch displays. In the Stage display it sets channel 12 at 50%, while in the Patch display it patches channel twelve to dimmer 5. This is why you should usually start the Macro with a display key.



**EXAMPLE:** To create and record Macro 1 "live" to execute with **[M1]** key, in the Setup display:

1. **(MACRO)** *(Opens the Macro Sub-display.)*
2. **[1]** *(Begins Recording Macro.)*
3. **[M1]** *(Ends the Record Macro command.)*



**EXAMPLE:** To create a LOAD CUE 5 Macro from the Setup displays:

1. **[1]** *(To start recording)*
2. **[STAGE]** *( Enter Stage display, "Recording Macro #" flashes)*
3. **[LOAD] [5] [ENTER]**
4. Press same **[M#]** key *(Ends recording of Macro. Flashing message stops.)*

## Macro Paging

---

There are eight black Macro keys, labeled **[M1]** - **[M8]**, on the console top panel. The MC 24/48 has up to 500 macros available. These are arranged in pages of eight macros per page. At any given time, a single page of macros is currently accessed by the Macro keys. The current Macro page is shown on the Macro soft key with the designation (**MP #**).



**EXAMPLE:** To change the current Macro page to Macro page 3, in the Stage Display:

1. **(MP #)** *(Command line responds "Macro Page")*
2. **[3] [ENTER]** *(Soft key changes to MP 3)*

## Real-time Macro Recording

---

In addition to simply recording keystrokes, the MC 24/48 allows for “real time” recording of Macros. This feature can be very useful in building special types of effects and playing them back as Macros rather than the sometimes tedious efforts required to build certain effects. For example, bump buttons can be used to bump channels in a specific order in a specific timed sequence to create an effect.



**EXAMPLE:** To record a Macro in “real time” using bump buttons from the Setup display:

1. **(MACRO)** *(Opens the Macro Sub-display.)*
2. **[2]** *(Access the real time record and execute.)*
3. **[ ] or [ ] [ENTER]** *(Turns off or on the Timed Record.)*
4. **[1]** *(Initiates the Macro recording.)*
5. **[STAGE]** *(This allows you to view what you are recording.)*
6. (Press bump keys in desired order and time) *(Records the bumps in real-time.)*
7. **[M#]** *(Records to the desired Macro key.)*

---

## Real-time Macro Playback

---

Once you have recorded a Macro in real time, you must set up the MC 24/48 to playback the Macro in real-time. For real-time playback, the following method is used.



**EXAMPLE:** To playback a Macro in “real time”:

<b>(MACRO)</b>	<i>(Opens the Macro Sub-display.)</i>
<b>[6]</b>	<i>(Access the Time Execute.)</i>
<b>[ ] or [ ] [ENTER]</b>	<i>(Turns off or on the Timed Execute.)</i>

---

## Viewing Macros

---

You can view the recorded contents (keystroke sequence) of any of the macros by using the **(MACRO)** soft key in the Setup display. The **(MACRO)** soft key opens the Macro Sub-display from the Setup Display shows the contents of the selected Macro as a sequence of keystrokes.



**EXAMPLE:** To view the contents of Macro 5, in the Setup display:

<b>(MACRO) [4]</b>	<i>(Selects the “Macro Number” selector in the display.)</i>
<b>[5] [ENTER]</b>	<i>(Presents Macro 5 to view.)</i>



**EXAMPLE:** To view a Macro in “real time from Macro Sub-display of the Setup display:

<b>(MACRO)</b>	<i>(Opens the Macro Sub-display.)</i>
<b>[5] [ENTER]</b>	
<b>[ ] or [ ] [ENTER]</b>	<i>(Turns on or off the time display.)</i>

You will now be able to view the times of the Macro steps in “real-time”.

You may also view the times of the Macro steps in the Macro display in one of three ways:

- Reference Last: Displays the time between presses of buttons in the Macro.
- Reference Begin: Displays a running total of time accumulated for the run of the Macro.
- Not Timed: References the keystrokes only.

---

## Editing Macros

---

Macros may be edited in one of three ways:

- Insert
- Modify
- Delete

It is possible to **insert** a step into the Macro by selecting the Macro and altering its contents in the Macro Sub-display.



**EXAMPLE:** To insert a step in a Macro from Macro Sub-display of the Setup display:

1. **(MACRO)** *(Opens the Macro Sub-display.)*
2. [ ], [ ], [←] and [→] *(Selects the portion of the Macro to edit.)*
3. [7] *(Allows inserts of Macro steps.)*
4. (Insert keystroke.) *(Performs the insert.)*

It is possible to **modify** a step of a Macro by selecting the Macro and altering its contents in the Macro Sub-display of the Setup Display



**EXAMPLE:** To modify a step in a Macro from Macro Sub-display of the Setup display:

1. **(MACRO)** *(Opens the Macro Sub-display.)*
2. [ ], [ ], [←] and [→] *(Selects the portion of the Macro to edit.)*
3. [8] *(Allows modification of the Macro steps.)*
4. (Insert new entry.) *(Performs the modification.)*

It is possible to **delete** a step into the Macro by selecting the Macro and altering its contents in the Macro Sub-display of the Setup Display



**EXAMPLE:** To delete a step in a Macro from Macro Sub-display of the Setup display:

1. **(MACRO)** *(Opens the Macro Sub-display.)*
2. [ ], [ ], [←] and [→] *(Selects the step of the Macro.)*
3. [9] *(Allows deletion of the Macro step.)*



---

# CHAPTER 18: Moving Lights

## Overview

---

A special feature of the MC 24/48 control console is that in addition to the operation of traditional stage lighting dimmers, it provides a special set of control features for the easy control of "Intelligent Lighting Devices". Separated from the stage control channels, the MC 24/48 provides 512 channels dedicated channels reserved exclusively for controlling Moving Lights and other Automated Lighting Devices. A rich Device Definition Language (DDL) has been developed for the MC 24/48, enabling virtually any DMX controlled automated fixture personality to be defined. Many popular personalities have already been defined within the console's non-volatile flash memory. Accessing a fixture is made simple using the menus and displays of the console.

Automated lighting fixtures, moving lights, scrollers all fall into the family of devices that may be controlled by the MC 24/48. It is EXTREMELY important that before you try to use an automated lighting device that you become familiar with its operation by reading the manual that came with your device. Several areas of specific importance are:

- |                               |  |
|-------------------------------|--|
| <b>AC Power requirements:</b> | Some units need power other than 120V power from a wall plug, or need a "non-dimming" power source.  |
| <b>Signal Availability:</b>   | Most new theaters are being constructed with the conduit and cabling to route DMX-512 to a number of locations. However, it is important to note that DMX-512 does have limitations in the number of "taps" that can be placed in line without a signal booster or repeater. |
| <b>Personality Traits:</b>    | What does your device do? Some color scrollers use only two channels, one for color and the other for speed. This can be contrasted with fully automated units that may have Pan, Tilt, Zoom, Speed, Color, Intensity, and Patterns (plus many other items).                 |
| <b>Mounting Requirements:</b> | Simply put, since most of these fixtures move or at least the beam of light moves, an eye for visual obstructions, space and physical mounting requirements is also a concern.   |

## Device Personality Traits and DMX-512

---

As mentioned, different types of moving lights have different traits. It is important to have a basic understanding of how DMX sends data to these devices so you as an operator will achieve the lighting design result you want. A significant issue is addressing. When DMX was used to address only dimmers, then the "512" meant up to 512 dimmers could be addressed from a single data stream. With Moving lights and other Automated Lighting Devices, this relationship changes since a single unit may need a number of data

channels in order to operate its functions. The example shown below is a moving light that uses 2 DMX channels for PAN, 2 DMX channels for TILT, 1 DMX channel for Color, 1 DMX channel for GOBO and finally 1 DMX channel for the light intensity. The starting address for this sample device is 60.

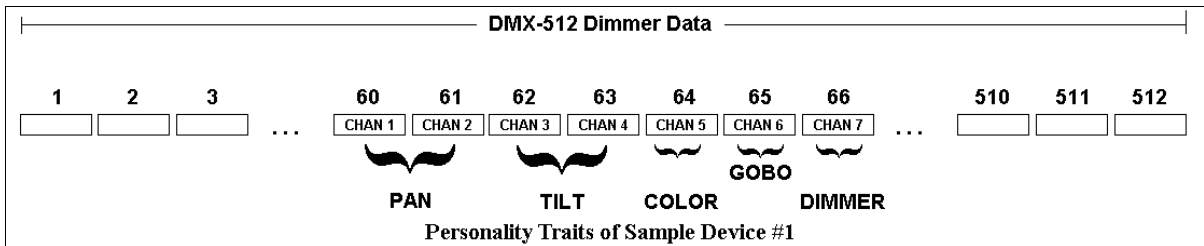


Figure 18.1 Illustration of Sample Moving Lighting traits and the relationship to DMX

The lighting industry has not standardized the names nor order of the many possible different traits for Moving Lights. This again reinforces the importance of understanding your Moving Light, its traits and its operating requirements.

## Initial Assignment

Before the MC 24/48 can control an Intelligent Lighting Device, it must first know what device it is going to control. These initial assignments are created in a sub-menu of the Setup Display. To see this display, press the [SETUP] display hard key and then the **(DEVICE)** soft key [S6]. This action will bring up on the current video monitor the Device Assignment sub display (figure 18.1). You will need to make a few decisions and know some information about the Moving Light that you plan to use. Specifically, you will need to know what DMX data port you will use from the MC 24/48 to the device and second how to set the starting address for that device.



**NOTE:** When making the initial device assignments the MC 24/48 will search for the first available data address not in use by a stage dimmer channel. If you plan on using a data port that is totally separate from the dimmer data port, go to the PATCH display and "clear" that patch table. The MC 24/48 will then start making assignments to that port.

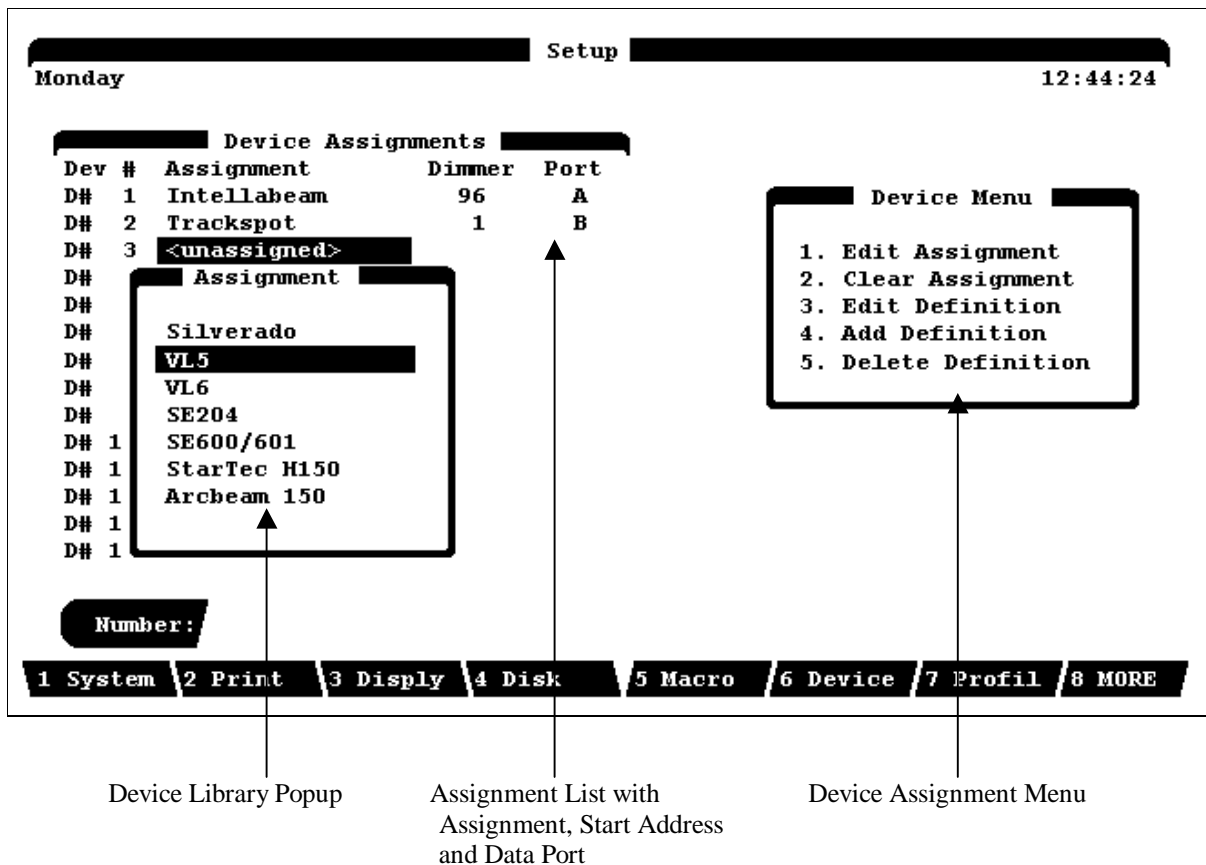


Figure 18.2 Device Assignment Display - a sub-menu of the Setup Display

## Assign Devices

The intelligent devices need to be assigned to device numbers. Up to 512 channels are reserved for these devices. Select [SETUP], (DEVICE), note the "Device Menu", and the selections as described below.

- |                             |  |
|-----------------------------|--|
| <b>1. Edit Assignment</b>   | <i>Use to assign the device, starting dimmer number and DMX port.</i>      |
| <b>2. Clear Assignment</b>  | <i>Use to delete the device assignment highlighted.</i>                    |
| <b>3. Edit Definition</b>   | <i>Use to call up the fixture library to edit a device definition.</i>     |
| <b>4. Add Definition</b>    | <i>Use to initiate the routine to add a new device to the library.</i>     |
| <b>5. Delete Definition</b> | <i>Use to initiate the routine for deleting a device from the library.</i> |

**EXAMPLE:** Assigning a Moving Light:

1. **[SETUP]** *(Enter SETUP Display.)*
2. **(DEVICE)** *(Enter DEVICE sub display.)*
3. **[-] [^] [↵] [®]** *(Use Arrow keys to highlight the desired device number.)*
4. **[1]** *(Select Edit Assignment from the Device Menu activating the Device Popup.)*
5. **[-] [^]** *(Scroll menu until you find you correct Automated Device. If you do not find it, you may need to add a new Device Definition. Refer to **Adding Device Definitions** later in this chapter.)*
6. **[ENTER]** *(To confirm your selection.)*

When the assignment was first made, the MC 24/48 looked at its Patch tables and assigned the Moving Light to the first dimmer address that was not assigned to a stage channel. This may not be the address you wish the fixture to respond to. If not, then, the Next step in making an assignment is setting the start address. In this step, two decisions must be made. First is what Data Port from the MC 24/48 is being used. Second, what is the starting address of the selected fixture.

**EXAMPLE:** Assigning starting address and port.

1. **[-] [^] [↵] [®]** *(Use Arrow keys to highlight the desired device dimmer number.)*
2. **[#]** *(Type the desired starting address.)*
3. **[ENTER]** *(Confirm the assignment.)*
4. Then if necessary change the port assignment.
5. **[-] [^] [↵] [®]** *(Use Arrow keys to highlight the desired device port letter.)*
6. **[A] [B] or [C]** *(Type the desired port using the Bump Button Alpha keys.)*

---

## Clearing a Device Assignment

---

Whereas from show to show, conventional light assignments change, the addressing of the Automated Lighting Devices tends to be more of a constant. Therefore, when you clear the console memory or the console Patch, the assignment of Moving Lights is NOT cleared. These assignments are cleared from the Device Assignment screen.

**EXAMPLE:** Clearing Assignments

1. **[SETUP]** *(Move to SETUP display.)*
2. **(DEVICE)** *(Move into the DEVICE ASSIGNMENT sub display.)*
3. **[-] [^] [↵] [®]** *(Use Arrow keys to highlight the desired device.)*
4. **[2]** *(Clear Assignment.)*

---

## Device Console Controls

---

The device section of the MC 24/48 console is provided to control the unique features of automated lighting devices. To activate a device simply select the **[DEVICE]** button on the data keypad along with the number of the device followed by **[ENTER]**. Once active, the traits of the personality assigned to the device are shown on the LCD, seven at a time along with the current value displayed either numerically or as a label. To modify a trait, simply turn the modify wheel up to increase or down to decrease the value.

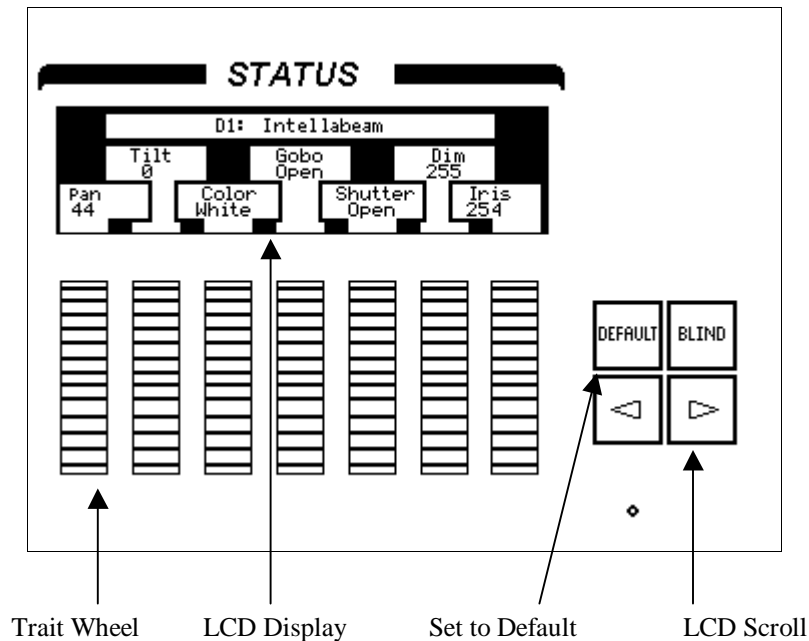


Figure 18.3 Console Device Controls

Since some devices have more than seven traits, a left and right arrow button has been included next to the encoder wheels. Pressing these buttons will cause the display to scroll in that particular direction. Once the last of the traits have been reached the display will no longer scroll.

Traits can be assigned to either axis of the Trackball (Pan and Tilt are common uses for this feature). If this is the case, these traits will be modified whenever the Trackball is operated.

---

## Device Definition Language

---

The Device Definition Language (DDL) is used to describe an object's personality, which will be controlled by the MC 24/48. Devices can include intelligent lighting fixtures, fog machines, traditional luminaire color scroller combinations or simply a series of dimmer channels. Through the use of DDL, the MC 24/48 can present the individual attributes or traits of the personality with descriptive labels rather than simple channel numbers as you would with a standard lighting console.

Device Definitions can be programmed directly into the console through the Device Assignment sub-display of the Setup or from ASCII Text files containing DDL definitions. Below is a table showing the many

options available for programming in a device definition. It may also help in understanding how the MC 24/48 communicates with your particular Automated Lighting Device.

Keyword	Valid Values	Description
Device	16 character text string	Defines the name of the device.
Trait	8 character text string	Defines the text label of the trait.
Type	Union, End Union, Continuous, Indexed	Defines the type of the trait.
Channel	1 - 256	Defines the channel offset of the trait.
Size	8Bit, 16Bit	Defines the trait as 8 bit or 16 bit. Only used in continuous types.
Invert	Yes, No	Causes the joystick or a wheel to work opposite of normal when controlling the trait.
X-axis	Yes, No	Assigns the trait to the horizontal movement of the joystick.
Y-axis	Yes, No	Assigns the trait to the vertical movement of the joystick.
Black	Yes, No	Assigns the trait to the Blackout button.
BoValue	8 Bit : 0 - 255 16 Bit: 0 - 65,535	Defines the value that the Blackout button assigns to the trait.
Master	Yes, No	Assigns the trait to the Master Wheel.
Default	8 Bit : 0 - 255 16 Bit: 0 - 65,535	Defines the value that the Default button assigns to the trait.
Maximum	8 Bit : 0 - 255 16 Bit: 0 - 65,535	Defines the maximum value of a continuous trait.
Minimum	8 Bit : 0 - 255 16 Bit: 0 - 65,535	Defines the minimum value of a continuous trait.
Index	8 character text string followed by a comma and a value ranging from 0 - 255.	Defines the text label and its value of an index entry of an indexed type trait.
End	None	Defines the end of the file. Only required for RS-232 input files.

## Adding Device Definitions

Chances are that the devices you will be using will already be defined within the MC 24/48. If not, or if you want to create a new device of say multiple fog machines or PAR devices, you will need to use the Add Definition setup mode. From here you can enter a unique name for the device and then define the personality traits of each channel.

After selecting "Add Definition" the name of a new device can be entered by either using the on board Alpha Numeric of the Sub Master Bumps, or the external keypad input on the back of the console, then press the [ENTER] button.

You can then add the personality traits. You can choose between Continuous, Indexed, Union or End Union traits as needed.

**Continuous traits:** Those that move continuously from a minimum value to a maximum value.

**Indexed traits:** Those that do not move continuously. Instead, discrete values are assigned to each index along with a unique label. These are most often used to describe the positions of such things as Gobo and Color Wheels.

---

**Union traits:** These are made of combinations of both Continuous and Indexed traits. An example of a Union would be a Color Wheel, which uses a continuous range of DMX 512 values for spins and then discrete values for fixed color positions. The End Union trait is used to flag the end of the Union structure. For example, if you were to define a Color Wheel as described above, you would first insert a Union trait, then insert Continuous and Discrete traits as needed followed by the End Union trait.

Several attributes can be assigned to the traits once the type has been determined.

**Trait Label:** The label can be up to eight characters long. There is a 512 entry table of labels to select from. Not all are predefined. Those that are can be sequenced through by selecting any of the insert commands from the Definition Menu display and using the cursor keys to highlight the label name.

Once the label has been selected press [ENTER]. The display will change to a setup display for that particular trait where details on the trait can be achieved. The label itself out of the table can be modified. Select " 1 Modify Attribute " until a label window is displayed and then enter a new name using either the alpha numeric function of the Submaster bumps or an external keypad. Keep in mind that changing the label contents will change the label for any other trait of any device using this table entry. Finally a new label can be created by selecting "New". An empty entry in the table will be selected and presented for editing on the display.

Once the label has been selected, the other parameters of the trait can be edited. Use the cursor keys to sequence through them. The first parameter actually shows the trait's type and can not be edited. It is shown for reference only.

**Parameters for Continuous traits:** Channel offset, Size of the Data, Invert, X axis, Y axis, Blackout, Default, Maximum and Minimum.

**Parameters for Indexed traits:** Channel, X axis, Y axis, Blackout, Default, Number of Indexes, Index Label and Index Value.

A discussion of each type of parameter follows.

**Channel offset:** This determines which channel of the DMX 512 stream should be used for this trait. This is a relative number which is added on to the base address of the device once it is assigned to a Fixture button.



**NOTE:** If Fixture 1 is assigned to DMX 512 channel 20 and a trait is assigned to channel 1, it will end up being assigned to channel 20 not 21. Size of data determines whether the trait will use one or two bytes of the DMX 512 stream. Choices are "8 Bit" or "16 Bit". 16 bit is mostly used for Pan and Tilt of high resolution devices.

**X/Y Axis Invert:** Sometimes it is nice to be able to invert a continuous trait such as Pan so that it moves the direction that the trackball moves. Select "Yes" if you would like to invert the trait. If a trait is to be assigned to the X or Y axis, select "Yes" for these parameters. More than one trait of a device may be assigned to either axis and a single trait can be assigned to both axis.

**Blackout:** If the Blackout parameter is activated, the trait will be set to the assigned Blackout Value whenever the Blackout button is pressed.

**Default Values:** When first selecting a fixture, it's trait can be any value. Default values for each trait can be assigned so that tapping the Default button will immediately cause the default value to be applied whenever a fixture is active.

---

**Maximums and Minimums:** Continuous traits can be assigned a maximum and minimum value. This is useful when a device does not use the full range of DMX 512 values. It is also useful when a continuous trait is part of a Union.

**Index Values:** Indexed traits are made of indexed values. Each indexed value can be assigned a specific label just as each trait can be assigned a specific label. First enter in the number of indexes that will be used by the trait, then enter in each label and value for each index. Any of these values can be changed at any time. The indexed labels use a separate 512 entry table from the Trait table.



**EXAMPLE:** Add Definition

1. [SETUP]
2. (DEVICE) [4] [ENTER]
3. Input fixture name using the alpha numeric keypad on Submaster bumps.
4. [ENTER]
5. Using the definition menu you may modify or insert traits accordingly.
6. Using cursor keys highlight the attribute and select [ENTER] to edit.
7. Select [CLEAR] to return to previous screen.



**NOTE:** Hold down the bump to get to the additional characters.

---

## Editing Devices

Devices definitions can edited on the console. By selecting [Edit Definition] the sequence for editing devices can be initiated. When this is selected the fixture library will appear for selection of a specific fixture to work on. After selecting a fixture to edit a device menu will appear. Please note the " device menu " as described below;

- |                          |  |
|--------------------------|--|
| 1. Modify Trait          | This will modify a specific trait of a selected fixture.         |
| 2. Insert Pan            | This will insert a pan trait in the position highlighted.        |
| 3. Insert Tilt           | This will insert a tilt trait in the position highlighted.       |
| 4. Insert Continuous     | This will insert a continuous trait in the position highlighted. |
| 5. Insert Indexed        | This will insert an Indexed trait in the position highlighted.   |
| 6. Insert Union          | This will insert a Union Trait in the position highlighted.      |
| 7. Insert Combined Trait | This will insert a combined trait in the position highlighted.   |
| 8. Delete Trait          | This will delete the trait highlighted.                          |



**NOTE:** For a more detailed explanation please refer to Adding Fixture Definitions above.



**EXAMPLE:** Edit Definition

1. **[SETUP]**
2. **(DEVICE)**
3. **[3]** Edit Definition
4. Using the cursor keys highlight the device to edit and press **[ENTER]**.
5. Using the cursor keys highlight the Trait to edit press **[ENTER]**.
6. Using the cursor keys highlight the parameter of the trait to edit.
7. Select **[1]** Modify Trait
8. Using the number keys for numbers or the up down cursor keys for phrases make the change.
9. **[ENTER]**

## Beginning to use your Automated Devices

---

There is much to digest and understand about the use of Moving Lights and other automated lighting devices. This chapter is at best an overview of Automated Devices and how they respond to the powerful features of the MC 24/48. The best teacher is practice. Both in setting up your Moving Light and then using it.

---

# CHAPTER 19: Programming with Moving Lights

## Device Display

Once the automated devices have been assigned they will begin to appear in the various displays. You can view up to five devices at a time in the Device Display. It is especially important to note the color of the device trait names. In all modes, only traits showing bright white are recorded in your cues, groups, and Submasters. It is possible to adjust a trait without it being selected to record. As with cases of moving and copying cues with "tracking level" where the look of a cue can change when it is moved or renumbered. So, too, can the appearance, position, color, or speed of an Automated Device.

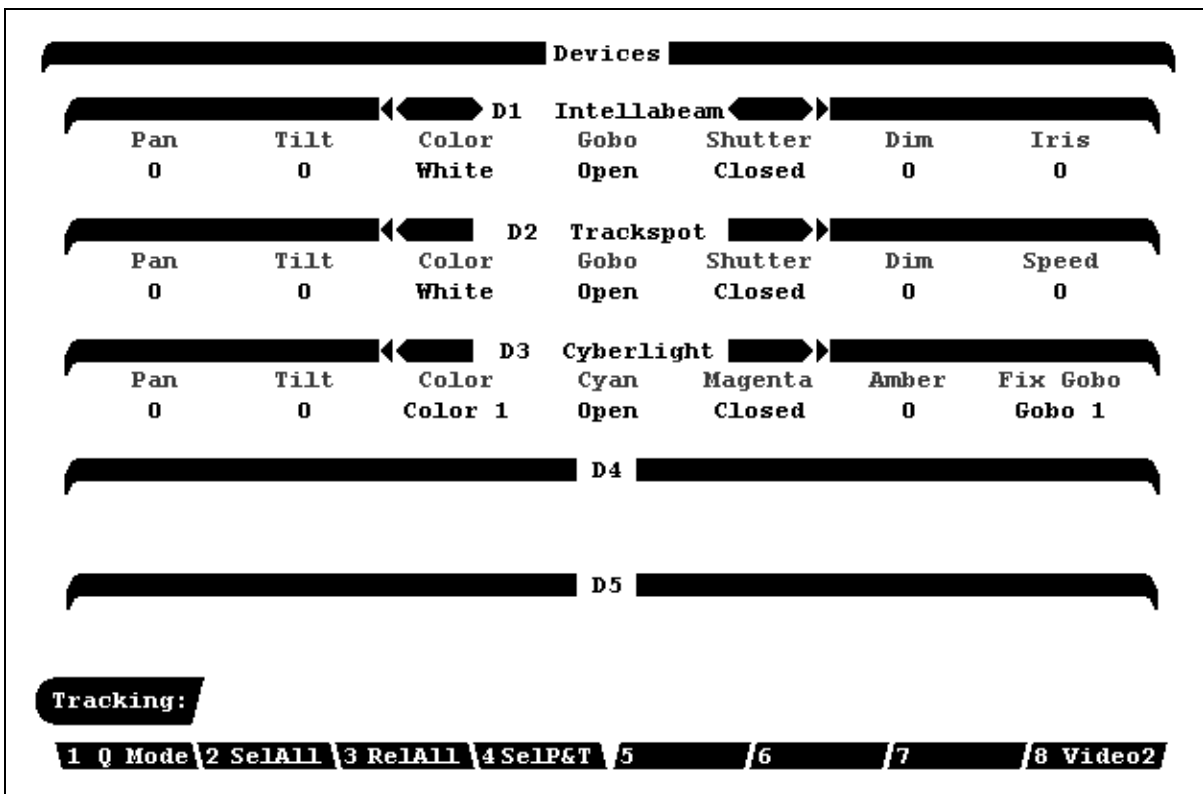


Figure 19.1 Sample Device Display

## Submasters

The Submasters of the MC 24/48 can record static looks from conventional and moving lights. They are very dynamic in nature allowing the user to program even specific traits of the moving lights. For example you could program the Submasters to affect only colors, positions, Gobos and special effects creating pallets. These pallets could then be used to change traits of devices while automated on the autofaders. You can also bounce these specifics to cues thus building some very elaborate shows. It is important to remember that if you assign a Moving light to a Submaster with a specific look, position or color, that Submaster must be

played at FULL in order to show that look. A value less than full will modify the data going to the Automated device and give different results.



**EXAMPLE:** Program Submaster 1 with a position using device one:

1. **[DEVICE][1] [ENTER]** *(Selects Device 1 and Displays it on the LCD display.)*
2. **[DEFAULT]** *(This will position the device in the middle of its pan and tilt, open the shutter, and bring the dimmer to full. )*
3. Position the device as needed using the onboard trackball.
4. Check the device display to verify the device traits are select to be recorded.
5. **[RECORD SUB] [1] [ENTER]** *(Submaster 1 recorded with the active traits.)*



**EXAMPLE:** Record a set of Device Color Traits in Submaster 2

1. **[DEVICE]** *(Enter device display.)*
2. **(RELALL)** *(Release ALL traits from recording and note the color of the traits is gray.)*
3. Use the trackball and position the cursor over the "COLOR" trait.
4. **[CHANGE]** *(Note that the color trait should turn white.)*
5. **[DEVICE][#] [AND] [#] [ENTER]** *(Activate the desire devices on the LCD.)*
6. Using the encoder wheel position to the color needed.
7. **[RECORD SUB] [2] [ENTER]** *(Completes the recording of this color combination.)*



**NOTE:** The above example can be used for Gobos, and other effects such as strobes or spins.

## Groups

---

Any device or specific traits of a device can be programmed as a group. With the examples given in the Submaster section the user can build up positions, colors, Gobos and effects such as strobing or scrolling to be used as building blocks for cues or effects. It is important to remember that if you assign a Moving light to a Group with a specific look, position or color, that Group must be recalled at FULL in order to show that look. A value less than full will modify the data going to the Automated device and give different results.



**EXAMPLE:** Program Group 1 with a position using device one.

1. **[DEVICE][1] [ENTER].** *(Selecting Device #1 to LCD.)*
2. **[DEFAULT]** *(Moves Device 1 to default position.)*
3. Position the device as needed using the onboard trackball.
4. Repeat 1 through 3 above as necessary for all desired devices
5. **[RECORD GROUP] [1] [ENTER]**



**EXAMPLE:** Record a set of Device Color Traits in Group 12:

1. **[DEVICE]** *(Enter device display.)*
2. **(RELALL)** *(Release ALL traits from recording and note the color of the traits is gray.)*
3. Use the trackball and position the cursor over the "COLOR" trait.
4. **[CHANGE]** *(Note that the color trait should turn white.)*
5. **[DEVICE][#] [AND] [#] [ENTER]** *(Activate the desire devices on the LCD.)*
6. Using the encoder wheel position to the color needed.
7. **[RECORD GROUP] [12] [ENTER]** *(Completes the recording of this color combination.)*

With the above examples focus points can be established and used in cues, Submasters, and effects such that if the stage changed, new points can be established that cues, Submasters and effects can reference to. So with this in mind it should be relatively easy to realign the show based upon new staging and plotting.

## Effects

---

Effects can be used to control automated devices and any traits there of. The effects engine is set up to allow the user to input Submasters, device traits, groups, and channels in elements of which there are 10 per step. See details on programming in *Chapter 15: Effects*.

## Cues Live on Stage

---

As with conventional stage channels the easiest way to program cues is live on stage. In this way you can view a particular look and then save it. The same is true for automated lighting devices. Whether you call up and set an individual device or a group of devices, always keep in mind the following items:

- |                         |   |
|-------------------------|---|
| <b>Trait Selection:</b> | Only Selected Traits Record, Unselected Traits are ignored.                   |
| <b>Tracking Mode:</b>   | As with conventional Stage lights, Levels, or Positions can track cue to cue. |

**Timing:** In addition to the normal fade times of cues, you also have the ability to change the speed of some portions of Automated devices.

**Anticipation Cues:** You may want to become more aware of the need for Transition Cues when using Automated devices. These are cues where lights that are "OFF" are moved to position and color or pattern set as an unseen cue prior to fading up the lights.

It is very useful to create your "building blocks" of Groups and Submasters prior to recording your stage cues.