expression 2x

Lighting control system

Version 2.0

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User Manual

Limited Warranty

Declaration of Conformity

Manufacturer's Name: Electronic Theatre Controls, Inc.
Manufacturer's Address: 3030 Laura Lane
Middleton, WI 53562 USA

declares that the product

Product name: Expression 2 lighting control console
Model: Expression 2x, Concept 2x, Insight 2x, Insight 2, Impression 2, Lighting Playback Controller
Product Options This declaration covers all options of the above products.

conforms to the following product specifications:

Safety: EN 60950
EMC: CISPR 22/EN55022 Class B
IEC 801-2:1984/IEC 1000-4-2:1995-01 8KV AD
IEC 801-3:1984/ENV 50140, ENV 50204:1993   3 V/M 26-1000 MHz
IEC 801-4:1988/IEC 1000-4-4:1995-01   .5kV Sig. Lines   1kV power line

Supplementary information:
The products herewith comply with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC, as amended by Directive 92/31/EEC.

Middleton, Wisconsin, USA   25 April 1995 _
Jonathan R. Ide/Vice President of Research and Development

European contact: Your local ETC Technical Services office, or ETC Ltd, 5 Victoria Industrial Estate, Victoria Road, London W3 6UU, UK, Tel: (+44) 181 896 1000   Fax: (+44) 181 896 2000

table of contents

chapter 1
introduction

This chapter includes information to orient you to the console and the manual. It includes the following sections:

- Troubleshooting
- Using this manual
- Using Help
- Text conventions
- Output level conventions
- About Show

Troubleshooting

If you have problems with your console, please refer to the manual or the console's Help function for instructions. (For more information about using Help, see page 3.)

If you do not find the answer in the manual, call your local dealer or ETC Technical Services. Please have the following information available before you call:

- Console model and serial number (located on back panel)

- Software version (displayed on Setup menu)

- Options installed

- Dimmer installation type

- Dimmer manufacturer

To reach the ETC Technical Services department, call one of the numbers shown below. After hours and weekend calls are answered electronically and forwarded to a service representative.

U.S.

Electronic Theatre Controls, Inc.
Technical Services Department
3030 Laura Lane
Middleton, WI 53562

Monday through Friday, 8:00 AM to 6:00 PM CST
800/775-4382
608/831-4116

Europe

ETC Europe Ltd.
Technical Services Department
5 Victoria Industrial Estate
Victoria Road, London W3 6UU

(+44) 181 896 1000

Asia

ETC Asia, Ltd.
Technical Services Department
Room 1619-20, Metro Centre II, 21 Lam Hing Street
Kowloon Bay, Kowloon, Hong Kong

(+852) 2799 9325

Using this manual

This manual provides instructions for using Expression 2x's features and optional accessories.

Setting up Expression 2x

If you are setting up the system for the first time, chapters 4 and 5 and appendix A instruct you in installing and configuring Expression 2x. If the system is already in place, you may not need to refer to these chapters.

New users

If you are new to lighting consoles, or to Expression 2x in particular, read chapters 5 through 11 for instructions on setting channel levels and using cues, groups, and submasters. These are the building blocks for creating and running any show. Once you are comfortable with these functions, chapters 12 through 22 provide more advanced information on effects, subroutines, macros, and the Link List.

Experienced users

Once you are familiar with the system, refer to *Appendix D, Glossary*, and the console's Help function for answers to any remaining questions you may have.

Using Help

Help screens are available for all Expression 2x keys, including softkeys and wheels. To display help screens, press [Help], then press any key on the console.

Text conventions

In this manual, console keys are indicated by square brackets, such as [Enter]. Messages that appear on the console displays are printed in bold-face, such as **Select channel**. References to other sections of the manual are printed in italics, such as *Chapter 1, Introduction*.

Output level conventions

In almost every case, Expression 2x uses a highest level, or pile-on, convention to determine levels for channels affected by more than one output. Expression 2x reads all output levels it receives for a specific channel and sets that channel to the highest one. A level setting entered on the keypad, however, takes priority over almost any other input.
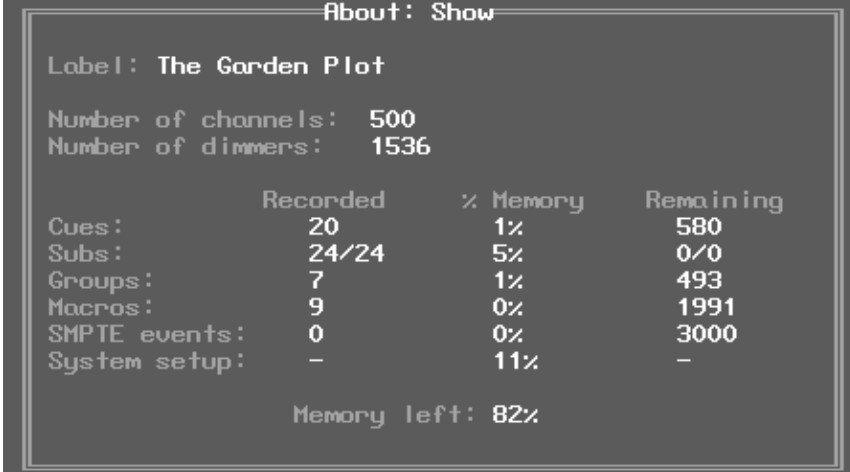
For example, if a channel is included in both a submaster and a cue that has played back and is in a fader, Expression 2x sets the channel at the higher of the two levels. You may then use the keypad to select that channel and set it to any level, regardless of the levels set by the cue and the submaster.

About Show

About Show provides you with memory usage information regarding the currently loaded show. It tells you how many channels and dimmers your show is configured for, and how many of the available cues, submasters, groups,macros and SMPTE events you are using. It also indicates the percentage of the console's available memory used for each function.

Press [About] [Enter] to display the **About Show** window.

Note: There is not enough memory to record the maximum number of all functions at the same time. Use About Show to monitor your memory usage as the complexity of your show increases. If you fill the available memory, you can reclaim it by clearing cues, groups, subs, macros, or events that you are no longer using.

```
┌────────────────About: Show────────────────┐
│                                            │
│  Label: The Garden Plot                    │
│                                            │
│  Number of channels:   500                 │
│  Number of dimmers:    1536                │
│                                            │
│                  Recorded   % Memory   Remaining │
│  Cues:              20         1%        580     │
│  Subs:              24/24      5%        0/0     │
│  Groups:            7          1%        493     │
│  Macros:            9          0%        1991    │
│  SMPTE events:      0          0%        3000    │
│  System setup:      -          11%       -       │
│                                            │
│             Memory left: 82%               │
│                                            │
└────────────────────────────────────────────┘
```

The **Memory left** indicator shows you how much console memory is still available to record additional functions. Expression 2x allows you to record up to 600 cues, 500 groups, 2,000 macros, and 3,000 SMPTE events as available memory permits.

*Note: The console software uses approximately 10-15 percent of the available memory to store setup options and other console information, shown above as **System setup**.*

chapter 2
monitor displays

Expression 2x provides two color video monitors. The Playback display appears on one monitor. This display provides information regarding your show, including a cue list, submaster list and the current status of the console's two fader pairs. The Command display appears on the other monitor. It provides a variety of displays, which you may choose from the console. These displays allow you to create and run shows and to configure your console and your lighting system.

Note: Press [Swap] to reverse the monitor each display appears on. Press the [Expand] key to extend the information appearing on the Command display onto the Playback display. For example, if you have a screen displaying channels on the Command display, [Expand] allows you to view up to an additional 125 channels on the Playback display.

If your system includes an ETCNet network, additional monitors may be installed at other locations, such as backstage or in the sound booth. These remote monitors show the same displays as the console's monitors. See *Appendix A, Installation*, for information about installing remote monitors.

The console also provides a set of seven LED displays across the top of your console face panel. These displays provide information regarding your faders, cues, submasters, groups, and levels. This information supplements that supplied by the monitors.

This chapter includes descriptions of the following displays:

- Stage
- Blind
- Fader
- Flexichannel
- Tracksheet
- Patch
- Park
- Playback
- LED displays

Channel colors

The colors in which channel numbers and output levels are displayed on screen provide information about the channels. The following chart shows the meaning of colors in Stage, Blind, Fader, and Tracksheet display modes. Information on the use of colors in other display modes are included in their sections of this chapter.

Channel numbers

Gray.................. Unselected channel.
Yellow .... Selected channel. Controlled by the level wheel when [Enter] is pressed, or when you move the wheel.
White............... Channel not selected by Only function.
Green .... Selected channel. Controlled by the X wheel through a link created in the Link List.

Channel output levels

White on Red.. Selected channel. Level instructions from the keypad or the level wheel affect this channel's level.
Yellow .... Channel output level was set by a submaster.
White............... Channel output level was set by an effect. In Tracksheet and Blind, white channel levels were set by an Allfade cue.
Gray.................. Channel was recorded into a multipart cue, but not in the currently displayed part (Blind only).
Red .... Channel has been de-selected, but its current level was established using the keypad.
Green .... Channel output level is changed from what it was in the previous cue. In Tracksheet and Blind only, channel output is lower than it was in the previous cue.
Magenta.......... Channel output level is the same as it was in the previous cue (tracking).
Blue .... In Tracksheet and Blind only, channel output level is higher than it was in the previous cue.

Changing pages

[S4], **Previous Page**, and [S5], **Next Page**, softkeys allow you to change pages on many displays. The arrow keys may also be used to switch from page to page. Pressing [←] takes you to the first page, pressing [↑] takes you to the previous page, pressing [↓] takes you to the next page, and pressing [→] takes you to the final page.

Stage

The Stage display shows you the current levels of all active channels. Up to 125 channels appear on the display at a time.

Display mode   **Keypad corner**

Channel level display

Prompt area

Attribute bar

Softkeys
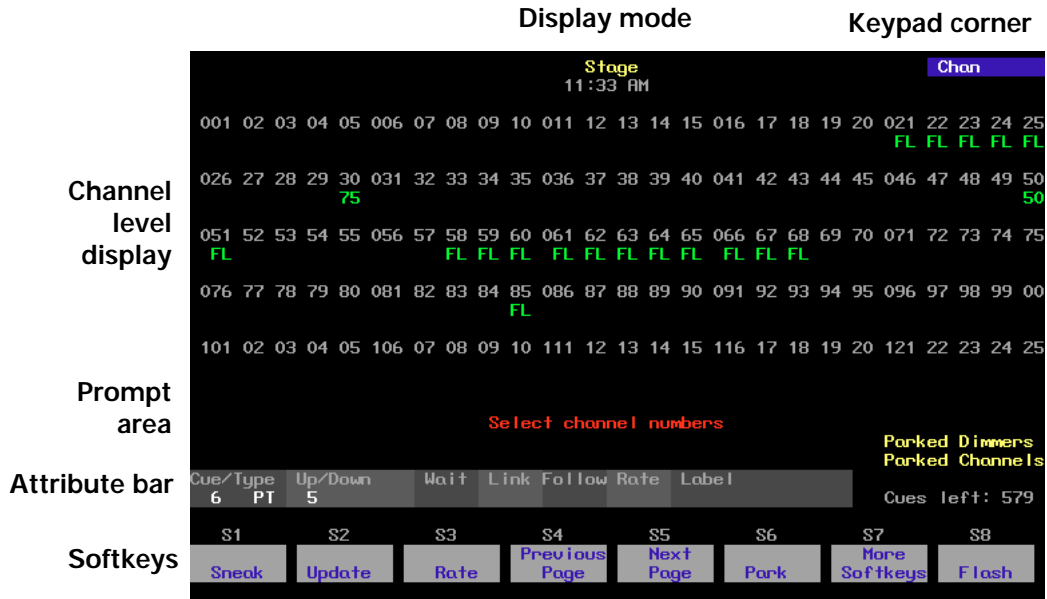
Display mode
Current display mode and time

Keypad corner
Indicates how the console will interpret the next number entered from the keypad. For example, if you press [Channel], the corner displays **Chan**, indicating that the console will read the next number as a channel number. If you enter a range, only the last number in the range will appear.

Channel level display
Current level of all channels.

Prompt area
Information and prompts appear here.

Attribute bar
Shows current settings for selected cue, group or submaster.

Softkeys
Stage functions for [S1] through [S8].

Blind

The Blind display lets you work on cues, groups and submasters without affecting the look on stage.

Display mode   **Keypad corner**

```
                          Blind                        Cue   10
                         11:33 AM

001 02 03 04 05 006 07 08 09 10 011 12 13 14 15 016 17 18 19 20 021 22 23 24 25
                                                                             00

026 27 28 29 30 031 32 33 34 35 036 37 38 39 40 041 42 43 44 45 046 47 48 49 50
            00                                                               00

051 52 53 54 55 056 57 58 59 60 061 62 63 64 65 066 67 68 69 70 071 72 73 74 75
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

076 77 78 79 80 081 82 83 84 85 086 87 88 89 90 091 92 93 94 95 096 97 98 99 00
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

101 02 03 04 05 106 07 08 09 10 111 12 13 14 15 116 17 18 19 20 121 22 23 24 25
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

                         Select cue number
                   To select cue type, press TYPE

Cue/Type  Up/Down    Wait  Link Follow Rate  Label
10    XF  5                                   Cue 10          Cues left: 579

   S1         S2         S3        S4         S5         S6         S7        S8
              Cue                Previous    Next      Delete
              List      Rate      Page       Page       Cue
```

Channel level display — (left label for the channel rows)

Prompt area — (left label)

Attribute bar — (left label)

Softkeys — (left label)

Display mode
Current display mode and time

Keypad prompt corner
Indicates how the console will interpret the next number entered from the keypad. For example, if you press [Channel], the corner displays **Chan**, indicating that the console will read the next number as a channel number. If you enter a range, only the last number in the range will appear.

Channel level display
Level of channels in the selected cue, group or submaster.

Prompt area
Information and prompts appear here.

Attribute bar
Shows current settings for selected cue, group or submaster.

Softkeys
Blind functions for [S1] through [S8].

Fader

The Fader display shows you only the levels on stage that have been set by one or both fader pairs or DMX In. Fader displays do not reflect the influence of the Grandmaster or inhibitive submasters. The Fader display shows all levels as they would appear if the Grandmaster and any inhibitive submasters were at Full.

Display mode
Current display mode and time.

Keypad prompt corner
This window indicates how the console will interpret the next number entered from the keypad. For example, if you press [Channel], the corner displays **Chan**, indicating that the console will read the next number as a channel number. If you enter a range, only the last number in the range will appear.

Channel level display
Current level of all channels set by either or both faders.

Prompt area
Information and prompts appear here.

Attribute bar
Shows current settings for selected cue, group or submaster.

Softkeys
Fader functions for [S1] through [S8].

Flexichannel

If your system has the Flexichannel feature enabled, only channels used somewhere in the show appear on the display screens. These channels may be in cues, Link List, submasters or groups, or may be channels you have selected recently. By only displaying channels used in the show, you can reduce the amount of time you spend moving from page to page to find channels. All other screen elements are unchanged.
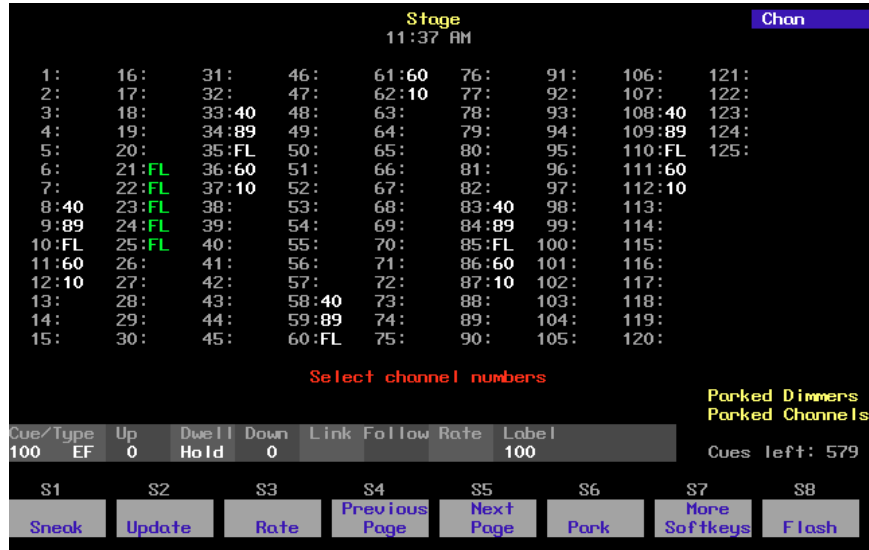
Working with Flexichannel active differs from working without Flexichannel in only one respect, selecting channels. See *Selecting channels in Flexichannel mode* on page 51 for more information.

Note: In Tracksheet and Patch modes, channels are highlighted if they appear in the Flexichannel list, or are grayed out if they do not.

See *Enable/disable Flexichannel* on page 24 for information on enabling Flexichannel.

Updating Flexichannel

When channels that were used in a show are removed from the show, they remain on the channel list until it is updated. The Purge Flexi softkey on the System Settings display updates the list of used channels. The list is also updated when you load a show from diskette, or when you first turn Flexichannel on. Press [Setup] [1] [Enter] [S1], **Purge Flexi**, to update Flexichannel displays.

Tracksheet

The Tracksheet display shows you how your channel levels are tracking through your cues.
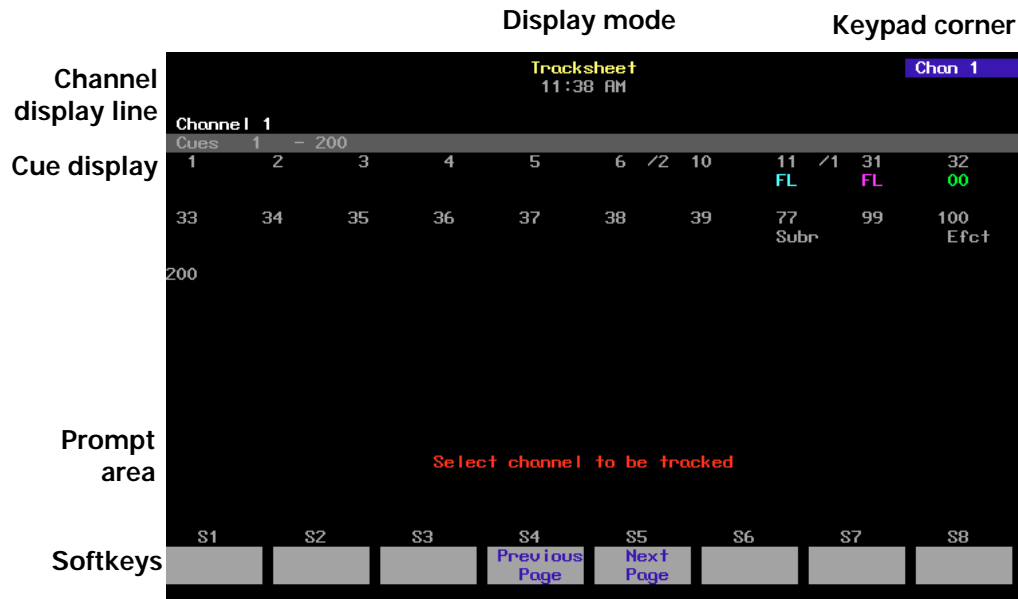
Display mode
Current display mode and time.

Keypad corner
This window indicates how the console will interpret the next number entered from the keypad. For example, if you press [Channel], the corner displays **Chan**, indicating th at the console will read the next number as a channel number.

Channel display line
This line displays the current channel number being tracked. In Flexichannel mode, used channels are marked with an asterisk (*).

Cue display
The cue display lists the cues the channel tracks through and the level recorded in each.

Prompt area
The operator prompt displays messages to guide you through Tracksheet functions.

Softkeys
Tracksheet functions for [S1] through [S8].

Patch

The Patch display allows you to create and modify your patch.
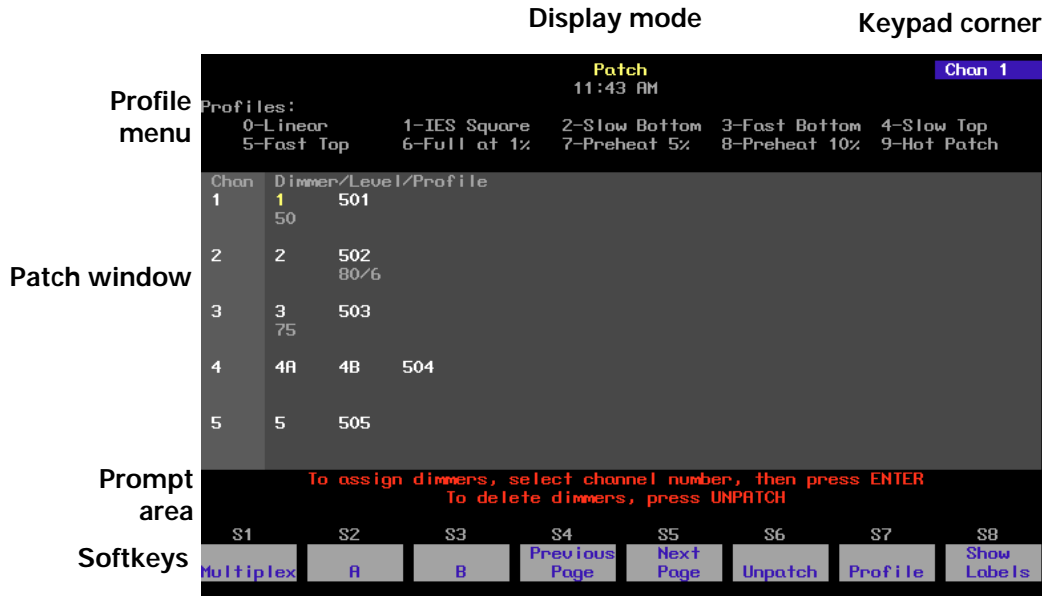
Display mode   **Keypad corner**

Profile menu

Patch window

Prompt area

Softkeys

Display mode
Current display mode and time.

Keypad corner
This window indicates how the console will interpret the next number entered from the keypad. For example, if you press [Channel], the corner displays **Chan**, indicating that the console will read the next number as a channel number. If you enter a range, only the last number in the range will appear.

Profile menu
Displays the profiles available to assign to dimmers.

Patch window
Lists channels, dimmers patched to channels, and levels and/or profiles assigned to the dimmers. In Flexichannel mode, channels that are used are marked with an asterisk (*).

Prompt area
The operator prompt displays messages to guide you through Patch functions.

Softkeys
Patch functions for [S1] through [S8].

Park

The Park display lists parked dimmers on the top half of the screen, and parked channels on the lower half, along with their parked levels.

Display mode　　　　　　　**Keypad corner**

Parked Dimmer window

Parked Channel window

Prompt area

Softkeys

```
                              Park
                            12:59 PM                              Chan

Parked Dimmers:
   10    15    16    22
   85    85    85    85




Parked Channels:
  100   101   102   103   104   105   106   107   108   109   110   111
   FL    FL    FL    FL    FL    FL    FL    FL    FL    FL    FL    FL

  112   113   114   115   116   117   118   119   120   121   122   123
   FL    FL    FL    FL    FL    FL    FL    FL    FL    FL    FL    FL

  124   125
   FL    FL     Select channel number(s), then press AT to park,
                       or press RELEASE to unpark
 S1        S2        S3        S4        S5        S6        S7        S8
                             Previous  Next
           A         B         Page     Page
```
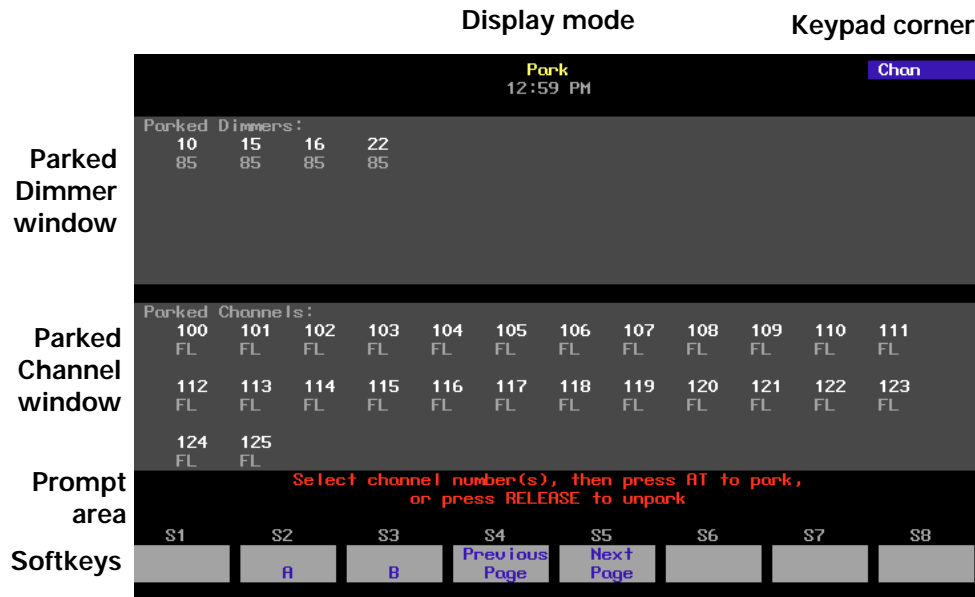
Display mode
Current display mode and time.

Keypad corner
This window indicates how the console will interpret the next number entered from the keypad. For example, if you press [Channel], the corner displays **Chan**, indicating that the console will read the next number as a channel number. If you enter a range, only the last number in the range will appear.

Parked Dimmer window
Lists up to 36 parked dimmers and their levels.

Parked Channel window
Lists up to 36 parked channels and their levels.

Operator prompt line
The operator prompt displays messages to guide you through Park functions.

Softkeys
Park functions for [S1] through [S8].

Playback

The Playback display shows you a Cue List, a Submaster List and the current status of the faders.

Grandmaster   **Show name**   **Submaster List**

Cue List

Fader status

Grandmaster
Current Grandmaster setting and Blackout alert.

Show name
Name of the show currently loaded in the console.

Playback Submaster List
Submaster page and Submaster List. List includes submasters, labels, and current submaster slider settings. The color of submaster numbers identifies the type of submaster. Grey is unprogrammed, green is pile-on, red is inhibitive and white is effect. If a submaster's rate is controlled by the rate wheel, its number turns blue. A blue **R** appears at the top of the list, next to the submaster's current rate.

Playback Cue List
Lists all cues along with their attributes. **The pending cue is highlighted in yellow.** This can be changed from Stage mode, but not from Blind.

Fader status
Indicates current status of both fader pairs. Shows cue running in fader, fade times, percentage of completion, and follow times.

LED displays

| A/B | Next Cue | | C/D | Record | Channel/Group | Rate X | Level Y | A ⦶ B |
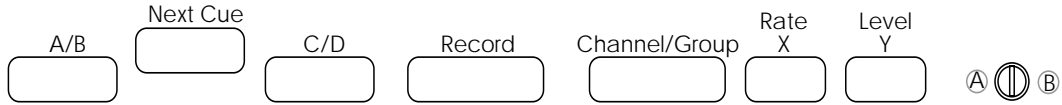
Expression 2x provides a set of seven LED displays across the top of your console face panel. These displays provide information regarding your faders, cues, submasters, groups, and levels. This information supplements the information supplied by the monitors.

A/B display

The A/B display shows the cue number of the cue currently playing in the A/B fader.

Next cue display

The Next cue display shows the cue number of the next cue on the cue list. This is the cue that will play the next time you press either [Go] button.

C/D display

The C/D display shows the cue number of the cue currently playing in the C/D fader.

Record display

The Record display shows the currently selected item. In Stage or Fader modes, this would be either a cue or a submaster. In Blind mode, this would be a cue, submaster or group. In Track Sheet, this would be the selected cue, or the highest selected cue if more than one are selected.

Channel/group display

The Channel/group display generally shows the last selected channel or group. In Stage, Fader or Blind modes this could be either a group or a channel. In Tracksheet, the channel you are tracking appears. In Patch mode, if you are setting a channel to a level on stage, that channel's number appears.

Rate/X display

When the Rate wheel is used as a level wheel (when adjusting linked channels) this display shows the level to which the channel is set. Otherwise, the display is not used. See *Chapter 14, Working with moving lights,* for more information about this wheel.
If more than one channel is selected, the display will show the level of the highest numbered channel.

Level/Y display

The Level/Y display shows the level to which the currently selected channel is set. If more than one channel is selected, the display will show the level of the highest numbered channel.

chapter 3
system settings

System settings allow you to customize Expression 2x for the number of dimmers and channels in your system, set system modes and screen formats, and choose default settings for a variety of console functions. The following illustration shows default settings.

This chapter includes the following sections:

- Setting number of dimmers

- Setting number of channels

- Setting default fade times

- Setting default Level

- Setting default fader clear times

- Setting default Sneak time

- Selecting Designer's Worksheet option

- Blackout key

- Selecting Flexichannel mode

- Master Type

- Set Channels/Submasters 1-to-1

- Selecting time format

- Record Lockout

- Bump keys

- Setting clock

- Naming show

Setting number of dimmers

One of the first steps in configuring Expression 2x is to enter the number of dimmers in your system. Expression 2x defaults to 1,536 dimmers, the maximum number of dimmers the console can address.

Follow these steps to select up to 1,536 dimmers:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings,** and press [Enter].	Selects System Settings menu
3. Select [1], **Number of Dimmers**, and press [Enter].	Prompt reads: **Select number of dimmers, then press ENTER**
4. Press [8][0][0] to enter the desired number of dimmers.	Corner reads: **Dim 800**
5. Press [Enter].	Number of dimmers is set to 800

Note: If you increase the number of dimmers, the additional dimmers are initially patched to channel zero. From there, you can assign them to the channel of your choice.

Setting number of channels

Expression 2x allows you to control your dimmers with control channels. Expression 2x defaults to 600 channels, the maximum number of channels the console can address.

Follow these steps to select the number of channels to use:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings**, and press [Enter].	Selects System Settings menu
3. Select [2], **Number of Channels**, and press [Enter].	Prompt reads: **Select number of channels, then press ENTER**
4. Press [4][5] to enter the desired number of channels.	Corner reads: **Chan 45**
5. Press [Enter].	Number of channels is set to 45

Setting default fade times

Expression 2x allows you to assign default upfade and downfade times to cues or to control fade times manually. Default fade times are five seconds.

Fade times may be expressed in minutes and seconds, or as fractions of seconds (in decimal format). Fade times can be programmed from .1 second to 99:59 minutes. Acceptable time values include: .2 (.2 seconds), 00:12 (12 seconds), 5.5 (5.5 seconds), or 5:30 (five minutes, 30 seconds).

Follow these steps to assign your desired fade times:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings**, and press [Enter].	Selects System Settings menu
3. Select [3], **Default Fade Time**, and press [Enter].	Prompt reads: **Enter default up fadetime**
4. Press [6] to enter a six second upfade time.	Corner reads: **UpTime 6**
5. Press [Enter].	Prompt reads: **Enter default down fadetime**
6. Press [3] to enter a three second downfade time.	Corner reads: **DnTime 3**
7. Press [Enter].	Fade times are reset

Note: If the upfade and downfade times are the same, both will change when you change the upfade time.

Setting default Level

Expression 2x allows you to assign a value to the [Level] key. The default value is 100 percent. You may assign [Level] any value between zero and 100.

Follow these steps to assign a value to [Level]:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings**, and press [Enter].	Selects System Settings menu
3. Select [4], **Default Level**, and press [Enter].	Prompt reads: **Enter default level** **(Press FULL button for 100%)**
4. Use the keypad to enter the two-digit value (00-99) you wish to assign to [Level], or press [Full].	New default for [Level] is set

Note: To enter a level between one and nine percent, you must press zero then the number. For example, to set the default level to five percent, press [0][5] in step 4.

Setting default fader clear time

Pressing the [Clear] key above one of the fader pairs clears the cue from the fader, fading all channels in that fader to zero. The default fader clear time determines the fade time for both [Clear] keys. Channels black out immediately when clear time is zero.

Fade times may be expressed in minutes and seconds, or as fractions of seconds (in decimal format). Fade times can be programmed from .1 second to 99:59 minutes. Acceptable time values include: .2 (.2 seconds), 00:12 (12 seconds), 5.5 (5.5 seconds), or 5:30 (five minutes, 30 seconds).

Follow these steps to set a new default fade time:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings**, and press [Enter].	Selects System Settings menu
3. Select [5], **Default Fader Clear Time**, and press [Enter].	Prompt reads: **Enter default fader clear time**
4. Press [9] to enter the time value you wish to assign.	Corner reads: **Time 9**
5. Press [Enter].	New default time is set to nine seconds

Setting default Sneak time

Sneak allows you to fade or restore channel levels on stage in a specified time.

The console allows you to assign a default Sneak time. For more information about the Sneak function, see page 53. Default time is five seconds for a Sneak.

Follow these steps to set a new Sneak time:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings,** and press [Enter].	Selects System Settings menu
3. Select [6], **Default Sneak Time**, and press [Enter].	Prompt reads: **Enter default sneak time**
4. Enter the time you wish to assign as the Sneak time and press [Enter].	Sets the new default Sneak time

Setting Designer's Worksheet options

The Designer's Worksheet options display allows you to choose the template you wish to use and enable the sliders on either the console or the digitizer.

Note: The Grandmaster, fader and submaster sliders may only be enabled on the console or the digitizer, not both.

For more information about the Designer's Worksheet, see page 211.

Follow these steps to set Designer's Worksheet options:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings,** and press [Enter].	Selects System Settings menu
3. Select [7], **Designer's Worksheet Setup**, and press [Enter].	Prompt reads: **Select Designer's Worksheet setup, then press ENTER** The following display appears:


```
                    Designer's Worksheet Setup              Menu 1
                             01:44 PM


              1 - 12x12 template,  with   submast     Enabled
              2 - 12x12 template, without submast
              3 - 12x17 template, without submast



                   Current Sliders Enabled: Console





              Select Designer's Worksheet setup, then press ENTER



     S1        S2        S3        S4        S5        S6        S7        S8
   Sheet
  Sliders                                                               Return
```
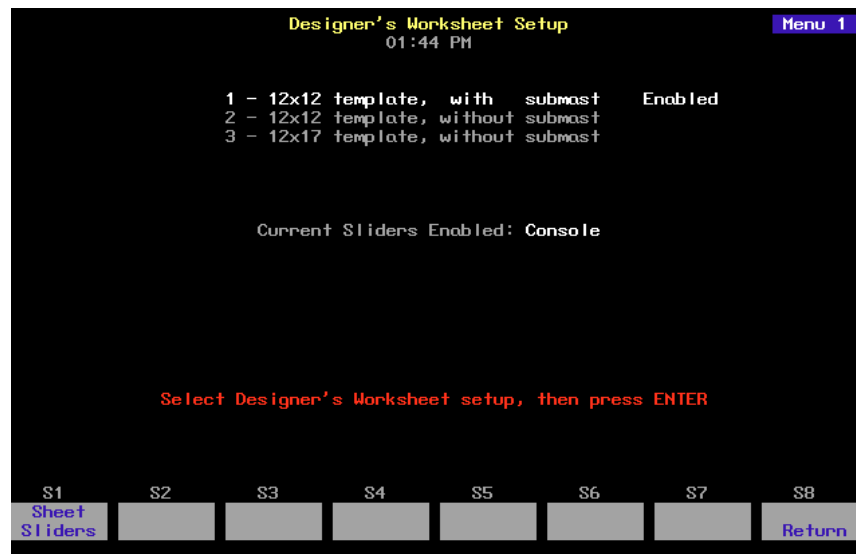
4. Press [2] to select a 12x12 template without submasters.	Corner reads: **Menu 2**
5. Press [S1], **Sheet Sliders**, to disable the slider controls on the console, or [S1], **Console Sliders**, to disable the slider controls on the digitizer (if any).	Display indicates which option is selected; softkey indicates which option is not selected
6. Press [Enter].	Designer's Worksheet option is set

Enable/disable Blackout key

Expression 2x's [Blackout] key may be enabled or disabled. Expression 2x defaults to enabled.

Follow these steps to enable or disable [Blackout]:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings**, and press [Enter].	Selects System Settings menu
3. Select [8], **Blackout Key**, and press [Enter].	Prompt reads: **Enable/disable blackout key** **(1 = Enable, 0 = Disable)**
4. Press [1] or [0].	Corner reads: **Black 1** Or... **Black 0**
5. Press [Enter].	[Blackout] is enabled or disabled

Enable/disable Flexichannel

Expression 2x's Command display can be set to operate in full display mode or in Flexichannel mode. In full display mode, channel displays show all channels and their current status. In Flexichannel mode, only channels with a recorded level or that are on the Link List appear. Expression 2x defaults to full channel display.

Follow these steps to enable or disable Flexichannel:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings**, and press [Enter].	Selects System Settings menu
3. Select [9], **Flexichannel**, and press [Enter].	Prompt reads: **Enable/disable flexichannel (1 = Enable, 0 = Disable)**
4. Press [1] or [0].	Corner reads: **Flexi 1** Or... **Flexi 0**
5. Press [Enter].	Flexichannel mode is enabled or disabled

Updating Flexichannel

When channels that were used in a show are removed from the show, they remain on the channel list until it is updated. The Purge Flexi softkey on the System Settings display updates the list of used channels. The list is also updated when you load a show from diskette, or when you first turn Flexichannel on. Press [Setup] [1] [Enter] [S1], **Purge Flexi**, to update Flexichannel displays.

Set Master type

You may set the Master slider (labeled Grandmaster on older Expression 2 line consoles) to one of three control options.

- **Disabled**
  Master slider does nothing.

- **Grandmaster**
  Master slider controls all levels on stage except parked channels and independent channels.

- **Sub Grandmaster**
  Master slider controls all levels on stage set by submasters.

To configure your Master slider, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [1], **System Settings**, [Enter].	Displays System Settings menu
3. Press [1][0], **Master Type**, [Enter].	Prompt reads: **Select master type and press ENTER (0 = Disabled, 1 = Grandmaster, 2 = Sub Grandmaster)**
4. Press [1] [Enter].	Master is set as Grandmaster

Set Channels/Submasters 1-to-1

Set Channels/Submasters 1-to-1 sets your console's channels to a one-to-one match with your submasters. Thus, channel 1 is patched to submaster 1, channel 2 to submaster 2, and so on. Channel levels are set to Full and up/dwell/down times are set to 1/Manual/1.

To reset your channels and submasters, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [1], **System Settings**, [Enter].	Displays System Settings menu
3. Press [1][1], **Set Channels/ Submasters 1-to-1**, [Enter].	Prompt reads: **Select page to default, then press ENTER (1 = Page 1, 2 = Page 2, 0 = All pages)**
4. Press [Enter].	Channels are assigned to submasters. The display returns to Setup menu

Setting time format

Expression 2x consoles allow you to display time in either 12 or 24 hour format.

Follow these steps to choose your preference:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings,** and press [Enter].	Selects System Settings menu
3. Select [1][2], **12/24 hour clock**, and press [Enter].	Prompt reads: **Enter 12 or 24 hour clock** **(0 = 12 hour, 1 = 24 hour)**
4. Enter [0] or [1] and press [Enter].	Sets the clock mode

Record Lockout

You may set the console to disable the Record function. This protects a finished show from inadvertent changes.

To disable the Record function in your system, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings,** and press [Enter].	Selects System Settings menu. Menu indicates current status of Record Lockout
3. Select [1][3], **Record Lockout**.	Prompt reads: **Enable/Disable record lockout** **(1 = Enable, 0 = Disable)**
4. Press [1] [Enter] to lock out the record function.	Record is locked out. If you attempt to record anything, the prompt reads: **Record is locked out** **(Press CLEAR to continue)**

Note: As always, the <u>best</u> way to safeguard your show is to make backups. See Chapter 17, Diskette functions, for instructions on backing up a show to diskette.

Enable/disable Bump keys

Expression 2x's submaster bump buttons may be enabled or disabled. Expression 2x defaults to enabled.

Follow these steps to enable or disable all submaster bump buttons:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [1], **System Settings**, and press [Enter].	Selects System Settings menu
3. Select [1][4], **Bump key**s, and press [Enter].	Prompt reads: **Enable/disable bump keys** **(1 = Enable, 0 = Disable)**
4. Press [1] or [0].	Corner reads: **BpStat 1** Or... **BpStat 0**
5. Press [Enter].	Submaster bump buttons are enabled or disabled

Setting clock

To set the current time and date in your system, follow these steps:

Keystrokes:	**Action:**
1. Press [Setup].	Selects Setup display
2. Press [S2], **Set Clock**.	The following screen appears:

```
            Enter current time (24 hour clock)
      (To start clock, press RECORD — To quit, press CLEAR)

                     Time  16:14
                     Date  11 Feb 94
                     Day   Friday
```
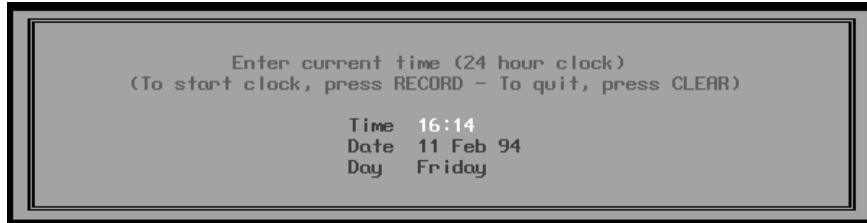
3. Enter the current time in hours and minutes. Time entry format corresponds to your clock mode setting in System Settings. (In 24-hour format, 930 = 9:30 AM, 1625 = 4:25 PM) (In 12-hour format, use [+] to select AM or PM.	New time appears on screen
4. Press [Enter].	Time is set; Date is highlighted
5. Enter the day of the month (1-31) and press [Enter].	New date is set; Month is highlighted
6. Enter the month (1-12) and press [Enter]	New month is set; Year is highlighted
7. Enter the year (00-99) and press [Enter]	New year is set; Day is highlighted
8. Enter the day of the week (1-7) and press [Enter]	New day is set; Time is highlighted
9. Press [Record] to reset Real Time Clock with the new settings.	Returns to Setup display

Note: You may use [+] and [–] to scroll through the options in any of the fields on this screen.

Naming show

You can use an alphanumeric keyboard to name the show currently loaded in the console. The names you give shows can consist of letters, numbers or the symbols: **#**, **%**, **&**, *****, **(**, **)**, **+**, **'**, **–**, **[**, **]**, **/** as well as the comma and period. You may enter the name using overwrite or insert mode. In overwrite, you type over any previously entered characters; in insert mode, each new character pushes the previously entered characters one space to the right. Press [Insert] on the keyboard to switch between insert and overwrite mode. See page 302 for information about installing an alphanumeric keyboard.

To name the show in your system, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Press [S1], **Show Name**.	Prompt reads: **Type show label** **(F6 = clear to end)**
3. Enter the name you want to give the show on the alphanumeric keyboard. The show name can have up to 20 characters.	New name appears in corner of screen
4. Press [Enter] on the alphanumeric keyboard to record the name, or press [Esc] to quit and return to Setup display.	Show is named

chapter 4
patch

Before you begin creating cues for a show you should first create your patch. The patch assigns individual dimmers to control channel numbers. The Expression 2x Patch display allows you to assign up to 1,536 DMX512 dimmers to up to the maximum number of control channels your console can address.

You can use Expression 2x's default one-to-one patch, or you may create a custom patch. In addition, Expression 2x's proportional patching capability allows you to set dimmer output levels and assign one of ten output profiles to dimmers.

If you are patching dimmers in a Strand CD80 dimmer rack, see page 43 for special instructions.

Before patching, be certain that the system settings reflect the total number of available dimmers and channels. See *Chapter 3, Entering system settings,* on page 18 for information on setting the number of dimmers and channels.

This chapter includes the following sections:

- Selecting one-to-one patch

- Creating custom patch

- Proportional patching

- Labeling dimmers

- Assigning a profile to a dimmer

- Capturing channels in Patch

- Dimmer check

- About Dimmer

- Multiplexed dimmers

- Patching to a Strand CD80 dimmer rack

Selecting one-to-one patch

The one-to-one patch assigns dimmer 1 to channel 1, dimmer 2 to channel 2 and so on. If there are more dimmers than channels, the one-to-one patch assigns the first extra dimmer to channel 1, the second extra dimmer to channel 2, and so on.

Follow these steps to select Expression 2x's default one-to-one patch:

Keystrokes:	Action:
1. Press [Setup] to display the Setup menu.	Selects Setup display
2. Press [4], **Clear Functions** [Enter].	Prompt reads: **Select function number, then press ENTER**
3. Press [9], **Reset Patch 1 to 1** [Enter].	Prompt reads: **To reset patch, press ENTER To cancel, press CLEAR**
4. Press [Enter] to confirm your selection of one-to-one default patch, or press [Clear] to cancel the operation.	Sets patch to default one-to-one patch

Creating custom patch

Expression 2x's custom patching capability allows you to create virtually any dimmer to channel configuration you like. (Groups of dimmers may be assigned to single channels, but only one channel may be patched to a dimmer.)

Hint: If you use the same patch for several shows, create the patch, and record it on a disk before you record any cues. Label the disk **Standard patch***. When you start your next show, read the Standard patch show into the console, then begin writing cues to avoid reentering the patch.*

Patching dimmers to channels

Follow these steps to patch a dimmer(s) to a control channel:

Keystrokes:	**Action:**
1. Press [Patch].	Selects Patch display
2. Press [Dim]. (If the LED in the [Dim] key is lit, you may omit this step.)	
3. Use the keypad to enter the numbers of the dimmers you want to patch. Use [And] and [Thru] if you want to select more than one dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
4. Press [Enter].	Prompt reads: **To assign dimmers, select channel number, then press ENTER** **To delete dimmers, press UNPATCH**
5. Enter the channel number to which you want to patch the selected dimmers and press [Enter].	Dimmer(s) are patched to the channel
6. Repeat steps 2 through 4 to patch additional dimmers.	

Proportional patching

Expression 2x allows you to proportionally inhibit the output of individual dimmer levels from the Patch display. Dimmers output at 100 percent unless you patch them at a lower level.

Dimmer intensity levels set in Patch function at full level on all other screens. For example, if you enter a level of 60 for a dimmer on the patch screen, when you set that channel to full in a cue or submaster, the dimmer will output at 60 percent.

Follow these steps to assign a proportional dimmer output level:

Keystrokes:	Action:
1. Press [Patch].	Selects Patch display
2. If the [Dim] LED is unlit, press [Dim] to indicate that the next number entered will be a dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
3. Use the keypad to enter the desired dimmer number(s). Use [And] and [Thru] if you want to select more than one dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
4. Press [At]	Prompt reads: **Select dimmer level**
5. Use the keypad to enter the desired maximum output level for the dimmer(s). Full is displayed until a new level is entered. Enter a zero before single-digit levels (i.e., **08**).	Dimmer's proportional level is set

Note: If the dimmer's level is highlighted, white on red, you may use [+] and [–] to adjust the level. Press [Enter] to record the edited level.

Unpatching individual dimmers

Channel zero is not an actual control channel. It functions as a holding area in which you may store dimmers not included in your patch. Before you begin creating a custom patch, you may find it helpful to assign all dimmers to channel zero. Then, when you begin patching, you can select dimmers from channel zero and patch them to channels as you like.

Dimmers assigned to channel zero are listed at the end of channel list under "- -." These dimmers are not assigned to any channel, but remain on the patch screen.

Follow these steps to assign dimmers to channel zero in By Dimmer mode:

Keystrokes:	Action:
1. Press [Patch].	Selects Patch display
2. If the [Dim] LED is unlit, press [Dim] to indicate that the next number entered will be a dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
3. Use the keypad to enter the desired dimmer number(s) Use [And] and [Thru] if you want to select more than one dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
4. Press [S6], **Unpatch.**	Selected dimmers are unpatched and assigned to channel zero (- -)

Labeling dimmers

Expression 2x allows you to assign alphanumeric labels to your dimmers. Dimmer labels may be up to five characters long and may consist of any combination of characters, including letters, numbers and symbols.

In the Patch display, Expression 2x allows you to view labels you have assigned to dimmers. Press [S8], **Show/Hide Labels**, to reveal or hide the labels. Hiding labels provides space to show additional dimmers.

This example demonstrates how to assign a label to a dimmer:

Keystrokes:	Action:
1. Press [Patch].	Selects Patch display
2. Press [5] [Label].	Selects dimmer 5 to label Prompt reads: **Type dimmer label** **(F6 = clear to end,** **F7 = last dimmer label,** **F8 = next dimmer label)**
3. Use the alphanumeric key-board to type "House."	Corner reads: **Label House**
4. Press [Enter] on the Expression 2x keypad.	Dimmer 5 is labeled "House"

Note: In step 4, if you wish to label another dimmer, press [F7] or [F8] instead of [Enter]. Expression 2x records the current dimmer's label, and brings up the previous or next dimmer to be labeled.

Assigning a profile to a dimmer

Dimmer profiles allow you to select one of ten output curves (profiles) and assign it to a dimmer. These profiles allow you to compensate for non-linear light outputs from certain types of fixtures or incorporate a preferred response in a fade. The ten curves are listed below.

If you do not select a profile, all dimmers use profile zero; a linear fade.

Follow these instructions to assign a profile to a dimmer:

Keystrokes:	Action:
1. Press [Patch].	Selects Patch display
2. If the [Dim] LED is unlit, press [Dim] to indicate that the next number entered will be a dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
3. Use the keypad to enter the desired dimmer number(s) Use [And] and [Thru] if you want to select more than one dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
4. Press [S7], **Profile**, then use the keypad to enter the number of the desired profile. Profile numbers are listed on menu at the top of the Patch screen.	Prompt reads: **Select dimmer profile number**

Note: To reset profile to a linear fade, assign profile zero to the dimmer.

Dimmer profiles

0 - Linear
1 - IES square
2 - Slow bottom
3 - Fast bottom
4 - Slow top
5 - Fast top
6 - Full at 1%*
7 - Preheat 5%[†¶]
8 - Preheat 10%[†¶]
9 - Hot patch[‡¶]

*   Dimmer intensity jumps from 0% to 100% at 1% output.
†   Dimmer at 5% or 10% whenever console power is on. Dimmer intensity increases when output exceeds 5% or 10%.
‡   Dimmer at full whenever console power is on.
¶   Affected by [Blackout] but not by Grandmaster.

Capturing channels in Patch

Expression 2x lets you select and capture channels without returning to Stage mode. This allows you to bring channels up on stage to view the proportional settings of dimmers assigned to a channel while you set them.

To select channels from the patch screen, follow these steps:

Keystrokes:	Action:
1. Press [Patch].	Selects Patch display
2. Press [Channel].	Prompt reads: **Select channel numbers**
3. Use the keypad to enter the desired channel number(s) Use [And] and [Thru] if you want to select more than one channel.	Prompt reads: **Select channel numbers**
4. Press [Full] to set channel level at 100 percent, [Level] to set channel at the default level, or press [At] and enter a level setting.	Selected channels are set at the indicated level
5. Press [Rel] to release channel(s).	

Dimmer check

A dimmer check allows you to raise your dimmers to a specified level on stage, one at a time. Expression 2x allows you to select the starting dimmer and set it at a level. Once you select the dimmer, use [+] to check each consecutive dimmer.

Follow these steps to run a dimmer check:

Keystrokes:	**Actions:**
1. Press [Dim].	Prompt reads: **Enter dimmer number(s), then press AT to select level**
2. Press [1] to start dimmer check with dimmer 1.	Keypad corner reads: **Dim 1**
3. Press [At].	Prompt reads: **Select dimmer level (Press FULL button for 100%)**
4. Press [7][5] to set the dimmer's level at 75 percent. You may also press [Full] or [Level] to set the dimmer at 100 percent or at the [Level] setting.	Prompt reads: **To unpatch dimmer for dimmer check, press ENTER** **To park or unpark dimmer(s), press PARK**
5. Press [Enter].	Dimmer 1 is set at 75 percent Dimmer Check window appears Prompt reads: **Press [+] or [–] to step through dimmers. Press [Clear] to cancel dimmer check.**
6. Press [+] to select dimmer 2. Repeat as necessary. Press [Clear] to end dimmer check.	Dimmer 1 returns to zero, dimmer 2 is set at 75 percent

Note: If a dimmer is parked, the Dimmer Check window displays the level at which it is parked. The Dimmer Check does not change its level on stage.

Note: To check a multiplexed B dimmer, enter the number, selecting the A dimmer, then press [+] to select the B dimmer.

About

[About] provides you with information about dimmers. The following pages describe the use of About Dimmer and the information available in the About Dimmer window.

Note: See page 55 for information on using About Channel.

About Dimmer

About Dimmer provides attribute and status information for a selected dimmer. To display the About Dimmer window, follow these steps:

Keystrokes:	Action:
1. Press [About] [Dimmer].	Prompt reads: **About: Select dimmer number, then press ENTER**
2. Press [6].	Keypad corner reads: **Dim 6**
3. Press [Enter].	About Dimmer window is displayed

- **Label**: The dimmer's label.

- **Channel**: The channel to which the dimmer is assigned.

- **Proportion**: The dimmer's assigned proportional level.

- **Profile**: The dimmer's assigned profile.

- **Console dimmer level**: The dimmer output level the Expression 2x console is sending to the dimmer.

- **Parked**: Whether or not the dimmer is parked.

Note: Press [Clear] to remove the About window.

About Dimmer with ETCLink

If your console uses ETCLink to monitor dimmers in an ETC Sensor dimming system, the About Dimmer window displays additional dimmer monitoring information. The following expanded About Dimmer window appears if dimmer monitoring is enabled.

```
════════════════════About:  Dimmer 2════════════════════
║                                                       ║
║   Label:                       Channel: 2             ║
║   Proportion: 100              Profile: 0             ║
║   Console dimmer level: 54     Parked:  n             ║
║                                                       ║
║                                                       ║
║   Rack/slot number:      1/1   Recorded lamp load:  700W ║
║   Rack dimmer level:      54   Load at full:        700W ║
║   Dimmer level source: DMX A   Actual load:           0W ║
║                                Boost:                 -- ║
║   Dimmer errors: None                                 ║
║                                                       ║
════════════════════════════════════════════════════════
        Press [+] or [-] to page through About window
```

- **Label:** The dimmer's label.
- **Channel:** The channel to which the dimmer is assigned.
- **Proportion:** The dimmer's assigned proportional level.
- **Profile:** The dimmer's assigned profile.
- **Console dimmer level**: The dimmer output level the Expression 2x console is sending to the dimmer.
- **Parked**: Whether or not the dimmer is parked.
- **Rack/Slot number**: The rack and slot in which this dimmer is located.
- **Rack dimmer level**: The actual output level at which the dimmer is set.
- **Dimmer level source**: The source of the control signal which set the dimmer's level. Possible sources include:
    DMX A
    DMX B
    Rack #

The following information is available on Sensor Advanced Features dimming systems.

- **Recorded lamp load**: The load at which the selected dimmer was recorded.
- **Load at full**: The estimated load on the dimmer when the level is at Full.
- **Actual load**: The actual load currently on the dimmer.
- **Boost**: The dimmer's boost level, if any.
- **Dimmer error**: Current dimmer errors, if any.

Multiplexed dimmers

ETC's Multiplex dimming technology can increase the capacity of your dimming system. The ETC Multiplexer converts the output of a single ETC Sensor or L86 dimmer into two separate signals. Both signals then provide discrete levels for two ETC Source Four lighting fixtures.

Warning: The DMX512 port that serves the dimmer must be in multiplex mode. Setting the port to multiplex mode erases your current patch. Set the port mode BEFORE you create your patch. To set the port's mode, see Setting Multiplex mode on page 300.

Before you create your patch, you must identify any dimmers whose signals are multiplexed. Expression 2x indicates the split by adding an **A** or **B** to the dimmer number.

Follow these steps to multiplex a dimmer:

Keystrokes:	Action:
1. Press [Patch].	Selects Patch display
2. If the [Dim] LED is unlit, press [Dim] to indicate that the next number entered will be a dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
3. Use the keypad to enter the desired dimmer number(s) Use [And] and [Thru] if you want to select more than one dimmer.	Prompt reads: **Select dimmer numbers, then press ENTER to assign to a channel, or press AT to assign a level, or press PROFILE to assign a profile**
4. Press [S1], **Multiplex**.	Selected dimmers are identified as Multiplexed

*Note: Use [S2], **A**, and [S3], **B**, along with the numeric keypad, to enter dimmer numbers as you create your patch. If you select a multiplexed dimmer without specifying **A** or **B**, the system defaults to **A**.*

Patching to a Strand CD80 dimmer rack

Strand CD80 dimmer racks have 48 dimmer slots. Each dimmer slot holds either two 2.4kW dimmers or one 6kW or 12kW dimmer. The console requires that you include all 96 possible dimmer numbers per rack in the patch.

Refer to the charts below to determine dimmer numbers for each slot on each rack. When patching 6kW or 12kW dimmers, enter the slot's odd dimmer number under the desired channel number. Enter the slot's even dimmer number under channel zero.

For example, to patch a 6kW dimmer into the last dimmer slot on the first rack, enter dimmer 95 in the desired channel number and dimmer 96 in channel zero.

1 2	3 4	5 6	7 8	9 10	11 12
13 14	15 16	17 18	19 20	21 22	23 24
25 26	27 28	29 30	31 32	33 34	35 36
37 38	39 40	41 42	43 44	45 46	47 48
49 50	51 52	53 54	55 56	57 58	59 60
61 62	63 64	65 66	67 68	69 70	71 72
73 74	75 76	77 78	79 80	81 82	83 84
85 86	87 88	89 90	91 92	93 94	95 96

97 98	99 100	101 102	103 104	105 106	107 108
109 110	111 112	113 114	115 116	117 118	119 120
121 122	123 124	125 126	127 128	129 130	131 132
133 134	135 136	137 138	139 140	141 142	143 144
145 146	147 148	149 150	151 152	153 154	155 156
157 158	159 160	161 162	163 164	165 166	167 168
169 170	171 172	173 174	175 176	177 178	179 180
181 182	183 184	185 186	187 188	189 190	191 192

chapter 5
setting channel levels

Setting channel levels is the first step in recording cues, submasters and groups. Setting channel levels in Stage mode brings light levels up on stage. Setting channel levels in Blind mode does not affect stage lights.

This chapter includes the following sections:

- Channel modes
- Channel attributes
- Selecting channels
- Setting channel levels
- Channel check
- About Channel

Channel modes

Channels may be in any of the following modes. Each responds differently to commands.

Captured channels

Captured channels are channels that you have selected and are live on stage. They remain live until you press [Rel] to release them. **Captured channels override all other channel settings.** For example, if a channel is in a fader at 100 percent and you capture it and set it to 50 percent, Expression 2x sets the captured channel at 50 percent. Press [Rel] twice to release captured channels.

Selected channels

Selected channels are channels over which you have immediate keypad control. You can modify selected channels with [Full], [At], [+], [–], or the fader wheel. Selected channels are displayed in yellow, and their levels are red on white. You can select channels in all display modes.

Selected, captured channels are *live* channels that are under immediate keypad control. Channels can be *selected and captured* only in Stage modes. You can select channels in Blind, but they won't be captured since Blind mode is not live. Press [Rel] once to release selected channels.

Recorded channels

Recorded channels are channel levels that have been recorded in a cue, group or submaster. In Stage mode, recorded levels are displayed in green or magenta. Recorded channels may be either moving or tracked in Blind mode (see below). Channel levels controlled by effects are displayed in white. Channel levels controlled by submasters other than effect submasters are displayed in yellow.

Moving channels

Moving channels are channel levels that change from one cue to the next. In Stage mode, all moving channels are displayed in green. In Blind and Tracksheet, moving channels are displayed in green if they are moving down or blue if they are moving up.

Tracked channels

A tracked channel is a channel whose level is unchanged from the preceding cue. Tracked channels are displayed in magenta.

Channel Attributes display

The Channel Attributes display allows you to assign attributes to specific channels, including:

- **Independent**
  Allows a channel to be unaffected by Grandmaster, Flash, Release, Solo, and Blackout. (Release requires an extra keypress.)

- **Flip**
  Allows a channel's output to be reversed. A flipped channel outputs at full when set to zero and at zero when set to full.

- **Label**
  Allows you to assign labels to channels.

To go to the Channel Attributes display, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup menu
2. Press [1][1] [Enter].	Selects Channel Attribute display

Independent channels

An independent channel is not affected by the Grandmaster, Blackout, Solo, or Flash. Otherwise, independent channels function normally. Use [S1], **Independent**, to make a channel independent. Press [Rel] three times to release all independent channels.

Channels that control movement of moving lights or color scrollers will often be set as Independent. This assures that in the case of a blackout or change in the Grandmaster setting, the position of the moving light or color scroller will not change.

To mark a channel as independent, follow these steps:

Keystrokes: **Action:**

1. Press [Setup].   Selects Setup menu

2. Press [1][1] [Enter].   Selects Channel Attributes display
                                     Prompt reads:
                                     Select channel number(s)

3. Enter channel number(s)   Selects channel
    to be independent and   Prompt reads:
    press [S1], **Independent**.   **Enable/disable independent**
    Use [Thru], [And] and   **channel(s) (1 = Enable, 0 = Disable)**
    [Except] to select multiple
    channels.

4. Press [1], then press   Channel is independent
    [Enter].

Flipped channels

The Flip command inverts the output of the channel to which it is applied. A flipped channel outputs at full when set to zero and at zero when set to full.

Use [S2], **Flip**, to mark a channel flipped. The flipped channels will have their outputs inverted. The levels will not appear inverted on the Stage display, but the level sent to the channel is inverted. This is particularly useful for some moving light functions.

For example, flip the output of the channel controlling the pan of one of two moving lights. If you then record both lights' pan control channels to a submaster, the two lights' movements mirror each other.

To mark a channel as flipped, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup menu
2. Press [1][1] [Enter].	Selects Channel Attributes display Prompt reads: **Select channel number(s)**
3. Enter channel number(s) to flip and press [S2], **Flip**. Use [Thru], [And] and [Except] to select multiple channels.	Selects channel Prompt reads: **Enable/disable flipped channel(s) (1 = Enable, 0 = Disable)**
4. Press [1], then press [Enter].	Channel is flipped

Labeling a channel

The Channel Attributes display's Label function allows you to assign an alphanumeric label of up to 16 characters to a channel.

To label a channel, follow these steps:

Keystrokes:	**Action:**
1. Press [Setup].	Selects Setup menu
2. Press [1][1] [Enter].	Selects Channel Attributes display Prompt reads: **Select channel number(s)**
3. Enter channel number(s) to label and press [Label]. Use [Thru], [And] and [Except] to select multiple channels.	Selects channel to label Prompt reads: **Type channel label (F6 = clear to end, F7 = last channel label, F8 = next channel label)**
4. Use an alphanumeric keyboard to enter the channel's label, then press [Enter].	Channel is labeled

Selecting channels

Using the keypad to set channel levels involves two steps: selecting the channels whose levels you want to modify, then entering output levels.

- To select a single channel, enter the channel number.
  For example, [Channel] [1] selects channel 1.

Note: When selecting channels, you only need to press [Channel] if the [Channel] LED is not lit.

- To select two channels that are not consecutively numbered, enter the number of the first channel, then press [And] and enter the number of the second channel.
  For example, [Channel] [1] [And] [7] selects channels 1 and 7.

- To select a group of consecutively numbered channels, enter the number of the first channel, then press [Thru] and enter the last number.
  For example, Channel] [1] [Thru] [9] selects channels 1, 2, 3, 4, 5, 6, 7, 8, and 9.

- To exclude channels from a selected group of consecutively numbered channels, enter the first channel, press [Thru], enter the last channel, then press [Except] and enter the channels to leave out.
  For example, [Channel] [1] [Thru] [1][5] [Except] [5] [Thru] [1][3] selects channels 1, 2, 3, 4, 14, and 15.

- Use [And], [Except] and [Thru] to select multiple, non-consecutive groups of channels.
  For example, [Channel] [1] [Thru] [5] [And] [8] [Thru] [1][2] [Except] [9] selects channels 1, 2, 3, 4, 5, 8, 10, 11, and 12.

Hint: If no channels are selected, press [Enter] to select all channels currently at a level above zero.

Once you have entered your channel selections, you are ready to set channel levels.

Selecting channels in Flexichannel mode

In Flexichannel mode, only channels that are used in the show appear on the Stage, Blind and Fader displays. When Flexichannel mode is enabled, the [Thru] key functions slightly differently. For example, in normal mode, pressing [1] [Thru] [5] selects all channels from 1 to 5. In Flexichannel mode, pressing [1] [Thru] [5] selects all <u>visible</u> channels from 1 to 5.

To select <u>all</u> channels from 1 to 5, including channels that haven't been used in the show so far, press [1] [Thru] [Thru] [5]. Pressing [Thru] a second time alerts the system to ignore Flexichannel for that channel selection.

*Note: When channels that were used in a show are removed from the show, they remain on the channel list until it is updated. The Purge Flexi softkey on the System Settings display updates the list of used channels. The list is also updated when you load a show from diskette, or when you first turn Flexichannel on. Press [Setup] [1] [Enter] [S1], **Purge Flexi**, to update Flexichannel displays.*

Setting channel levels

You assign output levels to channels using the basic format [Channel] [#] [At] [#] where the first number is the channel and the second is the level. For example, [Channel] [4] [At] [7][5] sets channel 4 at 75 percent. If you enter a single digit for the level, Expression 2x multiplies it by ten and you must follow it with [Enter]. In other words, [Channel] [4] [At] [1] [Enter] sets channel 4 to 10 percent. To set channel 4 to 1 percent, enter [Channel] [4] [At] [0][1]. You can also use the level wheel, [Full], [Level], or [S8], **Flash**, to set channel levels.

Level wheel

To set channel levels with the level wheel, select the channels whose levels you want to modify, then use the wheel (labeled **Level Y**) to set the desired output level. You can also use the wheel to adjust output levels for all active channels.

To set selected channel levels, enter [Channel] [1] [Thru] [5] then move the level wheel to set levels.

To modify all channels currently at a level above zero, press [Enter] then move the level wheel to set levels.

Full

[Full] sets selected channel levels to 100 percent. For example, press [Channel] [1] [Thru] [5] [Full] to set channels 1, 2, 3, 4, and 5 to 100 percent.

Level

[Level] sets selected channel levels to the output level assigned to the [Level] key. The default value for [Level] is 100 percent. (See *Chapter 3, Entering system settings*, page 20 for instructions on changing default settings.) For example, if [Level] is set at 75 percent, press [1] [Thru] [5] [Level] to set channels 1, 2, 3, 4, and 5 to 75 percent.

Flash

Flash sets the selected channel's level to 100 percent if the channel is currently at a level at or below 50 percent. If the channel's level is above 50 percent, **Flash** sets it to zero. Levels set by Flash are only maintained while the key is pressed. For example, press [Channel] [5], then press and hold [S8], **Flash**, to set channel 5 to either 100 or zero.

Sneak

Sneak is a softkey that you can use to fade channels on stage to a level you choose, in a specific time or to restore channels to the last level at which they were set with a fader or submaster. For example, if you bring up a cue, then change the look, you can use sneak to go back to the look created by the original cue. If you do not indicate a time, the sneak occurs in the default sneak time, set in System Settings.

Follow these steps to use Sneak to set a channel level:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [S1], Sneak.	Selects Sneak mode Prompt reads: **Sneak mode - Select channels, then press ENTER to sneak, or AT to select sneak level, or TIME to select sneak time**
3. Select the channel(s) you want to sneak and the level to which you want it to fade. For example, press [5] [At] [5].	Selects channel 5. Sets level at 50 percent Prompt reads: **Sneak mode - Select level**
4. Press [Time] and enter the time for the sneak. For example, press [Time] [1][0].	Selects Sneak time of ten seconds Prompt reads: **Sneak mode - Select time**
5. Press [Enter].	Fades channel 5 to 50 percent over ten seconds

Follow these steps to restore a channel to its last fader or submaster level:

Keystrokes:	Action:
1. Press [Sneak] and select the channel(s) you want to restore. For example, press [5].	Selects channel 5 to sneak Prompt reads: **Sneak mode - Select channels, then press ENTER to sneak, or AT to select sneak level, or TIME to select sneak time**
2. Press [Enter].	Fades channel 5 back to its most recent cue or sub level

Note: Press [Sneak] [Enter] to restore all channels to their current fader or submaster levels.

Channel check

Use a Channel Check to check which channel controls which light. Expression 2x allows you to check channels by selecting a single channel and setting it at a level. Once you have selected a channel you can then advance sequentially through the channels, checking one at a time.

Follow these steps to run a channel check:

Keystrokes:	Actions:
1. Press [Stage].	Selects Stage display Prompt reads: **Select channel numbers**
2. Press [Channel] [1].	Corner reads: **Chan 1**
3. Press and hold [S8], **Flash**.	Sets channel 1's level to 100 percent if its current level is at or below 50 percent or... Sets channel 1's level to zero if its current level is above 50 percent
4. While holding [S8], press [+] or [–] to select the next or previous channel.	Flashes each channel in turn
5. Once you have checked all the channels, release [S8], **Flash**.	

Note: You may start a channel check with any channel. Substitute the desired channel in step 2.

Note: If a channel is Independent, it will not Flash.

About

[About] provides you with information about channels. The following pages describe the use of [About] and the information available in the About channel window.

Note: See page 40 for information on using About Dimmer.

About Channel

About Channel provides attribute and status information for a selected channel. To display the About Channel window, follow these steps:

Keystrokes:	Action:
1. Press [About] [Channel].	Prompt reads: **About: Select channel number, then press ENTER**
2. Press [6].	Keypad corner reads: **Chan 6**
3. Press [Enter].	About Channel window is displayed. Press [Clear] to remove the window

- **Label**: The channel's label.
- **Link**: The channel's link number on the Link List.
- **Attributes**: Whether or not the channel is flipped or independent.
- **Wheel**: The wheel on which the channel is linked.
- **First used:** The first cue in which this channel appears.
- **Last used:** The highest numbered cue in which this channel appears.
- **Number of cues:** The total number of cues in which this channel appears.
- **Number of moves:** The total number of cues in which this channel moves.
- **Level**: The channel's current level.
- **Source:** The control device that is providing the channel's level. Possible sources include: **Captured, Fader #, Sub #, DMX In**
- **Parked**: Whether or not the channel is parked.
- **Inhibited**: The inhibitive submaster, if any, which is controlling the level of the channel.
- **Dimmers:** The dimmers assigned to the channel, as space permits.

chapter 6
cues

This chapter includes instructions on recording, modifying and deleting cues.

After you select channels and set their intensity levels, you can store the resulting look as a cue. You can play cues back in a timed fader. Expression 2x allows you to record up to 600 cues per show.

This chapter contains the following sections:

- Cue types
- Record functions
- Creating cues
- Viewing cues
- Working with cues in Stage mode
- Recording a cue in Stage
- Working with cues in Blind mode
- Recording a cue in Blind
- Recording a cue with a single fade time
- Recording a cue with split fade times
- Recording a cue with a wait time
- Recording cues with Link and Follow
- Recording a cue using Solo
- Labeling cues
- Modifying a recorded cue live
- Modifying cue attributes
- Using Update to modify a cue
- Deleting cues
- Copying cues
- Inserting cues
- Cue List

Cue types

[Type] displays the fade type options described below. The menu that appears in Stage omits the effect and subroutine options. Effects and subroutines are explained in their own chapters.

To select a cue fade type in Stage, Blind or Fader modes, press [Type], and enter an option number. If you change a cue's fade type, you must re-record the cue. For example, [Cue] [2] [Type] [2] [Record] [Enter] records cue 2 with an allfade.

If you do not enter a fade type, cues default to crossfade.

Crossfade

In a crossfade cue, channel levels that increase fade to their new level in the assigned upfade time. Channel levels that decrease fade to their new level in the assigned downfade time. The cue starts when you press [Go]. You may use a wait time to delay the start of the upfade or downfade.

Allfade

An allfade cue forces all unused channels to zero intensity when you press [Go] and clears the other fader. Allfade is useful for forcing an end cue when tracking channels. For more information on using allfade cues for tracking, see *Chapter 7 Track*.

Subroutine

A subroutine is a cue that controls the playback of a series of recorded cues. Subroutines are similar to linked cues, except that you have more playback options. For more information on using subroutines, see *Chapter 13, Working with subroutines.*

Effects

An effect cue contains an effect. Effects allow you to assign channels to a series of steps. When you play back the effect, the steps run in assigned chase patterns, or in random order. For more information on using effects, see *Chapter 12, Working with effects.*

Record functions

Expression 2x has two record functions; Record and Track. Record saves all channels as they appear on the screen (what you see is what you get) in the cue, group or submaster you specify. When you use Record to record a cue, levels are recorded in only one cue.

Track is a record function that works only with cues. It allows you to build a new cue from the previous cue's channel settings. Tracked channels are channels whose levels do not change from one cue to the next. A *track* often runs through several cues for the length of a scene or an act.

Track also allows you to add tracked channels through existing cues. For example, if you have created all cues for a scene, and then decide to add a few new channels to all cues, or adjust the level of a channel throughout the cues, Track lets you do so with one short record command. To do the same thing with Record would require you to add the new channels to each cue individually.

Note: When a channel level that tracks through a series of cues reaches an Allfade cue, the track ends.

We use the standard Record function for all cues in this chapter. Instructions for using the Track function are included in *Chapter 7, Track.*

Creating cues

Expression 2x allows you to save up to 600 cues per show. A cue is a look you have created and recorded, and can replay in a timed fader pair. If your show requires more than 600 cues, you can read a second show from diskette during a break, or between cues. See *Chapter 17, Diskette functions,* for more information about recording shows on diskette.

This chapter includes instructions and examples for creating and modifying cues using several different methods. If you follow the examples, you will have several cues recorded. You will also know how to modify, copy and delete cues.

If you have several cues already stored, you may want to use the look from one cue and modify it to create another. In other circumstances, you may want to enter all channel levels manually.

There are several ways you can go about creating any one look. The following instructions give examples of how you *could* generate each cue.

Note: Before you clear cues, as described below, make sure that the show currently in the console memory is saved on diskette.

The examples in this chapter assume there are no cues stored in the console. To erase any cues, press [Setup] [4] [Enter] [2] [Enter] [Enter].

Viewing cues

You can view stored cues in two ways, live in Stage mode, or just on the screen in Blind mode.

To view cues live, you must select the cue and play it back in a fader. See *Chapter 9, Playing back cues,* for instructions.

To view a cue only on the screen, select Blind mode and enter the desired cue number. To view a different cue, press [Cue] and the new cue number that you want to see.

In Blind mode you can also use [+] and [–] to move through recorded cues, and cue parts, one at a time. Press [Cue]; then press [+] to display the next cue or part; press [–] to display the previous cue or part.

Working with cues in Stage mode

Stage mode display appears on the Command display monitor. A sample Stage mode display is shown below.
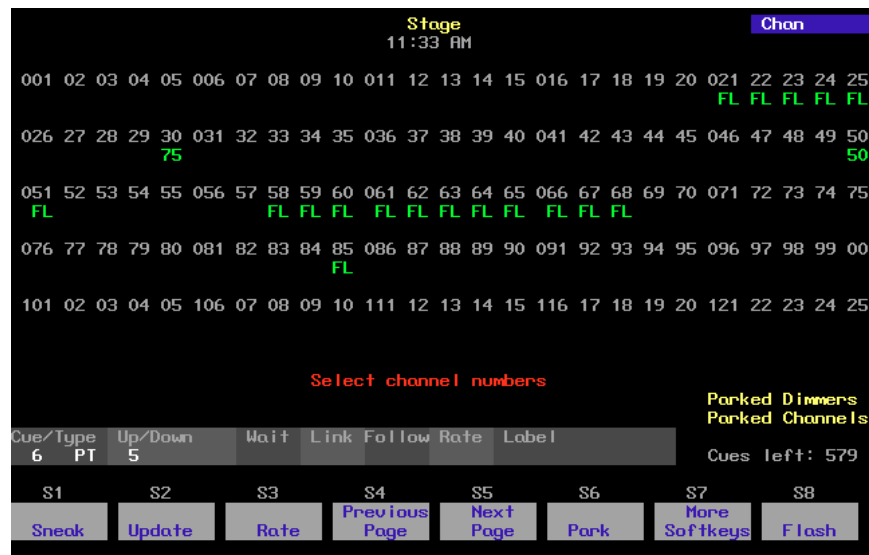
The examples in this chapter demonstrate how to create a variety of cues in Stage display mode. Cues consist of channel levels and cue attributes. Each example in the text illustrates a different cue attribute. However, multiple attributes can be applied to one cue.

Recording a cue in Stage

In this cue, you will only set channel levels. Default settings will determine all other attributes of the cue. You can change most default settings from the System Settings menu. See *Chapter 3, Entering system settings*, for information about setting and changing defaults.

Follow these steps to record cue 1:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode Prompt reads: **Select channel numbers**
2. Press [1] [Thru] [1][0].	Selects channels 1 through 10
3. Press [At].	Prompt reads: **Enter intensity**
4. Press [5][0].	Sets a level of 50 percent for channels 1 through 10
5. Press [Record].	Prompt reads: **To record cue, select number and press ENTER** **To cancel, press CLEAR**
6. Press [1].	Selects cue 1

Note: The keypad defaults to cue mode when you press [Record].

7. Press [Enter].	Records cue 1 containing channels 1 through 10 at 50 percent
8. Press [Rel].	Releases captured channels

Working with cues in Blind mode

Blind mode allows you to create, preview or modify cues without affecting the current look on stage. If you prefer to work with live looks, you should work in Stage mode.

When you press [Blind], Expression 2x displays the following screen on the Command display:
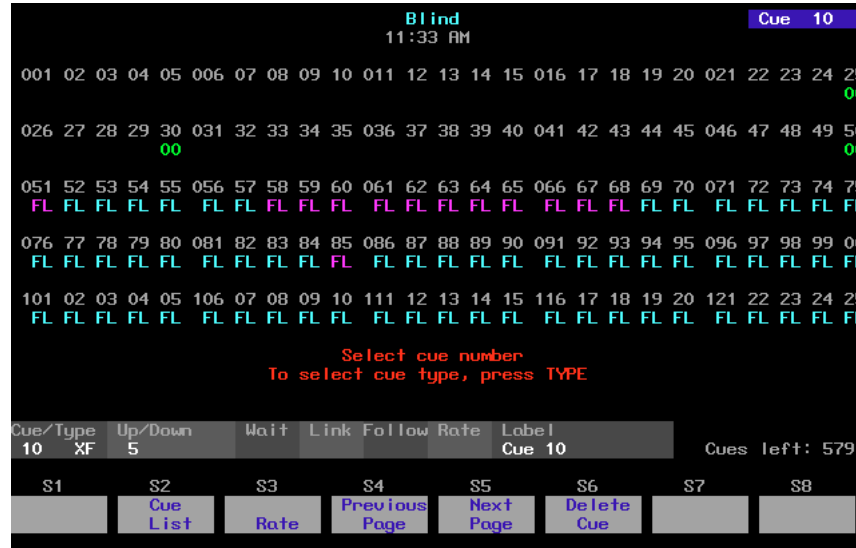
Recording a cue in Blind

This example creates a cue in Blind mode. Blind allows you to work on cues without affecting the look on stage. Expression 2x automatically enters 00 for channels used in cue 1 to indicate that they will downfade in cue 2.

Follow these steps to record cue 2 in Blind mode:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode Prompt reads: **Select cue number** **To select cue type, press TYPE**
2. Press [2].	Selects cue 2
3. Press [Channel] [1][3].	Selects channel 13 Prompt reads: **Select channel numbers**
4. Press [And] [1][5].	Adds channel 15 to your selected channels. Selected channels are displayed in yellow
5. Press [Full].	Sets channels at full intensity level

Note: When using [Full], you do not have to press [At] first.

6. Press [Record].	Prompt reads: **To record cue, select number and** **press ENTER** **To cancel, press CLEAR**
7. Press [Enter].	Records cue 2 with channels 13 and 15 at Full

When you record the cue, channel levels set by a fader change from red (indicating a channel level set on the keypad) to colors based on the channels' level movements from cue to cue. See page 6 for more information on what channel level colors mean.

Recording a cue with a single fade time

Unless you tell it otherwise, Expression 2x assigns default fade times to any cue you record. If you prefer, you may record cues with custom fade times instead.

Fade times can be zero seconds to 99:59 minutes long. They may be expressed in minutes and seconds, or as fractions of seconds (in decimal format). Acceptable time values include: .2 (.2 seconds), 00:12 (12 seconds), 5.5 (5.5 seconds), or 5:30 (five minutes, 30 seconds).

Follow these steps to record a cue with a custom fade time:

Keystrokes:	Action:
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Cue]	Prompt reads: **Select cue number** **To select cue type, press TYPE**
3. Press [3]	Selects cue 3
4. Press [Time].	Prompt reads: **Enter upfade time**
5. Press [8].	Enters a fade time of 8 seconds. Corner reads: **UpTime 8**
6. Press [Enter] [Enter].	Enters matching downfade time
7. Press [Record].	Prompt reads: **To record cue, select number and** **press ENTER** **To cancel, press CLEAR**
8. Press [Enter]	Records cue 3 with fade time of eight seconds

Note: If the cue already exists, you may omit steps 7 and 8.

Recording a cue with split fade times

Expression 2x allows you to record cues with different upfade and downfade times. These cues are said to have *split* fade times. On the Expression 2x display, the time to the left of the **/** refers to the upfade time; the number to the right refers to the downfade time.

Follow these steps to record a cue with split upfade and downfade times:

Keystrokes:	Action:
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Cue]	Prompt reads: **Select cue number** **To select cue type, press TYPE**
3. Press [4]	Selects cue 4 Corner reads: **Cue 4**
4. Press [Time].	Prompt reads: **Enter upfade time**
5. Press [1][0].	Enters an upfade time of ten seconds Corner reads: **UpTime 10**
6. Press [Enter].	Prompt reads: **Enter downfade time**
7. Press [1][5].	Enters a downfade time of 15 seconds Corner reads: **DnTime 15**
8. Press [Record].	Prompt reads: **To record cue, select number and** **press ENTER** **To cancel, press CLEAR**
9. Press [Enter].	Records cue 4 with upfade time of ten seconds and downfade time of 15 seconds

Note: If the cue already exists, you may omit steps 8 and 9.

Recording a cue with a wait time

Wait time is the time that elapses between when you press [Go] and when the actual fade begins. You can record Expression 2x cues with a wait time of up to 99:59 minutes. Expression 2x allows you to program a wait time for either the upfade or the downfade; not both. If you do not enter a wait time, Expression 2x assigns the cue a wait time of zero.

Follow these steps to record a cue with a downfade wait time:

Keystrokes:	Action:
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Cue]	Prompt reads: **Select cue number** **To select cue type, press TYPE**
3. Press [5]	Selects cue 5
4. Press [Wait] once or... Press [Wait] twice.	Prompt reads: **Enter upfade wait time** or... **Enter downfade wait time**.
5. Press [6].	Enters a wait time of six seconds Corner reads: **UpWait 6** or... **DnWait 6**
6. Press [Enter].	Records cue 5 with wait time of six seconds

Recording cues with Link and Follow

When you record a cue, it automatically becomes part of the Cue List. The Cue List is a list of all cues, organized in numeric sequence. Normally, when you press [Go] to execute cues, Expression 2x plays them back in the sequence in which they appear in the Cue List. [Link] allows you to modify the sequence in which cues play back. [Follow] allows you to play back multiple cues automatically.

Link

Normally, pressing [Go] plays back cues in the sequence indicated on the Cue List. [Link] allows you to play back cues out of sequence by linking them together. For example if you link cue 6 to cue 2, then play cue 6, pressing [Go] plays cue 2.

Follow these steps to record a linked cue.

Keystrokes:	Action:
1. Press [Stage] or [Blind].	Selects display mode
2. [Cue] [6].	Selects cue 6
3. Press [Link].	Prompt reads: **To link to cue, select cue number To link to macro, press ENTER MACRO**
4. Press [2] [Enter].	Links cue 6 to cue 2. After you play back cue 6, press [Go] to play back cue 2

Note: You can also link cues to macros. For more information on linking cues to macros, see page 174 in Chapter 15, Working with macros.

Follow

[Follow] allows you to play a series of cues automatically. The [Follow] time indicates how long the console waits after the cue starts before the next cue runs. [Follow] plays back the next cue on the Cue List unless you use [Link] to specify a different sequence.

Follow times may be expressed in minutes and seconds, or as fractions of seconds, up to 99:59 minutes.

Follow these steps to record a cue with [Follow].

Keystrokes:	Action:
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Cue] [7].	Selects cue 7
3. Press [Follow].	Prompt reads: **Enter follow time (or press ENTER to confirm default time)**
4. Press [5] [Enter].	Records cue 7 with a Follow time of five seconds. After you start cue 7, the next cue in the Cue List plays automatically five seconds later

Combining Link and Follow to create playback loops

Expression 2x allows you to use Link and Follow to create cue playback sequences in which a group of cues plays back automatically and repeats.

Follow these steps to create a five-cue sequence:

Keystrokes:	Action:
1. Create five cues numbered 1, 2, 3, 4, and 5.	Cue list displays cues 1 through 5
2. Press [Cue], then press [1], the number of the first cue you want to include in the playback loop.	Selects the first cue
3. Press [Follow] [5] [Enter].	Assigns a follow time of five seconds to the first cue
4. Repeat steps 2 and 3 for cues 2 through 5.	Assigns a follow time of five seconds to the remaining cues
5. Press [Cue], then press [5], the number of the last cue in the playback loop.	Selects the last cue in the playback loop
6. Press [Link], then press [1], the number of the first cue in the playback loop. Press [Enter].	Creates a loop by linking the last cue to the first cue

Note: You may also use effects to create loops. See Chapter 12, Effects, for more information.

Using Link to link a macro to a cue

[Link] allows you to automatically run a macro when a cue runs. If you want the macro to delay before running, start the macro with a Macro Wait of the desired length. See *Chapter 15, Working with macros*, for information about creating macros.

Follow these steps to link a macro to a cue:

Keystrokes:	**Action:**
1. Press [Stage] or [Blind].	Selects display mode
2. [Cue] [6].	Selects cue 6
3. Press [Link].	Prompt reads: **To link to cue, select cue number To link to macro, press ENTER MACRO**
4. Press [Enter Macro]	Prompt reads: **To link to macro, select macro number To link to cue, press CUE**
5. Press [7] [Enter].	Records cue 6 linked to macro 7. When you press [Go] to play cue 6, macro 7 will run at the same time

Recording a cue using Solo

[Solo] lets you record a cue that contains some of the channels that make up the current look, but not others. Often you will create cues by adding to, subtracting from and modifying previously recorded cues.

Follow these steps to create a cue using Solo:

Keystrokes:	Action:
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Channel].	Prompt reads: **Select channel numbers**
3. Press [2][0].	Enters channel number to mark the start of the selected range
4. Press [Thru].	Indicates you are selecting a range of channels
5. Press [3][0]	Selects channels 20 through 30
6. Press [Solo].	*S*ets all channels other than 20 through 30 to zero Prompt reads: **(To restore levels, press SOLO)** **Select channel numbers**
7. Move fader wheel; press [Full], [Level], [+], or [–]; or use [At] and numeric keypad to set levels for selected channels.	Sets channels 60 through 70 to a new level
8. Press [Record].	Prompt reads: **To record cue, select number and press ENTER** **To cancel, press CLEAR**
9. Press [7].	Corner reads: **Cue 7**
10. Press [Enter].	Records cue 7 with channels 60 through 70
11. Press [Solo].	Restores channels other than 60 through 70 to previous levels

Warning: If you press [Solo] in Stage mode, unselected channels controlling lights on stage will go to zero.

Labeling cues

Expression 2x allows you to use an alphanumeric keyboard to assign labels to cues. Labels can consist of any combination of letters, numbers and symbols and may be up to 16 characters long. See page 302 for information on installing an alphanumeric keyboard.

Follow these steps to label a cue:

Keystrokes:	Action:
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Cue] [1][2] [Label].	Selects Cue 12 Prompt reads: **Type cue label** **(F6 = clear to end,** **F7 = last cue label,** **F8 = next cue label)**
3. Use the alphanumeric keyboard to type the desired label. For example, call cue 12 "Toad exits."	Enters cue label Corner reads: **Label Toad exits**
4. Press [Enter].	Records Cue 12 with label "Toad exits"

Note: If the cue did not previously exist, press [Record] [Enter] in step 4. This will create the cue and label it as indicated, all in one step.

Modifying a recorded cue live

All the preceding examples have involved creating a new cue. In Stage, if you want to add, remove or modify channel levels, you must play back the cue, make your changes, then re-record the cue. If you are changing cue attributes, you do not need to play back the cue.

Modifying channels in a cue

If you are not familiar with procedures for playing back cues, see *Chapter 9 Playing back cues.* Follow these steps to modify cues in Stage mode:

Keystrokes:	**Action:**
1. Press [Stage].	Selects Stage display mode
2. Press [Cue], enter cue number and press [Go].	Plays back selected cue
3. Select channels and set channel levels to make the desired changes to the cue.	Modifies cue channel levels
4. Press [Record] [Enter]. or... Press [Record] [8] [Enter].	Re-records cue with desired modifications or... Records the modified cue as cue 8

Note: If you re-record as the same cue, modifications affect the look on stage. If you record the cue with a new number, modifications are not reflected in the fader; you may want to run the cue through a fader before you release channels if you don't want to lose the look from stage.

Modifying cue attributes

Follow these steps to modify cue attributes:

Keystrokes:	**Action:**
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Cue] then enter the number of the desired cue.	Selects the desired cue
3. Press the key that corresponds to the attribute you want to modify. Options include: Type*, Time, Wait, Link,Follow, and Label.	
4. Enter the new setting for the attribute.	Modifies cue attribute
5. Press [Enter].	Re-records cue with modifications

* Note: if you change the cue's type, press [Record] [Enter] in step 5. Type changes will not take effect unless recorded.

Using Update to modify channels in a cue

The Update feature allows you to easily record changed levels on Stage into a selected cue. You may record all levels on Stage into the cue, or you may record only changes to channels that were previously recorded in the cue. This allows you to modify the channel levels in the active cue, then re-record the cue without recording the entire stage look.

Note: Levels provided by submasters aren't updated. Only channel levels set on the keypad are recorded.

Follow these steps to use Update to modify a cue in Stage mode:

Keystrokes:	**Action:**
1. Press [Stage].	Selects Stage display mode
2. Press [Cue], enter cue number and press [Go].	Plays back selected cue, bringing up its current levels
3. Modify channel levels as desired.	
4. Press [S2], **Update**. (If you wish to update the levels in a cue other than the active cue, enter the desired cue number.)	Prompt reads: **To update cue, select number and press ENTER (TRACK + ENTER for tracking) (Press ONLY + ENTER to update only those channels already in cue)**
5. To record changes only to channels that are already in the cue, press [Only].	Limits update to channels in cue
6. Press [Enter] or... Press [Track] [Enter].	Updates and re-records the active cue

*Note: Press [Track] after you press [S2], **Update**, if you wish changes to track into subsequent cues.*

Using Update to add channels to a cue

Normally when you re-record a cue, you record all the channel levels currently on stage. Expression 2x's Update feature allows you to record only those channels that you specify.

This allows you to add specific channels to the active cue, then re-record the cue without recording the entire stage look.

Follow these steps to use Update to modify a cue in Stage mode:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [Cue], enter cue number and press [Go].	Plays back selected cue, bringing up its current levels
3. Modify or add channel levels as desired.	
4. Press [S2], **Update**. (If you wish to update the levels in a cue other than the active cue, enter the desired cue number.)	Prompt reads: **To update cue, select number and press ENTER (TRACK + ENTER for tracking) To cancel, press clear**
5. Press [Channel].	Prompt reads: **To update channel(s), select number(s) and press ENTER To cancel, press clear**
6. Enter the channel number(s) you wish to add to, or update in, the cue.	
7. Press [Enter] or... Press [Track] [Enter].	Updates and re-records the active cue

Note: Press [Track] instead of [Enter] in step 7 if you wish changes to track into subsequent cues.

Using Update to modify fade rate

You may also use the Update function to record manually modified fade rates into cues.

Follow these steps to update a rate for a cue running in a fader:

Keystrokes:	Action:
1. Press [Rate] key for the fader in which the cue is running.	Activates rate control
2. Move rate wheel to adjust fade rate.	Fades are placed under control of the rate wheel. The Fader Status window shows the current rate
3. Press [S2], **Update**.	Prompt reads: **To update cue, select number and press ENTER (TRACK + ENTER for tracking) (Press ONLY + ENTER to update only those channels already in cue)**
4. Press [Enter].	New rate is recorded into cue

Deleting cues

Follow these steps to delete a cue in Stage or Blind mode.

Keystrokes:	Action:
1. Press [Stage] or [Blind]. If you press [Stage], press [S7], **More Softkeys**.	Selects display mode
2. Press [S6], **Delete** in Stage, **Delete Cue** in Blind).	Prompt reads: **To Delete cue, press ENTER - Delete cue and tracking, press TRACK + ENTER To cancel, press CLEAR**
3. Enter number of cue to delete. This is optional if you wish to delete the currently selected cue.	Selects cue to delete
4. To delete just the current cue, press [Enter]. To delete the current cue and any channels that track from that cue, press [Track] [Enter].	Prompt reads: **To confirm, press ENTER To cancel, press CLEAR**
5. Press [Enter]	Deletes cue

For more information on tracking, see *Chapter 7, Track*, page 81.

Copying cues

In some cases, you may want to copy a cue's channel levels and use them as the foundation for a new cue. To copy cue, follow these steps:

Keystrokes:	Actions:
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Cue] [1].	Prompt reads: **Select cue number To select cue type, press TYPE**
3. If you are in Stage display, press [Go].	
4. Press [Record].	Prompt reads: **To record cue, select number and press ENTER To cancel, press CLEAR**
5. Press [Cue] [2].	Corner reads: **Cue 2**
6. Press [Enter].	Cue copy is complete. Channel levels have been copied from cue 1 to cue 2. You can now modify the new cue

Note: You may also copy a look from a cue to a submaster or a group. To do so, press [Sub] or [Group] in place of [Cue] in step 5.

Inserting cues

You may want to insert a cue between recorded cues. For example, you may want to modify cue 1 slightly and insert it between cues 1 and 2. You can number cues with a one-digit decimal. Therefore, you can insert up to nine cues between 1 and 2 (1.1, 1.2, etc.).

Follow these steps to insert a cue between existing cues:

Keystrokes:	Action:
1. Press [Blind] or [Stage].	Selects display mode
2. Press [Cue] and enter the number of the cue to modify, then press [Enter].	Selects the desired cue
3. If you are working in Stage mode, press [Go].	Brings up cue on stage and on the display
4. Add or modify channels and cue attributes.	Cue is modified
5. Press [Record].	Prompt reads: **To record cue, select number and press ENTER** **To cancel, press CLEAR**
6. Enter cue number with a decimal to insert it between cues (e.g., [1][.][5]). If you do not enter a new cue number, you will overwrite the existing cue.	Corner reads: **Cue 1.5**
7. Press [Enter].	New cue 1.5 is recorded between cues 1 and 2

Cue List

The Blind Cue List displays a list of the cues in your show. Up to 18 cues are displayed on screen at any time. The Cue List includes the cue number and type, its upfade, downfade and wait times, its link and follow settings, its rate, and its label.

Press [S2], **Cue List**, in Blind mode to display the Cue List. A sample Cue List display is shown below:

Follow this example to modify a cue in Cue List display:

Keystrokes:	**Action:**
1. Press [Blind].	Selects Blind display mode
2. Press [S2], **Cue List**.	Displays Cue List
3. Use the keypad to enter the cue(s) to modify. Use [And], [Except] and [Thru] to select multiple cues.	Selects desired cue(s) Prompt reads: **Select cue number(s)**
4. Press [→] until the cursor reaches the attribute you wish to edit.	The prompt indicates your options or prompts you to enter a new setting
5. Enter the new setting for the attribute and press [Enter].	Setting change is reflected on cue list

Editing cue attributes in Cue List

The Cue List allows you to edit attributes across a range of cues simultaneously.

For example, if you wanted cues 1 through 5 to have upfade wait times of ten seconds, you could set them all in one command. Follow these steps to do so:

Keystrokes:

Actions:

1. Press [Blind] [S2], **Cue List**.

Displays Cue List
Prompt reads:
Select cue number(s)

2. Press [1] [Thru] [5].

Selects cues 1 through 5

3. Press [Wait].

Prompt reads:
Enter upfade wait time

4. Press [1][0] [Enter].

Sets upfade wait time for cues 1 through 5 to **10**

chapter 7
track

Track record function

Track record allows you to record cues and modify recorded cues. Additionally, it allows you to designate whether or not the levels in the displayed cue should track into subsequent cues until a new level instruction is encountered.

It also allows you to modify groups of cues quickly and add channels to cues. You can also use it to create a new cue from the previous one, by pulling all levels forward into the Blind display of the new cue.

Tracksheet mode

Tracksheet displays one channel's level settings for all cues in which it appears. From it, you can follow the track of that channel quickly. You can then select a cue or a group of cues from the Tracksheet and modify that channel's level throughout. Tracksheet provides one means for tracking channels through allfade cues.

Track record

When you record a series of cues, you typically record the first cue, then build the second cue from the first. Some of the channels change, but many remain the same. The third cue is built from the second and so on. This procedure results in many channels being set to a level in one cue and staying at that level for several cues.

A channel whose level does not change through a series of consecutive cues is said to "track" from cue to cue. That same sequence of unchanged levels is also referred to as a "track." The [Track] key creates tracks by pulling channel levels from the previous cue (in Blind mode), or by adding tracks to existing cues (in either Blind, Stage or Tracksheet).

Rising channel levels are displayed in blue in the Blind display. Falling channel levels are displayed in green. Channel levels displayed in magenta indicate that the channel is tracking, i.e., that its level is the same as in the previous cue.

The following examples demonstrate how Track works. They include five cues, each with five channels. In these examples, when a channel changes level from one cue to the next it is printed in **bold**; tracked channels are printed normally. This corresponds to how Blind displays levels – channels that rise or fall are displayed in blue or green; tracked channels are displayed in magenta.

Using record to create tracks

In Stage mode, the following keystrokes create the five cues illustrated below. Each cue adds channels to the previous cue. The example uses [Record] to record the cues.

Cue 1   [Chan] [1] [Full] [Record] [1] [Enter]
Cue 2   [Chan] [2] [Full] [Record] [2] [Enter]
Cue 3   [Chan] [3] [Full] [Record] [3] [Enter]
Cue 4   [Chan] [1] [At] [2][5] [Chan] [4] [Full] [Record] [4] [Enter]
Cue 5   [Chan] [1] [Thru] [4] [At] [0][0] [Record] [5] [Enter]

These keystrokes produce the results illustrated in Figure 1.

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Cue 1	**FF**				
Cue 2	FF	**FF**			
Cue 3	FF	FF	**FF**		
Cue 4	**25**	FF	FF	**FF**	
Cue 5	**00**	**00**	**00**	**00**	

Figure 1

Notice the vertical tracks that develop when a channel remains at the same level through a number of cues. For example, channel 1 tracks from cue 1 to cue 3. When a channel is not set at any level (such as channel 5 above) it is considered tracked at clear.

Recording modified cues

The difference between Record and Track is apparent when you modify a cue or insert a new cue between two existing cues. Record and Track produce different results.

The following keys were pressed to release captured channels and play back cue 1.

[Stage] [Rel] [Rel]   Release captured channels.
[Cue] [1] [Go]   Play back cue 1.
[Chan] [1] [At] [5][0]   Modify channel 1 to 50 percent.

With cue 1 in a fader, channel 1 is modified to 50 percent. To change a channel level that affects only the cue you modify, use [Record]. Modify the cue; press [Record]; enter the cue number, and press [Enter]. Only the current cue is modified. The track that encompasses the channel is interrupted but continues in the following cues at the originally tracked level.

The results of modifying cue 1 and using [Record] are illustrated in Figure 2.

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Cue 1	**50**				
Cue 2	**FF**	**FF**			
Cue 3	FF	FF	**FF**		
Cue 4	**25**	FF	FF	**FF**	
Cue 5	**00**	**00**	**00**	**00**	

Figure 2

Note that channel 1 is not affected in cues 2 and 3. Also note that when you record a modified cue that is in a playback fader, the changes are reflected in the fader. That is, when you release the channels you have modified, they remain on stage.

If you change the level in the beginning or middle of a track, you may want the change to continue through the remainder of the original track. To track the level modification we just recorded in the example above, use [Track] instead of [Record] to modify channel 1. Press [Track], enter cue number, and press [Enter]. If you use [Track] rather than [Record] to record the changes made to the cue illustrated in Figure 1, the results will be as illustrated in Figure 3 (versus the results from using [Record] illustrated in Figure 2).

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Cue 1	**50**				
Cue 2	50	**FF**			
Cue 3	50	FF	**FF**		
Cue 4	**25**	FF	FF	**FF**	
Cue 5	**00**	**00**	**00**	**00**	

Figure 3

The modified level is recorded in the current cue and carries through the entire track (cues 1 through 3).

Inserting cues

If you insert a cue in this sequence, Record and Track produce different results. Record saves changes only in the cue you insert; Track saves the changes you make and tracks them through the following cues.

The following keys were pressed to release captured channels and play back cue 1. With cue 1 in a fader, channel 4 is added at 50 percent. The new look is inserted as cue 1.1.

[Stage] [Rel] [Rel]	Release captured channels.
[Cue] [1] [Go]	Play back cue 1.
[Chan] [4] [At] [5][0]	Add channel 4 at 50 percent.
[Record] [1][.][1] [Enter]	Inserts new look as cue 1.1.

Figure 4 displays the result inserting the cue using [Record]. Notice the new channel is not added to the cues that follow it.

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Cue 1	**50**				
Cue 1.1	50			**50**	
Cue 2	50	**FF**		**00**	
Cue 3	50	FF	**FF**		
Cue 4	**25**	FF	FF	**FF**	
Cue 5	**00**	**00**	**00**	**00**	

Figure 4

Note that Expression 2x enters a level of 00 percent for channel 4 in cue 2. This fades channel 4 out when cue 2 is played.

When you insert a cue with [Track], new channels track through the cues after it until Expression 2x encounters a cue with a level previously recorded for that channel.

Pressing [Track] (rather than [Record] as in the previous example) then [1][.][1] [Enter] to insert and record the same cue 1.1 as above produces the results illustrated in Figure 5. Compare it to the results illustrated in Figure 4, in which the same cue was inserted using [Record] rather than [Track].

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Cue 1	**50**				
Cue 1.1	50			**50**	
Cue 2	50	**FF**		50	
Cue 3	50	FF	**FF**	50	
Cue 4	**25**	FF	FF	**FF**	
Cue 5	**00**	**00**	**00**	**00**	

Figure 5

Channel 4 creates a track from the cue after 1.1 until a pre-recorded level interrupts it.

Blackout cues and tracking

Sometimes you may add a channel to a sequence of cues that has not used that channel yet. For example, you may want to add a channel to all cues in a scene. To do this, add the channel to the first cue in the sequence, and use Track to track the change through the remaining cues.

However, the last cue in sequence may be a blackout cue. When you track the channel, the new channel tracks until it runs into a different recorded level. To ensure that channels are not tracked through a blackout cue, make the blackout cue an allfade cue. An allfade cue assigns a level of zero to any unused channels. This blocks any potential tracks. An allfade cue also clears the opposite fader.

Figure 6 displays what happens when we track channel 5 through the sequence when cue 5 is a regular crossfade cue.

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Cue 1	**50**				**FF**
Cue 1.1	50			**50**	FF
Cue 2	50	**FF**		**00**	FF
Cue 3	50	FF	**FF**		FF
Cue 4	**25**	FF	FF	**FF**	FF
Cue 5	**00**	**00**	**00**	**00**	FF

Figure 6

Channel 5 tracks through cue 5 and ruins the blackout cue.

If cue 5 is an allfade, Expression 2x records all unused channels at 00 percent. In the example below, an allfade enters 00 in channel 5, cue 5. When you track channel 5 through the sequence, it won't track through the blackout cue.

To select the allfade type for cue 5, enter these keystrokes:

[Blind] [Cue] [5] [Type] [2]   Selects allfade fade type.
[Record] [5] [Enter]   Re-records cue.

Now when we track channel 5 through the sequence, cue 5 blocks the track. The result is illustrated in Figure 7.

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5
Cue 1	**50**				**FF**
Cue 1.1	50			**50**	FF
Cue 2	50	**FF**		**00**	FF
Cue 3	50	FF	**FF**		FF
Cue 4	**25**	FF	FF	**FF**	FF
Cue 5	**00**	**00**	**00**	**00**	**00**

Figure 7

For more information on cue fade types, see *Cue types* on page 58.

Tracksheet

Tracked channels are channels whose levels do not change from one cue to the next. Tracksheet allows you to display one channel's settings for all recorded cues. At a glance you can see which cues have tracking levels for that particular channel. You can also use Tracksheet to add or modify a tracked channel through recorded cues.

To display Tracksheet, press [Tracksheet]. Step-by-step instructions for using Tracksheet are on the following pages. If more cues are recorded than fit on one screen, press [S5], **Next Page**, to display the next screen of cues.
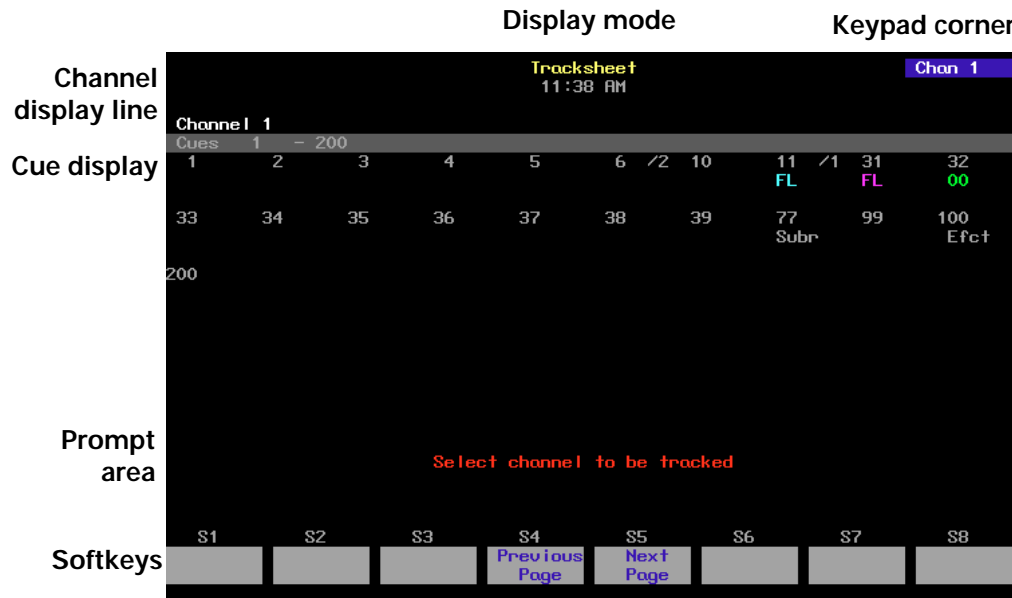
Keypad corner
This window indicates how the console will interpret the next number entered from the keypad. For example, if you press [Channel], the corner displays **Chan**, indicating that the console will read the next number as a channel number.

Channel display line
This line displays the current channel number and the range of cues displayed.

Cue display
The cue display lists recorded cues and the level recorded in each.

Prompt area
The operator prompt displays messages to guide you through Tracksheet functions.

Using Tracksheet

With Tracksheet, you can track one channel at a time through any group of cues at any level, including zero. Tracksheet is useful when you want to track a channel through blackout cues, or when you want to complete a track that has been blocked.

To track a channel, follow these steps:

Keystrokes:	Action:
1. Press [Tracksheet].	Displays Tracksheet Prompt reads: **Select channel to be tracked**
2. Press [5].	Selects channel 5 as the channel number to track
3. Press [Cue].	Prompt reads: **Select cues to be modified**
4. Press [2] [Thru] [5]. Use [And] and [Thru] to indicate a range or group of cues. Press [+] and [–] to select the next or previous cue.	Selects cues 2 through 5 as the cues that you want to track this channel through. Cue numbers are highlighted in yellow
5. Press [At] [5][0]. You may also use the fader wheel, [+], [-], or [Full] to enter levels.	Enters 50 percent intensity level. Prompt reads: **Enter intensity**
6. Press [Record].	Prompt reads: **To record, press ENTER** **To cancel, press CLEAR**
7. Press [Enter] to record level settings.	Records tracked channel in selected cues Prompt reads: **Select channel to be tracked**
8. To track a different channel, enter the next channel number you want to display.	

Hint: To track a channel at zero through all cues it is included in, press [Solo]. The channel goes to zero in all cues. Press [Record] or [Enter].

chapter 8
multipart cues

A multipart cue consists of up to eight parts, each of which is essentially an independent cue with its own channel levels and timing information. Parts accept most standard cue attributes, with the exception of Follow and Label, which apply only to the overall cue. You may record a cue as a multipart cue, or record it as a standard, one-part cue and split it later.

Each part of a multipart cue may consist of any number of channels, but a channel may only be included in one part of a multipart cue. If you record a channel in a part and that channel is already included in another part, the channel will be placed in the new part and be removed from the older part automatically.

Upfade and downfade wait times in multipart cues allow you to program fades that do not start immediately when you play the multipart cue. When you press [Go] to start a multipart cue, some parts may start immediately and others may start up to 99:59 minutes later, depending on the assigned wait time. The total duration of a multipart cue is equal to the combined wait and fade times of the longest part.

Note: Multipart cues can be recorded in either Stage or Blind mode.

Multipart cues are stored like normal cues in the console's memory and on disk.

This chapter includes the following sections:

- Recording a multipart cue
- Converting a standard cue to a multipart cue
- Wait times in multipart cues
- Editing a multipart cue

Recording a multipart cue

Follow these steps to record a multipart cue:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [Channel], select channels and enter channel levels, then press [Enter]. For example, [Channel] [1] [Thru] [5] [Full].	The Prompt reads: **Select channel numbers**
3. Press [Record], then enter the number of the cue you want to record. For example, press [1][2].	Indicates that you want to record a cue Prompt reads: **To record cue, select number and press ENTER** **To cancel, press CLEAR**
4. Press [Part], then use the keypad to enter the number of the part you want to record. Parts can be assigned a number from 1 to 8 and can be created in any sequence.	Enters the part number to record Prompt reads: **Select part number to record** **To cancel, press CLEAR**
5. Press [Enter].	
6. Repeat steps 2 through 5, adding channels for each part you want to include in the multipart cue.	Records subsequent parts. Maximum number of parts is eight

Note: You do not need to re-enter the cue number for additional parts. Set channel levels, press [Record] [Part], enter the part number, and press [Enter].

Note: Follow, Link and Label attributes may be assigned to the overall cue.

Converting a standard cue to a multipart cue

If you have already created a single-part cue, Expression 2x allows you to reconfigure it as a multipart cue. You can convert a standard cue to a multipart cue in either Stage or Blind mode.

As you break the cue into parts to convert it to a multipart cue, Expression 2x automatically creates cue part 8. Any channels not included in the first recorded part are assigned to part 8 automatically. As channels are assigned to new parts, they are deleted from part 8 automatically.

Press [Channel] [1] [Thru] [2][0] [Full] [Record] [1] [Enter]. This creates a standard cue 1 containing channels 1 through 20 at Full. The following example divides this cue into four parts, numbered 1, 2, 3, and 8, each containing five of the channels in the original cue. Press [Stage] to return and continue.

Follow these steps to convert a standard cue to a multipart cue:

Keystrokes:	Action:
1. Press [Stage] or [Blind].	Selects display mode
2. Press [Cue] [1].	Selects cue 1
3. Press [Channel] [1] [Thru] [5] [Record] [Part] [1] [Enter].	Creates part 1. Places channels 1 through 5 in part 1. Remaining channels are placed in part 8
4. Press [Channel] [6] [Thru] [1][0] [Record] [Part] [2] [Enter].	Creates part 2. Moves channels 6 through 10 from part 8 to part 2
5. Press [Channel] [1][1] [Thru] [1][5] [Record] [Part] [3] [Enter].	Creates part 3. Moves channels 11 through 15 from part 8 to part 3. Part 8 contains channels 16 through 20

Note: When a normal cue is split into a multipart cue, all of the channels assigned to that cue are placed in part 8 initially. From part 8, they are moved to any one of the other seven parts. When all of the channels are assigned to a part, part 8 is deleted automatically.

Wait times in multipart cues

You can set individual wait times of up to 99:59 minutes for each part of a multipart cue. The wait time is the delay between when you press [Go] and when the part begins. If no wait is recorded, all parts run simultaneously when you press [Go].

Follow these steps to assign a wait time to a part:

Keystrokes:	Action:
1. Press [Cue], then enter the cue number.	Selects cue number Prompt reads: **Select cue number**
2. Press [Part], then enter the part number.	Selects part number Prompt reads: **Select part number**
3. Press [Wait] [1][0].	Selects wait time of ten seconds Prompt reads: **Enter wait time**
4. Press [Enter].	Sets wait time for the part to ten seconds. Part will wait ten seconds, then run

Editing a multipart cue

Once you have created a multipart cue, you can add or delete parts, add or delete channels from the parts, change channel levels, or change fade and wait times.

Deleting a part from a multipart cue

Follow these steps to delete a part from a multipart cue in Blind:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode
2. Press [Cue] [4] [Part] [1].	Prompt reads: **Select part number**
3. Press [S6], **Delete Part**.	Prompt reads: **To delete part, press ENTER –** **Delete part & tracking, press TRACK** **+ ENTER** **To cancel, press CLEAR**
4. Press [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
5. Press [Enter].	Deletes part 1 from cue 4

Note: If channels in your cue are tracking, removing a part may affect subsequent cues. Press [Track] after you enter the part number and before you press [Enter]. This removes channels from subsequent cues if they track from this cue part.

Adding, deleting and modifying channels

Follow these steps to edit channels in a multipart cue:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode
2. Enter the cue number.	Prompt reads: **Select cue number** **To select cue type, press TYPE**
3. Press [Part]; then press [+] or [–] until the desired part is displayed.	Prompt reads: **Select part number**
4. Press [Channel], and select the desired channels.	Prompt reads: **Select channel numbers**
5. Set channel levels. (Use [At], the fader wheel, [Full] or [Level], or [+] and [–]. Press [At] [Clear] to delete the channels.)	If the channels are new, this adds them to the part at the level indicated. If already in the part, this modifies their level
6. Press [Record] [Enter].	Records the modified part

Note: When you initially display a multipart cue, any channel levels that are tracking from the previous cue are displayed in green; new levels are displayed in blue. When you press [Part] this changes. Channels that make up the selected part are now displayed in blue; channels that make up other parts of the multipart cue are displayed in green (or gray, in Blind).

Modifying fade and wait times

If you do not assign fade and wait times to a part, Expression 2x automatically assigns it the default times. See *Setting default fade times* on page 19. No wait time will be recorded. Follow these steps to assign fade and wait times to parts in a multipart cue:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode
2. Enter the cue number.	Prompt reads: **Select cue number** **To select cue type, press TYPE**
3. Press [Part]; then press [+] or [-] until the part you want to edit is displayed.	Prompt reads: **Select part number**
4. Press [Time].	Prompt reads: **Enter upfade time**
5. Enter an upfade time between .1 second and 99:59 minutes and press [Enter].	Prompt reads: **Enter downfade time**
6. If you want a downfade time that is different from the upfade, enter the desired time and press [Enter]. If not, just press [Enter].	Fade times are set for the part
7. Press [Wait].	Prompt reads: **Enter wait time**
8. Enter wait time and press [Enter]. Wait time is the delay between when you press [Go] and when the part begins. If you do not enter a wait time, Expression 2x assigns a wait time of zero.	Wait time is set for the part

chapter 9
playing back cues

Expression 2x has two timed faders that allow you to play back recorded cues. Cue selection and playback can be automated, or you can control them manually.

Faders

A   B   C   D

Clear Rate Back   Clear Rate Back

Go Hold   Go Hold
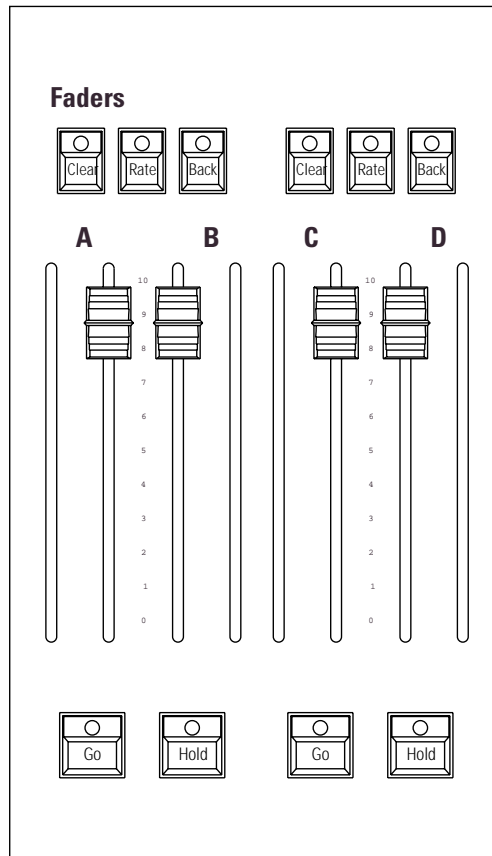
This chapter includes the following sections:

- Selecting cues
- Timed faders and LED displays
- Playback Cue List
- Fader Status display
- Selecting and playing cues
- Go to a different cue
- Controlling fades manually
- Quickstep

Selecting cues

There are three ways to determine which cue from the Cue List will play back on stage next:

• You can select a cue manually

• When a cue plays, Expression 2x automatically selects the next cue

• Expression 2x automatically selects linked cues

You must be in Stage mode to select cues to play back, but you can run the selected cue from either Stage or Blind by pressing [Go].

When one cue is playing, Expression 2x automatically selects the next cue on the Cue List to play next. To play the next cue, press the [Go] key under the fader in which you want the cue to be played. If you are working in Stage mode, you see the cue running on the monitor.

To select a cue other than the next on the Cue List, press [Cue], and enter the cue number. Then press [Go] to play the cue.

Cues that have been assigned a Follow time begin playing automatically once the cue before them on the Cue List finishes. When you play a string of follow cues you only need to start the first cue.

Timed faders and LED displays

Expression 2x has two timed faders that allow you to play back recorded cues. In each fader, the left slider (A and C) controls upfades. The right sliders (B and D) control downfades. You may play back a cue automatically, using the timing information programmed into it, or you may take manual control.

You can play back cues one at a time through a single fader, or you can play back a different cue in each fader simultaneously. You can also play a cue in one fader, leave it there, and then play another cue in the second fader.

For example, you may want to play a ten-minute sunset cyc cue in one fader and play several cues during the same period in the other fader.

Each fader slider has a strip of LEDs next to it. When running a timed crossfade cue, the lit LEDs indicate the progress of the cue. This is displayed as a percentage. For example, when the LEDs are at **5**, 50 percent of the cue has run.

Expression 2x's faders function in level over-ride mode. This means that the fader sliders control the percentage of completion of the fade.

If you like, you can use the fader sliders to take manual control of fades. For information on taking manual control of fades, see the section titled *Controlling fades manually* later in this lesson.
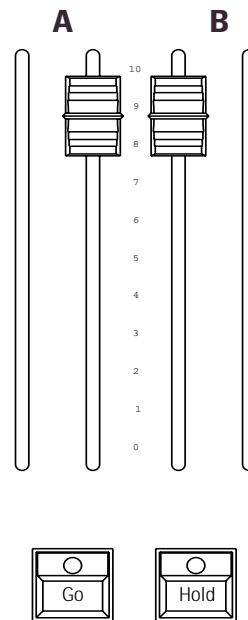
Clearing faders

Each timed fader is equipped with a blue [Clear] key. To remove a cue from the fader, press the appropriate [Clear] key. Press [Clear] twice to clear an effect cue. Pressing [Clear] removes the cue from the fader immediately unless you have reset the default fader clear time. For instructions on changing fader clear time, see *Setting default fader clear time* on page 20.

Playback Cue List

The Playback Cue List appears on the playback display (usually the left monitor). The Cue List provides a list of cues for the show, including all of the cues' programmed attributes. In addition, the playback display provides information about which cue is active or running and on which fader the cue is running.

The Cue List on the Playback monitor displays the last cue played before the pending cue. If a cue is currently playing, the list shows the last cue played, the playing cue and then the pending cue. **The pending cue is highlighted in white.**

```
Grandmaster 100%                    The Garden Plot

Cue List
Cue/Type      Time   Wait    Link Follow Rate Label
    1       ↑  2    ↑10            3           Curtain up
            ↓  3
    2          5    ↑10            6           Toad enters
    3          5    ↑10            6           Sunrise
    4          5    ↑10            5           Mist on Garden
    5          5    ↑10       1                Gunshot
    6    PT    5                               Headquarters
    2          5
   10          5                               Toad exits
   11    PT   25                               Part Cue  11
    1          5
    2          5     5
    3          5    10
    4          5    15
    5          5    20
   31          5    ↑10                        C31
   32          5                               C32
   33          5                               C33
```

Cue indicators

The color in which a cue is displayed provides information about the cue's current status.

Gray .... Cue is not selected and is not in a fader.

White .... Pending cue, will play back next time either [Go] button is pressed.

Yellow .... Cue is in a fader, and is selected in Stage.

Gold .... Cue is in a fader, but is not selected in Stage.

Light red .... Cue is currently running and is selected in Stage.

Dark red .... Cue is currently running, but is not selected in Stage.

> .... Cue is selected in Stage or Blind.

Fader Status display

The fader status display consists of two windows at the bottom of the Playback display. It provides information about the cues loaded to the console's faders, including fade times and rates. The left window monitors the A/B fader, the right window monitors the C/D fader. The display counts down wait times for cues and indicates which step is running when an effect is active.

The illustration below shows where each piece of information appears.

Fader   **Cue in fader**

Upfade information or effect fade times   **Downfade information or effect step**
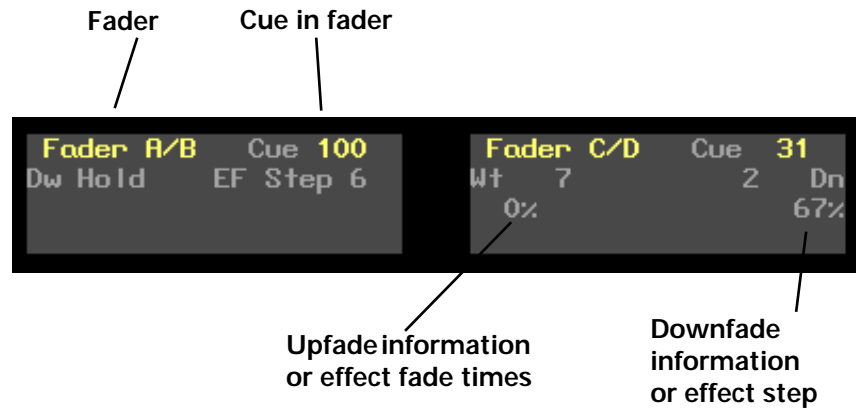
Selecting and playing a cue

Selecting a cue moves it to the top of the Cue List. It will not run until you press [Go]. Follow these steps to select a cue and play it on the fader of your choice.

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [Cue].	Prompt reads: **Select cue number** **To select cue type, press TYPE**
3. Press [1][.][5].	Selects cue 1.5 to play
4. Press [Enter].	Cue List moves cue 1.5 to the top of the list
5. Press [Go] on fader A/B.	Cue 1.5 runs on fader A/B; Cue 2 moves to the top of the Cue List
6. Press [Go] on fader C/D.	Cue 2 starts to run on fader C/D

Go

Each fader has its own [Go] key. Press [Go] to play back the cue selected on the Cue List.

If you have pressed [Hold] to interrupt the playback of a cue, press [Go] to resume the fade.

If you press [Go] before a cue finishes playing, the previous cue stops, and the new cue begins from the levels at which the previous cue was interrupted.

Hold

Each fader has its own [Hold] key. If a cue is running, press [Hold] to pause playback of the cue. Press [Hold] a second time to cancel playback of the cue in the fader, leaving it in the fader where it stopped, or press [Go] to resume the fade.

Back

Each fader has its own [Back] key. Press [Back] to replay the cue most recently played on that fader. Press [Back] again to play the cue before it on the Cue List, and so forth, moving backward through the Cue List. Cues play back using the fade and wait times recorded with the cue.

Note: The cue following the cue replayed by [Back] becomes the first cue in the Cue List. If you then press [Go], that cue plays.

Note: [Back] ignores cue links.

This example demonstrates the use of the [Go], [Hold] and [Back] keys:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage mode display
2. Press [Cue] [2].	Selects Cue 2
3. Press [Go].	Runs cue 2
4. While cue is running, press [Hold].	Running cue pauses
5. Press [Go].	Cue resumes
6. Once cue finishes, press [Back].	Previous cue fades up on stage

Go to a different cue

To play back a cue other than the cue highlighted on the Cue List, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage mode display
2. Press [Cue] [2].	Selects cue 2
3. Press [Go].	Runs cue 2

Controlling fades manually

Expression 2x provides two ways to take manual control of cue playback; manual override and rate override.

Manual override

Manual override allows you to use the fader sliders to take manual control of fade levels. When you take manual control of cue playback, moving the fader slider controls the fade.

Leave the fader sliders at **10** before pressing [Go] to play cues back as recorded.

When you move the fader sliders below **10**, the cue runs until it reaches the slider setting. You can set the slider before you play the cue, or move the slider after the fade starts. The fade stops when it reaches the slider's level, and the slider then controls the fade. For example, if you set the sliders at **8**, the cue will play until it reaches 80 percent of its recorded levels, then give you manual control.

Set the sliders at **0** before you press [Go] to take manual control of fade from the beginning of cue.

Hint: If you start a cue, and the performers skip ahead to the next cue, you have two options for speeding up to the next cue. If you do not need the current cue to reach its full intensity level settings, press [Go] to interrupt the current cue and begin the next one. However, if you need the current cue to reach its full level settings, push the sliders down to the lit LEDs and then back up to **10** *immediately. Then press [Go] to start the next cue.*

Once the fade is complete, the cue is no longer controlled by the fader.

Rate override

Manual override allows you to control both the fade's rate and percentage of completion. When you play back a cue using rate override, the console controls the percentage of completion, but you control the rate.

Rate override allows you to play back a cue faster or slower than the rate at which it was recorded. The rate wheel adjusts the fade rate.

Fade rate is expressed as a percentage. A cue with a fade rate of 100 percent plays back at its recorded fade time. A fade rate of 300 plays the cue back three times faster than its recorded fade time. A fade rate of 50 plays the cue back half as fast as its recorded fade time. For example, if you record a cue with a 10 second fade time, a rate of 200 causes it to play back in five seconds. A fade rate of 50 causes it to play back in 20 seconds.

You may take control of a cue's fade rate while the cue is running. In addition, you may press both [Rate] keys to control rate of both fades.

Follow this example to place a cue in a fader under rate override:

Keystrokes:	Action:
1. Press [Rate] key for the fader in which the cue is running. (Press both [Rate] keys if you wish to control both faders.)	Activates rate control
2. Move rate wheel.	Fades are placed under control of the rate wheel. Move the wheel to adjust fade rates. Fader Status window shows the current rate

Quickstep

Quickstep allows you to run through a show, checking all cues, without having to wait for fades. When Quickstep is active, the faders ignore all upfade, downfade, follow, and wait times. Cues snap immediately to their completed levels when you press [Go] or [Back].

To enable Quickstep and run a cue check, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [S7], **More Soft-keys**, [S1], **Enable Quick-step**.	Turns on Quickstep
3. Press [Cue] [1] [Enter].	Selects cue 1
4. Press [Go].	Cue 1 comes up on stage instantly
5. Continue to press [Go] until you have checked all cues.	Each cue comes up on stage instantly
6. Once you are finished, press [S1], **Disable Quickstep**.	Turns off Quickstep; fades will operate normally

chapter 10
groups

Expression 2x allows you to record frequently used combinations of chan-
nels into units called groups. *You* may record up to 500 groups.

Once you record a group, it can be combined with other channels and
groups to create cues, submasters effects, or other groups. The principal
difference between a group and a cue is that a group cannot be played
back through a fader or slider. Consequently, it has no fade times, wait
times or other playback attributes.

Group numbers are independent of cue numbers and may be numbered
from 1 to 999.

This chapter includes the following sections

- Creating groups
- Displaying groups on stage
- Working with groups in Blind
- Modifying groups
- Labeling groups
- Deleting groups
- Copying groups
- Using cues or submasters as groups
- Using groups to modify cues, groups or submasters
- Only
- Group List

Creating groups

You can create groups in Stage, Blind and Fader modes.

To create a group, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Live display mode
2. Press [1] [Thru] [5] [Full] [6] [Thru] [9] [At] [5] [Enter].	Selects channels 1 through 9 and sets them at proportional levels
3. Press [Record] [Group].	Prompt reads: **To record group, select number and press ENTER** **To cancel, press CLEAR**
4. Press [1].	Enters the group number you want to record Corner reads: **Group 1**
5. Press [Enter].	Records group 1

Creating a group from the look on stage

To create a group from the look that's already on stage, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [Record] [Group].	Prompt reads: **To record group, select number and press ENTER** **To cancel, press CLEAR**
3. Press [2].	Enters the group number you want to record Corner reads: **Group 2**
4. Press [Enter].	Records group 2

Creating a group using Solo

To create a group using some of the channels on stage, but not all, record the group using Solo. To do this, select the channels to add to the group, then press [Solo].

Follow these steps to create a group containing channels 5 through 20 when channels 1 through 25 are active on stage:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [1] [Thru] [2][5] [Full].	Sets channels 1 through 25 to full on stage
3. Enter [5] [Thru] [2][0].	Selects channels 5 through 20. All other channels remain unselected Prompt reads: **Select excepted channel number**
4. Press [Solo].	All channels other than those selected drop to zero Prompt reads: **(To restore levels, press SOLO)** **Select channel numbers**
5. Press [Record] [Group].	Prompt reads: **To record group, select number and press ENTER** **To cancel, press CLEAR**
6. Press [3].	Enters the group number you want to record Corner reads: **Group 3**
7. Press [Enter].	Records selected channels into group 3
8. Press [Solo].	Restores full look to stage

Hint: Press [Except] [Sub] [1] in step 2 to deselect channels contributed by submaster 1.

Displaying groups on stage

To view a recorded group on stage, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [Group] [2].	Selects group 2 Prompt reads: **Group mode – Select group number to use as group**
3. Press [Full].	Prompt reads: **Group mode – Press AT or use wheel or trackpad to alter levels, or select channel numbers to edit**
4. Adjust channel levels, as desired. Press [Rel] to release the group's channels.	

Working with groups in Blind

There are two group modes in Blind, Group mode and Group Editing mode. In Group mode, Expression 2x brings up the channels from a group of your choice and allows you to use them to modify cues, submasters and other groups. In Group Editing mode, Expression 2x brings up the selected group itself and allows you to modify it.

Group mode

To enter Group mode and bring up a group's channels, follow these steps:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode
2. Press [Group] [1].	Selects group 1's channels Prompt reads: **Group mode – To recall a group, select the number and set it to a level** **To create or modify a group, select the number and press ENTER**
3. Press [At] [7][5].	Sets the channels to 75 percent of their recorded levels Prompt reads: **Group mode – Press AT or use wheel to alter levels, or select channel numbers to edit**
4. Press [Record] [Cue] [3] [Enter].	Records the current level settings as cue 3

Group Editing mode

To enter Group Editing mode and modify a recorded group, follow these steps:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode
2. Press [Group] [1].	Selects group 1's channels Prompt reads: **Group mode – To recall a group, select the number and set it to a level** **To create or modify a group, select the number and press ENTER**
3. Press [Enter].	Selects group 1. Group status bar appears above softkeys. Channel levels are white Prompt reads: **Select channel numbers**
4. Add, delete or modify channels as desired.	
5. Press [Record] [Enter].	Records the modified group 1

*Note: Once you are in Group Editing mode, use [S1], **Select Group**, rather than [Group], to bring up a different group. Use [Group] to access another group's levels as you modify the selected group.*

Modifying groups

Expression 2x allows you to modify groups in Stage or Blind modes.

In Blind

Follow these steps to add channels to a group in Blind display mode:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode
2. Press [Group].	Prompt reads: **Group mode – To recall a group, select the number and set it to a level**
3. Press [1].	Selects group 1's channels Corner reads: **Group 1**
4. Press [Enter].	Brings up group 1 in group editing mode. Channel levels should be white Prompt reads: **Select channel numbers**

*Warning: You must press [Enter] after you enter the group number. If you
do not, Expression 2x displays the channels used in the group, but does
not enter Group Editing mode.*

5. Press [2][5] [Thru] [3][0] [At] [5][0].	Modifies look, adding channels 25 through 30 at 50 percent
6. Press [Record].	Prompt reads: **To record group, select number and press ENTER To cancel, press CLEAR**
7. Press [Enter].	Records group 1 with new levels

*Note: This process can also be used to create a new group in Blind display
mode. If the group number you enter to modify doesn't exist, it is created
as a new group.*

In Stage

Follow these steps to change a group's channel levels in Stage display mode:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [Group] [2].	Selects the group number you want to modify Prompt reads: **Group mode – Select group number to use as group**
3. Press [Full].	Prompt reads: **Group mode – Press AT or use wheel to alter levels, or select channel numbers to edit**
4. Select channels you want to modify and adjust channel levels.	Alters look
5. Press [Record] [Group].	Prompt reads: **To record group, select number and press ENTER** **To cancel, press CLEAR**
6. Press [2].	Enters the group number you are modifying Corner reads: **Group 2**
7. Press [Enter].	Re-records group 2 with modified levels

Using Update to modify groups

The Update feature allows you to easily record changed levels on Stage into a selected group. You may record all levels on Stage into the group, or you may record only changes to channels that were previously recorded in the group. You may also add specific new channels to the group at their current Stage levels, to add all channels on Stage to the group at their current levels.

Using Update to add new channels to a group

You may use Update to add new channels to an existing group. To do so, you must specify the channels you wish to add. Follow these steps to use Update to add channels:

Keystrokes:	Actions:
1. Press [Stage].	Selects Stage display mode
2. Select channels to add to the group and set their levels.	Alters look
3. Press [S2], **Update**, [Group].	Prompt reads: **To update group, select number and press ENTER** **(Press ONLY + ENTER to update only those channels already in group)**
4. Press [2].	Selects group 2 to update Corner reads: **Group 2**
5. Press [Channel].	Prompt reads: **To update channel(s), select number(s) and press ENTER** **To cancel, press CLEAR**
6. Specify the channels to add. In this case, press [5] [Thru] [1][0].	Corner reads: **Chan 10**
7. Press [Enter].	Updates group 2 to include channels 5 through 10

Using Update to change levels in a group

Follow these steps to use Update to modify channels in a group:

Keystrokes:	Actions:
1. Press [Stage].	Selects Stage display mode
2. Press [Group] [5].	Selects group 5 Prompt reads: **Group mode – Select group number to use as group**
3. Press [Full].	Brings group 5's channels up on stage Prompt reads: **Group mode – Press AT or use wheel to alter levels, or select channel numbers to edit**
4. Change the levels for the channels you want to modify in the group. This process will **not** add new channels.	Selects channels and sets levels
5. Press [S2], **Update** [Group].	Prompt reads: **To update group, select number and press ENTER** **(Press ONLY + ENTER to update only those channels already in group)**
6. To update only channels already recorded in the group, press [Only].	Limits update to channels already in group
7. Press [5] [Enter].	Updates channel levels in group 5

Labeling groups

Expression 2x allows you to use an alphanumeric keyboard to assign labels to groups. See page 302 for more information about selecting and installing a keyboard. Group labels can consist of any combination of letters, numbers and symbols, and may be up to 16 characters long.

Follow these steps to add a label to a group:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode
2. Press [Group] [1].	Prompt reads: **Group mode – To recall a group, select the number and set it to a level** **To create or modify a group, select the number and press ENTER**
3. Press [Enter].	Prompt reads: **Select channel numbers**
4. Press [Label].	Prompt reads: **Type group label** **(F6 = clear to end,** **F7 = last group label,** **F8 = next group label)**
5. Use the alphanumeric keyboard to enter a label. Type " Scene 1 Cyc."	Corner reads: **Label Scene 1 Cyc**
6. On the Expression 2x keypad, press [Enter].	Group 1 is labeled

Note: Press [F7] or [F8] on the alphanumeric keyboard to select the previous group or the next group to label.

Deleting groups

You must be in Stage mode to delete individual groups. To delete all groups, you can use the Clear Groups option from the Clear Functions menu, as described in *Chapter 18, Clear Functions*, on page 202.

To delete individual groups, follow these steps:

Keystrokes:	Actions:
1. Press [Stage]	Selects Stage display
2. Press [S7], **More Soft-keys,** [S6], **Delete**, [Group].	Prompt reads: **To delete group, press ENTER** **To cancel, press CLEAR**
3. Press [2].	Enters group number to delete Corner reads: **Group 2**
4. Press [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
5. Press [Enter] to delete the group or [Clear] to cancel the action.	Group 2 is deleted from your show

Copying groups

You may make a copy of a group, then use the copy as the foundation for a new group. You can copy groups in Stage or Blind modes. To copy a look from one group to another, follow these steps:

Keystrokes:	Actions:
1. Press [Blind] or [Stage].	Selects display mode
2. Press [Group].	Prompt reads: **Group mode – Select group number to use as group**
3. Press [1].	Enters the number of the group you wish to copy Corner reads: **Group 1**
4. Press [Full].	Prompt reads: **Group mode – Press AT or use wheel to alter levels, or select channel numbers to edit**
5. Once the group is displayed, press [Record] [Group].	Prompt reads: **To record group, select number and press ENTER** **To cancel, press CLEAR**
6. Press [5].	Enters the number of the new group Corner reads: **Group 5**
7. Press [Enter].	Group copy is complete. You can now modify the new group

Note: You may also copy a group's channels and levels to a cue or a sub-master. To do so, press [Cue] or [Sub] in place of [Group] in step 5.

Using cues or submasters as groups

If you wish, you can treat the channels recorded in a cue or a submaster as if they were a group, bringing them up on stage or including them in other level setting operations.

For example, to bring up a cue on stage as a group, follow these steps:

Keystrokes:	Actions:
1. Press [Stage].	Selects Stage display mode
2. Press [Group].	Tells Expression 2x to treat the next entry as a group Prompt reads: **Group mode – Select group number to use as group**
3. Press [Cue] and enter the number of the cue you want to bring up.	Prompt reads: **Group mode – Select cue number to use as group**
4. Press [At] and enter the level at which you wish to bring the cue up. (Or press [Full].)	The cue's channels are brought up on stage at the specified level Prompt reads: **Group mode – Press AT or use wheel to alter levels, or select channel numbers to edit**

To use a submaster as a group, follow the same procedure, but press [Sub] instead of [Cue] in step 3.

Note: You may not group the channels in a cue part, only in a whole cue.

Note: You may not group the channels in an effect cue or effect submaster.

Using groups to modify cues or submasters in Blind

You can use groups to modify cues or submasters. For example, let's say you have created a group 3 that contains channels 1 through 10 at a level of 75 percent. Follow these steps to add group 3 to submaster 2:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display mode
2. Press [Sub] [2].	Prompt reads: **Select submaster number** **To select submaster type, press TYPE**
3. Press [Group] [3].	Selects group 3's channels Prompt reads: **Group mode –** **To recall a group, select the number and set to a level** **To create or modify a group, select the number and press ENTER**
4. Set channel levels. (Or, press [Enter] to impose only the group's proportions on the currently set levels.)	Prompt reads: **Group mode – Press AT or use wheel or trackpad to alter levels, or select channel numbers to edit**
5. Press [Record].	Prompt reads: **To record submaster, select number and press ENTER** **To cancel, press clear**
6. Press [Enter] to re-record the modified submaster.	Records submaster 2 with group 3's channels added

Submaster 2 now contains channels 1 through 10 at 75 percent, in addition to whatever other channels are already part of it. If any of the channels between 1 and 10 were already included, their levels were modified to match those in the group.

The same procedure can be used to combine groups and cues. Groups can also be used as elements in effects. Anywhere you set channel levels, you can use a group to select those channels and set their levels.

Only

Only allows you to select several groups and then adjust only the channels the groups have in common. For example, say you are working with moving lights. Each fixture is controlled by a number of channels, each of which controls a single parameter (level, tilt (vertical movement), pan (horizontal movement), colors, and so forth). You create groups that contain all the control channels for each light, as shown below.

In the example below, each group contains six channels, corresponding to pan, tilt, intensity, cyan, magenta, and yellow for a specific fixture.

Group 1 contains all channels for fixture 1
01 02 03 04 05 06

Group 2 contains all channels for fixture 2
11 12 13 14 15 16

Group 3 contains all channels for fixture 3
21 22 23 24 25 26

Group 4 contains all channels for fixture 4
31 32 33 34 35 36

Next you create a set of groups that each contain all the channels that control one parameter for your moving lights.

Group 5 contains all pan-controlling channels
01 11 21 31

Group 6 contains all tilt-controlling channels
02 12 22 32

Group 7 contains all level-controlling channels
03 13 23 33

Now, say you wish to change the level for fixtures 1 and 3. The following keystrokes would select only the appropriate channels.

[Group] [1] [And] [3] [Only] [Group] [7]

This selects groups 1 and 3, which correspond to fixtures 1 and 3, then selects only the channels in those groups which are also in Group 7, the level group (3 and 23). You may now press [At] [7][5] to set the levels of the two fixtures at 75 percent.

Group List

Press [Blind] [Group] [Enter] [S2], **Group List**, to display the Group List.

The Group List displays the group number and label of all recorded groups. Up to 38 groups may be displayed at a time. Use [S4], **Previous Page**, and [S5], **Next Page**, to move forward and backward from page to page or use [+] and [–] to scroll through the groups. The selected group is displayed in white and the selected field is highlighted in yellow; other groups are displayed in gray.
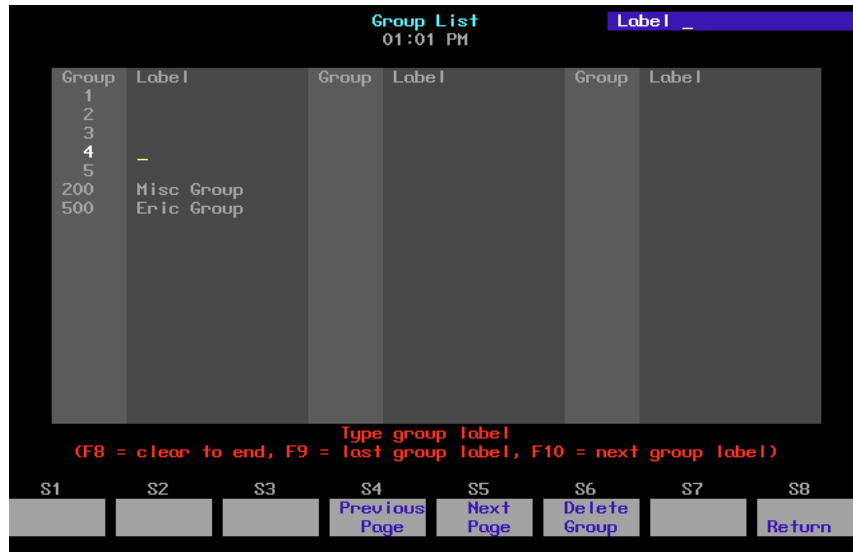
chapter 11
submasters

Expression 2x provides you with 24 submasters. A submaster is a group of channels recorded at proportional levels and controlled by a slider and a bump button. Submasters enable you to save complex looks you use frequently and play them back manually. They can also be used as building blocks when you create scenes, cues or other submasters.

A channel may be included in any number of submasters. You can record a total of 240 submasters. (24 submasters in each of ten pages of submaster memory.)

Each submaster consists of a slider and a bump button with one or two LEDs. The slider allows you to bring the submaster look up manually. The bump button allows you to flash the submaster to its full recorded level, or to begin its programmed fade, if it has one. The green LEDs show you which sliders contain recorded submasters. The red LEDs in the bottom row indicate whether the submasters are pile-on (green) or inhibitive (red).

This chapter includes the following sections:

- Submaster types
- Submaster pages
- Playback Submaster List
- Submaster LEDs
- Submaster bump buttons
- Recording submasters
- Creating inhibitive submasters
- Modifying submasters in Blind
- Modifying submasters in Stage
- Using Update to modify submasters
- Live control of a submaster
- Controlling submaster fades manually
- Labeling submasters
- Copying submasters
- Loading cues or groups to submasters
- Copying cues or groups to submasters
- Clearing submasters
- Submaster List

Submaster types

Submasters can be pile-on, inhibitive or effect.

Pile-on submaster

A pile-on submaster consists of channels recorded at proportional levels. If a pile-on submaster's channel levels are higher than established channel levels, the submaster's levels take precedence (except as noted below). If they are lower, the established levels take precedence. If a submaster slider contains a recorded pile-on submaster, the green LED lights.

Note: Channel levels set on the keypad and inhibitive submasters both override pile-on submaster levels.

Inhibitive submaster

An inhibitive submaster holds the output of channels below a specified level. An inhibitive submaster doesn't actually set channel levels, it just prevents them from exceeding a specified level. Only submasters 13 through 24 may be inhibitive. If a submaster slider contains a recorded inhibitive submaster, the red LED lights.

Effect submaster

An effect submaster has an effect recorded in it. Press an effect submaster's bump button or move its slider to start the effect running. See *Chapter 12, Working with effects*, for more information on effect submasters. Any submaster may be programmed with an effect. If a submaster slider contains a recorded effect submaster, the green LED lights.

Changing type

You can change a submaster's type by using the [Type] key. When you change a submaster type, levels recorded in the submaster are retained. This means that you can change a submaster from pile-on to inhibitive and back without losing any level or timing information. If you change the type to effect, channel and level information is erased.

To change a submaster's type, follow these steps:

Keystrokes:	Action:
1. Press [Blind].	Selects Blind display
2. Press [Sub] [#].	Prompt reads: **Select submaster number**
3. Press [Type].	Prompt reads: **Select submaster type** **(1 = Pile-on, 2 = Inhibitive, 3 = Effect)**
4. Press [1], [2] or [3] to select type.	New type is entered in submaster status bar

Type changes do not take effect while the submaster is active. An active submaster's bump button LED blinks after you change its type. To deactivate it, move its slider to zero if the green LED blinks, or to **10** if the red LED blinks.

The LED then blinks to indicate the new type. Again, move its slider to zero if the green LED blinks or to **10** if the red LED blinks. See *Submaster LEDs* on page 130 for more information about the LED.

Submaster pages

Expression 2x provides ten pages of submasters. A page is a block of console memory that contains one set of 24 recorded submasters, corresponding to the 24 submaster sliders. The ten pages of memory increases the number of possible submasters to 240.

Expression 2x displays the message **Sub page 1** (**2**, **3**...) in the upper right corner of the Playback display to indicate the current submaster page. To switch from one page to the other, press [Page], enter the desired page number, and press [Enter].

When you switch submaster pages, any submasters on stage remain on stage until you move their sliders to the home position. Until the new submaster loads, submaster LEDs flash slowly, indicating that the submaster on stage is from the previously loaded page. If flashing red, the new submaster is inhibitive; if green, the new submaster is pile-on. When you move the slider to its home position the new submaster is loaded and the LED stops flashing. This prevents the stage from going black or changing levels when you switch pages. (Fast flashes designate a submaster with a dwell time of **Hold**. See *Submaster LEDs* on page 130 for more information about LEDs.)

Note: When you read a new show into the console from a disk, the console loads the same page number that was loaded from the previous show. Any submasters on stage when you read a new show into the console remain on stage until you move their sliders to the home position. Until the new submaster loads, submaster LEDs flash, indicating that the submaster on stage is from the previously loaded show. If flashing red, the new submaster is inhibitive; if green, the new submaster is pile-on. When you move the slider to its home position the new submaster is loaded and the LED stops flashing.

Playback Submaster List

The Playback Submaster List display is the default display on the playback monitor (usually the left monitor). The Submaster List provides a list of submasters, including labels. In addition, the Submaster List provides information about which submasters are active or running, their type, rate, and percentage of completion.

Submaster colors

The colors used in the Submaster List provide information about the submasters.

Gray...........A gray submaster number identifies an unrecorded submaster. Also, submaster labels and percentage of completion are gray.

Green ....A green submaster number identifies a pile-on submaster.

Red ....A red submaster number identifies an inhibitive submaster.

White.........A white submaster number identifies an effect submaster.

Blue ....A blue submaster number identifies a submaster with a rate that is currently being controlled by the rate wheel. A blue **R** appears at the top of the list with the wheel's setting.

Submaster LEDs

Each submaster bump button contains one or two LEDs. The color and state of the LED indicates the current state of that submaster, as shown on the chart below:

Color	State	Meaning
––	Off	Submaster not loaded.
Green	Solid	Submaster (pile-on or effect) loaded.
Green	Slow Blink	New pile-on or effect submaster. Loads when slider reaches home position.
Green	Fast Blink	Submaster (pile-on or effect) on timed hold. Press bump button to begin downfade.
Red	Solid	Inhibitive submaster loaded.
Red	Slow Blink	New submaster is an inhibitive submaster. Loads when slider reaches home position.
Red	Fast Blink	Inhibitive submaster on timed hold. Press bump button to begin downfade.
Red & Green	Both on	Submaster slider serves as master for DMX In.

If the LED on a slider is blinking slowly, it means that you have changed pages and a new submaster is waiting to load. The old submaster stays loaded until you move the slider to the home position. If the green LED is blinking, move the slider to zero. If the red LED is blinking, move the slider to 10. If the submasters are changing type, you may need to do both. When the slider reaches home, the channel levels from the new page replace the old levels.

Note: If a submaster slider has both a submaster loading and a submaster on hold, the submaster on hold takes priority and the LED blinks fast. Press the bump button to downfade the old submaster.

Submaster bump buttons

A bump button is located immediately below each submaster slider. The bump button's function depends on its status (see below) and on whether the submaster has a programmed fade.

If the submaster does not have a programmed fade, the bump button allows you to bring up the submaster's contents on stage instantly. Press the bump button to raise the submaster to its full recorded level. Hold the button to maintain the levels on stage. Release the button to remove the submaster's levels.

If the submaster has a programmed fade, the bump button allows you to start the fade, or to reverse the direction of an ongoing fade. Press the bump button to start the upfade. Press the button again to interrupt the upfade and start the downfade.

Bump button status

Submaster bump buttons may be individually enabled, disabled or placed in Solo mode. An enabled bump button functions normally, a disabled button doesn't function at all, and a button in Solo mode brings its channels to their recorded level and reduces all other channels to zero.

If a submaster's bump button is disabled or in Solo mode a **D** or an **S** appear next to the submaster's number on the Submaster List and the Status Bar.

To set a bump button's status, follow these steps:

Keystrokes:	Action:
1. Press [Blind].	Selects Stage display mode
2. Press [Sub] [5].	Selects submaster 5
3. Press [S1], **Bump Status**.	Prompt reads: **Select bump status and press ENTER (1 = enabled, 2 = disabled, 3 = solo)**
4. Press [2].	Selects **disabled**. The keypad corner indicates the choice you have made
5. Press [Enter].	Submaster 5's bump button is disabled

Recording submasters

You can create submasters in Live or Blind mode. Follow these steps to record a simple, pile-on submaster:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Select channels and set channel levels.	Creates look
3. Press [Record].	Prompt reads: **To record cue, select number and press ENTER** **To cancel, press CLEAR**
4. Press [Sub] [5] [Enter] or… Press Submaster 5's bump button	The current stage look is recorded into submaster 5

Note: Use Solo to record specific channels into the submaster (rather than the full stage look). For example: [5] [Thru] [1][0] [Solo] [Record] [Sub] [5] [Enter] records only the current levels of channels 5 through 10 in submaster 5, regardless of what other channel levels may be up on stage.

Fade and dwell times for submasters

Normally, pressing a sub bump brings channel levels to their recorded level immediately. If you prefer, you can record submasters with fades. Expression 2x provides a submaster upfade time, downfade time and dwell time.

Upfade time is the length of time it takes a submaster's channels to fade to their recorded levels when the submaster bump button is pressed.

Dwell time is the length of time the submaster's channel levels stay at their full recorded levels before the downfade starts.

Downfade time is the length of time it takes a submaster's channels to fade from their recorded levels to zero.

When you record fade times for a submaster, you can play the recorded fade with the bump button or override it manually with the slider. See *Controlling submaster fades manually* on page 140 for more information.

Note: Default fade time is 0/Man/0, meaning the submaster has a zero upfade, a manually controlled dwell time, and a zero downfade. Channels stay at full recorded levels as long as the bump button is held.

Fade times may be expressed in minutes and seconds, or as fractions of seconds (in decimal format). Fade times can be programmed from .1 second to 99:59 minutes. Acceptable time values include: .2 (.2 seconds), 00:12 (12 seconds), 5.5 (5.5 seconds), or 5:30 (five minutes, 30 seconds).

Adding fade and dwell times

You can add fade and dwell times to a submaster from Stage or Blind mode. To add fade times to a submaster, follow these steps in either mode:

Keystrokes:	Action:
1. Press [Sub].	Prompt reads: **Select submaster number** **To select submaster type, press TYPE**
2. Press [5].	Selects submaster 5 Corner reads: **Sub 5**
3. Press [Time].	Prompt reads: **Enter upfade time**
4. Use keypad to enter upfade time and press [Time].	Prompt reads: **Enter dwell time** **(Press CLEAR for hold, press CLEAR CLEAR for manual operation)**
5. Use keypad to enter dwell time and press [Time]. (See next page for information about using a **Hold** dwell.)	Prompt reads: **Enter downfade time**
6. Use keypad to enter downfade time and press [Enter].	New fade times are recorded into submaster 5

Note: Once a timed submaster is running, press the bump button to change the direction of the fade. For example, if the upfade is half finished, pressing the bump button starts the downfade from 50 percent. If a downfade is running, pressing the bump button begins an upfade again from the current level.

Hold dwell time

If you record a submaster with a dwell time of **Hold**, the submaster fades up when you press the bump button, then holds until you press it again.

To add a dwell time of **Hold** to a submaster, follow these steps:

Keystrokes:	Action:
1. Press [Sub].	Prompt reads: **Select submaster number** **To select submaster type, press TYPE**
2. Press [5].	Selects submaster 5 Corner reads: **Sub 5**
3. Press [Time] [Time].	Prompt reads: **Enter dwell time** **(Press CLEAR for hold, press CLEAR CLEAR for manual operation)**
4. Press [Clear].	Corner reads: **Dwell Hold**
5. Press [Enter] [Enter].	Dwell time is set to **Hold** for submaster 5

Manual dwell time

If you record a submaster with a dwell time of **manual** and an upfade time other than zero, the upfade starts when you press and hold the bump button. It runs until channels reach full recorded levels, then holds at full as long as you hold the bump button; the downfade begins when you release it. If you don't hold the bump button for the duration of the upfade time, channels do not reach their full recorded levels.

Note: If you do not enter a dwell time for a submaster, the submaster defaults to a manual dwell.

To convert a timed dwell to a manual dwell in Blind mode, follow these steps:

Keystrokes:	Action:
1. Press [Sub].	Prompt reads: **Select submaster number** **To select submaster type, press TYPE**
2. Press [5].	Selects submaster 5 Corner reads: **Sub 5**
3. Press [Time] [Time].	Prompt reads: **Enter dwell time** **(Press CLEAR for hold, press CLEAR CLEAR for manual operation)**
4. Press [Clear] [Clear].	Corner reads: **Dwell Man**
5. Press [Enter] [Enter].	Dwell time is set to **Manual** for submaster 5

Adding a rate to a submaster

Rate allows you to record submasters that play back faster or slower than their recorded fade times. This can be especially helpful when you are trying to calculate complex timing information for effects loaded to a submaster.

Note: If you adjust the rate on a submaster containing an effect, the rate adjustments affect individual step timing, but do not change the overall effect timing.

Rate is expressed as a percentage. A submaster with a rate of 100 plays back at its recorded fade time. A rate of 300 plays the submaster back three times faster than its recorded fade time. A rate of 50 causes it to play back half as fast as its recorded fade time. You may assign a rate of up to 2,000 percent.

To add a rate to submaster 7, follow these steps:

Action:	Keystrokes:
1. Press [Blind].	Selects Blind display mode
2. Press [Sub] [7].	Prompt reads: **Select submaster number To select submaster type, press TYPE**
3. Press [S3], **Rate**.	Prompt reads: **Use keypad to select submaster rate (0 to 2000, 100 = Normal)**
4. Press [1][5][0].	Corner reads: **Rate 150**
5. Press [Enter].	Rate of 150 percent is recorded into submaster 7

Specifying a submaster's page

You may specify the page to which you record submasters. For example, if page 1 is loaded, you can record a submaster to page 2. To do so, follow these steps:

Keystrokes:	Action:
1. Create a look in Stage.	
2. Press [Record] [Sub].	Prompt reads: **To record submaster, select number and press ENTER To cancel, press CLEAR**
3. Press [Page] [2].	Prompt reads: **Select page on which to record submaster, then press submaster bump button**
4. Press submaster 6's bump button.	Current levels are recorded into submaster 6 on submaster page 2

Using Except to record a submaster without another submaster's channels

Expression 2x allows you to program a submaster containing all the current levels on stage except for those contributed by a specific cue, group, or another submaster.

This example illustrates how you record a submaster without including levels contributed by the specified submaster:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Select desired channels and set channel levels.	
3. Press [Record] [Sub].	Prompt reads: **To record submaster, select number and press ENTER** **To cancel, press CLEAR**
4. Press [5].	Selects submaster 5 to be recorded
5. Press [Except] [Sub] [3].	Instructs that levels raised by submaster 3 be ignored Prompt reads: **Select excepted submaster number**
6. Press [Enter].	Records submaster 5 minus submaster 3's levels

Note: Press [Cue] or [Group] in place of [Sub] in step 5 to leave out the channels supplied by a cue or group.

Note: [Except] will not work with effect cues or effect submasters.

Creating inhibitive submasters

A red LED on the bump button indicates an inhibitive submaster. Only submasters 13 through 24 may be inhibitive.

Inhibitive submasters allow you to limit the output of a group of channels. Channel outputs are limited to the level at which you set the slider. An inhibitive submaster set at **10** (100 percent), does not affect channel output. An inhibitive submaster controls the levels of its assigned channels in the same way the Grandmaster controls the levels of all channels.

Note: If channels that you expect to see on stage are missing or at the wrong levels, check to see if a submaster is inhibiting them. If a channel is fully inhibited by a submaster, its level will be displayed as a yellow zero.

Follow these steps to create an inhibitive submaster:

Keystrokes:	Actions:
1. Press [Stage].	Selects Stage display
2. Press [Sub] and enter the number of the submaster (13 to 24) you wish to be inhibitive.	Selects sub to change Prompt reads: **Select submaster number** **To select submaster type, press TYPE**
3. Press [Type].	Prompt reads: **Select submaster type** **(1 = Pile-on, 2 = Inhibitive** **[Other types are Blind only])**
4. Press [2]. LED flashes green, unless slider is at zero.	Channel levels change to **IN** and the submaster number is red
5. Move slider to zero. LED flashes red.	Pile-on levels are unloaded
6. Move slider to **10**.	Inhibitive control is loaded

Follow the same procedure to convert back to pile-on.

• You may include the same channel in more than one inhibitive submaster.

• If you press an inhibitive submaster's bump button, the submaster fades from its current slider location to zero and back, using its recorded fade times.

Modifying submasters in Blind

To modify a submaster in Blind, follow these steps:

Keystrokes:	Actions:
1. Press [Blind].	Selects Blind display
2. Press [Sub] [1].	Prompt reads: **Select submaster number** **To select submaster type, press TYPE**
3. Press [Enter].	Brings up current level settings for submaster 1 Prompt reads: **Select channel numbers**
4. Enter channel numbers and set desired new levels.	Sets new levels
5. Press [Record].	Prompt reads: **To record submaster, select number and press ENTER** **To cancel, press CLEAR**
6. Press [Enter].	Changes to submaster 1 are recorded

Modifying submasters in Stage

To modify a submaster in Stage, follow these steps:

Keystrokes:	Actions:
1. Press [Stage].	Selects Stage display
2. Use the submaster slider to raise submaster 2 to full on stage.	Submaster 2's channels rise on stage to recorded levels
3. Enter channel numbers and set desired new levels.	New levels are set on stage
4. Press [Record], then press submaster 2's bump button.	Submaster 2 is recorded with the new levels. Submaster LED blinks, indicating that submaster 2 has been changed and the changes have not been loaded
5. Press [Rel].	Releases newly set levels
6. Slide submaster slider to zero, then back to full.	Loads submaster 2's new levels and brings them up on stage

Using Update to modify submasters

The Update feature allows you to easily record changed levels on Stage into a selected submaster. You may record all levels on Stage into the submaster, or you may record only changes to channels that were previously recorded in the submaster.

Note: When you use Update to modify a submaster, the updated submaster takes control of all stage levels for channels in the submaster.

Follow these steps to update a submaster:

Keystrokes:	Actions:
1. Press [Stage].	Selects Stage display mode
2. Set submaster 6's slider to **10**.[†]	Puts submaster 6's current look on stage
3. Select and set desired levels for channels to update in the submaster.	Selects channels and sets levels
4. Press [S2], **Update**, [Sub].	Prompt reads: **To update submaster(s), select number(s) and press ENTER (Press ONLY + ENTER to update only those channels already in submaster(s))**
5. To update only the channels already recorded in submaster 6, press [Only].	Limits update
6. Press submaster 6's bump button.	Submaster 6 is updated

[†] *Note: If you do not set the slider to **10**, Expression 2x will update the submaster proportionally. This means that the outputs on stage will match their current level only when the slider is at its current position.*

*For example, if the slider is at 50 percent, channel 1 is on stage at 25 percent and you press [Update], channel 1 is set so that when the slider returns to **5**, channel 1 returns to 25 percent. This means that when the submaster is full, channel 1 is at 50 percent.*

The console will not allow you to update a channel in a submaster to a level higher than the level to which the submaster slider is set.

Live control of a submaster's rate

In Stage mode, selecting a submaster and pressing [S3], **Rate**, allows the timing of the submaster to be controlled by the rate wheel or keyboard entry.

Follow these steps to change the rate of an active submaster in Stage. (This procedure also works if the submaster is not active. In either case, the new rate is automatically recorded in the submaster.)

Keystrokes:	Action:
1. Press [Stage].	Selects Live display
2. Press [Sub] [5].	Selects submaster 5
3. Press [S3], **Rate**.	Activates rate control Prompt reads: **Select submaster rate and press ENTER, or use wheel or trackpad to alter rate** **(0 to 2000, 100 = Normal)**
4. Move Rate wheel.	Sets and records fade rate for submaster 5. If submaster is running, fade proceeds at new rate

Note: When the submaster rate is controlled by the rate wheel, the submaster's number turns blue on the Submaster List.

Controlling submaster fades manually

When you press the bump button on a timed submaster, recorded fade times play back as you recorded them. Expression 2x allows you to use the slider to take manual control of submasters recorded with fade times.

The Submaster List shows the progress of the submaster's fade. To override the fade, push the submaster's slider to a higher level than the fade (lower, if inhibitive).

Once the slider passes the fade (or meets it at Full on pile-on submasters or zero on inhibitive submasters), control of the fade transfers to the slider and you have full manual control of the submaster. Move the slider to set the fade level.

Labeling submasters

Expression 2x allows you to use an alphanumeric keyboard to label submasters. Submaster names can consist of any combination of letters, numbers and symbols, and may be up to 16 characters long. See page 302 for information about installing an alphanumeric keyboard.

Follow these steps to add the name "Bedroom wash" to submaster 4:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [Sub] [4].	Prompt reads: **Select submaster number** **To select submaster type, press TYPE**
3. Press [Label].	Prompt reads: **Type submaster name**
4. Use the alphanumeric keyboard to enter the label. Type **Bedroom wash**.	Corner reads: **Label: Bedroom wash**
5. On the Expression 2x keypad, press [Enter].	Submaster 4 is labeled **Bedroom wash**

Copying submasters

To copy a look from one submaster to another, follow these steps:

Keystrokes:	Actions:
1. Press [Blind].	Selects Blind display mode
2. Press [Sub].	Prompt reads: **Select submaster number** **To select submaster type, press TYPE**
3. Enter the number of the submaster you wish to copy.	Corner reads: **Sub 1**
4. Press [Record] [Sub].	Prompt reads: **To record submaster, select number and press ENTER** **To cancel, press CLEAR**
5. Enter the number of the new submaster.	Corner reads: **Sub 9**
6. Press [Enter]. Submaster copy is complete.	Contents of submaster 1 are copied to submaster 9

Note: You may also copy a look from a submaster to a cue or a group. To do so, press [Cue] or [Group] in place of [Sub] in step 4.

Loading cues or groups to submasters

[Load Sub] allows you to load the contents of one or more recorded groups or cues into submasters.

To load a look from a range of cues or groups to submasters, follow these steps:

Keystrokes:	Actions:
1. Press [Load Sub].	Prompt reads: **Select submaster(s) to load** **To cancel, press CLEAR**
2. Press [9] [Thru] [1][2].	Selects submasters 9 through 12 Corner reads: **Sub 12**
3. Press [Cue] (or [Group]).	Prompt reads: **Select cue(s) to load into** **submaster(s)** **To cancel, press CLEAR**
4. Press [1] [And] [3] [Thru] [5].	Selects cues 1, 3, 4, and 5 to copy to submasters 9 through 12 Corner reads: **Cue 5**
5. Press [Enter]. Submaster copy is complete.	Contents of cues 1, 3, 4, and 5 are copied to submasters 9, 10, 11, and 12, respectively

Copying cues or groups to submasters

To copy a look from a cue or a group to a submaster, follow these steps:

Keystrokes:	Actions:
1. Press [Blind].	Selects Blind display mode
2. Press [Cue] (or [Group]).	Prompt reads: **Select cue number** **To select cue type, press TYPE**
3. Press [1].	Selects cue to copy Corner reads: **Cue 1**
4. Press [Record] [Sub].	Prompt reads: **To record submaster, select** **number and press ENTER** **To cancel, press CLEAR**
5. Press [9].	Selects submaster 9 Corner reads: **Sub 9**
6. Press [Enter]. Submaster copy is complete.	Contents of cue 1 are copied to submaster 9

Clearing submasters

You must be in Blind or Stage display mode to clear the contents of individual submasters. This process erases all level setting instructions and attributes from the submaster. To clear all submasters, use the Clear Submasters option from the Clear Functions menu as described in *Chapter 18, Clear Functions*, on page 202.

To clear submasters, follow these steps:

Keystrokes:	Actions:
1. Press [Blind].	Selects Blind display
2. Press [Sub].	Prompt reads: **Select submaster number**
3. Press [S6], **Delete Sub**.	Prompt reads: **To delete submaster(s), select number(s) and press ENTER** **To cancel, press CLEAR**
4. Enter the number of the submaster you want to clear.	Corner reads: **Sub 2**
5. Press [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
6. Press [Enter] to delete the submaster or [Clear] to cancel the action.	Contents of submaster 2 are cleared

Submaster List

The Submaster List (shown below) displays a list of the submasters in your show. Each page is displayed separately, with up to 18 submasters on screen at any time. The Submaster List includes the submaster number, its bump button status, its current level on stage, its upfade, downfade and dwell times, its type, its rate, and its label.

Submasters with recorded levels (pile-on submasters) are displayed in green, inhibitive submasters in red and effect submasters in white. Submasters with no recorded levels are displayed in gray. As you scroll through the submasters, the currently selected submaster's attributes are highlighted in white and the currently selected field is highlighted in yellow. Use [S4], **Previous Page**, and [S5], **Next Page**, to move through the list within each page of submasters.

Follow these steps to display Submaster List:

Keystrokes:

1. Press [Stage] [S7], **More Softkeys**, [S2], **Sub List**.

2. Press [Page] [2] [Enter].

3. Press [Page] [1] [Enter].

Actions:

Displays Submaster List, page 1

Switch from Blind submaster page 1 to page 2

Switch from Blind submaster page 2 to page 1

Editing attributes in Submaster List

The Submaster List allows you to edit any attributes shown on the list across a range of submasters simultaneously.

For example, you can assign a five second wait time to submasters 1 through 5 in one command. Follow these steps to do so:

Keystrokes:	**Actions:**
1. Press [Blind] [Sub] [S2], **Sub List.**	Displays Submaster List
2. Press [1] [Thru] [5].	Selects submasters 1 through 5 Prompt reads: **Select submaster number(s)**
3. Press [Time] and enter [5].	Prompt reads: **Enter upfade time**
4. Press [Enter].	Sets upfade time for submasters 1 through 5 to five seconds

chapter 12
effects

An effect runs steps, containing channels, in a variety of patterns called chases. An effect can be positive, with lights starting off and being turned on in patterns, or negative, with lights starting on and being turned off in patterns.

Expression 2x allows you to record effects, each with up to 100 steps, into cues or submasters. Each effect includes level and timing controls for the steps in the effect, and overall timing controls for the effect itself. Each effect step can last for up to 99:59 minutes.

Note: Channel levels are not affected by an effect until a step runs that specifically addresses the channel.

This chapter includes the following sections:

- Steps
- Creating steps
- Configuring effects
- Modifying effects
- Running an effect cue
- Using an effect submaster

Steps

An effect may consist of up to 100 steps. A step is made up of elements. Elements may be either channels or groups. Each step may contain up to ten elements. For example, channels 1 through 10 would constitute ten elements, filling the step. However, a group containing channels 1 through 10 would constitute only one element, allowing nine more channels or groups to be added.

Each step in an effect is assigned a high and low level, a step time, and an in, dwell, and out time.

Step time

Step time is the time between the beginning of a step and the beginning of the next step. Default Step time is 0.2 seconds.

In time

In a positive effect, the time the step takes to fade from its starting level to its high level is the In time. In a negative effect, it is the time it takes to fade from its starting level to its low level. Default In time is zero seconds.

Dwell time

Dwell time is the length of time between the end of the In fade and the start of the Out fade. Default Dwell time is zero.

Out time

In a positive effect, the time the step takes to fade from its high level to its low level is the Out time. In a negative effect, it is the time it takes the step to fade from its low level to its high level. Default Out time is zero seconds.

Note: If the In/Dwell/Out times are 0/0/0, the step will rise instantly to its High level and remain there until the Step time has elapsed. Then it will drop instantly to its Low level.

High and Low levels

The High and Low levels represent the range of levels channels in the step are allowed to reach. Default High level is Full, default Low level is zero.

Note: If you create an effect step that includes groups, its high and low values are proportional levels.

Creating steps

Create an effect by selecting the effect type for a cue or submaster, then creating a series of steps in the Effect display. Use the arrow keys to move around the Effect display and enter settings. When you create a new step, it takes the previous step's attributes as its defaults. You may then edit the new step.

To edit a step attribute, use the arrow keys to select the field of the attribute you wish to edit. Use the keypad to enter the new setting for that attribute. Then, either press [Enter] to confirm the change without leaving the attribute field or press any arrow key to make the change and move to a different attribute field. You can also use softkeys to move from field to field.

Follow these instructions to create a series of steps:

Keystrokes:	Action:
1. Press [Blind].	Selects the Blind display
2. Press [Cue] or [Sub] [1].	Selects cue or submaster 1 Prompt reads: **Select cue number** **To select cue type, press TYPE** or... **Select submaster number** **To select submaster type, press TYPE**
3. Press [Type].	Prompt reads: **Select fade type (1 = Crossfade, 2 = Allfade, 3 = Effect, or 4 = Subroutine)** or... **Select submaster type (1 = Pile-on, 2 = Inhibitive, 3 = Effect)**
4. Press [3].	Identifies cue or submaster 1 as an effect. Selects Effect display Prompt reads: **Select step numbers**
5. If you are creating an effect submaster, press [S7], **More Softkeys**,	
6. Press [S1], **Step**, and enter the number of the step to edit. Press [Enter].	Prompt reads: **Select channel numbers (Precede with AND to add to existing step, or EXCEPT to delete from step**
7. Use the keypad to enter the channels or groups you want to include in the step, then press [→].	Prompt reads: **Select step time**
8. Use the keypad to enter step time (range is 0 to 9:59 minutes), then press [→].	Prompt reads: **Enter step in time**

9. Use the keypad to enter the **In** time, then press [→].

Prompt reads:
Enter step dwell time

10. Use the keypad to enter **Dwell** time, then press [→].

Prompt reads:
Enter step out time

11. Use the keypad to enter **Out** time, then press [→].

Prompt reads:
Select low level

12. Use the keypad to enter the low level, then press [→].

Prompt reads:
Enter high level

13. Use the keypad to enter high level, then press [Enter].

Prompt reads:
Select step numbers

14. Repeat steps 5 through 13 for each effect step you wish to create.

15. Press [Record], enter the cue or submaster number and press [Enter]. Press [Clear] to cancel.

Cue or submaster containing effect is recorded

Default element assignment

Rather than assign elements to steps one at a time, you can assign a range of elements to a range of steps on a one-to-one basis.

The console assigns elements (channels or groups) to each step in turn, i.e., channel 1 to step 1, channel 2 to step 2, and so on. If there are more elements than steps, Expression 2x assigns an element to each step, then returns to the first step and continues assigning elements, one per step, until all are assigned.

Follow these steps to create an effect that uses a one-to-one channel assignment. In the example, channels 1 through 22 are assigned to steps 1 through 10, creating a ten-step effect.

Keystrokes:	Action:
1. Press [Blind] [Cue] [2] [Type] [3].	Selects cue 2 in the Blind display and designates it as an effect cue
2. Press [S1], **Step**, and enter [1] [Thru] [1][0].	Prompt reads: **Select step numbers**
3. Press [Enter].	Prompt reads: **Select channel numbers**
4. Press [1] [Thru] [2][2], the range of channels to assign to the steps.	Prompt reads: **Select channel numbers**
5. Press [Enter].	Channels are assigned to steps as indicated above; see chart below

Step number:	Contains channels:		
Step 1	1	11	21
Step 2	2	12	22
Step 3	3	13	
Step 4	4	14	
Step 5	5	15	
Step 6	6	16	
Step 7	7	17	
Step 8	8	18	
Step 9	9	19	
Step 10	10	20	

Controlling effects

Effect steps are controlled by assigned attributes, fade times and rates. In addition, the cue or submaster containing the effect may be assigned fade times and rates that apply to the effect overall.

Attributes

Attributes control how the effect plays its steps. Press [S7], **More Softkeys**, [S8], **Attribute**, to reveal the attribute softkeys. Assign attributes using the following rules:

- All effects are either Positive or Negative. When you initially create an effect, it defaults to Positive.

- Alternate, Reverse, Bounce, and Build can be applied in any combination to a Positive or Negative effect.

- Random can be applied to any Positive or Negative effect. Random may not be combined with Alternate, Reverse, Bounce, or Build.

Note: In the following descriptions, "On" means elements are set to their high level, "Off" means they are set to their low level.

[S1] Positive
In a positive effect, all elements start Off. Each step turns its assigned elements On and the previous step's elements Off.

[S1] Negative
In a negative effect, all elements start On. Each step turns its assigned elements Off and the previous step's elements On.

*Note: [S1], **Positive/Negative**, switches back and forth between positive and negative.*

[S2] Alternate
The effect alternates between positive and negative chases through the steps. The first pass is positive if the effect is positive, negative if the effect is negative.

[S3] Reverse
Steps run in reverse numerical order.

[S4] Bounce
Steps run first in forward, then in reverse order. Subsequent passes alternate between forward and reverse.

[S5] Build
All elements are Off at the beginning of the chase. Each step turns its assigned elements On, and leaves the previous step On. At the end of the chase, all steps are On; they all turn Off to start the next pass.

In a negative effect, all steps are On at the beginning of the chase. Each step turns its assigned elements Off, and leaves previous step elements Off. At the end of the chase, all elements are Off; they all turn On to start the next pass.

[S6] Random
A Random effect plays steps back in random order. Random is ideal for creating lightning, flashing, or strobe effects.

Assigning attributes

Follow these steps to assign attributes to the effect you created in the previous example.

Keystrokes:

1. Press [Blind] [Cue] [2].

2. Press [S7], **More Soft-keys**, [S8], **Attribute**.

3. Select attributes from the softkeys on the screen.

Action:

Selects cue 2 in the Blind display

Displays attributes across the bottom of the screen
Prompt reads:
Select effect attributes

Selected patterns are displayed at the top of the effects display

Note: To remove an attribute, select it again.

Effect fade times

Each effect has an overall upfade, dwell and downfade time. When you create an effect cue, the times default to the cue fade times in your system settings. If you have not changed the default settings, this means an upfade of five seconds, a dwell of **hold**, and a downfade of five seconds. See *Setting default fade times* on page 19. [Time] allows the user to set the upfade, dwell and downfade time for the overall effect.

Note: Dwell time is the length of time the effect runs between the upfade of the first step and the downfade of the last step. **Hold** *assigns an infinite dwell time, meaning the effect runs until the associated [Clear] key or bump button is pressed to start the downfade.*

Times may be expressed in minutes and seconds, or as fractions of seconds (in decimal format). Times can be programmed from .1 second to 99:59 minutes. Acceptable time values include: .2 (.2 seconds), 00:12 (12 seconds), 5.5 (5.5 seconds), or 5:30 (five minutes, 30 seconds).

Change upfade, dwell and downfade

Follow these steps to change the effect's fade times.

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Press [Time] and enter the upfade time.	Prompt reads: **Enter effect upfade time**
3. Press [Time] and enter the dwell time.	Prompt reads: **Enter effect dwell time**
4. Press [Time] and enter the downfade time. Press [Clear] for hold dwell.	Prompt reads: **Enter effect downfade time**
5. Press [Enter].	Fade time entry is complete Prompt reads: **Select step numbers**

Change upfade only

Follow these steps to change only the effect's upfade time.

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Press [Time].	Prompt reads: **Enter effect upfade time**
3. Enter the upfade time.	Prompt reads: **Enter effect upfade time**
4. Press [Enter] [Enter] [Enter].	Prompt reads: **Select step numbers**

Change downfade only

Follow these steps to change only the effect's downfade time.

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Press [Time] [Time] [Time].	Prompt reads: **Enter effect downfade time**
3. Enter the downfade time.	Prompt reads: **Enter effect downfade time**
4. Press [Enter].	Prompt reads: **Select step numbers**

Change dwell only

Follow these steps to change only the effect's dwell time.

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Press [Time] [Time].	Prompt reads: **Enter effect dwell time**
3. Enter the dwell time.	Prompt reads: **Enter effect dwell time**
4. Press [Enter] [Enter].	Prompt reads: **Select step numbers**

Reset Hold dwell time

If the dwell time is set to **Hold**, an effect submaster will continue to run until you press the bump button. An effect cue will continue to run until you press either [Go] or [Hold] [Hold]. To reset the dwell time to **Hold** follow these steps:

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Press [Time] [Time].	Prompt reads: **Enter effect dwell time**
3. Press [Clear].	Prompt reads: **Enter effect dwell time**
4. Press [Enter] [Enter].	Dwell time set to **Hold** Prompt reads: **Select step numbers**

Using a random rate

An effect with a random rate runs at varying speeds, changing at random, within a range that you select.

The console applies a random rate to the assigned step time and to the step fade times.

To assign random rate and to select your maximum and minimum rates (from 0 percent to 2,000 percent), follow the steps below:

Keystroke:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Press [S7], **More Soft-keys**, [S8], **Attribute**.	Displays available attributes across the bottom of the screen
3. Press [S7], **Random Rate**.	Prompt reads: **Select low random rate (0 to 2000, 100=Normal)**
4. Enter the slowest desired effect rate. Press [Enter].	Prompt reads: **Select high random rate (0 to 2000, 100=Normal)**
5. Enter the highest desired effect rate.	
6. Press [Enter].	Prompt reads: **Select step number**

Note: You can control an effect's rate by adjusting the rate of the submaster or cue in which the effect is recorded. Adjusting the rate does not affect the overall Up/Dwell/Down times for the cue or submaster. It does, however, speed up or slow down the individual steps.

For more information about controlling cue or submaster rates, see pages 107 and 140.

Modifying effects

Expression 2x allows you to modify recorded effects by adding or deleting effect steps, changing step attributes, and adding or deleting step elements.

Inserting steps

You can insert a new step at any point in an effect. For example, to insert a step between steps 4 and 5, follow these steps:

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Press [S7], **More Softkeys**.	
3. Press [S5], **Insert Step**.	Prompt reads: **Select step number to insert, then press ENTER** **To cancel, press CLEAR**
4. Use the [↑] and [↓] keys to highlight the step you wish to insert or… Enter the number of the step.	Prompt reads: **Select step number to insert, then press ENTER** **To cancel, press CLEAR**
5. Press [Enter].	Prompt reads: **Select channel numbers** **(Precede with AND to add to existing step, or EXCEPT to delete from step**
6. Enter desired channels and settings.	

The new step is inserted in place of the old one. The old step 5 becomes step 6; step 6 becomes step 7 and so on. The timing and level attributes from step 4 are set as initial defaults in the new step 5.

Deleting steps

You may also delete steps from an effect. For example, to delete step 5, follow these instructions:

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Press [S7], **More Soft-keys**.	
3. Press [S6], **Delete Step**.	Prompt reads: **Select step number to delete, then press ENTER** **To cancel, press CLEAR**
4. Use the [↑] and [↓] keys to highlight step 5 or… Press [5].	Selects step 5 Prompt reads: **Select step number to insert, then press ENTER** **To cancel, press CLEAR**
5. Press [Enter], or press [Clear] to cancel.	Deletes step 5; Step 6 becomes step 5; step 7 becomes step 6 and so on Prompt reads: **Select step numbers**
6. Press [Record] [Enter],	Records your changes to the cue

Editing step characteristics

Use the arrow keys to select step characteristics to edit. For example, to edit a step's **In** time, follow these instructions:

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Use [↓] to select the step you want to edit, for example step 2 or… Press [S1], **Step**, [2].	Prompt reads: **Select step numbers**
3. Use [→] to highlight the **In** time field in step 2 or… Press [S7], **More Soft-keys**, [S3], **In Dwell Out**.	Prompt reads: **Enter step in time**
4. Press [8], the new **In** time.	New step time is added

Adding elements

To add a channel or group to a step, follow these steps:

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display
2. Select the step you wish to modify using [↓] and [↑], or press [S1], **Step**, and enter the step number.	Prompt reads: **Select step numbers**
3. Press [Enter] [And].	Prompt reads: **Select channel numbers (Precede with AND to add to existing step, or EXCEPT to delete from step)**
4. Enter the channel or group number to add.	Prompt reads: **Select channel numbers**
5. Press [Enter].	Channel 7 is added to element list Prompt reads: **Select step numbers**
6. Press [Record] [Enter].	Records your changes to the cue

Note: If you enter elements without using [And] or [Except], the channels or groups you enter replace the current element list.

Deleting elements

To remove a channel or group from a step, follow these steps:

Keystrokes:	Action:
1. Press [Blind] [Cue] [2].	Selects cue 2 in the Blind display.
2. Select the step you wish to modify using [↓] and [↑], or press [S1], **Step**, and enter the step number.	Prompt reads: **Select step numbers**
3. Press [Enter] [Except].	Prompt reads: **Select channel numbers (Precede with AND to add to existing step, or EXCEPT to delete from step)**
4. Enter the channel or group number to remove.	Prompt reads: **Select channel numbers**
5. Press [Enter].	Prompt reads: **Select step numbers**
6. Press [Record] [Enter],	Records your changes to the cue

Running an effect cue

Play back effects recorded as cues on the console's A/B or C/D faders, just as you would any other cue. The effect will run, using the cue's Up, Dwell and Down times to determine how long the cue lasts. To run the cue, press [Cue], enter the effect cue number, and press [Go].

An effect cue with a **Hold** dwell time runs on the fader until you press that fader's [Clear] key to begin the downfade. Press [Clear] once to fade out an effect cue in the recorded downfade time.

You may use the playback sliders to manually control the cue, allowing you to fade the effect up and down with the playback slider.

Note: Press the fader's [Clear] key twice to cancel an effect from the fader immediately.

Using an effect submaster

An effect recorded to a submaster interacts with cues and other submasters on a pile-on basis. Bring up the effect by pressing the submaster's bump button or raising the slider.

An effect submaster fades proportionally between zero and the effect's high level. The slider acts as a master. If the effect's low level is normally 10 percent, moving the slider to 50 percent will reduce the effect's low level to 5 percent.

Note: See Adding a rate to a submaster on page 135 for information on changing the rate of a submaster.

chapter 13
subroutines

A subroutine is a cue that controls the playback of a series of recorded cues. Subroutines are similar to linked cues, except that they have more playback options.

You can use subroutines and effects to create similar looks. However, subroutines have some advantages over effects. Since each step of a subroutine is a cue with channels set at proportional levels, you can create loops or chases with proportional looks. In an effect, channels are assigned to steps, but no levels are assigned. Thus, all channels in a step are at the same level. You can also create nested loops, or even use an effect cue as a step in a subroutine.
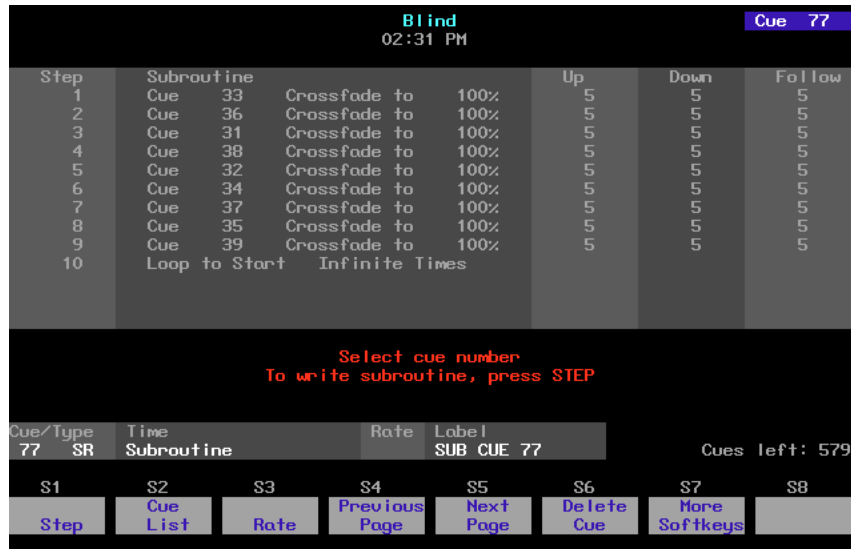
This chapter contains the following sections:

- Steps
- Cue steps
- Style steps
- Creating a subroutine
- Editing a subroutine
- Deleting a step
- Inserting a step

Steps

All subroutine steps are either cue steps or style steps. A cue step contains an existing recorded cue. The subroutine lets you change levels and fade rates for the cue step without changing the original cues. A cue step may contain an effect cue

A style step contains an instruction that controls the subroutine's playback pattern. This allows you to run loops, run bounces, pause the subroutine until you press go, or end the subroutine and jump to any other cue. The following display shows a subroutine that runs a series of cues in a loop.

```
                            Blind                          Cue  77
                           02:31 PM

 Step      Subroutine                             Up       Down     Follow
    1      Cue    33     Crossfade to    100%      5         5         5
    2      Cue    36     Crossfade to    100%      5         5         5
    3      Cue    31     Crossfade to    100%      5         5         5
    4      Cue    38     Crossfade to    100%      5         5         5
    5      Cue    32     Crossfade to    100%      5         5         5
    6      Cue    34     Crossfade to    100%      5         5         5
    7      Cue    37     Crossfade to    100%      5         5         5
    8      Cue    35     Crossfade to    100%      5         5         5
    9      Cue    39     Crossfade to    100%      5         5         5
   10      Loop to Start   Infinite Times

                        Select cue number
                  To write subroutine, press STEP


 Cue/Type  Time                    Rate   Label
 77    SR  Subroutine                     SUB CUE 77          Cues left: 579

   S1         S2         S3         S4       S5        S6        S7        S8
             Cue                 Previous   Next     Delete    More
   Step      List       Rate       Page     Page      Cue     Softkeys
```

The next two pages describe the types of cue and style steps that are available.

Cue steps

There are two types of cue step, crossfade and allfade.

Crossfade

In a crossfade step, all increasing levels fade in the upfade time; all decreasing levels fade in the downfade time.

Allfade

In an allfade step, all channels in both faders fade to a level that you choose and assign to the step.

Style steps

The following playback styles are available for subroutines. A style is assigned to a step. When the subroutine runs, the steps play back in numeric order, until the subroutine reaches a style step. The style step then determines whether the subroutine will loop, bounce, hold, or end and run a different cue.

Loop

The subroutine runs through steps until it reaches a Loop step. It then returns to the first step, and repeats the sequence for the number of times you specify.

When you create the Loop step, enter the number of times you want the loop to return to the top of the step list. If you enter **5**, the sequence will play six times. Enter **0** to create a continuous loop.

Bounce

The subroutine runs through steps until it reaches a Bounce step. It then runs back through the steps in reverse order, and repeats the sequence for the number of times you specify.

When you create the Bounce step, enter the number of times you want the subroutine to bounce. One bounce equals running through the sequence forward once and reverse once. Enter **0** for a continuous bounce.

Jump-to-cue

The subroutine runs through steps until it reaches a Jump-to-cue step. It then automatically starts another cue which is not included in the subroutine. You can jump to any type of cue:
regular, subroutine or effect.

When you create the Jump-to-cue step, enter the number of the cue to which to jump.

Hold-for-Go

The subroutine runs through steps until it reaches a Hold-for-Go step. It then pauses until you press [Go].

Subroutine attributes

The following attributes may be applied to each cue step.

Level

Sets an intensity level for the cue within the subroutine. The level proportionally affects the channel levels assigned to the original cue. Levels must be entered as two-digit numbers (e.g., **20** for 20 percent, **05** for five percent). Use [Full] for 100 percent.

Fade times

Upfade times may range from .1 seconds to 99:59 minutes. If you do not enter a time, the downfade will match the upfade.

Follow time

Follow time is the time between the start of one step and the start of the next. Follow times may range from .1 seconds to 99:59 minutes.

Creating subroutines

Each subroutine can hold up to 100 steps. Each step lists a cue or a style.

To create a subroutine, follow these steps:

Keystrokes:	Action:
1. Create the cues you want to use in your subroutine.	
2. Press [Blind]. (You must be in Blind mode to create subroutines.)	Displays Blind mode screen
3. Press [Cue] [7].	Selects cue 7 to be your subroutine cue
4. Press [Type].	Displays fade type menu Prompt reads: **Select fade type (1 = Crossfade, 2 = Allfade, 3 = Effect, or 4 = Subroutine)**
5. Press [4], **Subroutine**. Expression 2x displays the screen illustrated below.	Select subroutine fade type Prompt reads: **Select step number(s), then press ENTER**

Keystrokes:	Action:
6. Press [1] [→].	Selects step 1 Prompt reads: **Enter cue number to fade, or press STYLE to change step type**
7. Press [1] [→].	Selects cue 1 for step 1 of the subroutine Prompt reads: **Enter type of cue (1 = Crossfade, 2 = Allfade)**
8. Press [1].	Designates cue as a crossfade within the subroutine Prompt reads: **Enter intensity**

9. Press [5][5].	Selects a level of 55 percent for the cue within the subroutine Prompt reads: **Enter upfade time**
10. Press [8] [→].	Sets an upfade time of eight seconds Prompt reads: **Enter downfade time**
11. Press [→].	Sets a downfade time of eight seconds Prompt reads: **Enter follow time**
12. Press [2][0].	Sets a follow time of 20 seconds. Step 1 is now complete
13. Press [S1], **Step**, [2] [Enter].	Selects step 2 to edit
14. Repeat steps 7 through 13, altering attributes as desired, to add additional cues as subroutine steps.	
15. Press [S1], **Step**, [6] [Enter].	Selects step 6 to edit
16. Press [S2], **Style**, to select a subroutine style. (You may need to press [S7], **More Softkeys**, first.) Styles are described on page 163.	Prompt reads: **Select style of subroutine command (1 = Loop, 2 = Bounce, 3 = Jump to cue, 4 = Hold for go)**
17. Press [3] [Enter].	Selects Jump to cue style for step 6 Prompt reads: **Select cue number**
18. Press [8] [Enter].	Selects cue 8 for Jump to cue. When subroutine reaches step 6, the subroutine ends and runs cue 8
19. Complete entering all cue steps and style steps as described above.	
20. Press [Record], enter cue number, and press [Enter] to record subroutine cue.	

Editing a subroutine

To edit a subroutine, select the step you wish to change by pressing [S1], **Step**, and entering the step number. Use [And] and [Thru] to select multiple steps. Selected steps are displayed in white on the monitor.

Note: If you select a range of steps, only cue steps will be selected. Style steps may only be edited individually and will be left out of selected ranges.

Once the step is selected, choose the attribute you wish to edit by pressing one of the following softkeys. The selected attribute is displayed in yellow on the monitor.

[S2], **Style**　　　　Allows you to select a style from the style menu.

[S3], **Select Cue**　Allows you to enter a cue number for the selected step.

[S4], **Type/Level**　Allows you to select a crossfade or an allfade and to set intensity level.

[S8], **Up/Down/Follow**
　　　　　　　　Allows you to set upfade and downfade times and to set follow time.

Once you finish editing the subroutine, press [Record] [Enter] to save your changes.

Note: You may use the arrow keys to move from one field or line to the next. For example, press [↓] to select the next step, or press [→] to enter information one field to the right of the current field.

Deleting a step

Press [S6], **Delete Step**, and enter the step number. Then press [Enter]. Expression 2x deletes the selected step and renumbers the remaining steps.

Inserting a step

Press [S1], **Step**, and enter the step number where you want to insert the new step. Then press [Enter]. Expression 2x inserts a blank step before the selected step.

chapter 14
macros

A macro allows you to record a series of keystrokes and later replay it with one or two keystrokes. This can simplify complex tasks that you perform often. You can program up to 2,000 macros in Expression 2x, depending on how large they are.

This chapter includes the following sections

- Creating macros
- Playing macros
- Modifying macros
- Clearing macros
- Copying macros
- Sample macros

Creating macros

There are two ways to create a macro. You can create it in Macro display mode, entering and editing keystrokes without actually executing the instructions, or you can use Expression 2x's Learn mode to record a sequence of keystrokes as you perform the operation.

You can include any key or button on the console except [Enter Macro] in a macro. You cannot enter slider settings or wheel movements. Each macro can contain up to 50 keystrokes. In addition, you can link macros.

Using Learn

Expression 2x's Learn function allows you to create a macro by performing an actual sequence of keystrokes. Expression 2x records the keystrokes as you make them. The recorded keystroke sequence can then be rerun by pressing the appropriate macro key. Once you record a macro in Learn mode you can edit the sequence in Macro mode to adjust its operation. Learn works in any display mode except the Macro Editing display and the Designer's Worksheet Editing display.

To create a sample macro using Learn, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Live display mode
2. Press [Learn].	Prompt reads: **Select macro number to learn, then press ENTER** **To cancel, press CLEAR**
3. Press [7] [Enter].	**Learning Macro 7** flashes in red in the upper left corner of the monitor Prompt reads: **Select operation(s) for this macro – press ENTER MACRO when done (Wheels and sliders are not valid entries in macros)**
4. Enter [Channel] [1] [Thru] [5] [At] [5] [Enter].	Sets channels 1 through 5 at 50 percent
5. Press [Macro Wait].	Prompt reads: **Enter wait time** **Press ENTER when done**
6. Press [5] [Enter].	Inserts a five second wait into the macro Prompt reads: **Select operation(s) for this macro – press ENTER MACRO when done (Wheels and sliders are not valid entries in macros)**
7. Enter [Channel] [1] [Thru] [1][0] [Full].	Sets channels 1 through 10 at Full
8. Press [Macro Wait].	Prompt reads: **Enter wait time** **Press ENTER when done**

9. Press [5] [Enter].	Inserts a five second wait into the macro Prompt reads: **Select operation(s) for this macro –** **press ENTER MACRO when done** **(Wheels and sliders are not valid** **entries in macros)**
10. Enter [Channel] [1] [Thru] [1][0] [At] [0] [Enter].	Sets channels 1 through 10 at zero
11. Press [Enter Macro].	Concludes macro recording
12. Press [M*] [7] [Enter].	Macro 7 runs. Channels 1 through 5 rise to 50 percent. After five seconds, channels 1 through 10 rise to Full. After five seconds, levels drop to zero

Note: If your macro needs to contain softkeys from display modes other than the Macro Editing display, you <u>must</u> use Learn to create it.

Using Macro display mode

Macro display mode allows you to create or edit macros without affecting channel levels. Softkeys, [Enter Macro], [←], and [→] may not be entered in a macro in Macro display mode.

```
Insert Mode                    Macro Editing              Macro  1
                                11:04 AM

Macro   Operation(s)

  1     Setup 1 Enter 7 Enter 0 Enter Enter Stage

  2     Setup 1 Enter 7 Enter 1 Enter Enter Stage

  3     Bump24

  4     Setup 1 Enter 1 0 Enter DWS-Sliders Stage

  5     M6

  6     Bump1 Mwait-0 Bump2 Mwait-0 Bump3 Mwait-0 Bump4 Mwait-0 Bump5
        Mwait-0 Bump6 Mwait-0 Bump7 Mwait-0 Bump8 Mwait-0 Bump9 Mwait-0 Bump10
        Mwait-0 Bump11 Mwait-0 Bump12 Mwait-0 Bump13 Mwait-0 Bump14 Mwait-0
        Bump15 Mwait-0 Bump16 Mwait-0 Bump17 Mwait-0 Bump18 Mwait-0 Bump19
        Mwait-0 Bump20 Mwait-0 Bump21 Mwait-0 Bump22 Mwait-0 Bump23 M6

 10     Setup 1 Enter PurgeFlexi Stage

              Select macro number, then press ENTER

 1 Select   2            3 Delete   4          5          6 Delete   7  More     8
   Macro      Replace      Entry                           Macro     Softkeys    Return
```

Follow these steps to create a macro to record a show to diskette:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display screen
2. Select 8, **Macro Editing**, and press [Enter].	Selects Macro display screen Prompt reads: **Select macro number, then press ENTER**
3. Press [8] [Enter].	Blank macro created Prompt reads: **Select operation(s) for this macro – press ENTER MACRO when done (Wheels and sliders are not valid entries in macros)**
4. Press [Setup] [3] [Enter].	Enters setup display Macro contents line reads: **SETUP 3 ENTER**
5. Press [1] [Enter].	Selects **Write Show To Disk** Macro contents line reads: **SETUP 3 ENTER 1 ENTER**
6. Press [Enter].	Confirms selection Macro contents line reads: **SETUP 3 ENTER 1 ENTER ENTER**
7. Press [Enter Macro].	Stores macro 8

Caution: Expression 2x does not check the sequence of keystrokes to confirm that it will work. It is possible to create macros that don't work. When you run the macro, you will receive whatever error messages are appropriate.

To avoid problems, you should plan your macro before you start recording it by determining exactly what keystrokes you want to include. You might want to do this by running through the task and writing down each keystroke.

Next macro

When you press [Enter Macro], the Macro display selects the next macro. If you wish to begin recording the next macro, press [Enter].

Macro wait

To program a pause in the macro, press [Macro Wait] at the point in the macro where you want the pause to occur. Enter the time you would like the macro to hold, then press [Enter]. Continue to enter remaining macro commands.

Times may be expressed in minutes and seconds, or as fractions of seconds (in decimal format). Times can be programmed from .1 second to 99:59 minutes. Acceptable time values include: .2 (.2 seconds), 00:12 (12 seconds), 5.5 (5.5 seconds), or 5:30 (five minutes, 30 seconds).

Linking macros

Any macro may end with a link to another macro. When macros are linked, the first macro runs, then the second macro follows automatically. Press the appropriate macro key at the end of your sequence to create the link. Pressing the macro key automatically ends and stores the macro.

For example, to create a macro that sets all active channels to 50 percent, fades them out, then runs another macro, follow these steps:

Keystrokes:	Action:
1. Press [Setup] [8] [Enter].	Selects Macro editing mode
2. Press [1] [Enter].	Selects macro 1 to create Prompt reads: **Select operation(s) for this macro – press MACRO ENTER when done (Wheels and potentiometers are not valid entries in macros)**
3. Press [Enter] [At] [5][0] [Enter].	Sets all active channels to 50 percent Macro line reads: **ENTER AT 5 0 ENTER**
4. Press [Macro Wait] [1][0] [Enter].	Macro pauses for ten seconds Macro line reads: **ENTER AT 5 0 ENTER Mwait-10**
5. Press [Enter] [At] [0] [Enter]	Fades all active channels out Macro line reads: **ENTER AT 5 0 ENTER Mwait-10 ENTER AT 0 ENTER**
6. Press [M3].	Stores macro. Links macro to macro 3 Macro line reads: **ENTER AT 5 0 ENTER Mwait-10 ENTER AT 0 ENTER M3**

Note: You may also link a macro to a cue so the macro will run at the same time the cue does. See Chapter 6, Working with cues, for more details.

Using submasters in macros

Submaster bump buttons can function in macros in three different ways: as a normal bump button; to always fade a submaster to full (regardless of its current condition); or to always fade a submaster out (regardless of its current condition).

To include a bump button that starts a timed submaster or changes the direction of a running fade, press the submaster bump button while programming the macro.

Use [S1], **On Sub-Bump**, to fade the submaster up, regardless of its current setting. Use [S2], **Off Sub-Bump**, to fade a submaster out, regardless of its current setting.

To create a macro that turns a submaster on for five seconds, then turns it off, follow these steps:

Keystrokes:	Action:
1. Press [Setup] [8] [Enter].	Selects Macro editing mode
2. Press [4] [Enter].	Selects macro 4 to create Prompt reads: **Select operation(s) for this macro – press ENTER MACRO when done (Wheels and sliders are not valid entries in macros)**
3. Press [S7], **More Soft-keys**, [S1], **On Sub-Bump**.	Macro line reads: **OnBump** Prompt reads: **Enter submaster number**
4. Press [3] [Enter].	Macro line reads: **OnBump3**
5. Press [Macro Wait].	Macro line reads: **OnBump3 Mwait-0**
6. Enter [5] and press [Enter].	Macro line reads: **OnBump3 Mwait-5**
7. Press [S2], **Off Sub-Bump.**	Macro line reads: **OnBump3 Mwait-5 OffBump** Prompt reads: **Enter submaster number**
8. Press [3] [Enter].	Macro line reads: **OnBump3 Mwait-5 OffBump3**
9. Press [Enter Macro].	Records macro 4; leaves editing mode
10. Press [Stage] [M4].	Macro runs

Playing macros

As a macro runs, the LED in the macro's key flashes. Only one macro may run at a time.

To run macros 1 through 5, press the appropriate macro key. For example, to run macro 1, press [M1].

To play a macro recorded in [M1] - [M5], follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [M#].	Macro runs; prompt shows sequence of activity as if you were entering the key-strokes

To run any other macro, press [M*], the number of the macro, and [Enter]. For example, to run macro 10, press [M*] [1][0] [Enter].

To play a macro without its own key, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display mode
2. Press [M*] and enter the macro number.	Prompt reads: **Select macro number, then press ENTER**
3. Press [Enter].	Macro runs; prompt shows sequence of activity as if you were entering the key-strokes

Canceling a macro

To cancel a running macro, press any other macro key.

Powerup macro

You may select a macro to run automatically each time you turn your console on. To do so, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects the Setup menu
2. Press [6] [Enter].	Selects the Options Settings menu
3. Press [1][0] [Enter].	Selects the Powerup Macro option Prompt reads: **Select powerup macro number (Enter 0 to disable)**
4. Press [2][0] [Enter].	Selects macro 20 as your powerup macro. Each time you turn on the console, macro 20 runs

Modifying macros

Editing mode

In the Macro mode display, you can edit macros in Insert or Replace modes. In Insert mode, if you highlight a keystroke and type another keystroke, Expression 2x inserts the new keystroke before the highlighted one. In Replace mode, if you highlight a keystroke and type another keystroke, Expression 2x replaces the highlighted keystroke with the new one.

To switch from Insert mode to Replace mode, press [S2], **Replace**. To switch from Replace mode to Insert mode, press [S2], **Insert**. Expression 2x indicates the editing mode in the upper left corner of the command display.

Editing keys

[←] and [→] move the highlight left or right when you are editing a macro.

[S3], **Delete entry**, deletes highlighted keystroke.

Clearing macros

You must be in Macro display mode to clear individual macros. To clear all macros, you can use the Clear Macros option from the Clear Functions menu, as described on page 204.

To clear macros, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [8], **Macro Editing**, and press [Enter].	Selects Macro display mode
3. Press [S6], **Delete Macro**.	Prompt reads: **To delete macro(s), select macro number(s) and press ENTER** **To cancel, press CLEAR**
4. Enter macro or range of macros you want to clear.	Corner reads: **Macro 7**
5. Press [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
6. Press [Enter] to clear the macro or [Clear] to cancel the action.	Clears macro 7

Copying macros

You may want to copy a macro or use macros as building blocks for new macros. To copy contents of one macro to another, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [8], **Macro Editing**, and press [Enter].	Selects Macro display mode Prompt reads: **Select macro number, then press ENTER**
3. Press [S7], **More Soft-keys**, [S5], **Copy Macro**.	Prompt reads: **To copy macro(s), select macro number(s) to copy and press ENTER** **To cancel, press CLEAR**
4. Press [2].	Enters the number of the macro you wish to copy Corner reads: **Macro 2**
5. Press [Enter].	Prompt reads: **To copy selected macro(s), select target macro and press ENTER** **To cancel, press CLEAR**
6. Press [2][5], the number of the new macro.	Corner reads: **Macro 25**
7. Press [Enter].	Macro copy is complete. The contents of macro 2 have been copied into macro 25

Note: In step 4, you may use [And] and [Thru] to enter multiple macros to copy. If you do, the new macros will be numbered consecutively, starting with the macro you enter in step 6.

Sample macros

To create these sample macros, go to Macro display mode ([Setup] [8] [Enter]), select a macro and enter the keystroke sequences as shown below. More sample macros, created by Expression style console users, are available on ETC's World Wide Web page at the following URL:

http://www.etcconnect.com/html/service_macros.html

Channel check

This macro brings each channel up to full for a channel check. Before you begin, you'll probably want to bring up at least one channel for working light, then clear all other channels from stage. Press [Stage] and start macro. Press macro key again to check each subsequent channel.

[At] [0] [Enter] [+] [Full]
Macro line reads: **At 0 Enter + Full**

Auto channel check

This macro automatically runs through each channel with a two second wait between each channel. To pause the check, press [Macro Wait]. To resume macro, press macro key again.

[At] [0] [Enter] [+] [Full] [Macro Wait] [2] [Enter] [M#]
Macro line reads: **At 0 Enter + Full Mwait2 M#**
(**#** = this macro's macro number**)**

Turn off all lights except work lights

This macro captures all channels and sets them to zero. This overrides all faders and submasters. Then the macro sets work lights at full. You can easily return to previous settings by pressing [Rel] to release captured channels.

[Channel] [1] [Thru] [–] [At] [0] [Enter] [Channel] [#] [Full]
Macro line reads: **Chan 1 Thru - At 00 Enter Chan # Full (#**=work lights channel**)**

Clear faders and turn work lights on

This macro clears both faders and selects work lights.

[Clear AB] [Clear CD] [Channel] [#] [Full]
Macro line reads: **Clear-AB Clear-CD Chan # Full**
(**#**=work lights channel**)**

Clear unused channels in Flexichannel mode

This macro clears channels that are visible, but no longer in use. (Because this macro uses a softkey, you must create it using Learn.)

[Setup] [1] [Enter] [S1] [Stage]
Macro line reads: **Setup 1 Enter PurgeFlexi Stage**

Record show on disk

This macro records the current show on disk.

[Setup] [3] [Enter] [1] [Enter] [Enter]
Macro line reads: **Setup 3 Enter 1 Enter Enter**

chapter 15
diskette functions

```
                        Disk Functions                    Menu
                          02:35 PM


              1 - Write Show To Disk
              2 - Read Show From Disk
              3 -
              4 - Format Disk







              Select function number, then press ENTER


   S1        S2        S3        S4        S5        S6        S7        S8

                                                                      Return
```

This chapter includes instructions for using Expression 2x's diskette options. Expression 2x is equipped with a 3.5-inch, high density diskette drive on the console's right end panel. It allows you to save backup copies of shows on diskette. The following options are described in this chapter:

- Formatting diskettes
- Recording a show on diskette
- Reading a show from diskette

Diskette management

Expression 2x's diskette drive lets you save one show per high density 3.5-inch computer diskette. This allows you to work on more than one show at a time or to use more than 600 cues for your production by loading a second show into memory.

Label each diskette carefully and clearly to help you keep track of what show is on the diskette. You can also use the Read Show from Disk option to find out the name, storage date and time of the show on any diskette.

Note: For information on naming a show in the Setup menu, see page 29.

We recommend that you make two back-up copies of each show on separate diskettes and that you keep them in different locations. If your show diskette were damaged, a back-up diskette stored at home could save you hours of work.

When you select diskette options, any fades in progress are stopped. Therefore, if you need to load an additional show in the middle of a performance, load it between cues when all channels are static. Fader and submaster outputs are maintained as the new show loads.

Before you can use a diskette in Expression 2x, you must format it on the console or on an IBM PC-compatible with a high-density drive. Formatting instructions are on the following page.

Storing diskettes

- Store diskettes at a temperature between 50 and 140 degrees Fahrenheit.
- Keep diskettes away from magnets, magnetized objects or heavy electrical equipment, including large lighting equipment.
- Do not touch the magnetic disk inside the plastic diskette case.
- Do not eat, drink or smoke when you handle diskettes.

Formatting diskettes

Warning: Formatting a diskette erases all information recorded on the diskette. Formatting does not affect show in console.

Before you can use a diskette in an Expression 2x, you must format it on either an Expression 2 line console or a standard PC-compatible personal computer. To format a diskette on Expression 2x, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Press [3], **Disk Functions**, [Enter].	Selects Diskette Functions menu
3. Insert standard 3.5-inch, high-density diskette in disk drive.	
4. Press [4], **Format Disk**, [Enter].	The following screen appears:

```
                  To format disk, press ENTER
                  To cancel, press CLEAR




         (Use double sided, high density (1.44MB) disk only)
```

5. Press [Enter] to format the diskette, or press [Clear] to cancel the format command.	Message appears on screen: **Formatting disk - Do not remove from drive.** Message remains until disk is formatted

Warning: When you select this option, any fade in progress stops; once the formatting process is complete, the fade jumps to the point it would have reached if it hadn't been interrupted.

Recording a show on diskette

When you record a show to diskette, all system settings, patch settings, cues, groups, submasters, effects, and any other information that you have in the console at the time you record the show, are saved. We recommend that you keep at least two backup copies of each show on diskette.

When using the record option, any fades being executed are interrupted during the record operation; fades resume when record is complete. To record a show from memory to a diskette follow these steps:

Keystrokes: **Action:**

1. Insert a formatted diskette in disk drive.

2. Press [Setup].   Selects Setup display

3. Press [3], **Disk Functions**,   Selects Diskette Functions menu
    [Enter].

4. Press [1], **Write Show to**   The following screen appears:
    Disk, [Enter].

```
        To record show onto disk, press ENTER
               To cancel, press CLEAR


     Show:  Not Recorded



     (Use double sided, high density (1.44MB) disk only)
```

5. Press [Enter], or press   Message appears on screen:
    [Clear] to cancel the   **To disk in progress**. Message
    operation.   remains until show is recorded

Reading a show from diskette

When you read a show and system settings from a diskette and load it into memory, the new show completely overwrites the current show, including channel and dimmer counts and default times and level. Therefore, if you want to keep the current show, follow the instructions on page 184 to record current show before you read a new show from diskette. If your Designer's Worksheet setup is different in the new show, a message will warn you.

Fades being executed are interrupted during the read operation; fades resume when read is complete. To read all information from diskette into memory follow these steps:

Keystrokes:	Action:
1. Insert diskette in disk drive.	
2. Press [Setup].	Selects Setup display
3. Press [3], **Disk Functions**, [Enter].	Selects Diskette Functions menu
4. Press [2], **Read Show from Disk**, [Enter].	The following screen appears. Show information is displayed, including show name, date recorded, etc

```
          To read show from disk, press ENTER
                To cancel, press CLEAR


      Show:   The Garden Plot          16 Feb 94   11:30



      (Use double sided, high density (1.44MB) disk only)
```
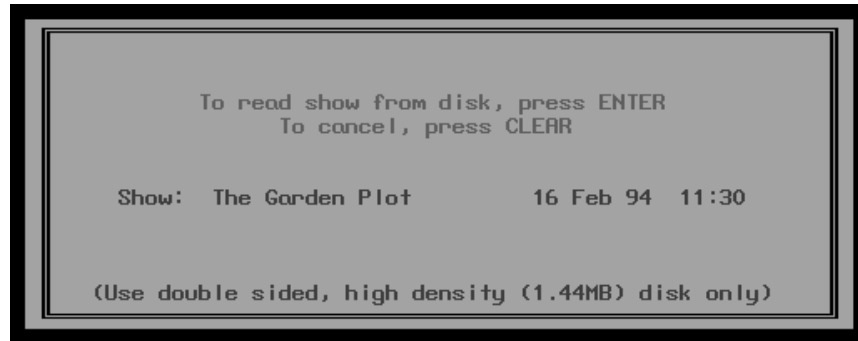
5. Press [Enter], or press [Clear] to cancel the operation.	Message appears on screen: **From disk in progress**. Message remains until show is loaded

chapter 16
printing

Expression 2x supports parallel printers, including some laser printers. Printer installation is described on page 303 of *Appendix A, Installation*. This chapter includes instructions for using Expression 2x's print options. Each of the following printouts is explained and illustrated on the following pages.

- Stage display
- Cues
- Groups
- Submasters
- Cue list
- Group list
- Submaster list
- Macros
- Patch
- Channel attributes
- Real Time Programs
- SMPTE events
- Tracksheet

Printer options

Before you begin printing, verify that your printer is installed correctly and that it is turned on. For instructions on installing printers, see *Appendix A, Installation*.

All print options are located on the Print Functions menu. To display the menu press [Setup], then select [5], **Print Functions**, and press [Enter]. Expression 2x displays the Print Functions menu illustrated below.


```
                    Print Functions                    Menu
                       02:35 PM

              1 - Print Stage Display
              2 - Print Cues
              3 - Print Groups
              4 - Print Submasters
              5 - Print Cue List
              6 - Print Group List
              7 - Print Submaster List
              8 - Print Macros
              9 - Print Patch
             10 -
             11 - Print Channel Attributes
             12 -
             13 - Print SMPTE Events
             14 - Print Tracksheet



            Select function number, then press ENTER


   S1        S2        S3        S4        S5        S6        S7        S8
  Stop     Pause
 Printer  Printer                                                     Return
```

You may pause the current printing job or cancel it at any time while print-ing. To stop the printer temporarily while it is printing, press [S2], **Pause Printer**. The printer prints a few more lines, then stops and waits. Press [S2] again to resume printing. To cancel a print job, press [S1], **Stop Printer**. The printer prints a few more lines, then stops.

Stage display

Print Stage display prints channel settings as they currently appear on Stage. To print a Stage display report, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [1], **Print Stage Display**, [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
4. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

Cues

Print Cues prints a list of cues recorded in the currently loaded show. Cues are listed by number. Information provided includes all cue attributes and levels of all channels included in each cue. To print a full list of cues, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [2], **Print Cues**, [Enter].	Prompt reads: **Press ENTER to print all cues, or select 1st cue number to print**
4. Press [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
5. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

To print a partial list of cues from the Print menu, follow these steps:

Keystrokes:	Action:
1. Press [2], **Print Cues**, [Enter].	Prompt reads: **Press ENTER to print all cues, or select 1st cue number to print**
2. Use the keypad to enter the first cue in the range you wish to print. Press [Enter].	Prompt reads: **Press ENTER to print cue, or select last cue number to print**
3. Use the keypad to enter the last cue in the range you wish to print. Press [Enter].	File sent to the printer

Groups

Print Groups prints a list of groups recorded in the currently loaded show. Groups are listed by number. Information provided includes the group's label and the levels of all channels included in each group.

To print a full list of groups, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [3], **Print Groups**, [Enter].	Prompt reads: **Press ENTER to print all groups, or select 1st group number to print**
4. Press [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
5. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

To print a partial group printout from the Print menu, follow these steps:

Keystrokes:	Action:
1. Press [3], **Print Groups**, [Enter].	Prompt reads: **Press ENTER to print all cues, or select 1st cue number to print**
2. Use the keypad to enter the first group in the range you wish to print. Press [Enter].	Prompt reads: **Press ENTER to print cue, or select last cue number to print**
3. Use the keypad to enter the last group in the range you wish to print. Press [Enter].	File sent to the printer

Submasters

Print Submasters prints full information about all 240 submaster memories. Submasters are listed by number. Upfade, dwell and downfade times, and rates and labels are included in the printout. Levels of all channels included in each submaster are also provided. To print a full list of submasters, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print menu
3. Press [4], **Print Submasters**, [Enter].	Prompt reads: **Press ENTER to print all submasters, or press PAGE to select submasters to print**
4. Press [Enter].	File sent to the printer

To print a partial submaster list, follow these steps:

Keystrokes:	Action:
1. Press [4], **Print Submasters**, [Enter].	Prompt reads: **Press ENTER to print all submasters, or press PAGE to select submasters to print**
2. Press [Page].	Prompt reads: **Select submaster page to print, then press ENTER (1 = Page 1, 2 = Page 2, 0 = All pages)**
3. Press [0], [1] or [2], then press [Enter].	Prompt reads: **Press ENTER to print all submasters, or select 1st submaster to print**
4. Use the keypad to enter the first submaster in the range to print. Press [Enter].	Prompt reads: **Press ENTER to print submaster, or select last submaster to print**
5. Use the keypad to enter the last submaster in the range to print. Press [Enter].	File sent to the printer

Cue List

Cue List prints a list of cues recorded in the currently loaded show as well as all cue attributes. Cues are listed by number. To print a full cue list print-out, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [5], **Print Cue List**, [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
4. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

Group List

Print Group List prints a list of groups recorded in the currently loaded show. Groups are listed by number. Information provided includes each group's label.

To print a full group list printout, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [6], **Print Group List**, [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
4. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

Submaster List

Print Submaster List prints full information about all 240 submaster memories. Submasters are listed by number. Upfade, dwell and downfade times, and rates and labels are included in the printout.

To print a full submaster list printout, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [7], **Print Submaster List**, [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
4. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

Macros

Print Macros prints a list of macro sequences recorded in the currently loaded show. Macros are listed by number. The printout provides complete information about each macro and its keystrokes.

To print a full macro list, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [8], **Print Macros**, [Enter].	Prompt reads: **Press ENTER to print all macros, or select 1st macro number to print**
4. Press [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
5. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

To print a partial macro list from the Print menu, follow these steps:

Keystrokes:	Action:
1. Press [8], **Print Macros**, [Enter].	Prompt reads: **Press ENTER to print all macros, or select 1st macro number to print**
2. Use the keypad to enter the first macro in the range you wish to print. Press [Enter].	Prompt reads: **Press ENTER to print macro, or select last macro number to print**
3. Use the keypad to enter the last macro in the range you wish to print. Press [Enter].	File sent to the printer

Patch

Print Patch prints the current dimmer-to-channel patch. To print a full patch report, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [9], **Print Patch**, [Enter].	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
4. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

Channel Attributes

Print Channel Attributes prints a list of channel attributes or a list of Link List links recorded in the currently loaded show.

To print a full Link List or list of channel attributes, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [1][1], **Print Channel Attributes**, [Enter].	Prompt reads: **Select attributes to print, then press ENTER** **(1 = Channel Attributes,** **2 = Link List, 0 = both)**
4. Press [0], [1] or [2], then press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

Real Time Programs

Print Real Time Programs prints a list of programs recorded in the currently loaded show. The printout provides complete information about the programs.

To print a full list of programs, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [1][2], **Print Real Time Programs**, [Enter].	Prompt reads: **Press ENTER to print all program events, or select first program number to print**
4. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

SMPTE events

Print SMPTE Events prints a list of events recorded in the currently loaded show. The printout provides complete information about the events.

To print a full SMPTE program, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [1][3], **Print SMPTE Events**, [Enter].	Prompt reads: **Press ENTER to print all SMPTE events, or select first event number to print**
4. Press [Enter], or press [Clear] to cancel the print operation.	File sent to the printer

Tracksheet

Print Tracksheet lists channel tracking information from your Tracksheet. To print a track for any channel, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [5], **Print Functions**, [Enter].	Displays Print Functions menu
3. Press [1][4], **Print Track-sheet**, [Enter].	Prompt reads: **Select channel number to track, then press ENTER**
4. Enter channel number, then press [Enter].	File sent to the printer

chapter 17
clear functions

This chapter includes instructions for using Expression 2x's clear options. Each of the following clear functions is explained and illustrated on the following pages.

- Show
- Cues
- Groups
- Submasters
- Show and patch
- Designer's Worksheet
- Macros
- Reset patch
- Channel attributes
- Real Time Programs
- SMPTE events
- Reset system

Clear functions

Each option on the Clear Functions menu erases information regarding an Expression 2x function from the console's memory. If that information is saved in a show on a diskette, it can be restored to the console. Otherwise, the information is lost permanently.

Warning: Be certain to save your shows on disk before erasing information you may need in the future. See Chapter 16, Diskette functions, for information about saving shows.

All clear options are located on the Clear Functions menu. To display the menu, press [Setup], then select [4], **Clear Functions**, and press [Enter]. Expression 2x displays the Clear Functions menu illustrated below.

```
                    Clear Functions              Menu
                       02:38 PM


             1 - Clear Show
             2 - Clear Cues
             3 - Clear Groups
             4 - Clear Submasters
             5 - Clear Show and Patch
             6 -
             7 - Clear Designer's Worksheet
             8 - Clear Macros
             9 - Reset Patch 1-to-1
            10 -
            11 - Clear Channel Attributes
            12 -
            13 - Clear SMPTE Events



         Select function number, then press ENTER



    S1       S2       S3       S4       S5       S6       S7       S8
  Reset
  System                                                          Return
```

Show

Clear Show erases all information associated with a specific show from your console's memory. This does not include patch information or system configuration information.

To erase a full show, follow these steps:

Keystrokes:	**Action:**
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [1], **Clear Show**, [Enter].	Prompt reads: **To clear show data, press ENTER To cancel, press CLEAR**
4. Press [Enter].	Show cleared. Returns to Stage display mode

Cues

Clear Cues erases all recorded cues from a show.

To erase all cues, follow these steps:

Keystrokes:	**Action:**
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [2], **Clear Cues**, [Enter].	Prompt reads: **To clear cues, press ENTER To cancel, press CLEAR**
4. Press [Enter].	Cues cleared. Returns to Setup menu

Groups

Clear Groups erases all recorded groups from a show.

To erase all groups, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [3], **Clear Groups**, [Enter].	Prompt reads: **To clear groups, press ENTER To cancel, press CLEAR**
4. Press [Enter].	Groups cleared. Returns to Setup menu

Submasters

Clear Submasters erases all recorded submasters from a show.

To erase all submasters, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [4], **Clear Submasters**.	Prompt reads: **To clear submasters, select page and press ENTER (0 = All pages)**
4. Press [Enter].	Submasters cleared. Returns to Setup menu

Show and Patch

Clear Show and Patch erases all information associated with a specific show from your console's memory, including patch information and system configuration information.

To erase a full show and patch, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [5], **Clear Show and Patch**, [Enter].	Prompt reads: **To clear show and patch, press ENTER** **To cancel, press CLEAR**
4. Press [Enter].	Show cleared. Returns to Stage display mode

Designer's Worksheet

Designer's Worksheet erases all regions from the Designer's Worksheet layout. Macros assigned to the regions are not erased.

To erase all regions, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [7], **Clear Designer's Worksheet**, [Enter].	Prompt reads: **To clear Designer's Worksheet, press ENTER** **To cancel, press CLEAR**
4. Press [Enter].	Designer's Worksheet regions cleared. Returns to Setup menu

Macros

Clear Macros erases all macro information from a show.

To erase all macros, follow these steps:

Keystrokes: **Action:**

1. Press [Setup]. Displays Setup menu

2. Press [4], **Clear Func-** Displays Clear Functions menu
   tions, [Enter]. Prompt reads: **Select function**
   number, then press ENTER

3. Press [8], **Clear Macros**, Prompt reads:
   [Enter]. **To clear macros, press ENTER**
   To cancel, press CLEAR

4. Press [Enter]. Macros cleared
   Returns to Setup menu

Reset 1-to-1 Patch

Reset Patch 1-to-1 resets your console's patch to a one-to-one, patch.
Thus, channel 1 is patched to dimmer 1, channel 2 is patched to dimmer
2, and so on. This function is independent of your show. It does not clear
label, level or profile settings. See *Chapter 5, Patch*, for more information
about patch.

To clear all patch information, including label, level and profile settings,
press [Setup] [4] [Enter] and select Clear Show and Patch or press [S1],
Reset System.

To reset your patch, follow these steps:

Keystrokes: **Action:**

1. Press [Setup]. Displays Setup menu

2. Press [4], **Clear Func-** Displays Clear Functions menu
   tions, [Enter].

3. Press [9], **Reset Patch** Prompt reads:
   1-to-1, [Enter]. **To reset patch, press ENTER**
   To cancel, press CLEAR

4. Press [Enter]. Patch is reset. Returns to Setup menu

Channel Attributes

Clear Channel Attributes erases all channel attribute information from a show.

To erase all channel attribute information, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [1][1], **Clear Channel Attribute**, [Enter].	Prompt reads: **To clear channel attributes, press ENTER** **To cancel, press CLEAR**
4. Press [Enter].	Channel attribute and Link List settings are cleared. Returns to Setup menu

Real Time Programs

Clear Real Time Programs erases all program information from a show.

To erase all programs, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [1][2], **Clear Real Time Programs**, [Enter].	Prompt reads: **To clear all real time clock programs, press ENTER** **To cancel, press CLEAR**
4. Press [Enter].	Programs cleared. Returns to Setup menu.

SMPTE

Clear SMPTE Events erases all SMPTE information from a show.

To erase all SMPTE events, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [1][3], **Clear SMPTE Events**, [Enter].	Prompt reads: **To clear all SMPTE events, press ENTER** **To cancel, press CLEAR**
4. Press [Enter].	SMPTE events cleared. Returns to Setup menu.

Reset system

Reset System erases all show information from the console, resets your patch, and resets all configuration information to factory defaults.

To reset Expression 2x, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Displays Setup menu
2. Press [4], **Clear Functions**, [Enter].	Displays Clear Functions menu Prompt reads: **Select function number, then press ENTER**
3. Press [S1], **Reset System**.	Prompt reads: **To clear entire system and reset to default settings, press ENTER** **To cancel, press CLEAR**
4. Press [Enter].	System resets and returns to Stage mode display

chapter 18
accessories

This chapter includes instructions for working with the following Expression 2x accessories:

- Remote Focus Unit (RFU)

- Infrared Remote Focus Unit (IRFU)

- Designer's Worksheet

- Alphanumeric keyboard

- Full Tracking Backup

For accessory installation instructions, see *Appendix A, Installation.* For purchase information, please contact your local dealer or ETC.

Remote Focus Unit (RFU)

The Remote Focus Unit (RFU) is a small, portable control panel you can use from a remote location, such as in the house, on your studio set or from backstage. You can use an RFU with or without a remote monitor.

Remote Focus Unit
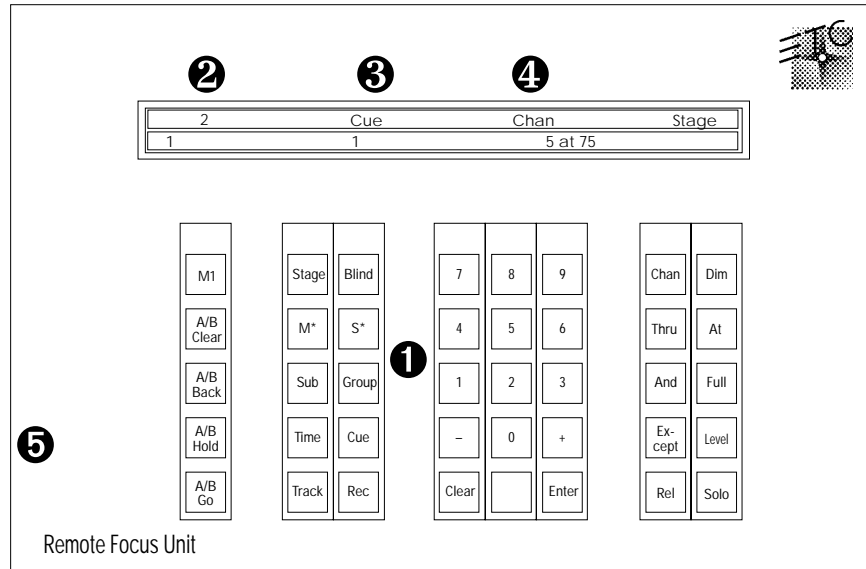
❶ Keypad
The keys on the RFU's keypad function exactly like their counterparts on the console.

❷ Fader window
The top line displays the next cue on the cue list. The bottom line displays the cue in the A/B fader on the left and the cue in the C/D fader on the right.

❸ Cue/channel number window
Displays the currently selected cue, group or submaster

❹ Keypad prompt window
Displays the same prompt that appears in the upper right corner of the Stage or Blind display.

❺ Power switch
Power switch is on in the up position and off in the down position.

For RFU installation instructions see *Appendix A, Installation.* RFU must be turned **Off** before you install it. For instruction on installing a remote monitor, see *Installing remote video monitors* on page 321.

To operate your installed RFU, move power switch to **On**.

The console keypad and RFU are able to operate simultaneously. Changes made from both console and RFU are displayed immediately on both console monitor and RFU.

You can control most console functions with RFU; you cannot control submasters, however.

Warning: Do not connect or disconnect the RFU when it is turned on.

Infrared Remote Focus Unit (IRFU)

The Infrared Remote Focus Unit (IRFU) allows you to control the Expression 2x console from distances up to 50 meters. With it you can play back cues and macros, and access dimmers, channels, groups, and cues. The IRFU can also be wired to the main control console. To enable the IRFU in Expression 2x, ETC must modify the console at the factory and setup options must be adjusted. See *Installing Infrared Remote Focus Unit* on page 323 for more information.
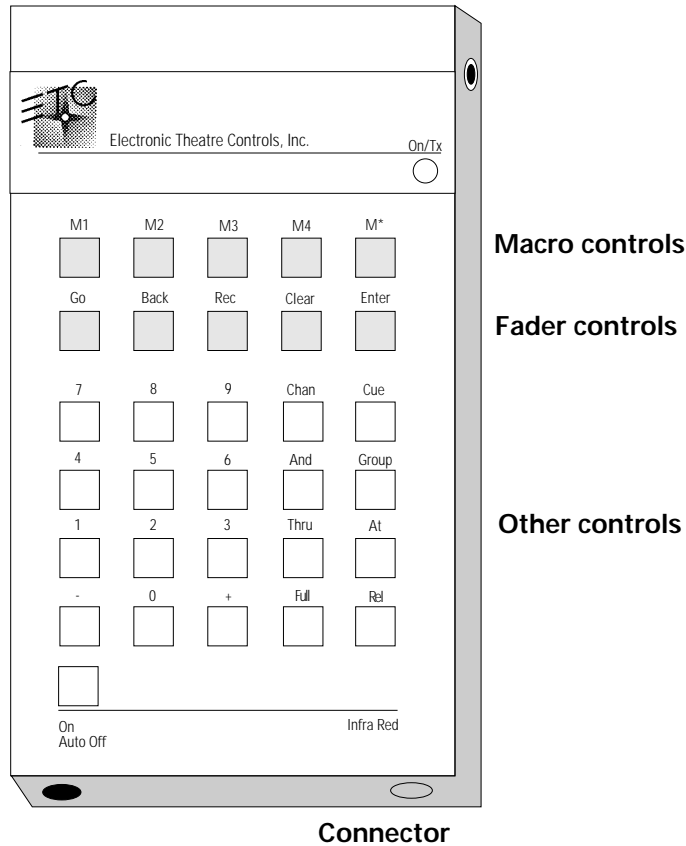
Macro controls

The five macro keys allow you to access macros. M1, M2, M3, and M4 allow you to access macros 1,951 through 1,954. M* allows you to enter any other macro. To access other macros, press [M*], enter the desired macro number, and press [Enter].

Fader controls

The fader control keys allow you to play back cues in the console's cross-faders. [Go] controls the AB fader pair; the remaining keys function as on the console keypad.

Other controls

The remaining controls enable you to select dimmers, channels, groups, and cues. Keys function as they do on the console keypad.

Connector

Connector for hard wire connection to receiving unit.

Press [On] key on the infrared controller to turn power on. The unit shuts off after three minutes if no key is pressed. The unit is powered by a 9V, size PP3 battery.

Console controls and the infrared controller may operate simultaneously. Changes made from both console and infrared controller are displayed immediately on the console monitor.

Designer's Worksheet

Designer's Worksheet gives you control of the console from remote locations such as in the house, on the set, or backstage. The Designer's Worksheet is a digitizer tablet that emulates the console face panel and provides user-definable regions. All functions may be selected using the stylus supplied with the Designer's Worksheet.

If you have not yet installed your Designer's Worksheet, see *Appendix A, Installation.*

Three digitizer templates are available. The correct template for your worksheet depends on your digitizer's size. Each digitizer allows you to program up to 2,000 regions, each of which may be associated with a macro.

12 x 12 inch digitizer

If you own a 12 x 12 inch digitizer, you can select one of two digitizer layouts. One layout provides control of submasters and faders, while the other deletes the submasters for increased workspace area.

12 x 17 inch digitizer tablet

The 12 x 17 layout provides control of fader keys and all console functions other than submasters, fader sliders, and the Grandmaster slider.

Note: You may control submaster sliders from either the console or the digitizer, but not both. Use the Designer's Worksheet Setup display to select this option. See Setting Designer's Worksheet options on page 22 for information on the Designer's Worksheet Setup display.

Using the Designer's Worksheet

To use the Designer's Worksheet to control console keys, touch the corresponding area on the worksheet with the stylus. To use submaster sliders or the wheels, drag the stylus along the corresponding control strip.

The remaining area of the tablet is available for user-definable regions. To each of these regions you may assign a macro containing a sequence of up to 50 console keystrokes. Each region's macro can execute cues, manipulate channel levels or execute any series of keystrokes. Once you assign a macro to a region, start the macro by touching the region on the tablet.

For example, you might draw a picture of the stage and outline regions corresponding to various instruments or fixtures on stage or in a studio. You might program each region to select the channels for that area of the stage. You can then touch that region to select channels, and then enter desired level.

Or, you might program more abstract regions on the worksheet. For example, you might program several areas on the worksheet, each representing a song in a band's play list.

Programming regions

Before you begin programming, design your worksheet regions by draw-
ing them on the worksheet tablet provided. Be certain that the tablet has
been calibrated. See *Appendix A, Installation*, for details on calibrating the
tablet. Place your drawing under the clear plastic cover sheet, and you're
ready to start.

To create new or edit existing regions and macros, follow these steps:

Keystrokes:	Actions:
1. Turn Designer's Work-sheet on.	
2. With the worksheet pen, touch [Setup].	Selects Setup display
3. Select 7, **Designer's Worksheet Editing**, and touch [Enter].	Prompt reads: **Select region number or touch a previously defined region, then touch ENTER** Expression 2x displays the following screen

Insert Mode | Designer's Worksheet Editing | Region 1
02:39 PM

Region Operation(s)

R 1   Setup 1 Enter 7 Enter 0 Enter Enter Stage

R 2   Setup 1 Enter 7 Enter 1 Enter Enter Stage

R 3   Bump24

R 4   Setup 1 Enter 1 0 Enter DWS-Sliders Stage

R 5   M6

R 6   Bump1 Mwait-0 Bump2 Mwait-0 Bump3 Mwait-0 Bump4 Mwait-0 Bump5
Mwait-0 Bump6 Mwait-0 Bump7 Mwait-0 Bump8 Mwait-0 Bump9 Mwait-0 Bump10
Mwait-0 Bump11 Mwait-0 Bump12 Mwait-0 Bump13 Mwait-0 Bump14 Mwait-0
Bump15 Mwait-0 Bump16 Mwait-0 Bump17 Mwait-0 Bump18 Mwait-0 Bump19
Mwait-0 Bump20 Mwait-0 Bump21 Mwait-0 Bump22 Mwait-0 Bump23 M6

10   Setup 1 Enter PurgeFlexi Stage

Select region number or touch a previously defined region,
then touch ENTER

S1	S2	S3	S4	S5	S6	S7	S8
Select Region	Replace	Delete Entry	On Sub-Bump	Off Sub-Bump	Clear Region	Copy Region	Return

4. Enter the new region num-ber, or select an existing region, either by touching the region or by entering its number from the key-pad.	
5. Touch [Enter].	Prompt reads: **Outline region or touch ENTER to continue**

6. To create a new region or to add to an existing region, trace the area you want to define for that region number, then press [Enter]. To keep an existing region, touch [Enter].

The console displays a highlighted **R** next to the macro number to indicate that it has been assigned to a region Prompt reads:
Select operations for this region Touch ENTER MACRO when done

7. Touch desired keystrokes to create a new macro assigned to the new region.

As you touch keys on the worksheet or console, they are displayed on the editing screen

8. Use the arrow keys to edit macros, if necessary. Macro editing is described in greater detail in *Chapter 15, Working with macros.*

9. Press or touch [Enter Macro] to save the macro. Each macro has a 50 keystroke limit.

Prompt reads:
Select region number or touch a previously defined region, then touch ENTER

10. Enter another macro or edit an existing macro by following steps 4 through 9. Or, return to another mode by touching the appropriate key.

Hint: If you need to exceed the 50 keystroke limit, link another macro to the end by entering its number as the last keystroke, then enter the rest of your commands in the linked macro.

Macro Wait

To program a pause in the macro, press [Macro wait]. Expression 2x displays **Mwait-0**. Enter the length of the pause in minutes and seconds, or as a fraction of a second in decimal form from .1 second to 99:59 minutes.

Copying regions

You may want to copy a region or use regions as building blocks for new regions. To copy contents of one region to another, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [7], **Designer Work-sheet Editing**, and press [Enter].	Selects Macro display mode Prompt reads: **Select region number or touch a previously defined region, then touch ENTER**
3. Press [S7], **Copy Region**.	Prompt reads: **To copy region(s), select region number(s) to copy and touch ENTER** **To cancel, touch CLEAR**
4. Press [2] [Enter].	Prompt reads: **To copy selected region(s), select target region and touch ENTER** **To cancel, touch CLEAR**
5. Press [Enter].	Prompt reads: **To copy selected macro(s), select target macro and press ENTER** **To cancel, press CLEAR**
6. Press [2][5], the number of the new region.	Corner reads: **Region 25**
7. Press [Enter].	Region copy is complete. The contents of region 2 have been copied into region 25

Note: In step 4, you may use [And] and [Thru] to enter multiple regions to copy. If you do, the new regions will be numbered consecutively, starting with the region you enter in step 6.

Clearing regions

You must be in Designer's Worksheet Editing display mode to clear individual regions. To clear all regions, you can use the Clear Designer's Worksheet option from the Clear Functions menu, as described on page 203.

Note: Clearing regions does not affect the macro assigned to the region. Clearing a region removes it from the digitizer and the Designer's Worksheet display, and removes the macro assignment.

To clear regions, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [7], **Designer's Worksheet Editing**, and press [Enter].	Selects Designer's Worksheet Editing display mode
3. Press [S6], **Clear Region**.	Prompt reads: **To clear region(s), select region number(s) and touch ENTER** **To cancel, touch CLEAR**
4. Press [7].	Selects region 7 to clear Corner reads: **Region 7**
5. Press [Enter].	Prompt reads: **To confirm, touch ENTER** **To cancel, touch CLEAR**
6. Press [Enter] to clear the region or [Clear] to cancel the action.	Clears region 7 from the Designer's Worksheet layout; removes the assignment of macro 7 to region 7

Alphanumeric keyboard

Expression 2x supports a standard alphanumeric keyboard. The keyboard allows you to assign names to cues, dimmers, submasters, groups and shows.

See *Installing an alphanumeric keyboard* on page 302 for installation information.

Naming cues, submasters, groups, and shows

You can use the alphanumeric keyboard to assign names to cues, submasters, groups, and shows. Names can consist of letters, numbers or the symbols **#**, **%**, **&**, *****, **(**, **)**, **+**, **'**, **-**, **[**, **]**, **/** as well as the comma and period.

Follow these steps to name a cue, submaster or group:

1. Press [Stage], [Blind] or [Fader] to select a display mode.

2. Press [Cue], [Submaster] or [Group], then use the console's number keys to select the desired cue, submaster or group.

3. Press [Label] on the console or [F5] on the keyboard, and type the desired name on the alphanumeric keyboard. Names can have up to 16 characters.

   You may enter the name using overwrite or insert mode. In overwrite, you type over any previously entered characters; in insert mode, each new character pushes the previously entered characters one space to the right. Press [Insert] on the keyboard to toggle between insert and overwrite mode.

4. Press [Enter] on the alphanumeric keyboard to record the name, or press [Esc] to quit and return to the original Expression 2x display screen.

Note: Press [F8] on the alphanumeric keyboard to advance to the next cue, submaster or group. Press [F7] to go to the previous cue, submaster or group. Press [F6] to clear the name from the cursor to the end of the line.

Naming shows

To name a show, press [Setup] [S1], **Show Name**, then use the alphanumeric keyboard to enter the show's name.

Full Tracking Backup

Full Tracking Backup (FTB) allows you to connect two consoles, or one console and a Lighting Playback Controller (LPC), using one as a backup for the other. This provides you with a working console running your current show even if something happens to your main console.

Use the keyswitch on the back right corner of the console's face panel to switch from one processor to the other. The LEDs labeled **A** and **B** indicate which console is which, and which is the main console.

Note: Only the main console may be used to control outputs. The backup console (or LPC) remains inert until either the keyswitch transfers control to it or the link between the two consoles is broken.

The FTB system

In an FTB system, the main console's processor controls the lighting system. If the backup console's processor detects an interruption in operation of the main console's processor, the backup takes over. This happens with no effect on operation other than a warning message and a momentary pause (about five seconds).

When you turn the system on, the **A** console is the main processor, and the **B** console is the backup. Set DIP switches 2 and 3 on each console to determine which is **A** and which is **B**. Switch control from **A** to **B** or back by turning the **System** keyswitch.

Note: The B console will only be the main console if manually switched or if control switches due to a problem in A. See Appendix B for DIP switch information.

Backing up shows

When you turn an FTB system on, the show in console **A** (main) is loaded automatically into console **B** (backup). During operation, all keystrokes and slider moves entered on the main console are mirrored on the other console's displays. Changes and updates are recorded on both.

> *Warning: If you work on console **B** while console **A** or FTB is turned off, any changes you have made will be erased when you activate FTB. The show in console **A** always replaces the show in console **B** when an FTB system starts up.*
>
> *To avoid this, save the show on console **B** to a diskette before you reactivate FTB. Once the system is back on, you may load the show from the diskette onto console **A**.*

LEDs

Two LEDs labeled **A** and **B** are located in the back right corner of the consoles' face panels. On console A, the **A** LED is lit. On console B, the **B** LED is lit. The LED flashes on the backup console and is solid on the main console. If neither LED is lit, FTB is off, or has been interrupted.

Using Full Tracking Backup

To use Full Tracking Backup, follow these steps:

1. Turn system on. As part of the startup process, the show in console **A**'s memory is copied to console **B**, overwriting the contents of **B**.

2. If the show you want to run is not in **A**'s memory, insert the show diskette into the main console's diskette drive after the Stage display appears. Only the main console's diskette drive may be used when FTB is activated.

3. Read show into the main console's memory from diskette. The show is read simultaneously into the backup console. Continue using consoles normally.

If the main processor does not contact the backup processor within 30 seconds, the following message appears: **System B does not respond. System A is now operating as a stand-alone system. System B has been disconnected from the network. To reconnect System B to the network, you must reboot both System A and System B**.

Press [Clear] to remove the message. You can now use the main console in normal, single console operation.

If either console fails, the other console takes control automatically and allows you to use the functioning console in normal, single console operation.

If the link between the two consoles is interrupted, the system informs you and allows you to use both consoles in normal, single console operation.

Full Tracking Backup with an LPC

A Full Tracking Backup system may consist of two tracking consoles, or of one console and a Lighting Playback Controller (LPC). In a system that includes an LPC, the A/B keyswitch on the console remains active regardless of which processor is in control. You can always use the keyswitch to switch from one to the other.

For more information regarding running a show from an LPC, please refer to the *LPC QuickGuide* that came with your LPC.

chapter 19
sensor dimming

Expression 2x lighting control systems may be connected to ETC Sensor dimming systems via the ETCLink communication network. In this configuration, the Expression 2x can provide you with a wide range of system status information, including overall system status and specific information about individual dimmer modules and dimmer racks.

You may access ETCLink through the ETCLink Functions menu. Most of the dimmer, rack and system information accessible through Expression 2x displays is also available from your Sensor dimming system through the Control Electronics Module (CEM).

To reach the ETCLink Functions menu, press [Setup] [9] [Enter]. The following display appears:
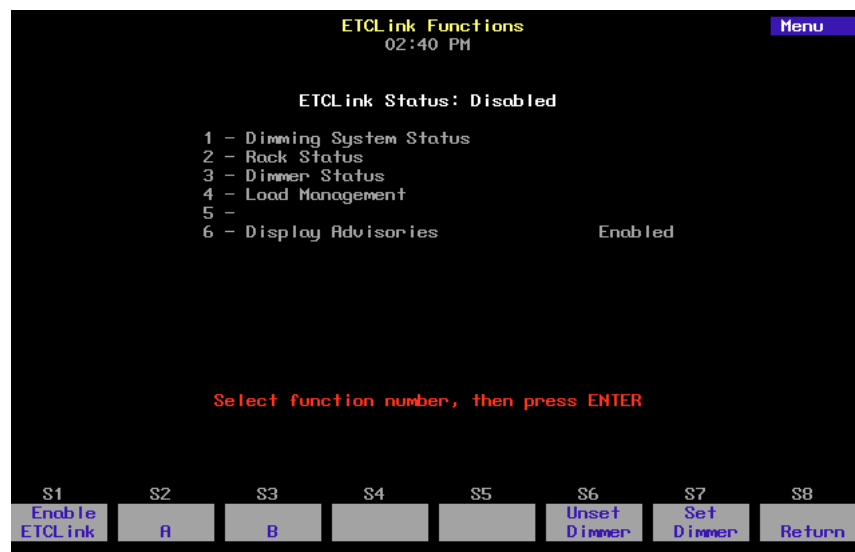
Enabling ETCLink

Before using ETCLink functions, you must connect the system to the ETCLink network. Follow these steps to activate your ETCLink connection, allowing you to monitor the dimming system:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup menu.
2. Select 6, **Options Settings**, and press [Enter].	Selects Options Settings menu
3. Press [8], **ETCLink**, [Enter].	Prompt reads: **Enable/disable ETCLink (1 = Enable, 0 = Disable**
4. Press [1] [Enter].	Dimmer Monitoring is enabled
5. If you wish to change the ETCLink address, press [9], **ETCLink Address**, [Enter].	Prompt reads: **Select ETCLink address**
6. Press [1] [Enter]. (ETCLink address may be **1** or **2**.)	ETCLink address is changed

Note: If you change the ETCLink address, you must cycle power to the console before the new address will take effect.

Enabling ETCLink messages

If you wish ETCLink advisory messages to be displayed while you are operating the console, you must enable them from the ETCLink Functions menu.

To enable advisories, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2 Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
3. Select [6], **Display Advisories**, and press [Enter].	Prompt reads: **Enable/disable display of ETCLink advisories (1 = Enable all, 2 = Enable fatal error advisories only, 0 = Disable)**
4. Press [1] [Enter].	All ETCLink advisories are enabled

Note: To disable some or all advisories, follow the same steps, but select **0** *or* **2** *in step 4*

Monitoring dimmers

When used in conjunction with Sensor dimming equipment, the Expression 2x allows you to monitor individual dimmer loads in your system. This can greatly simplify troubleshooting by identifying such things as burned out lamps, and incorrectly lamped or unplugged fixtures.

When dimmer monitoring is in use, Sensor electronics constantly monitor dimmer loads. If there is an unexpected fluctuation of more than 20 percent in the load on any dimmer, a message identifying the dimmer and describing the problem is displayed in a window on one of the console's display screens. (Note: Error messages are also displayed on the system's Sensor CEMs.)

In order to monitor normal dimmer loads, the system must first *learn* what constitutes a normal load. Record Loads is the operation that allows you to *teach* the system what the range of normal loads is. You may Record Loads either from the Expression 2x, or from a Sensor AF CEM.

You should run Record Loads any time you relamp your fixtures, change the type of fixtures you are using, change the dimmer numbering scheme, or make any other significant changes to your system. In general, Record Loads should be the last step in setting up your system. Loads are recorded from the Load Management display, shown above.

Note: Loads may not be recorded on Sensor systems without the AF option. See the Sensor CEM Users Manual for more information on recording loads from your dimming system.

Recording dimmer loads

When you Record Loads, the system records load information only for the dimmers set at a level above zero. Choose the dimmers you wish to record, set them to a level, then run Record Loads.

Record Loads records 24 dimmers per rack at a time until all dimmers at levels above zero have been recorded. (If you have multiple racks, 24 dimmers in each rack are recorded simultaneously.)

Note: On single phase racks, the system records 16 dimmers per rack at a time.

*Caution: Record Loads changes levels on stage. Dimmer outputs rise and fall for several minutes during the procedure. To cancel a Record Load operation that has already started, press [S7], **Cancel**, [Enter].*

Follow these steps to Record Loads for your system.

Keystrokes:	Action:
1. Set desired dimmers to a level above zero. Only dimmers at levels above zero are recorded.	
2. Press [Setup].	Selects Setup display
3. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
4. Select [4], **Load Management**, and press [Enter].	Selects Load Management display

Note: If you wish, instead of setting the desired dimmers to a level in step 1, you may enter a list of dimmers to record in step 5.

Keystrokes:	Action:
5. Press [S5], **Record Loads**. If you wish, you may enter a specific dimmer or dimmers to record.	Prompt reads: **To record loads, select dimmer(s) and press ENTER (Enter 0 to record loads for all dimmers)**
6. Press [0] [Enter].	Advisory reads: **New loads will be recorded for all dimmers with levels above zero. Levels on stage will change while the Record Load is in progress. The system will automatically vary the dimmer outputs during the Record Load. The process may take several minutes to complete.** Press [Enter] to proceed, or press [Clear] to cancel
7. Press [Enter] to proceed with the load record, or press [Clear] to cancel the operation.	New loads are recorded for all dimmers with levels above zero

Checking dimmer loads

Load Check compares the current load on selected dimmers with their recorded loads. Loads that differ by more than 20 percent are shown in the Load Management display. Use [Page +] and [Page –] to page through the display. The system checks load information only for selected dimmers. To identify the dimmer(s) you wish to check, use either the Expression 2x or the CEM to set the desired dimmers at a level above zero.

The system checks 24 dimmers per rack at a time until all dimmers at levels above zero have been checked. (If you have multiple racks, 24 dimmers in each rack are checked simultaneously.)

Note: On single phase racks, the system checks 16 dimmers per rack at a time.

*Caution: Load Check changes levels on stage. Dimmer outputs rise and fall for several minutes during the procedure. To cancel a check load operation in progress, press [S7], **Cancel**, [Enter].*

Follow these steps to check loads for your system.

Keystrokes:	Action:
1. Set dimmers to be checked to a level above zero. Only dimmers above zero are checked.	
2. Press [Setup].	Selects Setup display
3. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
4. Select [4], **Load Management**, and press [Enter].	Selects Load Management display

Note: If you wish, instead of setting the desired dimmers to a level in step 1, you may enter a list of dimmers to record in step 5.

5. Press [S4], **Load Check**. (You may enter specific dimmers to check.)

Prompt reads:
To check loads, select dimmer(s) and press ENTER (Enter 0 to check loads for all dimmers)

6. Press [0] [Enter].

Advisory reads:
All dimmers with levels above zero will have their loads checked. Levels on stage will change while the Load Check is in progress. The system will automatically vary the dimmer outputs during the Load Check. The process may take several minutes to complete.

Press [Enter] to proceed, or press [Clear] to cancel

7. Press [Enter] to proceed with the load check, or press [Clear] to cancel the operation.

Loads are checked for all dimmers with levels above zero

Once complete, advisory reads:
**Record Loads processing has completed
Press any key to continue**

Clearing dimmer loads

Clear Loads allows you to clear selected dimmer loads, thus disabling dimmer monitoring for those dimmers. This can be useful if you know that the load on a dimmer or group of dimmers will change over the course of a show and don't want to receive load error messages every time it happens.

To clear loads, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
3. Select [4], **Load Management**, and press [Enter].	Selects Load Management display
4. Press [S6], **Clear Loads**. (If you wish, you may enter a specific dimmer or dimmers to clear.)	Prompt reads: **To clear loads, select dimmer(s) and press ENTER (Enter 0 to clear loads for all dimmers)**
5. Press [0] [Enter].	Advisory reads: **Recorded loads will be erased for all dimmers with levels above zero, disabling load error messages for those dimmers.** **Press [Enter] to proceed, or press [Clear] to cancel**
6. Press [Enter] to proceed with the load clear, or press [Clear] to cancel the operation.	Loads are cleared for all dimmers with levels above zero Once complete, advisory reads: **Clear Loads processing has completed** **Press any key to continue**

Load errors

When a dimmer's load isn't within 20 percent of its recorded load, it generates a load error that appears on the Load Management display. The information shown on the Load Management display includes the dimmer number, the recorded load of the dimmer, and the actual load the system has detected for that dimmer.

Follow these steps to list all dimmers that have load errors:
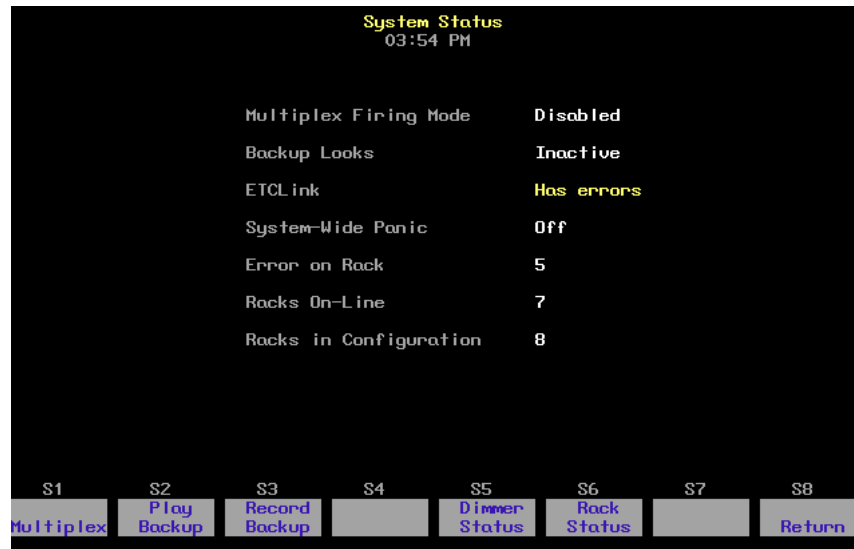
Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
3. Select [4], **Load Management**, and press [Enter].	Selects Load Management display

*Note: If you have a printer attached to your console, you may print the Load Errors screen. To print a list of dimmer load errors from this screen, press [S1], **Print Screen**. The console sends the Load Error list to the printer.*

Sensor dimming system status

The System Status display provides information about your Sensor dimming system. Press [Setup] [9] [Enter] [1] [Enter] to access the System Status display.

```
                        System Status
                          03:54 PM


              Multiplex Firing Mode      Disabled

              Backup Looks               Inactive

              ETCLink                    Has errors

              System-Wide Panic          Off

              Error on Rack              5

              Racks On-Line              7

              Racks in Configuration     8




     S1        S2        S3        S4        S5        S6        S7        S8
               Play      Record              Dimmer    Rack
   Multiplex   Backup    Backup              Status    Status              Return
```

- **Multiplex firing mode** shows whether Multiplex mode is enabled or disabled for your system. If Multiplex mode is disabled, dimmers in multiplex mode function as normal dimmers.

- **Backup looks** indicates whether a backup look is active, and, if so, which one.

- **ETCLink** displays any ETCLink errors.

- **System-wide panic** displays status of system-wide panic.

- **Error on rack** displays the number of the rack with an ETCLink error. If errors exist on multiple racks, the first rack with an error is displayed.

- **Racks on-line** displays the number of racks presently on-line throughout the ETCLink network.

- **Racks in configuration** displays the total number of racks in the system.

Dimmer rack status

The Rack Status display provides information about specified dimmer racks, including rack type, starting address, port information, voltage, frequency, and ambient temperature. Press [Setup] [9] [Enter] [2] [Enter] to access the Rack Status display. Press [S6], **Select Rack**, [#] [Enter] to select a specific rack, [+] to select the next rack, or [–] to view the previous rack.

```
                          Rack Status                    Rack 5
                           03:52 PM


        Rack: 5                          Has errors

             Rack Type                   Sensor-SP48
             Start Address               385
             Port A Type                 --
                  Status                 Ok
             Port B Type                 --
                  Status                 Ok
             Rack Voltage Phase A        118 VAC
                          Phase B        118 VAC
                          Phase C        118 VAC
             Rack Frequency              60 Hz
             Ambient Temperature         84 F

        Air flow blocked




                    Select rack number, then press ENTER

        S1      S2      S3      S4      S5      S6      S7      S8
                                System  Dimmer  Select
                                Status  Status  Rack
                                                                Return
```
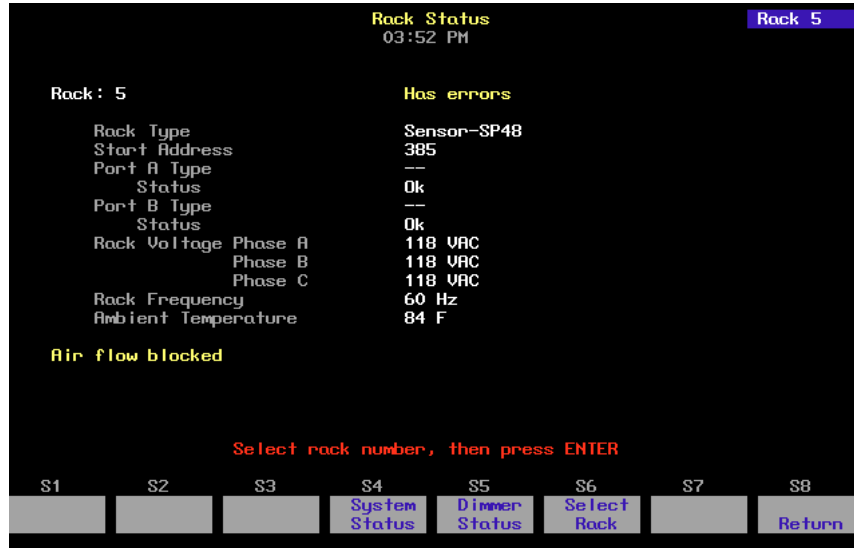
- **Rack type** displays the type of Sensor rack this rack is. Possible rack types include SR6, SR12, SR24, SR36, SR48, SP6, SP12, SP24, SP48, and may be followed by **AF** if the rack is equipped with Sensor's Advanced Features option.

- **Start address** displays the lowest dimmer number in the rack.

- **Port A/B type** indicates whether the port is normal or Multiplex. " -- " indicates a normal port.

- **Status** indicates the present status of the port.

- **Rack voltage** displays the input voltage for each of the three phases (A, B and C). Single phase racks only display values for A and C.

- **Rack frequency** displays the input frequency in hertz (Hz).

- **Ambient temperature** displays the temperature of the air drawn into the rack by the rack's fan. Ambient temperature is not displayed unless the fan is running.

Note: Rack error messages appear beneath the ambient temperature.

Dimmer status

The Dimmer Status display provides information about dimmers, including size and type, recorded load, firing mode, output curve, rack, slot, panic mode, and boost. Press [Setup] [9] [Enter] [3] [Enter] to access the Dimmer Status display.

```
                        Dimmer Status
                          03:55 PM

                                                    Has errors
 Dimmer   Type           Recorded Firing    Curve   Rack  Slot  Panic   Boost:
                         Load     Mode                          Mode
 1        20A Feedback   1200W    --         Square  1     1     --      --
 2        20A Feedback   650W     --         Square  1     1     --      102%
 3        20A Feedback   1200W    --         Square  1     2     --      116%
 4        20A Feedback   900W     --         Square  1     2     --      --
 5        20A Feedback   900W     --         Square  1     3     --      --
 6        20A Feedback   900W     --         Square  1     3     --      --
 7        20A Feedback   450W     --         Square  1     4     --      104%
 8        20A Feedback   700W     --         Square  1     4     --      --
 9        20A Feedback   0W       --         Square  1     5     --      --
 10       20A Feedback   0W       --         Square  1     5     --      --
 11       20A Feedback   0W       --         Square  1     6     --      --
 12       20A Feedback   0W       --         Square  1     6     --      --
 13       20A Feedback   0W       --         Square  1     7     --      --
 14       20A Feedback   0W       --         Square  1     7     --      --
 15       20A Feedback   0W       --         Square  1     8     --      --
 16       20A Feedback   0W       --         Square  1     8     --      --

            Press [+] or [-] to page through dimmers

   S1        S2        S3       S4        S5        S6        S7        S8
                               System    Select    Rack
                               Status    Dimmer    Status              Return
```

- **Type** shows the dimmer's amperage, and whether the dimmer is high-rise or standard. (**Feedback** indicates that the dimmers are Advanced Features modules.)

- **Recorded load** displays the load at which the selected dimmer was recorded.

- **Firing mode** indicates whether the dimmer is normal, multiplexed, or switched. "--" indicates a normal firing mode.

- **Curve** indicates the output curve assigned to the dimmer. "--" equals 00.

- **Rack** indicates the number of the rack where the dimmer is located.

- **Slot** indicates the number of the slot in the rack where the dimmer is located.

- **Panic mode** indicates whether the dimmer is assigned to a panic circuit. "--" indicates an unassigned dimmer.

- **Boost** indicates the dimmer's Boost level. "--" indicates a Boost level of 100 percent.

Up to 16 dimmers are shown on the display at once, along with error messages associated with each dimmer. Press [S5], **Select Dimmer**, [#] [Enter] to select a specific dimmer or use [+] and [–] to move through the list of dimmers a page at a time.

Setting and unsetting dimmers

If your console is connected to an ETC Sensor dimming system by an ETCLink network, you may use your console to set and unset dimmers at the dimmer rack.

Note: For more information on setting dimmers, see the Sensor CEM User Manual.

Setting a dimmer

To set a dimmer or group of dimmers to a level at the dimmer rack, ignoring any DMX512 outputs, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
3. Press [S7], **Set Dimmer**.	Prompt reads: **Select dimmer number(s) to set, then press ENTER** **(To cancel, press CLEAR)**
4. Enter the dimmers you wish to set and press [Enter].	Prompt reads: **Select dimmer level** **(Press FULL button for 100%)**
5. Enter the level at which to set the dimmers. Enter in two-digit form (e.g., one percent = **01)**	Advisory reads: **To confirm, press ENTER** **To cancel, press CLEAR**
6. Press [Enter].	Dimmers are set to desired level

Unsetting a dimmer

To unset a dimmer or group of dimmers and return them to normal operation, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
3. Press [S6], **Unset Dimmer**.	Prompt reads: **Select dimmer number(s) to unset, then press ENTER** **(Enter 0 to unset all dimmers)**
4. Enter the dimmers you wish to unset and press [Enter]. Press [0] [Enter] to unset all set dimmers.	Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
5. Press [Enter].	Dimmers are unset

Working with Sensor backup looks

A backup look is a recording of a selected look on stage stored in the Sensor CEM. The Sensor system allows you to use either your Expression 2x console or any CEM to bring that look up on stage. You may save and use up to 32 backup looks.

Recording a backup look

To record a backup look, follow these steps:

Keystrokes:	Action:
1. Use your console to create the desired look on stage.	Creates look on stage
2. Press [Setup].	Selects Setup display
3. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
4. Press [1], **Dimming System Status**, [Enter].	Selects System Status display
5. Press [S3], **Record Backup**.	Prompt reads: **Select backup look to record, then press ENTER**
6. Enter the backup look number (1-32) and press [Enter].	Advisory reads: **Record Backup processing has completed. Press any key to continue.**

Playing a backup look

Playing a backup look brings up the recorded look on stage. You may play back a backup look from the console or from a CEM.

Only one backup look may be on stage at a time. If there is a backup look on stage when you bring up a new one, the second look replaces the first.

Up and down fade times for backup looks are five seconds. They cannot be modified.

To use the Expression 2x to play a recorded backup look, follow these steps:

Keystrokes:	**Action:**
1. Press [Setup].	Selects Setup display
2. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
3. Press [1], **Dimming System Status**, [Enter].	Selects Dimming System Status display
4. Press [S2], **Play Backup**.	Prompt reads: **Select backup look to play, then press ENTER (Enter 0 to return to normal operation)**
5. Enter the backup look number (1-32) and press [Enter].	Advisory reads: **Play Backup processing has completed. Press any key to continue.**

Note: To clear a playing backup look follow the procedure listed above, but enter [0] in step 5 as the backup look number. The currently playing backup look will be cleared from the stage.

Error messages

ETCLink provides advisory messages for a wide variety of conditions, including information regarding your dimmers, racks, system, data, ports, and loads. These messages fall into two categories, fatal messages and secondary messages.

Fatal messages deal with anything that could potentially terminate or drastically change the look of your show. You may set fatal messages to be displayed even when secondary messages have been disabled.

Secondary messages deal with individual dimmer problems and warnings of potential rack temperature problems. These messages are generally less critical than the fatal messages. If you wish, secondary messages may be disabled without disabling fatal messages. See *Disabling secondary messages* on page 236 for more information.

Expression 2x displays error messages in advisory windows that appear regardless of which display mode you have chosen. They may also appear in abbreviated forms on the Status and About screens. Advisories are cleared as soon as you enter any keystroke.

For example, suppose the dimming system detects a problem with dimmer 1. As shown on the screen below, an advisory message appears, informing you of the problem.

See *ETCLink errors* on page 329 for a list of possible error messages.

Disabling secondary messages

You may prevent secondary ETCLink advisory messages from being displayed while you are operating the console. This is done from the ETCLink Functions menu.

For example, if you are rehanging a show, a large number of load errors will be generated despite the fact that nothing is actually wrong. Under these circumstances, you might want to turn off the secondary messages until the show is completely rehung and the new loads have been recorded. This would allow the board operator to use the console uninterrupted.

Note: See page 330 for a list of secondary messages.

To disable advisories, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [9], **ETCLink Functions,** and press [Enter].	Selects ETCLink Functions menu
3. Select [6], **Display Advisories**, and press [Enter].	Prompt reads: **Enable/disable display of ETCLink advisories** **(1 = Enable all, 2 = Enable fatal error advisories only, 0 = Disable)**
4. Press [0] [Enter].	All ETCLink advisories are disabled; to enable advisories, follow the same steps, but select **1** or **2** in step 4

chapter 20
control interfaces

Express allows you to control your console and/or remote devices using a variety of external and timed interfaces. This chapter describes the following choices:

- MIDI
- Real Time Clock
- DMX512 Input
- SMPTE
- Remote Macros

MIDI

MIDI (Musical Instrument Digital Interface) is a digital communication protocol that allows you to interconnect musical instruments and digital electronic equipment, such as lighting control consoles. If you are not familiar with MIDI and would like more information on how it works, *Control Systems for Live Entertainment*, by John Huntington, includes several sections that deal with the subject.

Expression 2x supports two versions of MIDI. In addition to ETC MIDI, a proprietary MIDI implementation developed by ETC, you may also use the entertainment lighting industry standard, MIDI Show Control 1.0 (MSC).

ETC MIDI

The console both transmits and receives MIDI messages with any MIDI instrument. The MIDI protocol can operate cues, macros and submaster bump switches.

ETC assumes that MIDI users have a working knowledge of MIDI. This section provides ETC MIDI interface information, message formats and message definitions. See *Installing MIDI* on page 309 for installation information. If you need more technical information about MIDI, contact ETC.

Note: Macros cannot execute MIDI commands.

Configuring ETC MIDI

The console must be configured to operate in MIDI mode. If you have any questions about this, please contact your dealer or ETC.

Once the console is on, the MIDI Channel must be set. Select 1, **ETC MIDI Channel** in the Options Settings menu.

The console operates at all times in MIDI Mode 3 or Omni = off/Poly. This means it only receives or transmits MIDI commands on the user-selected channel. The **Select MIDI Channel** function allows the user to specify the desired channel. Expression 2x ignores all MIDI commands on channels other than the specified one, so be sure your MIDI gear is set to the same channel. The console remembers the selected MIDI channel the next time it is turned on.

Follow these steps to configure Expression 2x for MIDI use:

1. Turn console on.

2. Press [Setup] to display Setup menu. Then select 6, **Options Settings**, and press [Enter] to display the Options Settings menu. The following display appears:

```
                    Options Settings                      Menu
                       01:03 PM

        1 - ETC MIDI Channel                12
        2 - MIDI Show Control Device IDs    122 / 5
        3 - DMX In Starting Channel         Disabled
        4 - Infrared Remote                 Disabled
        5 - SMPTE Input                     Disabled
        6 - SMPTE Frames Per Second         30
        7 - Display Cue List/SMPTE List     Cue List
        8 - Dimmer Monitoring               Disabled




              Select function number, then press ENTER


     S1      S2      S3      S4      S5      S6      S7      S8
   Disable
    MIDI                                                   Return
```
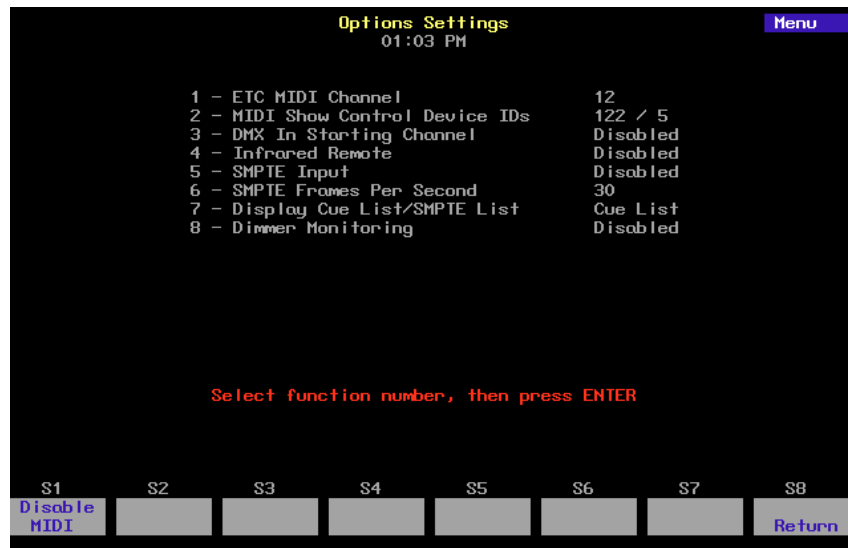
3. Select 1, **ETC MIDI channel**, and press [Enter].

4. Enter the MIDI channel you will use (1-16), and press [Enter]. Verify that your MIDI equipment is also set to the same channel. Expression 2x will ignore MIDI commands on other channels. Press [S1], **Disable MIDI**, to disable ETC MIDI mode.

ETC MIDI message formats

The following table lists MIDI message formats used to control Expression 2x. All numbers are in Hex format.

Note off message format

<8n><kk><vv>

8	Note off status
n	MIDI channel number (0-F)
kk	Key number (0-7F)
vv	Note off velocity (0-7F)

Note on message format

<9n><kk><vv>

9	Note on status
n	MIDI channel number (0-F)
kk	Key number (0-7F)
vv	Note on velocity (0-7F)
	[00=Note off]

Control change message format

<Bn><kk><vv>

B	Control change status
n	MIDI channel number (0-F)
kk	Control number (70-92)
vv	Control value (0-7F)

Program change message format

<Cn><kk>

C	Program (patch) change status
n	MIDI channel number (0-F)
kk	Program number (0-7F)

MIDI Message definitions

Submaster bump switch execution
Submasters 1 - 12   C5 - B5   #60 - #71
Submasters 13 - 24   C6 - B6   #72 - #83

Note: C5 = MIDI note #60 or middle C.

Cue execution in AB fader pair
Next cue	Program change 0
Cues 1 - 127	Program change 1 - 127
Cues 128 - 255	Controller change 70, parameters 0 - 127
Cues 256 - 383	Controller change 71, parameters 0 - 127
Cues 384 - 511	Controller change 72, parameters 0 - 127
Cues 512 - 639	Controller change 73, parameters 0 - 127
Cues 640 - 767	Controller change 74, parameters 0 - 127
Cues 768 - 895	Controller change 75, parameters 0 - 127
Cues 896 - 999	Controller change 76, parameters 0 - 103

Cue execution in CD fader pair
Next cue	Controller change 77, parameter 0
Cues 1 - 127	Controller change 77, parameters 1- 127
Cues 128 - 255	Controller change 78, parameters 0 - 127
Cues 256 - 383	Controller change 79, parameters 0 - 127
Cues 384 - 511	Controller change 80, parameters 0 - 127
Cues 512 - 639	Controller change 81, parameters 0 - 127
Cues 640 - 767	Controller change 82, parameters 0 - 127
Cues 768 - 895	Controller change 83, parameters 0 - 127
Cues 896 - 999	Controller change 84, parameters 0 - 103

Macro execution
Macros 1 - 127	Controller change 85, parameters 1 - 127
Macros 128 - 255	Controller change 86, parameters 0 - 127
Macros 256 - 383	Controller change 87, parameters 0 - 127
Macros 384 - 511	Controller change 88, parameters 0 - 127
Macros 512 - 639	Controller change 89, parameters 0 - 127
Macros 640 - 767	Controller change 90, parameters 0 - 127
Macros 768 - 895	Controller change 91, parameters 0 - 127
Macros 896 - 999	Controller change 92, parameters 0 - 103

MIDI Show Control (MSC)

The consoles recognize the following MSC commands:

- Go
- Stop
- Resume
- Fire

The consoles ignore all other commands.

The commands can be received and/or transmitted.

Configuring MIDI Show Control

Each device receiving MIDI Show Control information must be assigned a device ID. Expression 2x can receive MSC information, transmit MSC information, or both.

To enable input and/or output of MSC and to assign MSC device IDs for incoming and outgoing data, do the following:

1. Press [Setup] to go to the Setup menu.

2. Press [6] [Enter] to select the Options Settings menu. The following display appears:
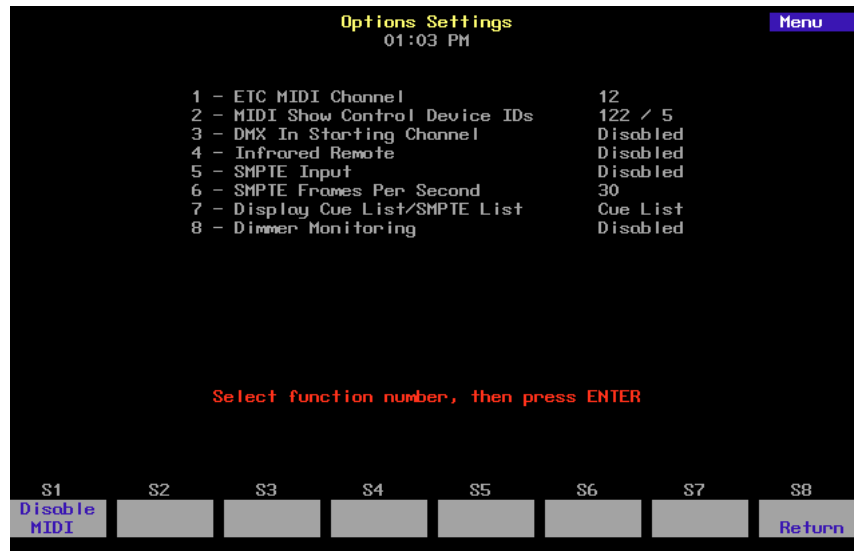
3. Press [2] [Enter]. The message **Select MIDI receiver device (#0 - 126), or press DISABLE MIDI to disable MIDI Show Control** appears.

4. Enter the receiver device ID (the ID of the device generating the MSC signal to which the console is listening). The ID must be between zero and 126.

5. Press [Enter]. The message **Select MIDI transmitter device (#0 - 126), or press DISABLE MIDI to disable MIDI Show Control** appears.

6. Enter the transmitter device ID (the ID of the device to which the console is transmitting MIDI signal). The ID must be between zero and 126. Press [Enter].

Disable MIDI Show Control

To disable MIDI Show Control from the Options Settings menu, press [2] [Enter] [S1], **Disable MIDI**.

MSC commands received by Expression 2x

Expression 2x consoles enabled for MSC accept the following MSC commands. When the console receives one of these commands, it executes the command immediately. In order to accept MSC commands, the console's receiver **Device ID** must match the target device ID for the MIDI device sending the signals.

Go	If no cue number is sent, **Go** presses [A/B Go] on Expression 2x. The next cue on the cue list runs in the A/B fader.
	If a cue number is sent, the specified cue runs on the A/B fader.
	If a cue number is sent, and **2** is sent as the list entry, that cue runs on the C/D fader.
	If cue **0** is sent, and **2** is sent as the list entry, the command presses [C/D Go]. The pending cue runs in the C/D fader. You may also press [A/B Go] by sending **Go-Cue 0-1**.
Stop	The **Stop** command by itself holds all fades in both fader pairs.
	If Stop is sent with a cue number and a list entry of 1, only the cue running in the A/B fader holds.
	If Stop is sent with a cue number and a list entry of 2, only the cue running in the C/D fader holds.
	The cue number field is ignored, but must be included if a list entry is sent.
Resume	The **Resume** command by itself resumes all holding fades in both fader pairs.
	If Resume is sent with a cue number and a list entry of 1, only a cue holding in the A/B fader resumes.
	If Resume is sent with a cue number and a list entry of 2, only the cue holding in the C/D fader resumes.
	The cue number field is ignored, but must be included if a list entry is sent.
Fire	The **Fire** command executes a specified macro. Macro number must be in the range 1-127. If no macro is specified, or if the macro number is out of range, the command is ignored.

MSC commands transmitted by Expression 2x

MIDI Show Control (MSC) allows the console to send the following commands to MIDI devices. If MSC output is enabled on the console, the console automatically sends the MSC commands. The console's transmitter **Device ID** must match the device ID for the MIDI device receiving the signals.

[A/B Go]	If a cue is pending, the console transmits [A/B Go] with cue number and a list entry of 1.
	If a cue is holding, the console transmits [A/B Resume] with cue number and a list entry of 1.
[C/D Go]	If a cue is pending, the console transmits [C/D Go] with cue number and a list entry of 2.
	If a cue is holding, the console transmits [C/D Resume] with cue number and a list entry of 2.
[A/B Hold]	If a cue is running, the console transmits [A/B Stop] with cue number and a list entry of 1.
[C/D Hold]	If a cue is running, the console transmits [C/D Stop] with cue number and a list entry of 2.
Macros	For macros 1-127, the console transmits **Fire** with the macro number.

Real time clock

The Real Time Clock allows you to program macros to run in real time, that is to run automatically at any time of day, on any day of the week. For example, you might program the work lights to come on for a choir rehearsal between 7 PM and 9 PM on Monday and Wednesday. Or, you might want to warm the filaments of your studio instruments 15 minutes prior to your news program.

You can record up to 500 real time programs. This section includes instructions for creating and editing real time programs. See *System Settings* for instructions on setting the real time clock.

Real time programs

The system will run recorded macros at specific times on specified days. Real time programs must be enabled before they will function.

Enabling real time programs:

To enable or disable real time programs, follow these steps. Default is enabled.

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [6] [Enter].	Selects Options Settings menu
3. Press [1][1] [Enter].	Selects Real Time Programs Prompt reads: **Enable/Disable real time programs** **(1 = enable, 0 = disable)**
4. Press [1] [Enter].	Enables Real Time Programs.

Note: To disable Real Time programs, repeat procedure and enter zero in step 4.

Creating real time programs

Follow these steps to create a real time program.

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S1], **Select Program**, [1] [Enter].	Prompt reads: **Enter time (12 hour clock)** **Press [+] to enter AM or PM**
4. Press [8][0][0] [Enter].	Enters time to run macro Prompt reads: **Enter days of week (1=Mon, 2=Tue, 3=Wed, 4=Thu, 5=Fri, 6=Sat, 7=Sun)**
5. Press [1] [And] [3] [Thru] [5] [Enter].	Enters days to run macro Prompt reads: **Enter macro number**
6. Press [5] [Enter].	Creates real time program 1. Macro 5 will run at 8 AM every Monday, Wednesday, Thursday and Friday.

Editing real time programs

Once you have created a real time program, you can easily make changes in the Real Time Programs display. Press [←], [→], [↑] or [↓] to move the highlight. When you reach the right end of a line, press [→] to move to the next line. When you reach the last line, press [↓] and enter a time to add a new program.

Deleting real time programs

To delete real time programs, follow these steps.

Note: The Clear Real Time Programs menu option on the Clear menu allows you to delete all recorded programs.

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S6], **Delete Program**.	Prompt reads: **Select program number(s) to delete, then press ENTER** **To cancel, press CLEAR**
4. Press [5] [And] [6] [Enter].	Selects programs 5 and 6 to delete Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
5. Press [Enter].	Deletes programs 5 and 6

Inserting real time programs

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S7], **More Softkeys**, [S1], **Insert Program**.	Prompt reads: **Select program number to insert, then press ENTER** **To cancel, press CLEAR**
4. Press [4] [Enter].	Selects program 4 to insert before Prompt reads: **Select number of programs to insert, then press ENTER** **To cancel, press CLEAR**
5. Press [2] [Enter].	Inserts two new programs before program 4. All following programs are renumbered

Copying real time programs

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S7], **More Softkeys**, [S2], **Copy Program**.	Prompt reads: **Select program number(s) to copy, then press ENTER** **To cancel, press CLEAR**
4. Press [1] [Thru] [5] [Enter].	Selects programs 1 through 5 to copy Prompt reads: **To copy selected programs(s), select time and press ENTER** **Press [+] to enter AM or PM**
5. Press [7][0][0] [+] [Enter].	Copies program 1 to a new program starting at 7:00 AM; the rest of the programs maintain their original relationship in time

Moving real time programs

You may move one or more real time programs from one time slot to another. (To move a single program, you may also use the arrow keys to highlight the time for the program you want to move, use the keypad to enter the new time, then press [Enter].)

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S7], **More Softkeys**, [S3], **Move Program**.	Prompt reads: **Select program number(s) to move, then press ENTER** **To cancel, press CLEAR**
4. Press [1] [Thru] [5] [Enter].	Selects programs 1 through 5 to move Prompt reads: **To move selected programs(s), select time and press ENTER** **Press [+] to enter AM or PM**
5. Press [5][0][0] [Enter].	Copies program 1 to a new program starting at 5:00 PM; the rest of the programs maintain their original relationship in time.

DMX512 input

The DMX In feature allows you to combine console output with output from a second source of DMX512 (for example, a moving lights console). DMX512 input from the secondary source is routed through the main console and combined with the main DMX512 output signal.

In this scenario, the secondary DMX512 source maintains nominal control of its own levels, but a predetermined submaster on the main console has proportional control. On Expression 2x, this proportional control is assigned to submaster 24. The submaster does not control independent channels.

Note: While DMX In is enabled, submaster 24's normal recorded function is disabled. When DMX In is disabled, the submaster's normal function is restored.

DMX In Fader display

The Fader display's DMX In display option allows you to view the DMX In levels that are currently live on Stage. Press [Fader] [4] to select the DMX In Fader display.

DMX In softkey

The DMX In softkey appears on the Stage and Fader displays. Use the softkey to record only the DMX512 input levels into a cue, group or sub-master.

For example, to record current DMX512 input into a cue, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [S7], **More Soft-keys**.	Reveals second set of Stage softkeys
3. Press [Record] [Cue] [8].	Selects cue 8 to record Prompt reads: **To record cue, select number and press ENTER** **To cancel, press CLEAR**
4. Press [S8], **DMX In**.	
5. Press [Enter].	Records only current DMX In levels into cue 8

DMX In starting channel

In order to enable DMX In, you must set the DMX In starting channel. The starting channel is the channel to which the first DMX In channel level will be assigned.

DMX512 levels from another source pile onto the levels set by your console. In other words, a channel set to two different levels goes to the higher of the levels. For this reason, it usually makes sense to assign the incoming levels to a range of channels that are not being actively used by your console.

For example, say you are using channels 1 through 200 in your show. You then use DMX In to bring in ten DMX512 levels from another console. If you set your DMX In starting channel as channel 201, the DMX In levels control channels 201 through 210.

Enabling DMX In

```
                    Options Settings                    Menu
                       01:06 PM

            1 - ETC MIDI Channel               Disabled
            2 - MIDI Show Control Device IDs    Disabled / Disabled
            3 - DMX In Starting Channel         257
            4 - Infrared Remote                 Disabled
            5 - SMPTE Input                     Disabled
            6 - SMPTE Frames Per Second         30
            7 - Display Cue List/SMPTE List     Cue List
            8 - Dimmer Monitoring               Disabled




                Select function number, then press ENTER



     S1        S2       S3       S4       S5       S6       S7       S8
  Disable                                                          Return
   MIDI
```

To enable the console to accept DMX512 input, follow these steps:

Keystrokes:	**Action:**
1. Press [Setup].	Selects Setup menu
2. Press [6] [Enter].	Selects Options Settings menu
3. Press [3] [Enter].	Prompt reads: **Select DMX512 In starting channel (Enter 0 to disable)**
4. Enter the first channel to be controlled by DMX In and press [Enter]. See *DMX In starting channel* on page 251 for more information.	Enables DMX In and selects desired starting channel
5. If submaster 24's red LED is flashing, move its slider to 10, then to zero. If its green LED is flashing, move its slider to zero.	The DMX In slider is set to control DMX In; red and green LEDs both light

Note: On Insight 2 consoles the submaster sliders must be in Submaster Mode to enable DMX In. Use the [Sub Mode] key to set the sliders to Submaster Mode.

SMPTE

Your console allows you to create and run shows controlled automatically by SMPTE time code. Shows consist of a series of lighting cues, submasters and macros programmed to play back at specified times. SMPTE times are provided by an internal SMPTE time clock. If you wish to run shows using SMPTE time code from an external source, you must purchase the optional SMPTE upgrade.

A SMPTE program consists of up to 3,000 individual SMPTE events and a Reset Loop time of up to 24 hours. A SMPTE event consists of any combination of two cues loaded in faders (one cue per fader), a submaster bump button, and a macro, The event is programmed to play back at a specified SMPTE time. SMPTE times are expressed in hours, minutes, seconds, and frames. Thirty frames equal one second. For example, 00:25:30:17 is twenty-five minutes, thirty seconds and seventeen frames. Up to 32 events may be assigned to the same SMPTE time.

Note: You may change the number of frames per second to 24 or 25 in the Options Settings menu.

The Reset Loop time allows you to set when the SMPTE program loop repeats. The Reset Loop time can be changed at any time, but you will most often set it when you are creating or editing your SMPTE program.

If you purchase the external SMPTE option, the system will run recorded SMPTE events in response to SMPTE time code it receives from an external source. If the flow of SMPTE data to the system is interrupted, the internal clock takes over and begins to generate its own time code. This allows the SMPTE program to continue to run even if the flow of external SMPTE data is stopped. Contact ETC for more information about this option.

*Note: SMPTE must be enabled on your console before you can create or run SMPTE programs. This requires setting DIP switch 4 to **On**. See page 311 for more details.*

Enabling SMPTE input

Before you can run SMPTE programs driven by an external SMPTE time source, you must enable the SMPTE port. To enable the SMPTE port, follow these steps.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [6], **Options Settings**, and press [Enter].	Selects Options Settings menu
3. Press [5], **SMPTE Input**, [Enter].	Prompt reads: **Enable/disable external SMPTE input (1 = Enable, 0 = Disable)**
4. Press [1] [Enter].	External SMPTE is enabled

When the console detects SMPTE data, it will automatically run the SMPTE program. If external data is not detected, and the internal clock is disabled, the message **Waiting for input** appears above the SMPTE list. To run the SMPTE program, start the flow of external SMPTE data.

Setting SMPTE frame rate

The SMPTE frame rate may be set to 24, 25 or 30 frames per second. 30 frames per second is the default. To change the frame rate, follow these steps.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [6], **Options Settings**, and press [Enter].	Selects Options Settings menu
3. Press [6], **SMPTE Frames Per Second**, [Enter].	Prompt reads: **Select SMPTE frames per second, then press ENTER (1 = 30 fps, 2 = 25 fps, 3 = 24 fps)**
4. Press [2] [Enter].	SMPTE frame rate is set to 25 fps

Creating SMPTE programs

The console allows you to create SMPTE programs in the SMPTE Events display or in Learn mode.

In the SMPTE Events display, use the four arrow keys to move the yellow highlight around the screen. Press [←] or [→] to move the highlight horizontally. Press [↑] or [↓] to move the highlight vertically. When you reach the right end of a line, pressing [→] moves to the next line. When you reach the last line, press [↓] and enter a new time to add a new SMPTE event.

Hint: If you are creating a series of similar SMPTE events you may find it helpful to create one event, then copy it. See Copying SMPTE events on page 262 for more information.

In the SMPTE Edit display

Follow these steps to create a SMPTE program from the SMPTE Events display:

Keystrokes:

Actions:

1. Record the cues, submasters and macros you want to include in the program.

2. Press [Setup].

   Selects Setup display

3. Press [1][3], **SMPTE Events**, and press [Enter] [Enter].

   Selects SMPTE Events display
   Prompt reads:
   Select SMPTE Time
   (Press TIME to edit specific fields)

4. Enter [1][0][0].

   Selects one second as the time of the first SMPTE event you want to create

5. Press [→].

   Highlight moves to the **A/B** field
   Prompt reads:
   Select SMPTE A/B Cue

6. Press [1].

   Enters cue 1 for event 1 to play on the A/B fader

7. Press [→].

   Highlight moves to the Rate field
   Prompt reads:
   Select SMPTE A/B Rate
   (0 to 2000, 100 = Normal)

8. Press [1][2][5]. (Zero stops the fade. 100 is normal. With fade rate set at 50, cue runs at half its recorded rate. If no rate is entered, the cue runs at its recorded rate.)

   Enters a rate of 125 percent of the recorded fade rate
   Corner reads:
   Rate 125

9. Press [→].

   Highlight moves to the **C/D** field
   Prompt reads:
   Select SMPTE C/D Cue

10. Repeat steps 6 through 8 for fader C/D.

11. Press [→].

    Moves the highlight to the **Bump** field
    Prompt reads:
    Select submaster number for
    SMPTE bump event, then press [+]
    for ON, or [–] for OFF

12. Enter the desired submaster number, then press [+] to set the submaster On, or [–] to set the submaster off.

13. Press [→] to move the highlight to the submaster **Rate** field.

    Prompt reads:
    Select SMPTE Bump Rate
    (0 to 2000, 100 = normal)

14. Press [→].	Leaves fade rate at normal and moves the highlight to the **Macro** field Prompt reads: **Select SMPTE Macro**
15. Press [5].	Selects macro 5 to run when event plays
16. Press [→].	Moves the highlight to the **Label** field Prompt reads: **Enter SMPTE Label**
17. Use an alphanumeric keyboard to enter a name for the event.	
18. Press [↓] and enter the SMPTE time to create the next event	Prompt reads: **Select SMPTE Time (Press TIME to edit specific fields)**
19. Repeat steps 4 through 18 until you have entered all your SMPTE events.	

In Learn mode

SMPTE Learn mode allows you to record macro keys, submaster bump buttons and fader [Go] keys into SMPTE events as you press them. Learn mode allows you to record a SMPTE program live without concerning yourself with SMPTE time.

Warning: If you use Learn to assign a cue to fader in which a cue already exists, the previously recorded cue will be overwritten by the new cue.

Follow these steps to record a SMPTE event in Learn mode:

Keystrokes:	**Actions:**
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S7], until [S6] reads **Learn Mode**.	
4. Press [S6], **Learn Mode**.	**SMPTE Learn** flashes in red in the upper left corner of the screen
5. If you are going to use the internal clock to time the show, press [S2], **Clock Enable**, to start the clock.	The SMPTE internal clock, in the upper left corner of the display, starts to run
6. Press [Stage].	Selects Stage display
7. If you are going to use external SMPTE to time the show, start SMPTE data flow now. The SMPTE port must have been enabled before you do this. See *External SMPTE source* on page 266 for details.	
8. Select the cues, submasters and macros you want to record as SMPTE events.	
9. At the exact moment in the program that you want each cue, submaster or macro to begin, press [Go] for the fader in which you want the SMPTE event to run the cue, press the submaster's bump button, or start the macro.	Each button press is recorded as an event in your SMPTE show
10. Press [Setup] [1][3] [Enter] [S6], **Learn Mode**.	Returns to SMPTE Events display and deactivates Learn mode; edit the events as necessary

Note: You may also enter events using Learn mode in the SMPTE Events display. From this display, while in Learn mode, press [Record] to enter a blank event.

Reset Loop time

The SMPTE program loop plays from the first event time to the last event time, then resets and plays again. The first and last times are displayed in the upper right corner of the display, and may be set by the user. Any events with SMPTE times before the first time or after the last time will not play.

Note: A SMPTE loop can last from five seconds up to 24 hours. If the loop is set to be less than five seconds, the internal clock resets it to five seconds from the loop's starting time.

To set or change the first and last event times, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S7] until [S8] reads **Reset Loop**.	
4. Press [S8], **Reset Loop**.	Prompt reads: **Enter first valid frame of SMPTE internal time, then press ENTER. (Press TIME to edit specific fields)**
5. Press [1][0][0][0]	Sets ten seconds as the starting time for the SMPTE show
6. Press [Enter].	Prompt reads: **Enter last valid frame of SMPTE internal time, then press ENTER. (Press TIME to edit specific fields)**
7. Press [5][0][0][0][0] then press [Enter].	Sets the SMPTE show to reset at the five minute mark

Editing SMPTE programs

Once you have created a SMPTE program, you can easily make changes. In the SMPTE edit display, use the arrow keys to move the highlight around in the display screen. Press [←] or [→] to move the highlight horizontally. Press [↑] or [↓] to move the highlight vertically. When you reach the right end of a line, press [→] to move to the next line. When you reach the last line, press [↓] and enter a time to add a new SMPTE event.

Editing Features

The console's SMPTE editing features allow you to Insert, Copy, Move, and Delete events. You may apply these functions to individual events, or to a range of events.

Deleting SMPTE events

Follow these steps to delete SMPTE events.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S7] until [S6] reads **Delete Event**.	
4. Press [S6], **Delete Event**.	Prompt reads: **Select event number(s) to delete, then press ENTER** **To cancel, press CLEAR**
5. Press [5] [And] [6] [Enter].	Enters events 5 and 6 to delete Prompt reads: **To confirm, press ENTER** **To cancel, press CLEAR**
6. Press [Enter] to delete the event or [Clear] to leave it unchanged.	

*Note: The **Clear SMPTE Events** menu option on the Clear menu allows you to delete all recorded SMPTE events. To do so, press [Setup] [4] [Enter] [1][3] [Enter] [Enter].*

Inserting SMPTE events

To add a new SMPTE event to an existing SMPTE program, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Use the arrow keys to select event 4. The new event will be inserted before this event.	Corner reads: **Event 4**
4. Press [S7] until [S1] reads **Insert Event**.	
5. Press [S1], **Insert Event**.	Prompt reads: **Select event number to insert, then press ENTER** **To cancel, press CLEAR**
6. Press [Enter].	Prompt reads: **Select number of events to insert, then press ENTER** **To cancel, press CLEAR**
7 Press [2].	Indicates that you wish to insert two new events Corner reads: **Insert 2**
8. Press [Enter].	New events 4 and 5 are inserted; all following events are renumbered

Copying SMPTE events

Allows you to copy the selected event or range of events from one time slot and insert the copy in another. Follow these steps to copy SMPTE events:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S7] until [S2] reads **Copy Event**.	
4. Press [S2], **Copy Event**.	Prompt reads: **Select event number(s) to copy, then press ENTER. To cancel, press CLEAR**
5. Press [1] [Thru] [5].	Selects events 1 through 5 to copy
6. Press [Enter].	Prompt reads: **To copy selected event(s), select time and press ENTER. To cancel, press CLEAR**
7. Press [Time] [Time] [2][5].	Selects 25 seconds for the first event to copy
8. Press [Enter].	Copies event 1 to a new event starting at 25 seconds; the rest of the events maintain their original relationship in time

Moving SMPTE events

The system allows you to move one or more SMPTE events from one time slot to another. Follow these steps to move a block of SMPTE events.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S7] until [S3] reads **Move Event**.	
4. Press [S3], **Move Event**.	Prompt reads: **Select event number(s) to move, then press ENTER** **To cancel, press CLEAR**
5. Press [1] [Thru] [5].	Selects events 1 through 5 to move
6. Press [Enter].	Prompt reads: **To move selected event(s), select time and press ENTER. To cancel, press CLEAR**
7. Press [Time] [Time] [Time] [5].	Selects five minutes for the first event to move
8. Press [Enter].	Copies event 1 to a new event starting at the five minute point; the rest of the events maintain their original relationship in time

Note: To move a single event, you may also use the arrow keys to highlight the SMPTE time for the event you want to move, then press [+] or [–] until the new SMPTE time is displayed in the keypad prompt window, and press [Enter]. Or, use the keypad to enter the new time, then press [Enter]. The event will move to the new time when you sort the event list or leave the SMPTE editing screen.

Editing events

Each event in a SMPTE program may contain a combination of cues, macros and submaster bump buttons. Each of the cues and submasters may have a rate applied, and the event may be labeled for easy identifications. You may add, change or delete any of these items from an event by following these steps.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Use the arrow keys to highlight the field of the item you want to edit.	Selects field to edit
4. Enter the new contents of the field. If you wish to delete the item, press [Clear].	
5. Press [Enter], or use the arrow keys to select another field.	

Range editing

If you wish to apply a change to a range of events, you may select multiple events and edit them all in a single step. For example, if you wanted to set the rates for your first ten events to 50 percent, you could do so by following these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S7] until [S1] reads **Select Event**.	
4. Press [S1], **Select Event**.	Prompt reads: **Select SMPTE event number**
5. Press [1] [Thru] [1][0].	
6. Press [S4], **Rate**.	The first rate field is highlighted Prompt reads: **Select SMPTE A/B Rate**
7. Press [5][0].	Sets the rate to 50 percent
8. Repeat steps 6 and 7 for the remaining rate fields.	

Or, for example, if you wanted to move ten events five seconds later in order to insert a new event into the middle of a program, you could do so by following these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S7] until [S1] reads **Select Event**.	
4. Press [S1], **Select Event**.	Prompt reads: **Select SMPTE event number**
5. Press [1][1] [Thru] [2][0].	
6. Press [S2], **SMPTE Time**.	The time field is highlighted Prompt reads: **Select SMPTE Time (Press TIME to edit specific fields**
7. Press [Time] [Time].	Selects the seconds field for all ten events Prompt reads: **Select SMPTE seconds**
8. Press [+] five times.	Each time you press [+], the seconds field for each event increases by one second
9. Press [Enter].	Sets the new times

Playing back the SMPTE program

The console allows you to play recorded SMPTE events in several ways. You may use any external source of SMPTE data to run the program, you may run the program using the console's built-in SMPTE clock, or you may play individual events manually.

Note: As you play back SMPTE programs, you may find it useful to display the SMPTE event list on the playback display. To do so, press [Setup] [6] [Enter] [7] [Enter] [1] [Enter].

External SMPTE source

Once you have recorded a series of cues in a SMPTE program, the console automatically runs the program in response to SMPTE time code. To run the SMPTE program, start the flow of external SMPTE data.

Before you start SMPTE flow, you must enable the SMPTE port. To do so, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [6], **Options Settings**, and press [Enter].	Selects Options Settings menu
3. Press [5], **SMPTE Input**, [Enter].	Prompt reads: **Enable/disable external SMPTE input (1 = Enable, 2 = Disable)**
4. Press [1] [Enter].	External SMPTE is enabled

When the console detects SMPTE data, it will automatically run the SMPTE program. If external data is not detected, and the internal clock is disabled, the message **Waiting for input** appears above the SMPTE list.

Internal SMPTE clock

To run the SMPTE program using the internal clock, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S1], **Internal Clock**.	Prompt reads: **Set SMPTE internal clock, then press ENTER (Press TIME to edit specific fields)**
4. Use the keypad or the [+] and [–] keys to enter the SMPTE time of the first event you want to view, or enter zero to start at the beginning of the SMPTE program.	
5. Press [Enter].	
6. Press [S2], **Clock Enable**, to start the internal clock running at the desired SMPTE time.	Each SMPTE event will run at its recorded time

Manual playback

The Manual Mode, Pause Mode, and Step softkeys allow you to manually control playback of SMPTE events with no external SMPTE time input and without the console's internal clock. [Time] allows you to select an event by specifying its SMPTE time.

Follow these steps to select and run SMPTE events out of recorded sequence.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], **SMPTE Events**, and press [Enter].	Selects SMPTE Events display mode
3. Press [S3], **Manual Mode** or... Press [S4], **Pause Mode**,	Interrupts SMPTE input and resets the console to the first recorded SMPTE event, or... Interrupts SMPTE input at current SMPTE event
4. Press [S5], **Step**.	Advances to the next recorded SMPTE event, (In Manual mode, pressing [Step] starts with the first recorded SMPTE event)
5. Repeat step 4 to advance sequentially through SMPTE events.	
6. If you are in Manual mode, press [S3], **Manual Mode**. If you are in Pause mode, press [S4], **Pause Mode**.	Returns to normal operation and the flow of SMPTE code resumes

*Note: Always press [S3], **Manual Mode**, or [S4], **Pause Mode**, to interrupt SMPTE code when you are programming the console. This prevents SMPTE events from running while you are working.*

Remote macros

The Remote macro feature provides the ability to access up to 8 macros from locations up to 1000 feet from the main console. Typically the Remote Macro control device is an eight button control station.

The remote macro outputs control macros 1,901 through 1,908. To run one of these macros from a remote location, press the appropriate control.

ETC does not provide remote macro units. However, the console does provide a 25-pin connector labeled **Remote Go** to which you may attach a user-supplied, remote macro control device. See *Installing remote macros* on page 324 for more information about installing remote macros.

Note: The Expression 2x Lighting Playback Controller provides four Remote Macro connectors, for a total of 32 remote macros. These are each equivalent to the single connector described above. These remote macro outputs control macros 1,901 through 1,932.

chapter 21
moving lights

Expression 2x channels can control intensity, color, pan, or tilt for an auto-mated lighting device such as a moving light or color scroller. By linking channels, using Expression 2x's Link List, you can use multiple channels to control combinations of these attributes for one or more instruments.

Link List allows you to link channels together for simultaneous control on the two wheels. The Flip attribute can create parallel or mirrored linked channel actions. Mirrored actions are particularly useful when you are working with moving lights.

This chapter contains the following sections:

- Link List overview
- Independent channels
- Setting up a link
- Using a link
- Linking two moving lights
- Flipped channels
- Mirroring two moving lights
- Using groups and Only with Link List
- Modifying links

Link List overview

Press [Setup] [1][1], **Channel Attributes**, [Enter] [S7], **Link List**, to reach the Link List display.

When two or more channels are used together, such as the pan and tilt channels for a moving light, the Link List allows you to determine which of the wheels will control each channel. Other channels that might commonly be linked include color and intensity channels for a color scroller or gobo and rotation rates.

A link allows channels to be simultaneously controlled on the two wheels. When you select a channel, it is placed under the control of one of the wheels and all channels linked to it are also selected and placed under control of the other wheel.

Links may contain up to ten channels on each of the X and Y lists. All channels in a link from one list are selected if any channel is selected from the other list.

Note: Each channel may appear in only one link.

All channels on the X list are controlled by the X wheel; channels on the Y list are controlled by the Y wheel.

Channels that control movement of moving lights or color scrollers will often be set as Independent. This assures that in the case of a blackout or Grandmaster movement, the current position of the moving light will not change. For more information about Independent channels, see page 48.

Setting up a link

To set up a link, you must assign at least one channel to the X channel list and one channel to the Y channel list. In the following example, two color scrollers are linked so that their color settings are controlled by the wheel. For the two scrollers, color is controlled by channels 1 and 11, respectively.

To link two channels, follow these steps:

Keystrokes:	Action:
1. Press [Setup] [1][1] [Enter].	Selects Channel Attributes display
2. Press [S7], **Link List**.	Selects Link List display Prompt reads: **Select link number**
3. Press [1] [Enter].	Selects link 1. Prompt reads: **Select X channel number(s)** **(Precede with AND to add to** **existing link, or EXCEPT to delete** **from link**
4. Press [1] [→].	Channel 1 is assigned to the link's X list Prompt reads: **Select Y channel number(s)** **(Precede with AND to add to** **existing link, or EXCEPT to delete** **from link**
5. Press [1][1] [→].	Channel 11 is assigned to the link's Y list. Link entry is complete Prompt reads: **Select fixture type, then press** **ENTER (1 = XY position, 0 = other)**
6. Press [0] [→].	The link sets the trackpad to double mode. Link entry is complete

Using a link

Once you have linked the color control channels for the two color scrollers, Expression 2x allows you to control them simultaneously on the X and Y wheels.

To control the scrollers, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [1].	Selects channel 1. Channel number is gold, signifying that it is assigned to the X list. Through the link, selects channel 11. Channel number is yellow, signifying that it is assigned to the Y list
3. Place your hand so it rests on both the X and Y wheels. Slowly push the wheels forward.	The levels on both channels rise together, each controlled by its corresponding wheel. As they do, the colors change on the color scrollers, corresponding to the levels. Both wheels' levels are displayed in the prompt corner

Note: If you move either wheel by itself, the color will change on only the corresponding scroller.

Linking two moving lights

Use Link List to link the pan and tilt channels on two moving lights. This link will control the pan for both lights on the X list and the tilt for both lights on the Y list. As you move the wheels, both lights' movement will be synchronized.

Channels 2 and 3 control pan and tilt for the first light and channels 12 and 13 control pan and tilt for the second light.

To link the channels, follow these steps:

Keystrokes:	Action:
1. Press [Setup] [1][1] [Enter].	Selects Channel Attributes display
2. Press [S7], **Link List**.	Selects Link List display Prompt reads: **Select link number**
3. Press [2] [Enter].	Selects link 2. Prompt reads: **Select X channel number(s)** **(Precede with AND to add to** **existing link, or EXCEPT to delete** **from link**
4. Press [2] [And] [1][2] [→].	The pan control channels are assigned to the link's X list Prompt reads: **Select Y channel number (Precede** **with AND to add to existing link, or** **EXCEPT to delete from link**
5. Press [3] [And] [1][3] [→].	The tilt control channels are assigned to the link's Y list Prompt reads: **Select fixture type,** **then press ENTER** **(1 = XY position, 0 = other)**
6. Press [1] [→].	The link sets the trackpad to XY mode. Link entry is complete

Note: Channels that control moving light movement should be set as Independent channels in the Channel Attributes display.

Flipped channels

Use Flip to control moving lights. Link the channels that control the pan attribute for moving lights on opposite sides of the stage and Flip one of the two channels. When you control the two lights using the two wheels, their movements are mirrored, rather than parallel.

The Flip command inverts the output of the channel to which it is applied. A flipped channel outputs at full when set to zero and at zero when set to full.

Use the Channel Attributes display to mark a channel flipped. The flipped channels will have their outputs inverted. The levels will not appear inverted on the live display.

Mirroring two moving lights

In the previous example, two moving lights were linked so that they would match movements. In other words, when one moved up, the other moves up. When one moves to the right, the other moves to the right, and so on.

In this example, the Flip attribute is used to reverse the pan control channel. With pan reversed, when one light moves to the left, the other moves to the right, and vice versa. The lights' tilt still matches.

All four channels are set as independent to protect the moving lights from sudden movement when the Grandmaster or Blackout controls are used.

Channels 4 and 5 control pan and tilt for the first light and channels 14 and 15 control pan and tilt for the second light.

To link two moving lights with a mirrored pan, follow these steps:

Keystrokes:	Action:
1. Press [Setup] [1][1] [Enter].	Selects Channel Attributes display
2. Press [4] [And] [14] [Enter].	Selects channels 4 and 14, the pan channels Prompt reads: **Enable/disable independent channel(s) (1 = Enable, 0 = Disable)**
3. Press [1] [→].	Sets both channels as independent Prompt reads: **Enable/disable flipped channel(s) (1 = Enable, 0 = Disable)**
4. Press [1] [→].	Sets both channels as flipped Prompt reads: **Type channel label (F6 = clear to end, F7 = last channel label, F8 = next channel label)**
5. If you have an alphanumeric keyboard attached to the console, type "Moving pan," then press [Enter].	Channels 4 and 14 are labeled **Moving pan** Prompt reads: **Select channel number(s)**

6.	Press [5] [And] [1][5] [→].	Selects channels 5 and 15, the tilt channels Prompt reads: **Enable/disable independent Y channel (1 = Yes, 0 = No)**
7.	Press [1] [→] [→].	Sets both channels as independent Prompt reads: **Type channel label (F6 = clear to end, F7 = last channel label, F8 = next channel label)**
8.	If you have an alphanumeric keyboard attached to the console, type "Moving tilt" then press [Enter].	Channels 5 and 15 are labeled **Moving tilt** Prompt reads: **Select channel number(s)**
9.	Press [S7], **Link List**.	Selects Link List display Prompt reads: **Select link number**
10.	Press [3] [Enter].	Selects link 3. Prompt reads: **Select X channel number (Precede with AND to add to existing link, or EXCEPT to delete from link**
11.	Press [4] [And] [1][4] [→].	The pan control channels are assigned to the link's X list Prompt reads: **Select Y channel number (Precede with AND to add to existing link, or EXCEPT to delete from link**
12.	Press [5] [And] [1][5] [Enter].	The tilt control channels are assigned to the link's Y list Prompt reads: **Select fixture type, then press ENTER (1 = XY position, 0 = other)**
13.	Press [1] [→].	The link sets the trackpad to XY mode. Link entry is complete

To test the moving lights setup, press [Stage], select channels 4 and 14, and move both wheels together.

Using groups and Only with Link List

Only allows you to select several groups and then adjust only the channels the groups have in common. Used in conjunction with Link List, this becomes a particularly powerful feature. For example, say you are working with the moving lights groups described in *Only* on page 122.

In that example, each of the first four groups contains six channels, corresponding to pan, tilt, intensity, cyan, magenta, and yellow for a specific fixture.

Group 1 contains all channels for fixture 1
01 02 03 04 05 06

Group 2 contains all channels for fixture 2
11 12 13 14 15 16

Group 3 contains all channels for fixture 3
21 22 23 24 25 26

Group 4 contains all channels for fixture 4
31 32 33 34 35 36

The next three groups each contain all the channels that control one parameter for your moving lights.

Group 5 contains all pan-controlling channels
01 11 21 31

Group 6 contains all tilt-controlling channels
02 12 22 32

Group 7 contains all level-controlling channels
03 13 23 33

Next, in the Link List, create a set of links that link each fixture's pan channel to its tilt channel. Put all the pan channels on the X list and all the tilt channels on the Y list. Now, any time you select either the pan channel or the tilt channel for any of these fixtures, both parameters will be selected and placed on the X and Y wheels.

Press [Group] [1] [And] [Group] [3] [Only] [Group] [5]. This selects the pan channels for fixtures 1 and 3. Link List then places them on the X list and selects the tilt channels and places them on the Y list. Both fixtures' positions are now controlled by the wheels.

Inserting a link

Use the edit features softkey [S5], **Insert Link**, to insert an empty link number ahead of the selected or specified link. All subsequent links will be renumbered.

Note: The order in which links are recorded does not affect their operation. However, your numbering may be useful to you in terms of logical organization.

To insert a link, follow these steps:

Keystrokes:	Action:
1. Press [Setup] [1][1] [Enter].	Selects Channel Attributes display
2. Press [S7], **Link List**.	Selects Link List display Prompt reads: **Select link number**
3. Press [S5], **Insert Link**.	Prompt reads: **Select link number to insert, then press ENTER.** **To cancel, press CLEAR.**
4. Press [1] [Enter].	Selects link 1 to insert. All links higher than 1, up to the first gap in the Link List (if any), are renumbered to make room Prompt reads: **Select X wheel channel number (Precede with AND to add to existing link, or EXCEPT to delete from link**
5. Proceed with normal link entry, as described in *Setting up a link* on page 273.	

Moving a link

Use [S7], **Move Link**, to renumber a link or a group of links. All links in a group will be renumbered sequentially.

To move a link to an empty space on the Link List, follow these steps:

Keystrokes:	Action:
1. Press [Setup] [1][1] [Enter].	Selects Channel Attributes display
2. Press [S7], **Link List**.	Selects Link List display Prompt reads: **Select link number**
3. Press [S7], **Move Link**.	Prompt reads: **Select link number(s) to move, then press ENTER** **To cancel, press CLEAR.**
4. Press [6] [Enter].	Prompt reads: **To move selected link(s), select target link and press ENTER** **To cancel, press CLEAR**
5. Press [9] [Enter]	Link 6 is renumbered as link 9

Note: If you move a link to a space on the Link List which already contains a link, the channels in the moved link are added to the existing link. See Merging two links on page 281 for more information.

Merging two links

If you move a link to a space on the Link List which already contains a link, the channels in the moved link are added to the existing link.

To move a link to an occupied space on the Link List, follow these steps:

Keystrokes:

Action:

1. Press [Setup] [1][1] [Enter].

   Selects Channel Attributes display

2. Press [S7], **Link List**.

   Selects Link List display
   Prompt reads:
   Select link number

3. Press [S7], **Move Link**.

   Prompt reads:
   Select link number(s) to move, then press ENTER
   To cancel, press CLEAR.

4. Press [6] [Enter].

   Prompt reads:
   To move selected link(s), select target link and press ENTER
   To cancel, press CLEAR

5. Press [7] [Enter]

   Prompt reads:
   Link already exists –
   To confirm, press ENTER
   To cancel, press CLEAR

6. Press [Enter]

   The channels in link 6 are added to the channels in link 7

Note: To split a link apart, create a new link with the channels you want to move. Since a channel can only be in one link at a time, it will be deleted from the original link and recorded in the new link.

Deleting a link

Use [S6], **Delete Link**, to remove a link from the Link List. All subsequent links will be renumbered.

To delete a link, follow these steps:

Keystrokes:	**Action:**
1. Press [Setup] [1][1] [Enter].	Selects Channel Attributes display
2. Press [S7], **Link List**.	Selects Link List display Prompt reads: **Select link number**
3. Press [S6], **Delete Link**.	Prompt reads: **Select link number(s) to delete, then press ENTER (Enter 0 to delete all links)**
4. Press [5] [Enter].	Prompt reads: **To confirm, press ENTER To cancel, press CLEAR**
5. Press [Enter].	The link is deleted from the Link List. All links with higher numbers are renumbered one lower

chapter 22
park

This chapter includes instructions for using Expression 2x's Park function. Park allows you to set channels or dimmers at a level and maintain those lights at that level on stage, regardless of other instructions. Parked channel and dimmer levels are not affected by any other instructions and will not be recorded into cues.
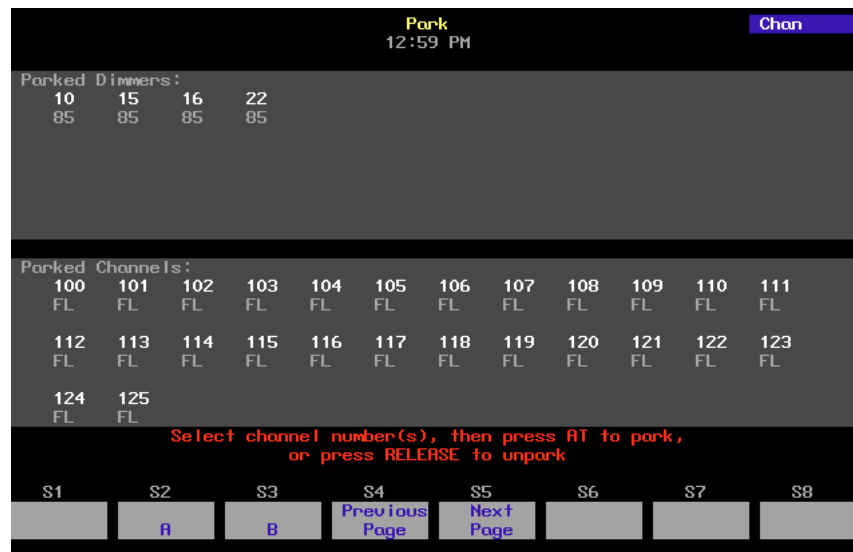
Note: [Blackout] will turn off parked dimmers and channels unless they are independent channels. Nothing else affects a parked dimmer or channel's level.

The following options are described in this chapter:

- Parking dimmers
- Unparking dimmers
- Parking channels
- Unparking channels
- Parking groups, cues and submasters
- Park display

Parking dimmers

To park a dimmer, indicate the dimmer you want to park and the level at which to park it. Once it is parked, nothing you do at the console will have any effect on that light (except for [Blackout]) until you unpark the dimmer. When dimmers are parked, a yellow alert appears in the lower right side of the command display that says **Parked Dimmers**.

To park a dimmer, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [S6], **Park**, [Dim].	Prompt reads: **Select dimmer number(s), then press AT to park, or press RELEASE to unpark**
3. Enter the dimmer number to park, then press [At].	Selects the dimmer to park Prompt reads: **Enter intensity for park dimmer(s)**
4. Enter the level at which to park the dimmer.	Parks the dimmer at the selected level Alert appears: **Parked Dimmers**

Unparking dimmers

You may unpark one or all dimmers at any time. When a dimmer is unparked, its level reverts to the level the console is currently assigning it.

Unpark a dimmer

To unpark a dimmer, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [S6], **Park**, [Dim].	Prompt reads: **Select dimmer number(s), then press AT to park, or press RELEASE to unpark**
3. Enter the dimmer number to unpark and press [Rel].	Unparks the dimmer

Unpark all dimmers

To unpark all parked dimmers, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [S6], **Park**, [Dim].	Prompt reads: **Select dimmer number(s), then press AT to park, or press RELEASE to unpark**
3. Press [Rel].	Prompt reads: **To release all parked dimmers, press ENTER To cancel, press CLEAR**
4. Press [Enter].	Unparks all parked dimmers

Parking channels

To park a channel, indicate the channel you want to park and the level at which to park it. Once it is parked, nothing you do at the console will have any effect on lights in that channel (except for [Blackout]) until you unpark the channel. When channels are parked, a yellow alert appears on the lower right side of the command display that says **Parked Channels**.

Note: If a dimmer is parked and the channel that controls it is also parked, the dimmer's parked level takes priority over the channel's parked level. If the dimmer is then unparked, it will revert to the channel's parked level.

To park a channel, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [S6], **Park**.	Prompt reads: **Select channel number(s), then press AT to park, or press RELEASE to unpark**
3. Enter the channel number to park, then press [At].	Selects the channel to park Prompt reads: **Enter intensity for park channel(s)**
4. Enter the level at which to park the channel.	Parks the channel at the selected level Alert appears: **Parked Channels**

Unparking channels

You may unpark one or all channels at any time. When a channel is unparked, its level reverts instantly to whatever level the console is currently assigning it.

Unpark a channel

To unpark a channel, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [S6], **Park**.	Prompt reads: **Select channel number(s), then press AT to park, or press RELEASE to unpark**
3. Enter the channel number to unpark and press [Rel].	Unparks the channel

Unpark all channels

To unpark all parked channels, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Stage display
2. Press [S6], **Park**.	Prompt reads: **Select channel number(s), then press AT to park, or press RELEASE to unpark**
3. Press [Rel].	Prompt reads: **To release all parked channels, press ENTER. To cancel, press CLEAR**
4. Press [Enter].	Unparks all parked channels

Parking groups, cues and submasters

Groups, cues and submasters are collections of channels with associated control instructions. Expression 2x allows you to park the channels used in groups, cues and submasters at a specified level, ignoring their recorded levels. For example, if all your worklights are recorded in a group, you could park that group, rather than parking all of the worklight channels individually.

Park a group

To park the channels in a group, follow these steps:

Keystrokes:	Action:
1. Press [Stage].	Selects Live display
2. Press [S6], **Park**, [Group].	Prompt reads: **Group mode - Select group number, then press AT to park, or press Release to unpark**
3. Enter the group number and press [At].	Selects the group to park Prompt reads: **Group mode - Enter intensity**
4. Enter the level at which to park the group's channel.	Parks the channels at the selected level

Park a cue or submaster

To park the channels used in a cue or submaster follow these steps, pressing either [Cue] or [Sub], respectively, in step 2:

Keystrokes:	Action:
1. Press [Stage].	Selects Live display
2. Press [S6], **Park**, [Cue].	Prompt reads: **Group mode - Select cue number to use as group, then press AT to park, or press Release to unpark**
3. Enter the cue number and press [At].	Selects the cue to park Prompt reads: **Group mode - Enter intensity**
4. Enter the level at which to park the cue's channel.	Parks the channels at the selected level

Unpark a group, cue or submaster

To unpark the channels in a group, cue or submaster, follow these steps, pressing [Group], [Cue] or [Sub], respectively, in step 2:

Keystrokes:	**Action:**
1. Press [Stage].	Selects Stage display
2. Press [S6], **Park**, [Group].	Prompt reads: **Group mode - Select cue number to use as group, then press AT to park, or press Release to unpark**
3. Enter the group number to unpark and press [Rel].	Unparks the group's channels

Park display

Press [Park] to bring up the Park display. The Park display lists parked dimmers on the top half of the screen, and parked channels on the lower half, along with their parked levels.
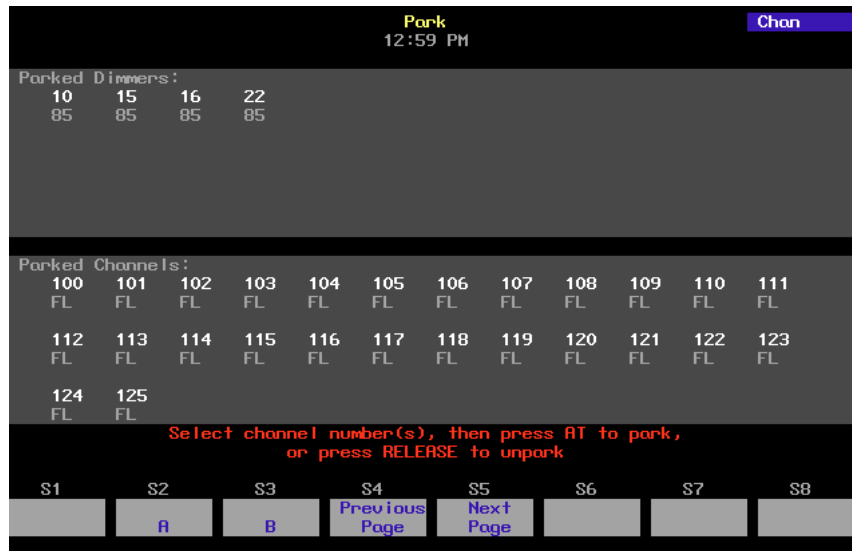
The Park display can show up to 36 dimmers and 36 channels. If you have more than 36 dimmers or channels parked, use [S4], **Previous Page**, and [S5], **Next Page**, to move through the Park display lists a page at a time. You can also move directly to a channel or dimmer in the list by entering the channel number and pressing [At] or by pressing [Dim], entering the dimmer number, and pressing [At].

appendix a
installation

This appendix includes instructions for installing your console and optional accessories. *Chapter 3, Entering system settings*, and *Chapter 4, Creating patch*, include instructions for entering the software settings you will probably update before you begin a new show.

This chapter includes the following installation procedures:

- Installing your console
- Installing your monitors
- Connecting your dimmers
- System configuration
- Installing the alphanumeric keyboard
- Installing a printer
- Installing Designer's Worksheet
- Installing Remote Focus Unit
- MIDI
- SMPTE
- ETCNet
- Installing remote video monitors
- Installing Full Tracking Backup
- Installing Infrared Remote Focus Unit (IRFU)
- Installing Remote Macros

An illustration of Expression 2x's back panel is included on the next page. Operating instruction for optional accessories are included in *Chapter 18, Accessories.*

Expression 2x back panel

DMX In
5-pin male XLR

1,536 DMX outputs
5-pin female XLR

ETCLink
6-pin
female XLR

SMPTE
3-pin female XLR

RFU
6-pin female XLR

Switched
accessory
outlets

AC
power
input

MIDI In/Out
5-pin female DIN

Digitizer
Serial
9-pin male
RS-232

VGA CRT outputs
15-pin female mini-D

Remote Go
25-pin female D

Alphanumeric
Keyboard
5-pin female DIN

Parallel Printer
25-pin female D

ETCNet

IRFU
5-pin female DIN

DIP switches and jumpers

Several components of the Expression 2x system contain DIP switches which must be set properly in order for the system to function properly. The DIP switch settings for the following components are listed in this appendix, along with instructions for changing them. New DIP switch settings take effect when you turn on the console.

Setting DIP switches

Expression 2x checks DIP switch settings when the system is turned on. You must restart the console for new DIP switch settings to take effect.

Switches are either **On** (**Closed**) or **Off** (**Open**). Two varieties of DIP switch are used in the Expression 2x. In one, the switches extend above the surface of the unit. You may use your fingers to set these switches. The other contains switches that are recessed into the unit. You will need to use a pin or other fine-pointed object to change the switch settings.

Setting jumpers

A jumper is a small plastic connector used to join a pair of pins sticking out of a printed circuit board. The jumper is installed when it covers both pins. It is not installed when it covers one or none of the pins (see illustration below).

Jumper
not installed

Jumper
installed
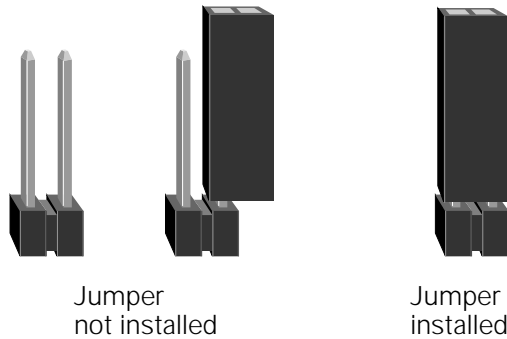
Circuit boards

Expression 2x components use one of two main circuit boards. Consoles contain a Main Processor board (part 4031B4006). Remote Interfaces contain a Node board (part 4052B4014). The circuit board may be identified by the part number and revision printed on the board. Illustrations of the two boards follow.

Main Processor Board - Revision 0 or B

The Revision 0 or Revision B Main Processor Board appears in the console. It contains one 8-switch DIP switch unit and two 6-switch DIP switch units.
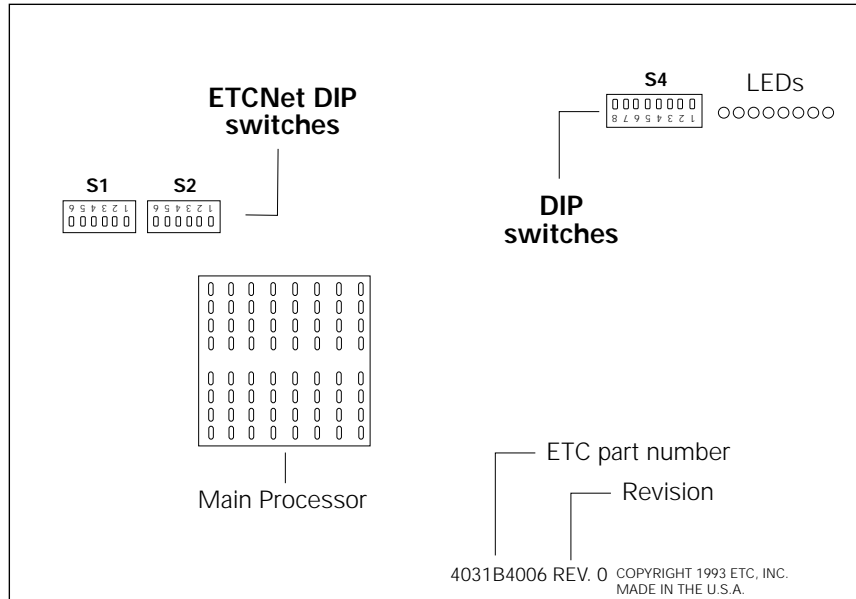
Node Board - Revision A

The Revision A Node Board appears in Remote Interfaces. It contains one 8-switch DIP switch unit and a set of 14 jumpers.
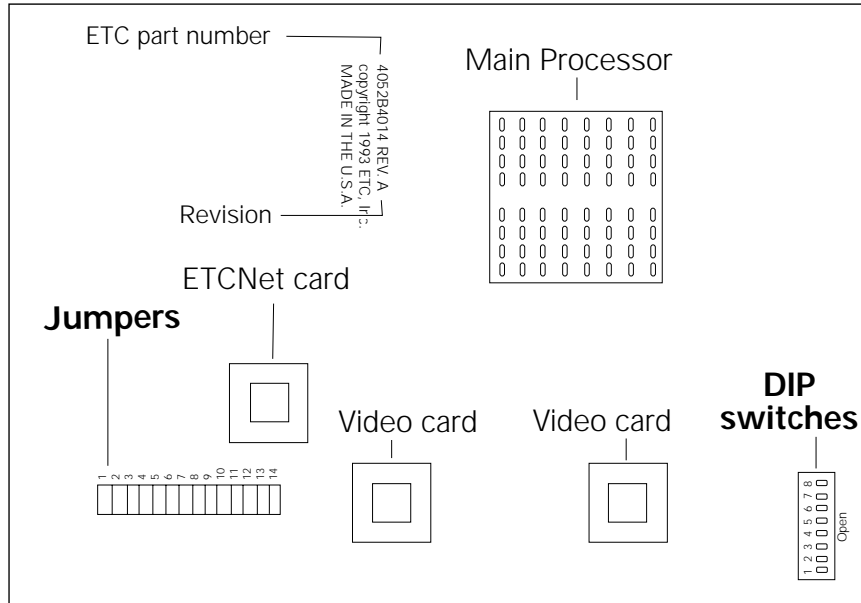
Before you use the device on the ETCNet network, set the ETCNet cabling jumpers to indicate what kind of cable the network uses. To set the jumpers, follow these steps.

1. Locate jumpers 1 through 14. (See illustration above.)

2. If your network cable is plugged into the BNC connector (ThinNet), install jumpers 1 through 6. Be certain jumpers 7 through 12 are not installed.

3. If your network cable is plugged into the RJ45 connector (Twisted Pair) or the DB15 connector (ThickNet), install only jumpers 7 through 12. Be certain jumpers 1 through 6 are not installed.

4. Jumper 13 must always be off. Jumper 14 should always be installed.

Installing console and monitors

Follow these steps to install Expression 2x and its monitors:

1. Place console on a hard, stable, flat surface. Leave at least six inches of space behind console for ventilation and cable clearance. Console should be at least six feet from dimmers and high-current AC lines.

    Caution: Do not leave the console in a road case tray or on a soft surface. This will inhibit proper ventilation.

2. Move console power switch (by fan on back panel) to the **Off** position. (Older consoles may have a keyswitch power switch on the face panel. If so, insert the key into the power switch, and turn it to the **Off** position.)

3. Connect the video cable from the monitor to the appropriate console connector labeled **CRT 1** on the back panel. Repeat for second monitor, using **CRT 2**.

4. Insert the female end of the console power cord in the connector labeled **Power in** on the console's back panel.

5. Insert the female end of the monitor power cord in the connector on the back of the monitor.

6. Insert the male end of the monitor power cords in the console connector labeled **Switched AC Outlets**. The switched AC outlets provide the same voltage the console is plugged into.

7. Insert the male end of the console power cord in a grounded 120 VAC outlet. For 220 VAC operation, consult ETC.

VGA monitor console connector
HD-DB15 female

VGA monitor pinout
1   Red video
2   Green video
3   Blue video
4   Ground
5   Ground
6   Red ground
7   Green ground
8   Blue ground
9   not connected
10 Ground
11 Ground
12 not connected
13 H. (H/V) sync
14 V. sync
15 not connected

Note: In some installations you may need additional grounding. An additional grounding location is provided on the rear of the console for this purpose. This console is not certified for use in wet locations.

Older console DIP switch settings

A set of DIP switches are located inside older consoles (with keyswitch style power switches) at the back right corner of the circuit board, to the left of a strip of eight LEDs. The settings of DIP switches 2 and 3 determine whether your system is using ETCNet and Full Tracking Backup. DIP switch 4 enables SMPTE.

To change the DIP switch settings, raise the top panel and hold it in upright position. Find the switches and adjust the settings as shown on the list below.

Expression 2x checks DIP switch settings when the console is turned on. You must restart the console for new DIP switch settings to take effect.

Switches are either **On** (**Closed**) or **Off** (**Open**). DIP switches 1, 5, 6, 7, and 8 should always be **Off**.

DIP Switch		*Function*
1		*Factory Use Only*
Off (Open)		Should always be set
2	*3*	*Console mode on start up*
Off	Off	Network off
On	**On**	Network on/One console
On	Off	Network on/FTB Console A
Off	**On**	Network on/FTB Console B
4		*SMPTE*
Off (Open)		SMPTE disabled
On (Closed)		SMPTE enabled
5 through 8		*Factory Use Only*
Off (Open)		Should always be set

Connecting dimmers

These instructions explain how to connect DMX512 outputs and provide DMX512 connector pinout specifications. The Expression 2x console provides three DMX512 output ports, for a total capacity of 1,536 outputs.

Follow these steps to connect dimmers to your console:

1. Verify that your dimmer connector pinout matches the pinout listed below. If your pinout does not match, contact your dealer or ETC.

    Caution: Your dimmer control common must be compatible with console control common; they must either be the same level, or the dimmer control common must float. Verify compatibility with your dealer if you are not sure.

2. Connect up to three DMX512 cables (1,536 outputs) to DMX512 output connectors on back panel of console. Output connector location is shown on page 292.

DMX512 connector
XLR 5-pin female
512 digital multiplex dimmers

DMX512 pinout
1   Common
2   Data (–)
3   Data (+)
4   not connected
5   not connected

Replacing the auxiliary fuse

If external devices, the RFU, or remote macros fail to operate correctly, and you suspect the console fuse might be the problem, follow these steps to replace the fuse:

1. Turn off the console.

2. Remove the power cord.

3. Using a small flat head screwdriver, genly press and rotate counter-clockwise the fuse holder labeled **RFU/Remote I/O**.

4. Replace the fuse with a fuse of rating T2.5A. Do not use a fuse with any other rating. This is a 2.5 amp 250 V time lag type fuse.

System configuration

Once your console is installed, you may need to reset some hardware configuration settings. The Input/Output Configuration screen allows you to reset the DMX512 starting numbers for your DMX512 ports, set your ports for ETC Multiplex dimming, and adjust the DMX512 signal speed if your dimming system requires a slower signal.

```
                    Input/Output Configuration            Port 1
                              16:09


       DMX Ports          Operating Mode      Starting DMX Number

       1                   Normal              1
       2                   Normal              513
       3                   Normal              1025


             Current DMX Transmission Speed: Max




                          Select DMX port



   S1        S2        S3        S4        S5        S6        S7        S8
 DMX Port   DMX      Start      DMX                                    Return
            Mode     Number     Speed
```
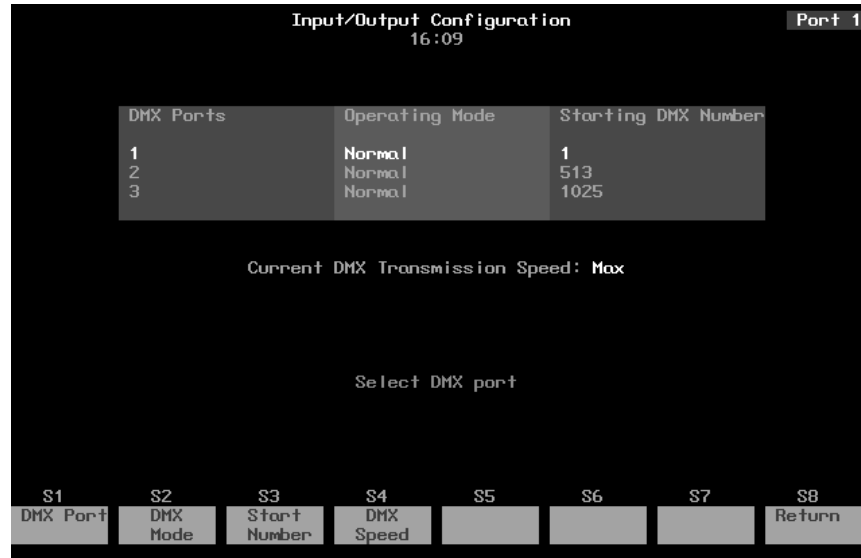
Setting DMX512 starting numbers

When you install your Expression 2x, the console sets the starting dimmer number for DMX512 port 1 to **1**, DMX512 port 2 to **513**, and DMX512 port 3 to **1,025**. If you prefer, you may set different starting numbers for the DMX512 ports. For example, if your system included 15 racks, each with 96 dimmers, you could set the ports to start at **1**, **481**, and **961**. This would avoid having any rack receiving signals from two ports. If you do so, you will need to specify this in the I/O Configuration screen.

To reset DMX512 port starting dimmer numbers, follow these steps:

1. Press [Setup] to display the Setup Menu.

2. Press [2], **Input/Output Configuration**, and press [Enter].

3. Press [↓] to select the port to configure (port 1, 2 or 3).

4. Press [S3], **DMX512 Start**.

5. Enter the desired starting number for the port.

6. Press [Enter] twice to confirm your choice.

7. Display indicates port starting number.

Setting Multiplex mode

If your console is controlling an ETC Sensor dimming system that utilizes ETC's Multiplex dimming, specify this in the I/O Configuration screen.

Warning: Changing a port to or from Multiplex mode resets your patch.

To configure your system for the type of fixtures you have, follow these steps:

1. Press [Setup] to display the Setup Menu.

2. Press [2], **Input/Output Configuration**, and press [Enter].

3. Press [S1], **DMX512 Port**, enter the port to configure (port 1, 2 or 3), and press [Enter]. You may also use [↓] to select a port.

4. Press [S2], **DMX512 Mode**.

5. Press [1] to set the port for Multiplex mode or [0] to set the port for normal mode.

6. Press [Enter] twice to confirm your choice.

7. Console indicates mode as either **Normal** or **Multiplex**.

Note: If you use multiplexed fixtures, you cannot set the ports' starting DMX512 numbers.

Setting DMX512 speed

If your console is controlling a dimming system that requires a slower DMX512 signal, specify this in the I/O Configuration screen

Expression 2x is designed to run at the highest rate provided for in DMX512 specifications. Some dimming systems (including some Colortran ENR™ dimmers) may require a signal slower than the full DMX512 specification. If this proves necessary, you may reset the console's signal speed.

Speed choices are **Slow**, **Medium**, **Fast**, and **Max**. Expression 2x normally runs at **Max**. If you have problems with outputs flashing, fades not running smoothly, or unselected dimmers rising spontaneously, experiment with slower speeds until the symptoms disappear. If the symptoms persist, please contact ETC Technical Services at 800/775-4382.

To reset Expression 2x's DMX512 signal speed, follow these steps:

1. Press [Setup] to display the Setup Menu.

2. Select 2, **Input/Output Configuration**, and press [Enter].

3. Press [S4], **DMX512 Speed**.

4. Press [0] for **Max**, [1] for **Fast**, [2] for **Medium**, or [3] for **Slow**. The speed you choose appears in the upper right corner of the display.

5. Press [Enter] to confirm your choice.

6. Display indicates new speed setting.

Updating Expression 2x software

Update procedure

Expression 2x software updates are distributed on diskette. Follow these steps to update the software in your Expression 2x console. Make sure the diskette is the correct one for your console.

1. Installing new console software clears all system memory. Please save your current show!

2. Turn the console off.

3. Insert the console software diskette into your console's diskette drive.

4. Turn the console back on. The console displays the boot screen and automatically installs the software. This process takes approximately one minute. The console displays the following messages as the installation progresses: **Loading**, **Erasing Flash**, **Writing Flash**. Wait until the Stage display appears.

5. Press [Setup] to confirm that the new software has been successfully installed. The current software version is displayed in the lower right corner of the display. This version number should match the number on the diskette. If it does not, repeat the procedure.

6. Press [4] [Enter] [S1], **Reset System**. The update is complete.

Software installation note

In ETCNet networked systems where an Expression 2x console is connected to Remote Interfaces and/or Remote Video Interfaces, both the console and the remote device must have the same version software installed. For instructions for upgrading remote device software, see *Installing remote unit software* on page 320.

If you have any questions or experience difficulties while upgrading, please call ETC's Technical Services department at 800/775-4382.

Installing an alphanumeric keyboard

Use the optional keyboard to assign alphanumeric names to cues, sub-masters, groups, effects, and shows.

If you wish to use your own keyboard rather than order one with the console, you can use any standard PC AT compatible alphanumeric keyboard. If the keyboard you use is switchable, use it only in its AT-compatible mode. ETC recommends the Cherry G80-1800 and Keytronic 101 keyboards. Although you may use keyboards from other manufacturers, ETC does not guarantee compatibility.

> *Caution: Do not connect or disconnect an alphanumeric keyboard while your system is turned on. Doing so may cause the keyboard to initialize improperly.*

Follow these steps to install an alphanumeric keyboard:

1. Be sure the selector switch is set to the AT position, if applicable.

2. Insert the keyboard cable into the connector labeled **Keyboard** on the Expression 2x or Remote Interface back panel.

Console connector
DIN 5-pin female

Keyboard pinout
1   Clock
2   Data
3   Reset
4   Ground
5   +5 Vdc

Installing a printer

Expression 2x supports parallel printers, including most laser printers. Printer functions are described in *Chapter 17, Printing.* Follow these steps to install printer:

1. Insert parallel printer cable into connector labeled **Parallel Printer** on the back panel of the console.

2. Insert opposite end of printer cable into printer.

3. Turn printer power switch on, and verify that printer is on line.

Console connector DB25F		*Printer connector* Centronics D36
Pinout	*Signal*	*Pinout*
1	STRB	1
2	D0	2
3	D1	3
4	D2	4
5	D3	5
6	D4	6
7	D5	7
8	D6	8
9	D7	9
10	ACK	10
11	Busy	11
12, 13	Not used	12, 18
14 to 17	not connected	13 to 15, 17, 19 to 36
18 to 25	Ground	16

Installing Designer's Worksheet

Designer's Worksheet is a remote digitizer tablet available for use with ETC consoles. Two different models of Kurta digitizers have been used as Designer's Worksheets, and each has a different configuration procedure, described below. Refer to Kurta digitizer tablet documentation if you need additional information. See *Designer's Worksheet* on page 211 for operation instructions.

Installing the Kurta XGT

The Kurta XGT digitizer tablet is shipped with current Designer's Worksheet systems.

Follow these steps to install and configure your Kurta XGT Designer's Worksheet:

1. Turn off your console or Remote Interface.

2. Plug the 9-pin serial connector on the interface cable into the console or Remote Interface connector labeled **Digitizer**.

3. Plug the other end of the interface cable into the interface connector on the back panel of the XGT. There is a small arrow or dimple on the plug. It should face up.

4. Plug the transformer cable into the DC connector on the interface cable's serial connector (plugged into the back panel of the console or Remote Interface).

5. Plug the transformer into an electrical outlet or a surge protecting power strip.

6. Turn on your console or Remote Interface. The XGT also turns on. The red power on LED in the back left corner should blink off and then on again. If it doesn't, check to be sure all cables are properly connected.

7. The XGT shipped with a page of instructions called *Configuring the Designer's Worksheet for use with Expression 2 line consoles.* Follow the instructions on that page now.

8. The digitizer is now configured properly. Remove the configuration page, store it in a safe place, and place one of the standard ETC template sheets under the clear plastic flap on the digitizer.

Note: Additional pads of Designer's Worksheet templates are available from your dealer or ETC.

9. Press [Setup] and select 1, **System Settings**.

10. Press [7], **Designer's Worksheet Setup** [Enter]. Expression 2x displays the Designer's Worksheet Setup Menu.

11. Select one of the displayed options, either on the console keypad, or by selecting [F2], [F3], or [F4] on the Worksheet template button bar, then press [Enter].

12. Press [S1], **Sheet/Console Sliders**, to enable slider control from either the digitizer or the console.

13. Touch the pen to the digitizer region labeled **Calibrate** (or [F1]).

14. Follow the instructions on the screen that direct you to touch the pen to the regions labeled **A**, **B** and **C**.

Installing the Kurta IS/ONE

The Kurta IS/ONE digitizer tablet was shipped with older Designer's Worksheet systems.

Follow these steps to install and configure your Kurta IS/ONE Designer's Worksheet:

1. Insert the 9-pin serial connector of the Designer's Worksheet cable into the console or Remote Interface connector labeled **Digitizer**.

2. Insert the plug end of the pointing device (pen or stylus) in the IS/ONE connector labeled **Pen/Cursor**.

3. Attach the pen holder to the upper left or right hand corner of the Worksheet by removing the protective paper from the base and pressing the adhesive to the tablet.

4. Place one printed template sheet under the clear plastic flap on the digitizer.

5. Set the voltage selection switch to match your electrical outlet. In the US, set the voltage switch to **110**.

6. Plug the power cord into the back of the Worksheet and into an electrical outlet or a surge protecting power strip.

Note: Additional pads of Designer's Worksheet templates are available from your dealer or ETC.

7. Set the three sets of DIP switches on the Worksheet as indicated in the chart below.

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Set A	*Down*	*Down*	*Down*	*Down*	*Up*	*Up*	*Up*	*Up*
Set B	*Down*	*Up*	*Down*	*Up*	*Down*	*Down*	*Up*	*Up*
Set C	*Up*	*Up*	*Down*	*Down*	*Down*	*Down*	*Up*	*Down*

8. Turn the Worksheet power on by pressing the on/off switch. The LED labeled **Indicator** (on the back panel) is lit when power is on. If the LED blinks four times after you turn the power on, the interface cable is not connected correctly.

9. Press [Setup], and select 1, **System Settings**.

10. Press [7], **Designer's Worksheet Setup** [Enter]. Expression 2x displays the Designer's Worksheet Setup Menu.

11. Select one of the displayed options, either on the console keypad, or by selecting [F2], [F3], or [F4] on the Worksheet template button bar, then press [Enter].

12. Press [S1], **Sheet/Console Sliders**, to enable slider control from either the digitizer or the console.

13. Touch the pen to the digitizer region labeled **Calibrate** (or [F1]).

14. Follow the instructions on the screen that direct you to touch the pen to the regions labeled **A**, **B** and **C**.

Designer's Worksheet DIP switch settings

Three sets of DIP switches are located on the back panel of the Kurta IS/ ONE Designer's Worksheet. These DIP switches need to be set as shown below for the digitizer to function properly. The Kurta XGT Designer's Worksheet does not have DIP switches.

Note: These settings are different from those used with old Expression-line consoles.

To change the DIP switch settings, find the switches and adjust the settings as shown on the illustration and chart below.

The Designer's Worksheet checks DIP switch settings when unit is turned on. You must restart the unit for new DIP switch settings to take effect.

Switches are either **Up** (On) or **Down** (Off).

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Set A	*Down*	*Down*	*Down*	*Down*	*Up*	*Up*	*Up*	*Up*
Set B	*Down*	*Up*	*Down*	*Up*	*Down*	*Down*	*Up*	*Up*
Set C	*Up*	*Up*	*Down*	*Down*	*Down*	*Down*	*Up*	*Down*

Installing Remote Focus Unit

The Remote Focus Unit (RFU) allows you to set channel levels, check dimmers or run cues from remote locations.

To install the RFU, follow these steps:

1. Verify that RFU power switch is turned **Off**. (Unit is off when switch is in the position toward the bottom edge of the RFU.)

2. Insert the RFU cable into the connector on the back of the console or Remote Interface labeled, **RFU**.

3. Turn RFU power switch to **On**.

RFU console connector
XLR 6-pin female

RFU pinout
1   Data (+) (to RFU)
2   Data (–)
3   Data (+) (from RFU)
4   Data (–)
5   Common (AC ground)
6   +12 Vdc (fused, 2 amp)

Installing MIDI

Connect Expression 2x to any MIDI equipment using a standard MIDI cable.

There are three round, 5-pin, DIN-type connectors labeled **MIDI In**, **MIDI Out**, and **Keyboard** on the back of the console. Turn console power off, then connect the cable from the **MIDI Out** of the electronic instrument or sequencer to the **MIDI In** on the console. Connect the cable from the **MIDI In** on the instrument or sequencer to the connector labeled **MIDI Out**.

*Warning: Do not plug the MIDI cable into the connector labeled **Keyboard**. This connector is for use with an optional alphanumeric keyboard and may damage MIDI equipment.*

If you like, you can set the **MIDI Out** connector as a **MIDI Thru** port. See next page for more information on this option.

Follow these steps to connect MIDI equipment to Expression 2x:

1. Turn console power off.

2. Insert standard MIDI cable into the connector on the back of the console labeled **MIDI In**. *Do not insert MIDI cable into connector labeled **Keyboard**.*

3. If you are sending MIDI commands from the console, insert another standard MIDI cable into the connector on the back of the console labeled **MIDI Out**.

MIDI console connectors
DIN 5 pin female

MIDI pinout
1   not connected
2   Ground
3   not connected
4   MIDI +
5   MIDI –

MIDI Out/Thru jumper setting

You may set the **MIDI Out** connector as a **MIDI Thru** port. Follow these steps to do so:

1. Locate the jumper at location J5 (J8 on Insight 2x) on the face panel circuit board in the lid of the console. With the lid in an upright position, the jumper should be near the lower right corner of the circuit board.

2. The jumper at location J5 (J8 on Insight 2x) should be installed on the pair of pins labeled **1** (**A** on Insight consoles) for MIDI Out to be active. To use the **MIDI Out** connector as a **MIDI Thru** connector, move the jumper to the pins labeled **2** (**B** on Insight 2x).

On older consoles (with keyswitch power switches), the jumper locations are slightly different. Follow these steps with older consoles:

1. Locate the jumper at location J20 on the face panel circuit board in the lid of the console. With the lid in an upright position, the jumper should be near the lower right corner of the circuit board, just below the level wheel.

2. The jumper at location J20 should be installed on the pair of pins labeled **1** for MIDI Out to be active. To use the **MIDI Out** connector as a **MIDI Thru** connector, move the jumper to the pins labeled **2**.

3. Close the console and test for proper operation.

Installing SMPTE

In order to use SMPTE equipment with Expression 2x, the SMPTE option must have been installed at the factory. Connect Expression 2x to SMPTE equipment using an appropriate SMPTE cable.

Follow these steps to connect SMPTE equipment to Expression 2x:

1. Turn console power off.

2. Insert SMPTE cable into the connector on the back of the console labeled **SMPTE**.

3. Set DIP switch 4 to enable SMPTE. See *Older console DIP switch settings* on page 297 for instructions.

SMPTE console connector
3 pin female XLR

Balanced SMPTE pinout
1   Common
2   Signal +
3   Signal −

*Note: This pinout is for balanced input. For unbalanced input, make the following connections in the user cable: Connect XLR pin 1 and pin 2 together, tying **Common** to **Signal +**. The unbalanced signal connects to XLR pin 3, **Signal −**.*

ETCNet

Expression 2x supports ETCNet, a specially designed network that allows you to connect a wide variety of ETC interface devices to the console at remote locations. Through these devices, you can attach monitors, DMX512 devices, RFUs, alphanumeric keyboards, and Designer's Worksheets to the network. Interface devices include the Remote Interface and the Remote Video interface

ETCNet connectors for two or three types of ETCNet wiring are located on the back panel of the console and all ETCNet interface devices. The connector you use will depend on what kind of wiring your location has installed.For more information about wiring choices, see the *ETCNet Planning and Installation Guide.*

To attach Expression 2x to the ETCNet network, insert the connector at the console end of the network cable into the appropriate console connector (BNC, RJ45, or 15-pin). Attach other devices to the interface device as described in the appropriate sections of this manual.

Note: For continued compliance with emissions requirements, all cables, with the exception of twisted pair cable, must be shielded.

ETCNet cabling DIP switch settings

Before you use the console on the ETCNet network, set the ETCNet DIP switches as described below.

1. Locate the DIP switches on the back panel of the console, to the left of the ETCNet connector(s).

2. Set DIP switch 7 to indicate what kind of wiring you are using.

DIP 7	*Wiring type/connector*
Up	BNC (ThinNet) connector
Down	RJ45 (Twisted Pair) connector

3. Set DIP switches 2 and 3 to indicate ETCNet network status. (If you are using Full Tracking Backup, the switches also determine which console is **A** and which is **B**).

DIP 2	*DIP 3*	*Console mode on start up*
Up	Up	Network off
Down	Down	Network on/Single console
Down	Up	Network on/FTB Console A
Up	Down	Network on/FTB Console B

4. If you are using Twisted Pair wiring, it may be necessary to change the setting of DIP switch 8. If you are using an external null concentrator, set DIP switch 8 up. If not, set the switch down.

DIP 8	*Twisted Pair Polarity*
Up	Off
Down	On

ETCNet DIP switches on older consoles

In order to activate ETCNet on older consoles (with keyswitch style power switches), you must first adjust the settings of the ETCNet cabling DIP switches on the console's logic board to indicate what kind of cable the network uses. You will need to use a pin, or a similar fine-pointed object, to set the switches.

Warning: Do not use a pencil to set the switches.

To set the DIP switches, follow these steps.

1. Loosen the knobs at the front of both ends of the front panel that secure the face panel.

2. Raise the face panel and hold or prop it in upright position.

3. Locate the two sets of DIP switches on the left side of the main circuit board. See illustration on page 294.

4. If the ETCNet cable is plugged into the RJ45 (Twisted Pair) connector or the DB15 (ThickNet) connector, set the left-hand set of six switches, labeled **S1**, to **On**. Set the other six (**S2**) to **Off**.

   Or...

   If the ETCNet cable is plugged into the BNC (ThinNet) connector, set the right-hand set of six DIP switches, labeled **S2,** to **On**. Set the other six (**S1**) to **Off**.

5. Close the face panel and secure it with the knobs.

6. Close the face panel and secure it with the knobs.

Installing Remote Interfaces

Remote Interfaces allow you to attach Expression peripherals to your network. Each Remote Interface contains connectors for three types of network cable (ThinNet, ThickNet and Twisted Pair). Choose the connector that matches your cable type.

To install the Remote Interface, follow these steps:

1. Plug the network connector into the appropriate back panel connector.

2. Plug the power cable into a grounded 120 VAC outlet.

The Remote Interface back panel contains connectors for up to two monitors, three DMX512 outputs and an RFU. The illustration below shows the Remote Interface's back panel and indicates the connector used by each accessory. The front panel includes a connector for a digitizer and an alphanumeric keyboard.
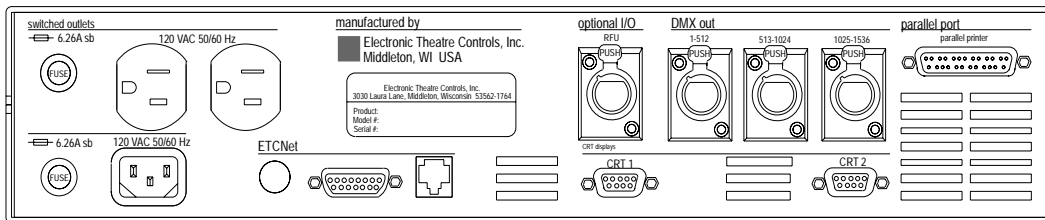
In order to activate the Remote Interface, you must first adjust the settings of a number of DIP switches on the Remote Interface's main circuit board.

DIP switch and jumper settings

The Remote Interface's main circuit board contains one 8-switch DIP switch unit at location S1 and a set of 14 jumpers at location J22. In order to activate the Remote Interface, you must first adjust the settings on these jumpers and switches.

1. Remove the screws that secure the top panel.

2. Raise the top panel to expose the internal circuitry.

3. Locate jumpers 1 through 14. (location **J22**)

4. If your network cable is plugged into the BNC connector (ThinNet), install jumpers 1 through 6. Be certain jumpers 7 through 12 are not installed.

5. If your network cable is plugged into the RJ45 connector (Twisted Pair) or the DB15 connector (ThickNet), install only jumpers 7 through 12. Be certain jumpers 1 through 6 are not installed.

6. Jumper 13 must always be off. Jumper 14 should always be installed.

7. Locate the DIP switches at location **S1** on the corner of the circuit board nearest the power switch. Switches are either **On** (**Closed**) or **Off** (**Open**). **DIP switch 1 must be Off and 2 must be On or the Remote Interface will not start.** Adjust the settings as necessary to match the table below.

DIP Switch	*Position*	*Function*
1	Off (Open)	Normal operation, Factory Use Only
2	On (Closed)	Normal operation, Factory Use Only
3	Off (Open)	Normal operation, Factory Use Only
4	Off (Open)	Normal operation, Factory Use Only
5	Off (Open)	Normal operation, Factory Use Only
6	Off (Open)	Normal operation, Factory Use Only
7	Off (Open)	Normal operation, Factory Use Only
8	Off (Open)	Normal operation, Factory Use Only

8. Close the face panel and replace the screws.

9. The Remote Interface checks DIP switch settings when it is turned on. Restart the unit for new DIP switch settings to take effect.

Installing Remote Video Interface

The Remote Video Interface allows you to attach Expression peripherals to your network. Each Remote Video Interface contains connectors for three types of network cable. Choose the connector that matches your network cable type.

To install the Remote Video Interface, follow these steps:

1. Plug the network cable into the appropriate connector.

2. Plug the power cable into a grounded 120 VAC outlet.

3. If necessary, set DIP switches as described below.

The Remote Video Interface provides ports for remote accessories. It supports two monitors, an alphanumeric keyboard and an RFU, and provides a serial port for a digitizer. The illustrations below show the Remote Video Interface's front and back panels and indicate the connector used by each accessory.

ETCNet Remote Video Interface back panel
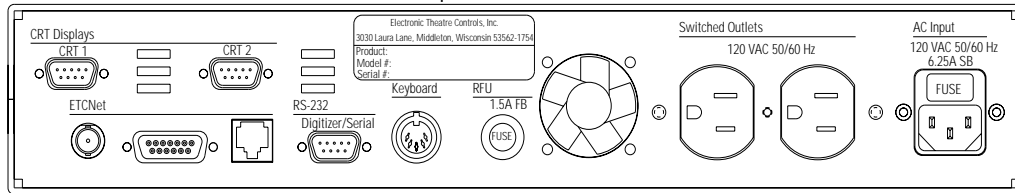
ETCNet Remote Video Interface front panel
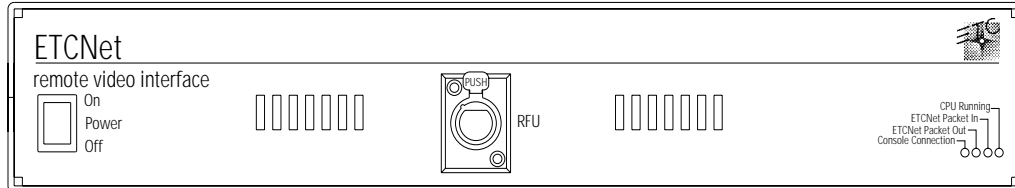
Remote Video Interface settings

The RVI Processor Board is the lower circuit board in the Remote Video Interface (RVI). It contains one 8-switch DIP switch unit. Under normal conditions, these switches will never need to be changed.
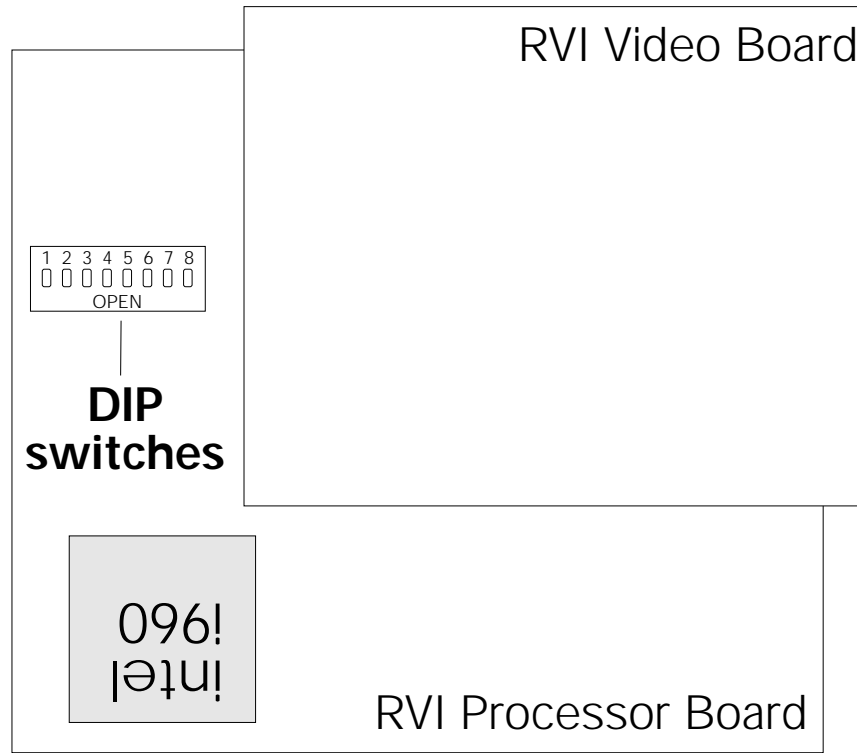
If the settings get changed and you need to restore them, find the switches at location **S4** and adjust the settings as listed below. The Remote Video Interface checks DIP switch settings when unit is turned on. You must restart the unit for the new settings to take effect.

DIP Switch	Position	Function
1	On (Closed)	Normal operation, Factory Use Only
2	Off (Open)	Normal operation, Factory Use Only
3	Off (Open)	Normal operation, Factory Use Only
4	Off (Open)	Normal operation, Factory Use Only
5	Off (Open)	Normal operation, Factory Use Only
6	On (Closed)	Normal operation, Factory Use Only
7	On (Closed)	Normal operation, Factory Use Only
8	Off (Open)	Normal operation, Factory Use Only

Switches are either **On** (**Closed**) or **Off** (**Open**).

RVI ETCNet DIP switch settings

In order to enable the Remote Video Interface (RVI) for use on the ETCNet network, you must first adjust the settings of the two sets of ETCNet DIP switches. You will need to use a pin, or a similar fine-pointed object, to set the switches.

To set the switches, follow these steps.

1. Locate the two sets of DIP switches, visible through the right side panel of the RVI.

2. If the ETCNet cable is plugged into the BNC (ThinNet) connector, set the back six DIP switches to **Off** (up). Set the front six to **On** (down).

3. If the ETCNet cable is plugged into the RJ45 (Twisted Pair) connector or the DB15 (ThickNet) connector, set the front six switches to **Off** (up). Set the back six to **On** (down).
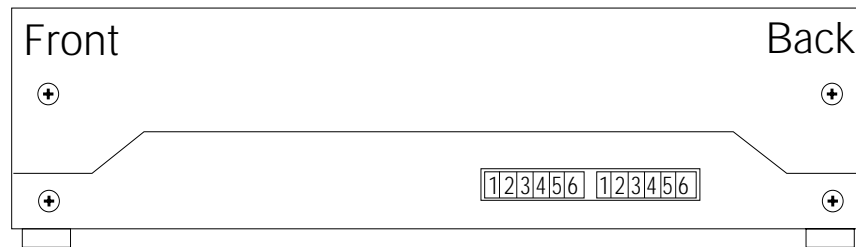
Installing remote unit software

Follow these steps to upgrade software for any Remote Interfaces or Remote Video Interfaces connected to your Expression control console via the ETCNet network. This will not upgrade software for a Remote Focus Unit (RFU).

1. Installing a new version of Remote Unit software will **<u>not</u>** clear system memory, but it is always best to be prepared. Save your current show!

2. Turn the console off.

3. Insert the Remote Unit Update software diskette into your console's diskette drive.

4. Turn the console back on. The console will display the boot screen and the message **Loading XX%**. Wait until the loading process is complete and the Remote Unit Update Program Menu appears. This menu displays the version number of the software currently being loaded, the console address and a list of all remote devices connected to the network (remote devices must be turned on to appear). It also shows the unit's network address, type and current software version. If your network devices are turned on, but don't appear on the display, and your network uses twisted pair wiring, press [S6], **Swap Twst Pair**. Devices should appear within ten seconds.

Updating software to all remote devices
To update the software on all remote devices, press [S1], **Update All Units**.

Updating software on selected remote devices
To update the software on multiple, remote devices, use the arrow keys to move through the list of devices. When the device you want to update is highlighted, press [S8], **Mark This Unit** to select that device. An **M** appears to the left of the device name, indicating that this device has been selected for updating. Repeat this procedure for each device you want to update, then press [S2], **Update Marked** to update the software in each of the marked devices.

Updating software on a single remote device
To update the software on a single remote device, use the arrow keys to select the device, then press [S3], **Update This Unit**.

Under the Status column in the Remote Units list, the percentage of completion will be shown. When the word **Pass** is visible, the update process is done.

5. Remove the Remote Unit Update disk from the console diskette drive.

6. Turn the console off and then back on again. The process is complete.

If you have any questions or experience difficulties while upgrading, please call ETC's Technical Services department at 800/775-4382.

Installing remote video monitors

You may want to install additional monitors at remote locations. Install monitors by connecting them to any interface devices on ETCNet. Additional monitors duplicate the master console's displays in remote locations.

Connect monitors to interface devices by following these steps.

1. Insert the female end of the monitor power cord in the monitor connector, and the male end of the monitor power cord in the interface device connector labeled **Switched outlets**.

2. Connect the cable to the appropriate connector labeled **CRT 1** or **CRT 2** on the interface device.

3. Turn monitor power switch to its **On** position.

VGA monitor console connector
HD-DB15 female

VGA monitor pinout
1	Red video
2	Green video
3	Blue video
4	Ground
5	Ground
6	Red ground
7	Green ground
8	Blue ground
9	not connected
10	Ground
11	Ground
12	not connected
13	H. (H/V) sync
14	V. sync
15	not connected

Installing Full Tracking Backup

Full Tracking Backup (FTB) allows you to connect two Expression 2x consoles, or one console and a Lighting Playback Controller (LPC), using one as a backup for the other. This provides you with a working way of running your show, even if something happens to your main console. See *Full Tracking Backup* on page 217 for more information.

Use the keyswitch at the right end of the console LED display panel to switch from one set of electronics to the other.

Follow these steps to install a Full Tracking Backup system.

1. Connect both consoles (or console and LPC) via the ETCNet network cable and terminate properly. See *ETCNet* on page 312 for more information about ETCNet.

2. Connect monitors to the second console (or LPC). See *Installing console and monitors* on page 296.

3. Set DIP switches on both processors, either on the console(s) or in the LPC, as described in *Appendix B, DIP switch settings*.

   Note: The console or LPC reads DIP switch settings when you turn it on. You must turn power off and back on for the console to recognize new settings.

Installing Infrared Remote Focus Unit

The optional Infrared Remote Focus Unit (IRFU) allows you to set channel levels, check dimmers or run cues from remote locations in your studio or theatre. The IRFU consists of two components; a receiver and a transmitter. The receiver is connected to the console with a standard multi-conductor cable. The transmitter is a hand-held, wireless unit that sends infrared control signals to the receiving unit.

To install the infrared remote control unit, follow these steps:

1. Verify that the receiver unit is properly connected to the console and that battery in transmitter is good. (See infrared remote documentation for correct connection procedure.)

2. Press [Setup].

3. Select 6, **Options Settings**, and press [Enter].

4. Select 4, **Infrared Remote**, and press [Enter].

5. Enter **1** to enable the IRFU or **0** to disable the IRFU. Press [Enter].

6. Press [On] key on the transmitter unit to turn power on. (Transmitter power automatically shuts off if no keys are pressed for three minutes.)

IRFU console connector
DIN 5-pin female

IRFU pinout
1   Ground
2   PPM data
3   +12V
4   WSI data
5   Charge current

Installing remote macros

The console provides eight remote macro inputs through the 25-pin connector on the back panel labeled **Remote Go**. A user-supplied remote device connects to the console via a 24 AWG, aluminum-shielded, multi-conductor cable with one twisted pair designated for each switch (Belden 9507 S-R PCV Insulated or Alpha 5477 80 Deg. C 300 V PVC). The cable connector at the remote device will vary depending on the device itself.

Console connector
DB-25 female

Remote connector
Connector type depends on unit

Pin	Function
1	- Macro 1,901
2	- Macro 1,902
3	- Macro 1,903
4	- Macro 1,904
5	- Macro 1,905
6	- Macro 1,906
7	- Macro 1,907
8	- Macro 1,908
9	not connected
10	Ground
11	+ 12 Vdc
12	not connected
13	not connected
14	+ Macro 1,901
15	+ Macro 1,902
16	+ Macro 1,903
17	+ Macro 1,904
18	+ Macro 1,905
19	+ Macro 1,906
20	+ Macro 1,907
21	+ Macro 1,908
22	not connected
23	Ground
24	+ 12 Vdc
25	not connected

Wiring remote macros

There are three typical ways to wire the Remote Go function:

- Connect all -Macro pins (pins 1-8) to ground (pin 10) and switch the leads connecting the +Macro pins (pins 14-21) to +12 Vdc (pin 24) as shown in the following diagram.

1 -Macro 1,901	14 +Macro 1,901
2 -Macro 1,902	15 +Macro 1,902
3 -Macro 1,903	16 +Macro 1,903
4 -Macro 1,904	17 +Macro 1,904
5 -Macro 1,905	18 +Macro 1,905
6 -Macro 1,906	19 +Macro 1,906
7 -Macro 1,907	20 +Macro 1,907
8 -Macro 1,908	21 +Macro 1,908
9 not connected	22 not connected
10 Ground	23 Ground
11 +12 Vdc	24 +12 Vdc
12 not connected	25 not connected
13 not connected	
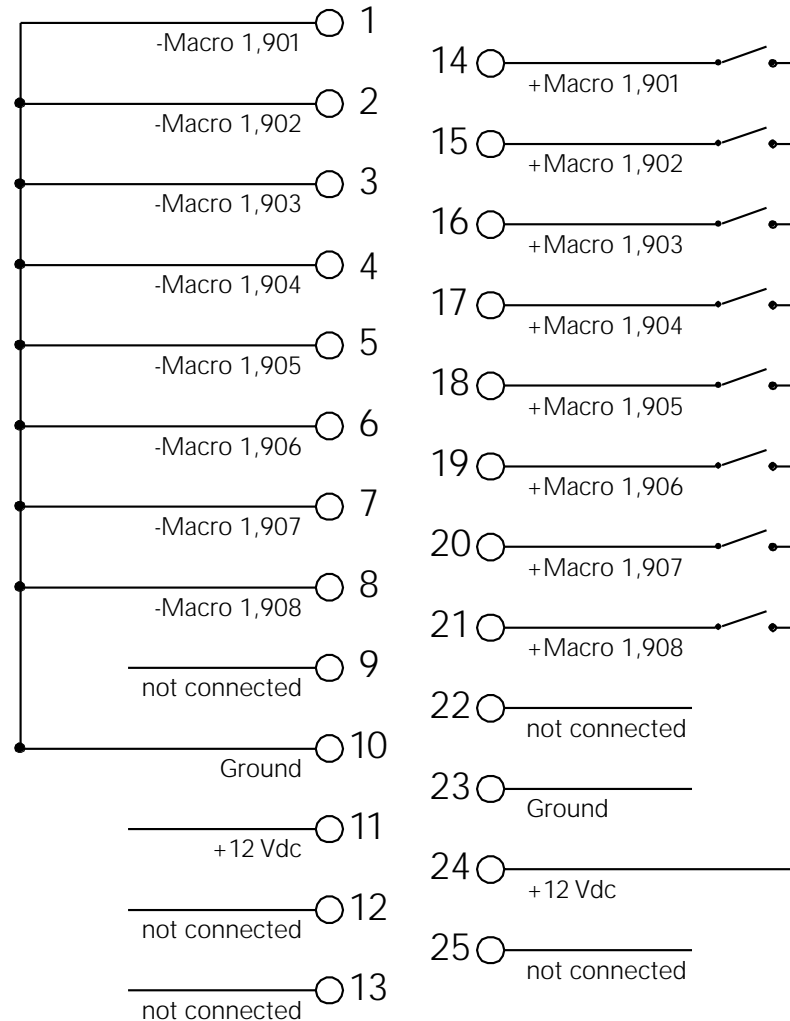
- Connect all +Macro pins (pins 14-21) to the +12 Vdc pin (pin 24) and switch the leads connecting the -Macro pins (pins 1-8) to the ground (pin 10).
- Provide your own power supply that generates a 12 Vdc potential between the +Macro and -Macro pins and switch either of these leads.

appendix b
error messages

Full Tracking Backup messages

System A does not respond. System B is now operating as a stand-alone system. System A has been disconnected from the network. To reconnect System A to the network, you must reboot both System A and System B.

Console A has been turned off or disconnected. Full Tracking Backup has turned full control of your system over to console B.

System B does not respond. System A is now operating as a stand-alone system. System B has been disconnected from the network. To reconnect System B to the network, you must reboot both System A and System B.

Console B has been turned off or disconnected. Full Tracking Backup has turned full control of your system over to console A.

Unable to connect this console as part of a tracking system because of a conflict on the network. Verify that no more than two consoles are attached to the network, with one set as 'A', and the other set as 'B'. Any other combination will not be valid for tracking. Be sure to turn on both consoles within thirty seconds of each other.

Waiting for the master console to respond. Please make sure the master console is turned on.

Both consoles must be turned on within 30 seconds of each other for Full Tracking Backup to be enabled.

Master console does not respond. Please check connections and cabling and make sure that network termination resistors are installed. This system is now operating as a stand-alone system. To re-establish tracking, turn off both consoles, then turn both back on within thirty seconds of each other.

Waiting for the backup console to respond. Please make sure the backup console is turned on.

Both consoles must be turned on within 30 seconds of each other for Full Tracking Backup to be enabled.

Backup console does not respond. Please check connections and cabling and make sure that network termination resistors are installed. This system is now operating as a stand-alone system. To re-establish tracking, turn off both consoles, then turn both back on within thirty seconds of each other.

Errors have been detected in the network. Please check connections and cabling and make sure that network termination resistors are installed. This system is now operating as a stand-alone system. To re-establish tracking, turn off both consoles, then turn both back on within thirty seconds of each other.

Diskette error messages

Bad Disk
Disk is unformatted or defective. Try formatting it. If that doesn't work, try a different disk.

Write-protected disk
The write-protect tab on this diskette is open. Close the tab to unprotect the diskette.

No disk in drive
Show diskette must be inserted in the diskette drive before you can save or read a show.

Disk controller failure
Call ETC Technical Service at 800/775-4382.

Unknown disk error - try again
Try the diskette again. If it fails again, call ETC Technical Service at 800/775-4382.

Corrupted Disk
This disk is defective. Try formatting it. If that doesn't work, try a different disk.

File not found
This disk does not appear to have a show stored on it. Please confirm that you have inserted the correct disk.

Disk full
Disk contains other files. Remove enough files to make room for show file.

Disk access failed because of tracking failure
This message appears on the backup console in a Full Tracking Backup system when the network or the master console fails during a diskette operation.

Other error messages

Out of memory
You have used up all system memory allotted to the function with which you are working. Delete unnecessary parts of the show to free up memory. If this doesn't work, you may want to break the show into two shows, one for each act. This message may also appear if you attempt to run too many effects.

System Error - This software version is incompatible with the existing hardware. Please reload the correct version of software, or contact your service representative for further assistance.

The Designer's Worksheet setup and regions stored in show memory DO NOT match what is being loaded from disk. To preserve current Worksheet setup, press ENTER. To load new Worksheet setup and regions from disk, press CLEAR.
Press [Enter] to retain the layout option you previously selected on the Designer's Worksheet setup screen. Existing regions have already been erased.

Press [Clear] to replace the current Designer's Worksheet layout option with the new show's layout. New regions will be loaded with the new show.

ETCLink errors

ETCLink provides advisory messages for a wide variety of conditions, including information regarding your dimmers, racks, system, data, ports, and loads. These messages fall into two categories, fatal messages and secondary messages.

Fatal messages deal with anything that could potentially terminate or drastically change the look of your show. You may set fatal messages to be displayed even when secondary messages have been disabled.

Secondary messages deal with individual dimmer problems and warnings of potential rack temperature problems. These messages are generally less critical than the fatal messages. If you wish, secondary messages may be disabled without disabling fatal messages. See *Disabling secondary messages* on page 236 for more information.

Fatal messages

Dimmer # has shut down due to an overtemperature condition. The dimmer will remain shut down until the condition is cleared at the dimmer rack. Use Dimmer Status to determine the rack number for the dimmer.

Rack # DMX port A/B failure. Either there is a problem with the DMX cabling/connections between the console and the rack, or the rack has been configured incorrectly.

Rack # A/B/C phase input (main) voltage is in error at #V.

Rack # input (main) frequency is out of spec at #Hz.

Rack # has shut down due to fan failure or other interruption of air flow. Please check the rack, looking for dirty air filters, blocked air passages, or fan failure.

ETCLink has failed. Please check cabling and connections. If the problem persists, please call a qualified service technician.

Rack # processor error.

Secondary Messages

Dimmer # has a load, but the recorded load is zero. Because the recorded load is zero, the Dimmer Monitoring system is unable to determine whether the dimmer has a load error.

The load on dimmer # has changed. Because the dimmer output is not at a high enough level, the Dimmer Monitoring system is unable to determine the size of the load. To correct the problem use [Check Loads] to determine the size of the load change.

The load on dimmer # has changed from #W to #W. A decreased load indicates lamp failure. An increased load indicates that a lamp has been added since the last [Record Load]. Correct the problem or, to prevent further error messages, use [Clear Load] or [Record Load].

DC output has been detected on dimmer #. If this condition persists, it may harm the connected load. Please check the connected load.

An SCR has failed On/Off in dimmer #. The dimmer should be replaced.

Dimmer # output has failed on. The dimmer should be replaced.

Dimmer # output has failed off. Either the circuit breaker has tripped or the dimmer needs to be replaced.

Dimmer #'s load has failed. The most likely cause is a lamp failure. Either replace the lamp or, to prevent further error messages, use [Clear Load] or [Record Load].

Data error on Rack # DMX port A/B. Please check DMX cabling and connections between the console and the rack.

Rack # ambient temperature is high at # degrees F. The temperature does not yet exceed acceptable operational limits, but the rack should be checked. Please check the cooling/ventilation in the dimmer room.

Rack # ambient temperature is low at # degrees F. Please check the cooling/ventilation in the dimmer room.

Rack # ambient temperature is outside the acceptable operating range at # degrees F. Please check the cooling/ventilation in the dimmer room immediately.

The phasing in Rack # is not allowed. The rack has been shut down. Please check the input power service.

appendix c
specifications

Electrical

- Voltage input 90-250 VAC, 50-60 Hz
- Maximum current 6.3 amps
- Maximum monitor load - two at 2.0 amps each

Internal interfaces

- Up to 1,536 DMX512 outputs
- Parallel printer
- RS-232C serial port
- Remote Focus Unit
- Infrared Remote Focus Unit
- Remote Macro option
- Alphanumeric keyboard
- MIDI
- SMPTE
- DMX512 Input
- ETCLink

System capacity

- 600 cues per show
- 600 control channels
- Proportional patching of up to 1,536 DMX512 dimmers
- Eight-part multipart cues
- Ten dimmer profile options
- 500 groups
- 2,000 macros/regions
- 3,000 SMPTE events
- 24 overlapping submasters
- Ten pages of submaster memory
- Two timed/manual fader pairs

Fader functions

- Fade times programmable from .1 second to 99:59 minutes
- Manual override of upfade and/or downfade
- Rate override
- Split time fades
- Manual fades
- User selectable default fade times
- Hold/Back functions

Playback controls

- Two timed/manual fader pairs
  Two [Go] buttons
  Two [Hold] buttons
  Two [Back] buttons
  Two [Rate] buttons
  Two [Clear] buttons
- 24 submasters
- Programmable Master on 100mm potentiometer
- Blackout function
- Level wheel
- Rate wheel
- Eight softkeys to streamline operations

Display functions

- Two VGA video outputs
- Extensive online Help displays available for all functions
- Stage
- Blind
- Fader
  A/B fader
  C/D fader
  Both faders
  DMX In
- Tracksheet
- Patch
- Park
- Setup
- Flexichannel (displays only recorded channels)
- Expand

Submaster functions

- Ten pages of 24 recorded submasters
- Fully overlapping channel assignments
- Proportional channel levels
- Bump buttons on all 24 submasters may be placed in enabled, disabled or solo mode as a group or individually
- Integral LEDs on all 24 submasters
- Programmable fade and wait times
- Live and programmed rate control
- 12 submasters programmable for overlapping pile-on or inhibitive operation
- All submasters programmable with effects
- Update function
- Control keypad features
- Submaster 24 may be used to master DMX In levels
- Submaster labels

Channel functions

- Group function to allow channels to be manipulated as proportionally balanced groups
- Proportional adjustment with level wheel
- [And], [Except], [Only], and [Thru] functions for selection of control lists
- [Full] function
- [Level] sets a channel to a user-selectable default value
- Channel Attribute display provides Independent, Flip channel and channel Label attributes
- Link List allows channels to be linked together for control by the two wheels

Cue functions

- Up to 600 cues numbered .1 to 999.9
- Discrete upfade and downfade times (00:00-99:59) for each cue
- Linked cue sequences
- Effect cues
- Split wait times
- Follow time
- Link to cue or macro
- Label
- Eight-part multipart cues
- Selective cue recording
- Update cue command
- Attribute range editing
- Subroutines

Group functions

- Up to 500 groups
- Any cue or submaster may be accessed as a group
- Group labels

Diskette drive

- 3.5-inch high-density diskette drive for show storage
- One show per disk
- Software updates installed through diskette drive

Macro functions

- Up to 2,000 macro selections for programming
- Macros may activate any key on the console
- Live Learn mode
- Blind editing
- Macros programmable for **Macro wait**
- Real Time Clock event programming
- Powerup macro
- * Remote Trigger function

Effects functions

- Up to 100 steps each
- Variability of rate during playback
- Step times
- In/Dwell/Out Step fade times
- High/Low Levels
- In/Dwell/Out Effect fade time
- Effects may be recorded as cues or submasters
- Range editing of effect attributes and step values

Profile functions

- Ten preset profiles
- Profiles may be assigned to dimmers

Level/X and Rate/Y wheels

- Proportional intensity control of channels or groups
- Proportional rate control of cues and submasters from zero to 2,000 percent
- Proportional control of linked channels to simplify programming moving lights

Options

- Parallel printer
- Alphanumeric keyboard
- Remote Focus Unit
- Infrared Remote Focus Unit
- Designer's Worksheet
- Lighting Playback Controller
- Remote VGA monitors
- Full Tracking Backup
- Remote Interface
- Remote Macros
- Dimmer feedback

Size and weight

- 40 x 16.5 x 6.5 inches
- 50 pounds

appendix d
reference

This appendix lists most Expression 2x functions, keys and softkeys in alphabetical order. Listings include a description and instructions or examples, as appropriate, for using it.

A

A is softkey [S2] in the Patch, Park and ETCLink Functions displays
[S2], **A**, allows selection of the A output of a multiplex dimmer.

Example: [Patch] [Dimmer] [1] [S2], **A**, [Channel] [6] [Enter] patches the A half of multiplex dimmer 1's output to channel 6.

Allfade

An allfade cue forces all unused channels to zero intensity when you press [Go] and clears the other fader. Allfade is useful for forcing an end cue when tracking channels.

Alphanumeric keys

Use the optional alphanumeric keyboard to label cues, groups or submasters and to name shows.

Alternate

Alternate is softkey [S2] in the Attribute list of the Effect display
Use [S2], **Alternate**, to program an effect that changes between positive and negative on each pass through the steps. If the effect is positive, the first pass will be positive, the second negative, the third positive, etc. If the effect is negative, the first pass will be negative, the second positive, etc. To cancel the Alternate attribute, press [S2] again.

And

Use [And] to select more than one dimmer, group or channel in a single statement.

Example: [Channel] [1] [And] [5] [And] [8] [At] [7][5] sets channels 1, 5 and 8 at 75 percent.

At

Use [At] to enter the intensity for a selected dimmer, channel or group.

Example: [Channel] [1] [And] [4] [At] [4][5] sets channels 1 and 4 at 45 percent.

Attribute

Attribute is softkey [S8] after [S7], More Softkeys, in the Effect display
Use [S8], **Attribute**, to access the effect attribute selection softkeys.

B

B is softkey [S3] in the Patch, Park and ETCLink Functions displays

[S6], **B**, allows selection of the B output of a multiplex dimmer.

Example: [Patch] [Dimmer] [1] [S6], **B**, [At] [7][5] gives the B half of multiplex dimmer 1 a patch level of 75 percent.

Back

Use [Back] to replace the cue in the fader with the previous cue.

Blackout

Press [Blackout] to reduce all channel outputs on stage to zero. Press [Blackout] again to restore lights. Independent channels are not affected by [Blackout]

Blind

The Blind display allows you to create and modify cues, groups and submasters without affecting current live levels. Blind also allows you to create effects and subroutines.

Bounce (effect)

Bounce is softkey [S4] in the attribute list of the Effect display

Use [S4], **Bounce**, to create an effect that alternates between a forward chase and a reverse chase. If the effect is not assigned the reverse attribute, the first pass will be forward, the second reverse, the third forward, etc. If the effect is assigned the reverse attribute, the first pass will be reverse, the second forward, etc. To cancel the Bounce attribute, press [S4] again.

Bounce (subroutine)

The subroutine runs through steps until it reaches a Bounce step. It then runs back through the steps in reverse order, and repeats the sequence for the number of times you specify.

When you create the Bounce step, enter the number of times you want the subroutine to bounce. One bounce equals running through the sequence forward once and reverse once. Enter **0** for a continuous bounce.

Build

Build is softkey [S5] in the attribute list of the Effect display

Use [S5], **Build**, to cause each step in an effect to remain active until the entire step list is executed. When the step list begins again, all steps go out and the cycle begins again. To cancel the Build attribute, press [S5] again.

Bump (SMPTE)

Bump is softkey [S5] after [S7], More Softkeys, in the SMPTE Events display
Use [S5], **Bump**, to access the submaster bump field in the SMPTE Events display.

Bump Status

Bump Status is softkey [S1] in the Blind Submaster displays
Use [S1], **Bump Status**, to change the function of the submaster bump button. Choices are: enabled, disabled or solo

Example: [S1], **Bump Status**, [2] [Enter] disables the bump button of the selected submaster

Calibrate

[Calibrate] is a region on the Designer's Worksheet. Whenever you install a new template on the digitizer tablet, use [Calibrate] to line up the keys and regions correctly. Using the digitizer pen, touch the region labeled **Calibrate** or touch [F1]. Then follow the directions on the screen that instruct you to touch the pen to the regions labeled **A**, **B** and **C**.

Cancel

Cancel is softkey [S7] in the Load Management display
Use [S7], **Cancel**, to interrupt a Record Loads operation that has already started.

Captured channels

Captured channels are channels that you have selected and are live on stage. They remain live until you press [Rel] to release them. **Captured channels override all other channel settings.** For example, if a channel is in a fader at 100 percent and you capture it and set it to 50 percent, Expression 2x sets the captured channel at 50 percent. Press [Rel] twice to release captured channels.

Channel

Use [Channel] to select a channel or group of channels. Use of this key is often optional.

Example: [Channel] [1] [Thru] [9] [Except] [4] [At] [7][5] sets channels 1 through 3 and 5 through 9 to 75 percent.

Clear (keypad)

Use [Clear] to clear the current keypad entry. Press twice to clear all entries.

Example: [Channel] [5] [Clear] [8] [Enter] selects channel 8.

Clear (fader)

Use the fader [Clear] to clear a fader pair of any cues which have been assigned to it. Also use [Clear] to initiate the downfade of an effect cue.

Clear Loads

Clear Loads is softkey [S6] in the Load Management display
Use [S6], **Clear Loads**, to disable dimmer monitoring for selected dimmer loads.

Clear Region

Clear Region is softkey [S6] in the Designer's Worksheet Editing display
Use [S6], **Clear Region**, to erase a recorded region.

Example: [S6], **Clear Region**, [3] [Enter] [Enter] removes region 3 from the Designer's Worksheet layout. It does not affect macro 3.

Clock Enable/Disable

Clock Enable/Disable is softkey [S2] in the SMPTE Events display
Use [S2], **Clock Enable/Disable**, to start or stop the SMPTE internal clock. If SMPTE input is enabled, the internal clock will hold until the first SMPTE frame is received, or until started manually by pressing [S1], **Internal Clock**, If the clock is disabled, the SMPTE events will only be executed if SMPTE input is received.

Copy Event

Copy Event is softkey [S2] after [S7], More Softkeys, twice, in the SMPTE Events display
Use [S2], **Copy Event**, to copy a group of SMPTE events. The target time of the first event in the group must be specified. The original spacing of subsequent events will be maintained.

Copy Macro

Copy Macro is softkey [S5] after [S7], More Softkeys, in the Macro Editing display
Press [S5], **Copy Macro**, to copy the contents of one macro to a second macro. If the destination macro is already recorded, the console will require a confirmation.

Example: [S1], **Select Macro**, [5] [S7], **More Softkeys**, [S5], **Copy Macro**, [9] [Enter] copies macro 5 to macro 9.

Copy Program

***Copy Program is softkey [S2] after [S7], More Softkeys, in the Real
Time Programs display***
Use [S2], **Copy Program**, to copy a group of programs. The target time of
the first program in the group must be specified. The original spacing of
subsequent programs is maintained.

Copy Region

***Copy Region is softkey [S5] after [S7], More Softkeys, in the Designer's
Worksheet Editing display***
Press [S5], **Copy Region**, to copy the contents of one region to a second
region. If the destination region is already recorded, the console will
require a confirmation.

Example: [S1], **Select Region**, [5] [S7], **More Softkeys**, [S5], **Copy
Region**, [9] [Enter] [Enter] copies region 5 to region 9.

Crossfade

In a crossfade cue, channel levels that increase fade to their new level in
the assigned upfade time. Channel levels that decrease fade to their new
level in the assigned downfade time. The cue starts when you press [Go].
You may use a wait time to delay the start of the upfade or downfade.

Cue

Use [Cue] to select a cue number.

Example: [Cue] [156.1] selects cue 156.1.

Cue (SMPTE)

***Cue is softkey [S3] after [S7], More Softkeys, in the SMPTE Events
display***
Use [S3], **Cue**, to access the cue fields in the SMPTE Events display.
Press once to select the A/B field, twice to select the C/D field.

Cue List

The Cue List appears on the playback display (usually the left monitor).
The Cue List provides a list of cues for the show, including all of the cues'
programmed attributes. In addition, the playback display provides informa-
tion about which cue is active or running and on which fader the cue is run-
ning.

The Cue List on the Playback monitor displays the last two cues played
before the pending cue. If a cue is currently playing, the list shows the last
cue played, the playing cue and then the pending cue. **The pending cue
is highlighted in yellow.**

Cue List

Cue List is softkey [S2] in the Blind Cue and Blind Subroutine displays
Use [S2], **Cue List**, to access the Cue List display, which provides a list of recorded cues and cue attributes.

Cue steps (subroutine)

There are two types of cue step, crossfade and allfade. The type determines how the step's fade runs.

Crossfade

All increasing levels fade during the upfade time; all decreasing levels fade during the downfade time.

Allfade

All channels in both faders fade to the level set in the allfade step.

Days of week

Days of week is softkey [S3] in the Real Time Programs display
Use [S3], **Days of week**, to select on which days of the week the real time program will run.

Decimal point

Use the decimal point [.] to select decimal cue numbers (.1-.9) or decimal fade times.

Example: [Cue] [5] [.] [1] [Time] [.][5] [Enter] sets the fade time for cue 5.1 to half a second

Delete

Delete is softkey [S6] after [S7], More Softkeys, in the Stage and Fader displays
Use [S6], **Delete**, to delete the contents of a cue or group. The keypad assumes a cue unless otherwise instructed.

Example: [S6], **Delete**, [6] [Enter] [Enter] deletes cue 6.
Example: [S6], **Delete**, [Group] [5] [Enter] [Enter] deletes group 5.

Delete Cue

Delete Cue is softkey [S6] in the Blind Cue and Blind Subroutine displays
Press [S6], **Delete Cue**, to delete the contents of a selected or specified cue.

Example: [S6], **Delete Cue**, [6] [Enter] [Enter] deletes cue 6.
Example: [S6], **Delete Cue**, [Enter] [Enter] deletes the selected cue.

Delete Entry

Delete Entry is softkey [S3] in the Macro Editing and Designer's Worksheet display
Use [S3], **Delete Entry**, to clear a button entry from a macro. Use the left and right arrow keys to move to the required entry. When selected, it will be highlighted in yellow. Press [S3] to clear the entry.

Delete Event

Delete Event is softkey [S6] after [S7], More Softkeys, in the SMPTE Events display
Use [S6], **Delete Event**, to delete SMPTE events from the event list.

Delete Group

Delete Group is softkey [S6] in the Blind Group displays
Press [S6], **Delete Group** to delete the contents of a selected or specified group.

Example: [Delete Group] [6] [Enter] [Enter] deletes group 6. Example: [Delete Group] [Enter] [Enter] deletes the selected group.

Delete Link

Delete Link is softkey [S6] in the Link List display
Press [S6], **Delete Link**, to remove a link from the Link List. All subsequent links will be renumbered.

Delete Macro

Delete Macro is softkey [S6] in the Macro Editing display
Use [S6], **Delete Macro**, to remove all recorded information from a macro.

Example: [S6], **Delete Macro**, [3] [Enter] [Enter] erases the contents of macro 3.

Delete Part

Delete Part is softkey [S6] in the Blind Multipart display
Press [S6], **Delete Part**, to delete one part of a selected or specified multipart cue.

Example: [S6], **Delete Part**, [6] [Enter] [Enter] deletes part 6.
Example: [S6], **Delete Part**, [Enter] [Enter] deletes the selected part.

Delete Program

Delete Program is softkey [S6] in the Real Time Programs display
Use [S6], **Delete Program**, to remove a program from the program list. All subsequent programs are renumbered..

Delete Step

***Delete Step is softkey [S6] after [S7], More Softkeys, in the Blind Effect
and Blind Subroutine displays***
Press [S6], **Delete Step**, to delete the selected step or a specified step.

Example: [S6], **Delete Step**, [4] [Enter] [Enter] deletes step 4. Example:
[S6], **Delete Step**, [Enter] [Enter] deletes the selected step.

Delete Sub

Delete Sub is softkey [S6] in the Blind Submaster and Sub List displays
Use [S6], **Delete Sub**, to clear a submaster of its recorded or loaded con-
tents.

Example: [S6], **Delete Sub**, [Enter] [Enter] unloads the selected submas-
ter.
Example: [Sub List] [S6], **Delete Sub**, [1] [Thru] [8] [Enter] [Enter] unloads
subs 1 - 8

Dimmer

Use [Dim] to start a dimmer check, park a dimmer, or to change dimmer
patch
assignments.

Example: [Dim] [1] [At] [Full] [Enter] [+] [+] [+] ...
Example: [Park] [Dim] [1] [At] [7][5]
Example: [Patch] [Dim] [6] [Channel] [7] [Enter]

Dimmer Status

***Dimmer Status is softkey [S5] in the System Status and Rack Status
displays***
Use [S5], **Dimmer Status**, to Check information about your dimmers,
including size and type, recorded load, firing mode, output curve, rack,
slot, panic mode, and boost.

Disable ETCLink

Disable ETCLink is softkey [S1] in the ETCLink Functions display
Use [S1], **Disable ETCLink**, to turn off dimmer monitoring. Softkey then
becomes **Enable ETCLink**.

Disable MIDI

Disable MIDI is softkey [S1] in the Options Settings display
Use [S1], **Disable MIDI**, to disable either ETC MIDI or MIDI Show Control.
Both MIDI protocols may be enabled at the same time, and are disabled
individually.

DMX512 Mode

DMX512 Mode is softkey [S2] in the Input/Output Configuration display
Use [S2], **DMX512 Mode**, to set a DMX512 port to multiplex mode or normal mode. Multiplex mode allows dimmers to be used with ETC Source 4 multiplexers. Switching from multiplex to normal mode will cause dimmers on that port to be taken out of the patch.

DMX512 Port

DMX512 Port is softkey [S1] in the Input/Output Configuration display
[S1], **DMX512 Port**, allows selection of a DMX512 output port to put into multiplex mode or to change the starting DMX512 number. DMX512 starting numbers may not be changed by the user if any port is in multiplex mode.

Example: [S1], **DMX512 Port**, [3] [S2], **DMX512 Mode**, [Enter] [1] [Enter] sets port 3 to multiplex mode.

DMX512 Speed

DMX512 Speed is softkey [S4] in the Input/Output Configuration display
[S4], **DMX512 Speed**, changes the DMX512 transmission rate to accommodate DMX512 receivers that accept data at different rates. Four rates are available: Max, Fast, Medium, and Slow. The DMX Speed should be set to Max when used with ETC DMX512 receivers. Other equipment may require slower speeds.

DMX512 Start

DMX512 Start is softkey [S3] in the Input/Output Configuration display
Use [S3], **DMX512 Start**, to set the starting dimmer number of a DMX512 port. If any port is in multiplex mode, the starting numbers may not be changed.

DMX In

DMX In is softkey [S8] after [S7], More Softkeys, in the Stage and Fader displays
Use [S8], **DMX In**, in Stage mode to record only the DMX512 input levels into a cue, group or submaster and in Fader mode to view any DMX512 input to the console.

Example: [Record] [Cue] [8] [S8], **DMX In**, [Enter] records only the current DMX512 input levels into cue 8.
Example: [Record] [Cue] [5] [Except] [S8], **DMX In**, [Enter] records current live levels on stage, except for those set by DMX512 input, into cue 5.

Down Arrow

Use [↓] to move through various displays, such as the Effect and Macro Editing display modes or the Stage and Blind displays.

Effect

Expression 2x allows you to create up to 600 effects, each with up to 100 steps. Effects allow you to assign channels to a series of steps. When you play back the effect, the steps run in assigned chase patterns, or in random order. You may record them as cues or submasters. Each effect includes level and timing controls for the steps in the effect, and overall timing controls for the effect itself. Each effect can run for up to 99:59 minutes.

Note: Current channel levels are not affected by an effect until a step runs that specifically addresses the channel.

Effect cue

An effect cue contains an effect. Effects allow you to assign channels to a series of steps. When you play back the effect, the steps run in assigned chase patterns, or in random order.

Effect submaster

An effect submaster contains an effect. Effects allow you to assign channels to a series of steps. When you play back the effect, the steps run in assigned chase patterns, or in random order. Play the effect by pressing the submaster bump button or by raising the submaster slider.

Enable ETCLink

Enable ETCLink is softkey [S1] in the ETCLink Functions display
Use [S1], **Enable ETCLink**, to allow dimmer monitoring on a system connected by ETCLink to a Sensor dimming system. Softkey then reads **Disable ETCLink**.

Enter

Use [Enter] to advance the operator prompt or terminate/verify selected console functions.

Example: [Record] [6] [Enter] records cue 6.
Example: [Load Sub] [5] [Group] [6] [Enter]

Enter Macro

Use [Enter Macro] to terminate the recording of a macro instruction. This is the last step in recording a macro, whether in Learn mode or blind Macro Edit, unless an instruction to run another macro is used to terminate recording.

Example: [Learn] [9] [Enter] [Record] [Cue] [5] [Except] [Sub] [1] [Enter Macro] records macro 9.

Except

Use [Except] to exclude channels, dimmers or groups from selection or record operations.

Example: [Record] [Cue] [5] [Except] [Sub] [3] [Enter] records the current look in cue 5, except for the channels included in submaster 3.
Example: [Channel] [1] [Thru] [9] [Except] [5] [At] [5] sets channels 1 through 4 and 6 through 9 at 50 percent.

Expand

The console supports two color video monitors called the Command and Playback displays.The [Expand] key extends the information appearing on the Command display onto the Playback display. For example, if you have a screen displaying channels on the Command display, [Expand] allows you to view up to an additional 125 channels on the Playback display.

Fader

The Fader display allows review and modification of channels in the A/B and C/D faders without affecting other channel levels.

Fader status display

The fader status display consists of two windows at the bottom of the playback monitor. It provides information about the cues loaded to Expression 2x's faders, including fade times and rates. The left window monitors the A/B fader, the right window monitors the C/D fader. The display counts down wait times for cues and indicates which step is running when an effect is active.

The illustration below shows the fader status display:
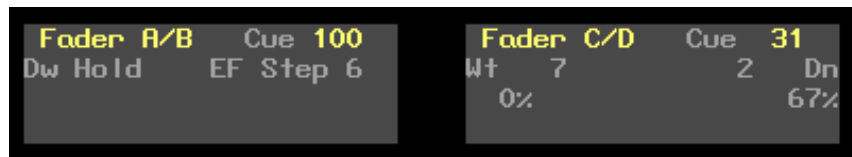
Flash

Flash is softkey [S8] in the Stage display

[S8], **Flash**, sets the selected channel's level to 100 percent if the channel is currently at a level at or below 50 percent. If the channel's level is above 50 percent, **Flash** sets it to zero. Levels set by Flash are only maintained while the key is pressed. For example, press [Channel] [5], then press and hold [S8], **Flash**, to set channel 5 to either 100 or zero. Use [+] and [–] to advance the channel while [Flash] is pressed.

Example: [4] [S8], **Flash**, flashes channel 4.

Flexichannel

Expression 2x's Command display can be set to operate in full display mode or in Flexichannel mode. In full display mode, channel displays show all channels and their current status. In Flexichannel mode, independent, flipped and linked channels and channels with a recorded level appear. Expression 2x defaults to full channel display. Flexichannel may be enabled or disabled from the System Settings menu.

Flip

Flip is softkey [S2] in the Channel Attributes display
Use [S2], **Flip**, to mark a channel 'flipped'. The flipped channels will have their outputs inverted. The levels will not appear inverted on the Stage display. See *Flipped channels* for more information.

Flipped channels

The Flip command in the Channel Attributes display inverts the output of the channel to which it is applied. A flipped channel outputs at full when set to zero and at zero when set to full.

Use [S2], **Flip**, to mark a channel flipped. The flipped channels will have their outputs inverted. The levels will not appear inverted on the Stage display. Channel control can be flipped; this inverts the level sent to the channel.

Use Flip to control moving lights. Link the channels that control the pan attribute for moving lights on opposite sides of the stage and Flip one of the two channels. When you control the two lights using the two wheels, their movements are mirrored, rather than parallel.

Follow

[Follow] allows you to play a series of cues automatically. The [Follow] time indicates how long the console waits after the cue starts before the next cue runs. [Follow] plays back the next cue on the Cue List unless you use [Link] to specify a different sequence. To remove a follow time from a cue, press [Follow] [Clear].

Example: [Cue] [1] [Follow] [1] [Enter] assigns a follow time of one second to cue 1. Cue 2 will start one second after cue 1 starts

Full

Use [Full] to assign a level of 100% to a dimmer channel or group.

Example: [Channel] [1] [Thru] [1][0] [Full] sets channels 1 through 10 to 100 percent.

Go

Press [Go] to execute the next cue in the key's associated fader.

Example: [Cue] [1] [A/B Go] runs cue 1 in the A/B fader.

Groups

Expression 2x allows you to record frequently used combinations of channels into units called groups. You may record up to 500 groups.

Once you record a group, it can be combined with other channels to create cues, submasters, effects, or other groups. The principal difference between a group and a cue is that a group cannot be played back through a fader or slider. Consequently, it has no fade times, wait times or other playback attributes.

Group numbers are independent of cue numbers and may be numbered from 1 to 999.

Group

Use [Group] to select, record or recall a proportional group of channels. Cues and submasters may also be recalled as groups.

Example: [Record] [Group] [1] [Enter] records the current look as group 1.
Example: [Group] [Cue] [3] [at] [5][0] brings up the channels in cue 3 as a group and sets them to 50 percent of their recorded levels.

Group Editing mode

In Group Editing mode, Expression 2x brings up the selected group itself and allows you to modify it. In this mode, use [S1], **Select Group**, rather than [Group], to bring up a different group. Use [Group] to access a group's levels as you modify the selected group.

Group mode

In Group mode, Expression 2x brings up the channels from a group of your choice and allows you to use them to modify cues and submasters.

Group List

Group List is softkey [S2] in the Blind Group display
Use [S2], **Group List**, to access the Group List display which provides a list of recorded groups and their labels

Help

Press [Help], followed by any key to receive a brief description of the key's function.

Hold

Hold is softkey [S2] in the Sub List display
Press [S2], **Hold**, when entering Submaster bump button dwell fade times. Hold causes a faded submaster to stay active until you press the bump button again. A flashing LED indicates that a submaster is holding. Hold causes an effect to hold until you press the clear button controlling the effect to fade the effect out.

Hold (fader)

Use the fader [Hold] to interrupt a fade. Press [Go] to resume, or [Hold] to cancel the fade execution.

Example: [Cue] [5] [Go] [Hold] [Go] starts cue 5, pauses it, then resumes its fade.

Hold-for-Go (subroutine)

A subroutine runs through steps until it reaches a Hold-for-go step. It then pauses until you press [Go].

In/Dwell/Out

In/Dwell/Out is softkey [S3] after [S7], More Softkeys, in the Blind Effect display

Use [S3], **In/Dwell/Out**, to access the fade time field for selected step(s). The first time value is the fade in-time, the second is the dwell time, and the third is the fade out-time for the step. Alternatively, the arrow buttons can be used to move through the display.

Example: [Step] [6] [S3], **In/Dwell/Out**, [1] [→] [2] [→] [1] sets an in time of one second, a dwell of two seconds and an out time of one second for step 5.

Independent

Independent is softkey [S1] in the Link List display

Use [S1], **Independent**, to mark a channel independent. Independent channels are not affected by the Grandmaster, Blackout, Solo, or Flash.

Independent channels

An independent channel is not affected by the Grandmaster, Blackout, Solo, or Flash keys. Otherwise, independent channels function normally. You may set a channel as independent in the Link List display. Press [Rel] three times to release independent channels.

Inhibitive submaster

Inhibitive submasters allow you to limit the intensity level for a group of channels. An inhibitive submaster doesn't actually set channel levels, it prevents channel outputs from exceeding a specified level. When an inhibitive submaster is set at **10** (100 percent), channel output is not inhibited. As you pull the slider down, channel outputs are limited to the level at which you set the slider. An inhibitive submaster controls the levels of its assigned channels in the same way the Grandmaster controls the levels of all channels. Only submasters 13through 24 may be inhibitive. An inhibitive submaster's LED is red.

*Remember, leave inhibitive submasters at **10** (100 percent) unless you want to inhibit channels. Otherwise channels may be missing from your cues. If channels are missing, or channel levels have changed, check your inhibitive submasters! If a channel is fully inhibited by a submaster, its level will be displayed as a yellow zero.*

Insert Event

Insert Event is softkey [S1] after [S7], More Softkeys, in the SMPTE Events display
Use [S1], **Insert Event**, to insert SMPTE events between two existing events. The events will be inserted ahead ahead of the selected event.

Insert Link

Insert Link is softkey [S5] in the Link List display
Press [S5], **Insert Link**, to insert an empty link number ahead of the selected or specified link. All subsequent links will be renumbered.

Insert Program

Insert Program is softkey [S1] after [S7], More Softkeys, in the Real Time Programs display
Use [S1], **Insert Program**, to insert an empty program number ahead of the selected or specified program. All subsequent programs are renumbered.

Insert/Replace

Insert/Replace is softkey [S2] in the Macro Editing and Designer's Worksheet Editing displays
Press [S2], **Insert/Replace**, to change the editing mode of the macro display. Replace Mode overwrites macro entries, and Insert Mode inserts new entries before the currently selected entry (displayed in yellow.)

Insert Step

Insert Step is softkey [S5] after [S7], More Softkeys, in the Blind Effect and Blind Subroutine displays
Press [S5], **Insert Step**, to insert an empty step ahead of the selected or specified step.

Example: [[S5], **Insert Step**, [Enter] [Enter] places an empty step in front of the selected step.
Example: [S5], **Insert Step**, [5] [Enter] [Enter] places an empty step in front of step 5.

Internal Clock

Internal Clock is softkey [S1] in the SMPTE Events display
Use [S1], **Internal Clock**, to set the SMPTE internal clock. This clock serves as a backup for SMPTE input, and will execute the SMPTE event list if the SMPTE input drops out. The internal clock may also be used to run the SMPTE events without any SMPTE input. The SMPTE time clock is displayed in green when SMPTE input is active. It is displayed in red when the internal clock is active.

Jump-to-cue (subroutine)

A subroutine runs through steps until it reaches a Jump-to-cue step. It then automatically starts another cue which is not included in the subroutine. You can jump to any type of cue: regular, subroutine or effect.

When you create the Jump to cue step, enter the number of the cue to which to jump.

Keypad Numbers

Use the keypad number keys to enter all numeric information (dimmers, channels, cues, times, intensities, etc.).

Label

Use [Label] to assign an alphanumeric label to a cue, group or submaster.

Example: [Cue] [6] [Label] [Act 1.1] [Enter] names cue 6 **Act 1.1**.

Label

Label is softkey [S3] in the Channel Attributes display and [S5] in the Real Time Programs display
Use [S3] or [S5], **Label**, to assign a label to a channel or a program.

Last Page

Last Page is softkey [S4] in many displays
Press [S4], **Last Page**, to go backward one display page. After software version 1.8, this key is renamed **Previous Page**.

Learn (Macro)

Expression 2x's Learn function allows you to create a macro by performing an actual sequence of keystrokes. Expression 2x records the keystrokes you execute in a macro. The recorded keystroke sequence can then be rerun by pressing the appropriate macro key. Once you record a macro in Learn mode you can edit the sequence in Macro mode to adjust its operation.

Example: [Learn] [M3] [Enter] starts the macro Learn process for macro 3.

Learn mode (SMPTE)

Learn Mode is softkey [S6] in the SMPTE Events display
Use [S6], **Learn Mode**, to record SMPTE events from the fader [Go] keys, the submaster bump buttons or the macro keys. To insert an event time only, go to SMPTE display mode and press [Record]. Press [S6] again to turn off Learn mode. Learned events will not be sorted and permanently stored until Learn mode is turned off.

Left Arrow

Use [←] to move through various displays, including Stage, Blind, effects, subroutines and macros.

Level

Use [Level] to immediately set channels and groups to the default level assignment determined in the Setup menu.

Example: [Channel] [6] [Level] sets channel 6 to the default level.

Level Wheel

Use the level wheel to proportionally adjust a selected group of channels.

Example: [Channel] [1] [Thru] [5] [Level Wheel] sets the levels for channels 1 through 5.
Example: [Group] [5] [Level Wheel] sets the level on all channels in group 5.

Link

Use [Link] to cause the linked cue to be loaded as the next available cue, to link a macro execution to a cue or to select a link in the Link List.

Example: [Cue] [1] [Link] [8] links cue 8 to cue 1.
Example: [Cue] [6] [Link] [Enter Macro] [4] [Enter] links macro 4 to cue 6.

Link

Link is softkey [S1] in the Link List display
[S1], **Link**, allows channels to be simultaneously controlled on the two wheels. When a channel is accessed, its linked channels are also selected and may be controlled by the corresponding wheel. A channel may appear in the link list only once.

Link List

Link List is softkey [S7] in the Channel Attributes display
Use [S7], **Link List**, to access the Link List display. The Link List lists channels linked for simultaneous control on the two wheels.

Load Check

Load Check is softkey [S4] in the Load Management display
Use [S4], **Load Check**, to compare the current load on selected dimmers with their recorded loads.

Low/High

Low/High is softkey [S4] after [S7], More Softkeys, in the Blind Effect display
Use [S4], **Low/High**, to access the level field for the selected step(s). The first value is the low level to which the step elements will be set, the second value is the high level for those elements.

Example: [Step] [4] [Thru] [8] [S4], **Low/High**, [0] [→] [9] [Enter] sets the low level for steps 4 through 8 to zero and the high level to 90 percent.

Loop (subroutine)

A subroutine runs through steps until it reaches a Loop step. It then returns to first step, and repeats the sequence for the number of times you specify.

When you create the Loop step, enter the number of times you want the loop to return to the top of the step list. If you enter **5**, the sequence will play six times. Enter **0** to create a continuous loop.

M1-M5

Use macro keys [M1]-[M5] to immediately execute the associated macro instructions.

M*

Analogous in function to macro keys [M1]-[M5] (used for macros 1-5). [M*] is used for macros 6 and higher. Press [M*], then enter macro number and press [Enter].

Macro

A macro allows you to store a series of keystrokes and later replay it with one or two keystrokes. Macros simplify complex tasks that you perform often. You can program up to 2,000 macros in Expression 2x, depending on how large they are.

Macro (Real Time/SMPTE)

Macro is softkey [S4] in the Real Time Programs display and [S6] after [S7], More Softkeys, in the SMPTE Events display
Use [S4] or [S6], **Macro**, to access a macro to run as part of a program or event.

Macro Wait

Use [Macro Wait] to place a pause in the macro execution. The Macro Wait instruction may be placed in the macro as many times as required.

Example: [Learn] [M4] [Enter] [Dim] [1] [At] [7][5] [Macro Wait] [5] [Enter] [M5]

Manual

If a submaster has a manual dwell, its upfade starts when you press and hold the bump button. It runs until channels reach full recorded levels, then holds at full as long as you hold the bump button; the downfade begins when you release it. Therefore, if you don't hold the bump button for the duration of the upfade time, channels do not reach their full recorded levels.

Note: If you do not enter a dwell time for a submaster, the submaster defaults to a manual dwell.

Manual Mode

Manual Mode is softkey [S3] in the SMPTE Events display
Use [S3], **Manual Mode**, to interrupt the input of SMPTE time code, and to reset the SMPTE event list to the first recorded event. Press again to return to normal operation. SMPTE events may be individually executed in Manual mode by pressing [Step].

Minus

Use [–] to decrease the selected number by one.

Example: [Cue] [4] [–] selects cue 3.
Example: [Dim] [6] [At] [7][5] [–] [–] patches dimmer 6 at 73 percent.

More Softkeys

More Softkeys is softkey [S7] in many displays

When a display has more than eight soft-keys, the console displays a softkey labeled [S7], **More Softkeys**. Press [S7] to display additional softkeys.

Move Event

Move Event is softkey [S3] after [S7], More Softkeys, in the SMPTE Events display
Use [S3], **Move Event**, to move a group of SMPTE events. The target time of the first event in the group must be specified. The original spacing of subsequent events will be maintained.

Move Link

Move Link is softkey [S7] in the Link List display
Use [S7], **Move Link**, to renumber a link or group of links. All links in a group will be renumbered sequentially.

Move Program

Move Program is softkey [S3] after [S7], More Softkeys, in the Real Time Programs display
Use [S3], **Move Program**, to move a group of programs. The target time of the first program in the group must be specified. The original spacing of subsequent programs is maintained.

Moving channels

Moving channels are channel levels that change from one cue to the next. In Stage mode, all moving channels are displayed in green. In Blind, moving channels are displayed in green if they are moving down or blue if they are moving up.

Multipart cue

A multipart cue consists of up to eight parts, each of which is essentially an independent cue with its own channel levels and timing information. Parts accept most standard cue attributes, with the exception of Follow and Label, which apply only to the overall cue. You may record a cue as a multipart cue, or record it as a standard, one-part cue and split it later.

Each part of a multipart cue may consist of any number of channels, but a channel may only be included in one part of a multipart cue. If you record a channel in a part and that channel is already included in another part, the channel will be placed in the new part and be removed from the older part automatically.

Multiplex

Multiplex is softkey [S1] in the Patch and System Status displays
[S1], **Multiplex**, allows a range of dimmers to be used with ETC Source Four multiplexers. A and B outputs will be created for each multiplex dimmer, which may be patched to discrete control channels. Multiplex assignments may be given only to dimmers on a DMX512 port that has been set for multiplex in the I/O Configuration menu.

Next Page

Next Page is softkey [S5] in many displays
Press [S5], **Next Page**, to go forward one display page.

Off Sub-Bump

Off Sub-Bump is softkey [S2] after [S7], More Soitkeys, in the Macro Editing and Designer's Worksheet Editing displays
Use [S5], **Off Sub-Bump**, in a macro instruction to force the submaster off via the submaster bump button. The downfade will occur in the downfade time for that bump button. Use the actual submaster bump button or the keypad when recording the macro.

Example: [Select Macro] [5] [Enter] [S5], **Off Sub-Bump**, Submaster 1's bump button, [Enter Macro] creates a macro that downfades submaster 1.

On Sub-Bump

On Sub-Bump is softkey [S1] after [S7], More Softkeys, in the Macro Editing and Designer's Worksheet Editing displays
Use [S4], **On Sub-Bump**, in a macro instruction to force the submaster on via the submaster bump button. The upfade will occur in the upfade time for that bump button. Use the actual submaster bump button or the keypad when recording the macro. The submaster will fade out after the dwell time has elapsed, unless it is programmed with a hold.

Only

Use [Only] to select a subset of the currently selected channels.

Example: [Group] [2][5] [And] [2][6] [Only] [Group] [5] [At] [7][5] [Only] [Group] [1][0] [At] [5][0] takes all the channels that are in group 25 and 26, sets those channels that are also in group 5 to 75 percent, and sets those that are also in group 10 to 50 percent.

Page

Use [Page] to load a different page into the submasters. Active submasters will hold their current look until the associated slider has been returned to its home position (zero for pile-on or effect submasters, **10** for inhibitive submasters.

Example: [Page] [2] [Enter] loads submaster page 2.

Park

Park is softkey [S6] in the Stage and Fader displays
Press [S6], **Park**, set a dimmer, channel or group at a specified level. Parked dimmers, channels or groups will remain at their park level until unparked.

Part

Use [Part] to break a cue into multiple fades. Each cue may contain up to eight parts. A wait time may be assigned to each part to hold the start of that part. A cue may be recorded as a multipart cue or may be broken into multiple parts at a later time. A channel may be in only one part.

Example: [Stage] [15] [Record] [5] [Part] [1] [Enter] records channel 15's current level into part 1 of cue 5.

Patch

The Patch display provides a list of dimmer-to-channel assignments, with associated proportional levels and profiles.

Pause Mode

Pause Mode is softkey [S4] in the SMPTE Events display
Use [S4], **Pause Mode**, to interrupt the input of SMPTE time code, without resetting the SMPTE event list. Press again to return to normal operation. SMPTE events may be individually executed in Pause mode by pressing [S5], **Step**.

Pause Printer

Pause Printer is softkey [S2] in the Print Functions display
Press [S2], **Pause Printer**, to interrupt a print function. Press [S2] again to resume printing.

Pile-on submaster

A pile-on submaster contains a specified set of channels, recorded at proportional levels. Pile-on submasters interact with established channel levels on a highest level basis.

Play Backup

Play Backup is softkey [S2] in the System Status display
Use [S2], **Play Backup**, to play back a recording of a selected look on stage that is stored in a Sensor CEM.

Plus

Press [+] to increase the selected number by one.

Example: [Cue] [6] [Time] [1][0] [+] [+] sets the fade time for cue 6 to 12 seconds.
Example: [Dim] [1] [At] [7][5] [+] [+] patches dimmer 1 at 77 percent.

Positive/Negative

Positive/Negative is softkey [S1] in the Blind Effect Attribute display
Press [S1], **Positive/Negative**, to change the effect attribute from a positive chase (steps are at their low value when off and their high level when on) to a negative chase (steps are at their high level when off and their low level when on). All effects must have either the positive or negative attribute assigned (all other attributes are optional).

Previous Page

Previous Page is softkey [S4] in many displays
Press [S4], **Previous Page**, to go backward one display page.

Print Screen

Print Screen is softkey [S1] in the Load Management display
Press [S1], **Print Screen**, to print a list of dimmer load errors.

Profile

Profile is softkey [S7] in the Patch display
Press [S7], **Profile**, to assign one of 10 profiles to a dimmer. A dimmer may be assigned a proportional patch level or a profile.

Example: [Dim] [6] [S7], **Profile**, [4] [Enter] assigns profile 4 to dimmer 6.

Purge Flexi

Purge Flexi is softkey [S1] in the System Settings display
Press [S1], **Purge Flexi**, to recalculate the list of channels used in Flexi-channel mode. This also happens automatically when you load a show from disk or when you turn Flexichannel on.

Quickstep

Enable/Disable Quickstep is softkey [S1] after [S7], More Softkeys, in the Stage and Fader displays
[S1], **Quickstep**, allows you to run through a show, checking all cues, without having to wait for fades. When Quickstep is active, the faders ignore all upfade, downfade, and wait times. Cues snap immediately to their completed levels when you press [Go] or [Back]. Disable Quickstep mode by pressing [S7] again, or by leaving the Stage display.

Rack Status

Rack Status is softkey [S6] in the System Status and Dimmer Status displays
Use [S6], **Rack Status**, to check information about your dimmer racks, including rack type, starting address, port information, voltage, frequency, and ambient temperature.

Random

Random is softkey [S6] in the Blind Effect Attribute display
Use [S6], **Random**, to cause the step list execution to be selected and run randomly. To cancel the Random attribute, press [S6] again.

Random Rate

Random Rate is softkey [S7] in the Blind Effect Attribute display
Press [S7], **Random Rate**, to cause the rate to be randomly selected and applied to each step. The selection will be within the range defined for Low random rate and High random rate. Rates may range from 0 to 2,000. To cancel the Random Rate attribute, press [S7] [Clear].

Example: [S7], **Random Rate**, [5][0] [[S7], **Random Rate**, 2][0][0] to set the minimum rate to 50 percent and the maximum rate to 200 percent.

Rate (fader)

Press the fader's [Rate] key to allow the fader rate to be controlled by the rate wheel.

Example: [A/B Rate] [Rate Wheel] adjusts the rate of the fade in fader A/B.

Rate

Rate is softkey [S3] in the Stage, Blind, Fader and List displays
Use [S3], Rate to edit the rate for a cue, submaster, multipart cue, effect, or subroutine. Also use [S3], **Rate**, to place the timing for a submaster under rate wheel control.

Example: [S3], **Rate**, [Sub Bump 3] followed by adjustment of the rate wheel modifies submaster 3's fade times.

Rate (SMPTE)

Rate is softkey [S4] after [S7], More Softkeys, in the Dimmer Status display
Use [S4], **Rate**, to access the rate fields in the SMPTE Events display. Press once to select the A/B cue rate, Press again to select the C/D cue rate and press once more to select the submaster rate.

Rate Wheel

Use the rate wheel, when one of the fader [Rate] keys is active, to alter the rate of fades.

Example: Press [AB Rate] then move the rate wheel to adjust the fade rate of the cue in the A/B fader.

Record

Use [Record] to save all cue, submaster or group information in console memory

Example: [Record] [6] [Time] [3] [Enter] records cue 6 and sets its fade time to 3 seconds.
Example: [1] [Thru] [6] [Record] [Sub Bump 1] records channels 1 through 6 to submaster 1.

Record Backup

Record Backup is softkey [S3] in the System Status display
Use [S3], **Record Backup**, to store a recording of a selected look on stage in a Sensor CEM. You may record up to 32 backup looks.

Record Loads

Record Loads is softkey [S5] in the Load Management display
Use [S5], **Record Loads**, to record load information for all dimmers set at a level above zero. Choose the dimmers you wish to record, set them to a level, then run Record Loads.

Record Lockout

You may set the console to disable the Record function. This protects a finished show from inadvertent changes.

To disable the Record function in your system, press [Setup] [1] [Enter] [1][3] [Enter] [1] [Enter].

Recorded channels

Recorded channels are channel levels that have been recorded in a cue, group or submaster. In Stage mode, recorded levels are displayed in green or magenta. Recorded channels may be either moving or tracked in Blind mode. Channel levels controlled by effects are displayed in white. Except for effect submasters, channel levels controlled by submasters are displayed in yellow. Channel levels set by channel sliders are displayed in gold

Release

Use [Rel] to release selected, captured, and independent channels from the control of the keypad in Stage, Blind or Tracksheet modes. First press releases any selected channels, second releases captured channels, and third releases independent channels.

Example: [Channel] [5] [At] [7][5] [Rel] sets channel 5 at 75 percent, then releases it.

Replace/Insert

Insert/Replace is softkey [S2] in the Macro Editing and Designer's Worksheet Editing displays
Press [S2], **Insert/Replace**, to change the editing mode of the macro display. Replace Mode overwrites macro entries, and Insert Mode inserts new entries before the currently selected entry (displayed in yellow.)

Reset Loop

Reset Loop is softkey [S8] after [S7], More Softkeys, in the SMPTE Events display
Use [S8], **Reset Loop**, to set the first and last valid SMPTE frames for the SMPTE program, so that the internal clock can correctly reset to the starting frame.

Reset System

Reset System is softkey [S1] in the Clear Functions display
Use [S1], **Reset System**, to clear all data from console and reset all settings to factory defaults.

Return

Return is softkey [S8] in numerous displays
Use [S8], **Return**, to return to the previous display.

Reverse

Reverse is softkey [S3] in the Blind Effect Attribute display
Use [S3], **Reverse**, to cause the effect step list to run in reverse order, beginning with the last recorded step. To cancel the reverse attribute, press [S3] again.

Right Arrow

Press [→] to move through various displays, such as Stage, Blind, effects, and macro mode.

Select Cue

Select Cue is softkey [S3] after [S7], More Softkeys, in the Blind Subroutine display
Press [S3], **Select Cue**, to create or edit a fade step in a subroutine cue.

Select Dimmer

Select Dimmer is softkey [S5] in the Dimmer Status display
Use [S5], **Select Dimmer**, to select a specific dimmer on the Dimmer Status display.

Select Event

Select Event is softkey [S1] after [S7], More Softkeys, in the Dimmer Status display
Use [S1], **Select Event**, to select a SMPTE event or a range of SMPTE events for modification.

Select Fader

Select Fader is softkey [S1] in the Fader display
Press [S1], **Select Fader**, to view the live output levels of the cues in the A/B fader, the C/D fader, both faders, or the DMX In levels.

Select Group

Select Group is softkey [S1] in the Blind Group display
Use [S1], **Select Group**, to specify which group to edit or view.

Example: [Blind] [Group] [S1], **Select Group**, [6] [Enter] brings up group 6 for editing.

Select Macro

Select Macro is softkey [S1] in the Macro Editing display
Use [S1], **Select Macro**, to access a macro for recording or editing.

Example: [S1], **Select Macro**, [6] [Enter] selects macro 6.

Select Program

Select Program is softkey [S1] in the Real Time Programs display
Use [S1], **Select Program**, to choose a program for editing.

Select Rack

Select Rack is softkey [S6] in the Rack Status display
Use [S6], **Select Rack**, to select a specific rack on the Rack Status display.

Select Region

Select Region is softkey [S1] in the Designer's Worksheet Editing display
Use [S1], **Select Region**, to access a macro for recording or editing.

Example: [S1], **Select Region**, [6] [Enter] selects worksheet region 6.

Selected channels

Selected channels are channels over which you have immediate keyboard control. You can modify selected channels with [Full], [At], [+], [–], or the fader wheel. Selected channels are displayed in yellow, or green (if linked), and their levels are red on white. You can select channels in most display modes.

Selected, captured channels are *live* channels that are under immediate keypad control. Channels can be *selected and captured* only in Stage modes. You can select channels in Blind, but they won't be captured since Blind mode is not live. Press [Rel] once to release selected channels.

Set Clock

Set Clock is softkey [S2] in the Setup display
Use [S2], **Set Clock**, to set the real time clock to correct time and date.

Set Dimmer

Set Dimmer is softkey [S7] in the ETCLink Functions display
Use [S7], **Set Dimmer**, to set a dimmer or group of dimmers to a level at the rack, ignoring any DMX512 levels. This requires a system connected by ETCLink to a Sensor dimming system.

Setup

The Setup display allows you to access system setting information, print and disk functions, and macro editing, as well as optional control information.

```
                           Setup                    Menu 11
                          12:56 PM
The Garden Plot
Memory left: 82%
                  1 - System Settings
                  2 - Input/Output Configuration
                  3 - Disk Functions
                  4 - Clear Functions
                  5 - Print Functions
                  6 - Options Settings
                  7 - Designer's Worksheet Editing
                  8 - Macro Editing
                  9 - ETCLink Functions
                 10 -
                 11 - Channel Attributes
                 12 -
                 13 - SMPTE Events


             Select function number, then press ENTER


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 S1        S2        S3      S4      S5      S6      S7      S8
Show      Set
Name     Clock
```

Sheet Sliders/Console Sliders

Sheet Sliders/Console Sliders is softkey [S1] in the Designer's Worksheet Setup display

Use [S1], **Sheet Sliders/Console Sliders**, to enable either the sliders on the console, or the sliders on the Designer's Worksheet.

Show/Hide Labels

Show/Hide Labels is softkey [S8] in the Patch display

Press [S8], **Show Labels**, in Patch mode to display or hide the alphanumeric dimmer labels.

Show Name

Show Name is softkey [S1] in the Setup display

Press [S1], **Show Name**, to label the show in memory, using the alphanumeric keyboard. The show name will be stored with the show when written to disk.

SMPTE Time

SMPTE Time is softkey [S2] after [S7], More Softkeys, in the Dimmer Status display

Use [S2], **SMPTE Time**, to access the time field in the SMPTE Events display.

Sneak

Sneak is softkey [S1] in the Stage display
Use Sneak to return modified channels to the level provided by the faders or submasters. Channels will fade in the Sneak time established in the Setup menu unless a time is specified. Channels may also 'Sneak' to a specified level

Example: [1] [S1], **Sneak**, [Enter]
Example: [1] [At] [7][5] [S1], **Sneak**, [Time] [5] [Enter]

Solo

Use [Solo] to clear non-selected channels. In Live mode, press again to restore channels to previous setting.

Example: [Channel] [1] [Thru] [1][0] [Solo] sets the levels of all channels other than channels 1 through 10 to zero.

Sort

Sort is softkey [S8] after [S7], More Softkeys, in the SMPTE and Real Time Programs displays
Use [S8], **Sort**, to reorder SMPTE events or Real Time Programs by time. The system will automatically conduct a sort when the mode is exited, or when moving, copying or deleting events or programs.

Stage

The Stage display represents the current live channel levels as set by the keypad, faders and submasters combined.

Step (Effect/Subroutine)

Step is softkey [S1] in the Blind Effect and Blind Subroutine displays
Press [S1], **Step**, to select a step or range of steps for modification.

Example: [S1], **Step**, [1] [Enter] selects step 1.
Example: [S1], **Step**, [5] [Thru] [9] [Enter] selects steps 5 through 9.

Step (SMPTE)

Step is softkey [S5] in the SMPTE Events display
Use [S5], **Step**, to execute the next SMPTE event in the event list. System must be in SMPTE manual or pause mode.

Steps, effect

An effect may consist of up to 100 steps. A step is made up of channels or groups, also known as elements. A step may contain up to ten elements. For example, channels 1 through 10 would constitute ten elements, filling the step. However, a group containing channels 1 through 10 would constitute only one element, allowing nine more channels or groups to be added.

Each step in an effect is assigned a high and low level, a step time, and an in, dwell, and out time.

Steps, subroutine

All subroutine steps are either cue steps or style steps. A cue step contains an existing recorded cue. The subroutine lets you change levels and fade rates for the cue step without changing the original cues. A cue step may contain an effect cue.

A style step contains an instruction that controls the subroutine's playback pattern. This allows you to run loops, run bounces, pause the subroutine until you press go, or end the subroutine and jump to any other cue.

Step Time

Step Time is softkey [S2] after [S7], More Softkeys, in the Blind Effect display
Press [S2], **Step Time**, to access the Time field for the selected step(s). Step time is the time between the activation of the selected step and the next step. Alternatively, the arrow keys can be used to move through the display.

Example: [Step] [5] [S2], **Step Time**, [.][2] [Enter] sets the step time of step 5 to .2 seconds.

Stop Printer

Stop Printer is softkey [S1] in the Print Functions display
Press [S1], **Stop Printer**, to cancel a print function. It may take a few moments for the printer to halt if its buffer is full.

Style

Style is softkey [S2] after [S7], More Softkeys, in the Blind Subroutine display
Use [S2], **Style**, to select or edit the sytle of a subroutine control step.

Style steps (subroutine)

A style is assigned to a subroutine step. When the subroutine runs, the steps play back in numeric order, until the subroutine reaches a style step. The style step then determines whether the subroutine will loop, bounce, hold, or end and run a different cue.

Press [Style] to select or edit the style of a subroutine control step.

Example: [Step] [5] [Style] [1] [Enter] sets the style of step 5 to loop.

Sub

Use [Sub] to select a submaster number.

Example: [Record] [Sub] [1] [Enter] records the current look in submaster 1.
Example: [Group] [Sub] [1] [At] [7][5] sets the channels in submaster 1 at 75 percent of their recorded levels

Sub List

Sub List is softkey [S2] in the Blind Submaster displays and [S3] after More Softkeys in the Stage Display
Use [Sub List] to access the Submaster List display, which provides a list of submasters, their fade times and labels

Submaster

A submaster consists of a slider, a bump button and one or two LEDs. The slider allows you to bring the submaster look up manually. The bump button allows you to flash the submaster to its full recorded level or to begin its programmed fade, if it has one. The LEDs show you which submasters are recorded and whether the submasters in the bottom row are pile-on or inhibitive.

A channel may be included in as many submasters as you choose. You can record up to 24 submasters in each of ten pages of submaster memory, for a total of 240.

Submaster bump buttons

Use a submaster bump button to drive the assigned channels to their recorded levels in the recorded fade time. This button may also be used when recording a submaster look.

Example: [Record] [Sub Bump 4] records the current look into submaster 4.
Example: [Update] [Sub Bump 1] records the channels in the current look that are also in submaster 1 at their current levels.

Submaster List

The Submaster List display is a default display on the playback monitor (usually the left monitor). The Submaster List provides a list of submasters for the show, including labels. In addition, the Submaster List provides information about which submasters are active or running, their type, rate, and percentage of completion.

Subroutine

A subroutine is a cue that controls the playback of a series of existing, recorded cues. Subroutines are similar to linked cues, except that they have more playback options.

Subroutines and effects can create similar looks. However, subroutines have some advantages over effects. Since each step of a subroutine is a cue with proportional levels, you can create loops or chases with proportional looks. You can also create nested loops, or even use an effect cue as a step in a subroutine.

Also, since subroutine steps are actual cues, there is no limit to the number of channels you can use.

Suppress Labels

Suppress Labels is softkey [S4] in the Patch display
Use [S4], **Suppress Labels**, in patch mode to hide the display of the dimmer labels. Softkey then reads **Show Labels**.

Swap

The console supports two color video monitors. The Command display appears on one monitor; the Playback display appears on the other. Press [Swap] to reverse the monitor on which each display appears.

System Status

System Status is softkey [S4] in the Rack Status and Dimmer Status displays
Use [S4], **System Status**, to check information about your Sensor dimming system, including system firing mode, current backup look status, ETCLink errors, and system configuration.

Thru

Use [Thru] to select a continuous group of dimmers or channels.

Example: [Channel] [1] [Thru] [5] [And] [8] [At] [7][5] sets channel 1 through 5 and channel 8 to 75 percent.

Time

Use [Time] to enter upfade and downfade times for cues and submasters.

Example: [Cue] [6] [Time] [5] [Enter] [1][0] sets cue 6's upfade to five seconds and its downfade to ten seconds.
Example: [Cue] [7] [Time] [3] [Time] [5] [Enter] sets cue 7's upfade to three seconds and its downfade to five seconds.

Time

Time is softkey [S2] in the Real Time Programs display
Use [S2], **Time**, to go to the time field for editing.

Track

Use [Track] to record channel levels that are to be tracked into subsequent cues.

Example: [Cue] [5] [Track] [Enter] tracks channels from cue 5 into following cues.

Tracked channels

A tracked channel is a channel whose level is unchanged from the preceding cue. Tracked channels are displayed in magenta.

Tracksheet display

Tracked channels are channels whose levels do not change from one cue to the next. Tracksheet allows you to display one channel's settings for all recorded cues. At a glance you can see which cues have tracking levels for that particular channel. You can also use Tracksheet to add or modify a tracked channel through recorded cues.

To display Tracksheet, press [Tracksheet]. If more cues are recorded than fit on one screen, press [S5], **Next Page**, to display the next screen of cues.

Example: [Tracksheet] [Channel] [5] [Enter] [Cue] [1] [At] [7][5] [Record] [Enter] records channel 5 at 75 percent in cue 1.

Type

Use [Type] to select the fade type for a cue, or the submaster type for a submaster.

Example: [Blind] [Cue] [4] [Type] [3] [Enter] makes cue 4 an effect cue.
Example: [Blind] [Sub] [6] [Type] [2] [Enter] makes submaster 6 inhibitive.

Type/Level

Type/Level is softkey [S4] after [S7], More Softkeys, in the Blind Subroutine display
Press [S4], **Type/Level**, to select between crossfade and allfade steps in a subroutine cue. Press again to specify a final fade level of less than 100%.

Example: [Step] [1] [S4], **Type/Level**, [2] [Enter] sets the step as an allfade cue.
Example: [Step] [3] [Select Cue] [8] [S4], **Type/Level**, [S4], **Type/Level**, [5][0] will fade cue 8 to 50 percent of its recorded level.

Unpatch

Unpatch is softkey [S6] in the Patch display
Use [S6], **Unpatch**, to unpatch (patch to channel 0) selected dimmers.

Example: [Dimmer] [5] [S6], **Unpatch**, [Enter] unpatches dimmer 5.
Example: [S6], **Unpatch**, [Dimmer] [7] [Enter] unpatches dimmer 7.

Unset Dimmer

Unset Dimmer is softkey [S6] in the ETCLink Functions display
Use [S6], **Unset Dimmer**, to return a dimmer or group of dimmers to normal dimming. This requires a system connected by ETCLink to a Sensor dimming system.

Up Arrow

Use [↑] to move through various displays, such as Stage, Blind, effects and macro mode.

Up/Down/Follow

Up/Down/Follow is softkey [S8] after [S7], More Softkeys, in the Blind Subroutine display
Use [S8], **Up/Down/Follow**, to assign upfade and downfade times and to specify amount of time to hold before beginning the next subroutine step.

Example: [Step] [1] [S8], **Up/Down/Follow**, [2] [S8], **Up/Down/Follow**, [4] [S8], **Up/Down/Follow**, [5] [Enter] assigns an upfade time of two seconds and a downfade time of four seconds to step 1. Step 2 will start five seconds after step 1 starts.

Update

Update is softkey [S2] in the Stage and Fader displays
Press [S2], **Update**, to re-record active submasters, cues and groups as a selective record. Modified levels are recorded into the source and control is simultaneously returned.

Example: [S2], **Update**, [Sub] [1] [Enter] records Sub 1 with any modified channels originally controlled by Sub 1. Channel control is restored to Sub 1.

Wait

Use [Wait] to hold the start of the upfade or downfade, to accomplish lag/lead type cues. The first wait will hold the upfade, the second will hold the downfade. The wait time (0 to 99:59) will begin counting when the cue is activated.

Example: [Cue] [5] [Time] [6] [Wait] [6] [Enter] sets cue 5 to wait six seconds before starting a six second upfade.
Example: [Cue] [7] [Wait] [Wait] [5] [Enter] sets cue 7 to wait five seconds before starting the downfade.

X Channel

X Channel is softkey [S2] in the Link List display
Press [S3], **X Channel**, to select the X channels of a selected link.

Y Channel

Y Channel is softkey [S3] in the Link List display
Press [S2], **Y Channel**, to select the Y channels of a selected link.

appendix e
softkeys

The following charts show all available softkeys on Expression 2x consoles using software version 2.0.

Stage
1 - Sneak
2 - Update
3 - Rate
4 - Previous Page
5 - Next Page
6 - Park
7 - More Softkeys → *Stage 2*
8 - Flash

Stage 2
1 - Enable/Disable Quickstep
2 -
3 - Sub List
4 - Previous Page
5 - Next Page
6 - Delete
7 - More Softkeys → *Stage*
8 - DMX In

Blind Cue
1 -
2 - Cue List → *Cue List*
3 - Rate
4 - Previous Page
5 - Next Page
6 - Delete Cue
7 -
8 -

Cue List
1 -
2 -
3 - Rate
4 - Previous Page
5 - Next Page
6 - Delete Cue
7 -
8 - Return → *Blind Cue*

Blind Multipart
1 -
2 - Cue List → *Cue List*
3 - Rate
4 - Previous Page
5 - Next Page
6 - Delete Part
7 -
8 -

Blind Group
1 - Select Group
2 - Group List →*Group List*
3 -
4 - Previous Page
5 - Next Page
6 - Delete Group
7 -
8 -

Group List
1 -
2 -
3 -
4 - Previous Page
5 - Next Page
6 - Delete Group
7 -
8 - Return → *Group*

Blind Submaster
1 - Bump Status
2 - Sub List →*Sub List*
3 - Rate
4 - Previous Page
5 - Next Page
6 - Delete Sub
7 -
8 -

Sub List
1 - Bump Status
2 - Hold
3 - Rate
4 - Previous Page
5 - Next Page
6 - Delete Sub
7-
8 - Return → *Submaster*

Blind Cue Effect
1 - Step
2 - Cue List →Cue List
3 - Rate
4 - Previous Page
5 - Next Page
6 - Delete Cue
7 - More Softkeys → *Effect 2*
8 -

Effect 2
1 - Step
2 - Step Time
3 - In/Dwell/Out
4 - Low/High
5 - Insert Step
6 - Delete Step
7 - More Softkeys → *Effect*
8 - Attribute → *Attributes*

Attributes
1 - Positive/Negative
2 - Alternate
3 - Reverse
4 - Bounce
5 - Build
6 - Random
7 - Random Rate
8 - Return → *Effect*

Blind Sub Effect
1 - Bump Status
2 - Sub List → *Sub List*
3 - Rate
4 - Previous Page
5 - Next Page
6 - Delete Sub
7 - More Softkeys → *Effect* 2
8 -

Blind Subroutine
1 - Step
2 - Cue List →Cue List
3 - Rate
4 - Previous Page
5 - Next Page
6 - Delete Cue
7 - More Softkeys → *Subr2*
8 -

Subr 2
1 - Step
2 - Style
3 - Select Cue
4 - Type/Level
5 - Insert Step
6 - Delete Step
7 - More Softkeys → *Blind Subroutine*
8 - Up/Down/Follow

Fader
1 - Select Fader
2 - Update
3 - Rate
4 - Previous Page
5 - Next Page
6 - Park
7 - More Softkeys → *Fader 2*
8 -

Fader 2
1 - Enable/Disable Quickstep
2 -
3 -
4 -
5 -
6 - Delete
7 - More Softkeys → *Fader*
8 - DMX In

Tracksheet
1 -
2 -
3 -
4 - Previous Page
5 - Next Page
6 -
7 -
8 -

Patch
1 - Multiplex
2 - A
3 - B
4 - Previous Page
5 - Next Page
6 - Unpatch
7 - Profile
8 - Show/Hide Labels

Park
1 -
2 - A
3 - B
4 - Previous Page
5 - Next Page
6 -
7 -
8 -

Setup
1 - Show Name
2 - Set Clock
3 -
4 -
5 -
6 -
7 -
8 -

System Settings
1 - Purge Flexi
2 -
3 -
4 -
5 -
6 -
7 -
8 - Return → *Setup*

Designer's Layout
1 - Sheet/Console Sliders
2 -
3 -
4 -
5 -
6 -
7 -
8 - Return → *Settings*

I/O Configuration
1 - DMX512 Port
2 - DMX512 Mode
3 - DMX512 Start
4 - DMX512 Speed
5 -
6 -
7 -
8 - Return → *Setup*

Disk
1 -
2 -
3 -
4 -
5 -
6 -
7 -
8 - Return → *Setup*

Clear Functions
1 - Reset System
2 -
3 -
4 -
5 -
6 -
7 -
8 - Return → *Setup*

Print Functions
1 - Stop Printer
2 - Pause Printer
3 -
4 -
5 -
6 -
7 -
8 - Return →*Setup*

Options
1 - Disable MIDI
2 -
3 -
4 -
5 -
6 -
7 -
8 - Return → *Setup*

Designer's Editing
1 - Select Region
2 - Insert/Replace
3 - Delete Entry
4 -
5 -
6 - Clear Region
7 - More Softkeys → *Des 2*
8 - Return →*Setup*

Designer's Editing 2
1 - On Sub-Bump
2 - Off Sub-Bump
3 -
4 -
5 - Copy Region
6 -
7 - More Softkeys → *Des*
8 -

Macro Editing
1 - Select Macro
2 - Insert/Replace
3 - Delete Entry
4 -
5 -
6 - Delete Macro
7 - More Softkeys → *Macro 2*
8 - Return →*Setup*

Macro Editing 2
1 - On Sub-Bump
2 - Off Sub-Bump
3 -
4 -
5 - Copy Macro
6 -
7 - More Softkeys → *Macro*
8 -

ETCLink Functions
1 - Enable/Disable ETCLink
2 - A
3 - B
4 -
5 -
6 - Unset Dimmer
7 - Set Dimmer
8 - Return →*Setup*

System Status
1 - Multiplex
2 - Play Backup
3 - Record Backup
4 -
5 - Dimmer Status
6 - Rack Status
7 -
8 - Return → *ETCLink*

Rack Status
1 -
2 -
3 -
4 - System Status
5 - Dimmer Status
6 - Select Rack
7 -
8 - Return → *ETCLink*

Dimmer Status
1 -
2 -
3 -
4 - System Status
5 - Select Dimmer
6 - Rack Status
7 -
8 - Return →*ETCLink*

Load Management
1 - Print Screen
2 -
3 -
4 - Load Check
5 - Record Loads
6 - Clear Loads
7 - Cancel
8 - Return → *ETCLink*

Channel Attributes
1 - Independent
2 - Flip
3 - Label
4 - Previous Page
5 - Next Page
6 -
7 - Link List
8 - Return → *Setup*

Link List
1 - Link
2 - X Channel
3 - Y Channel
4 -
5 - Insert Link
6 - Delete Link
7 - Move Link
8 - Return → *Attributes*

SMPTE
1 - Internal Clock
2 - Clock Enable/Disable
3 - Manual Mode
4 - Pause Mode
5 - Step
6 - Learn Mode
7 - More Softkeys→*SMPTE 2*
8 - Return → *Setup*

SMPTE 2
1 - Select Event
2 - SMPTE Time
3 - Cue
4 - Rate
5 - Bump
6 - Macro
7 - More Softkeys→*SMPTE 3*
8 - Reset Loop

SMPTE 3
1 - Insert Event
2 - Copy Event
3 - Move Event
4 - Previous Page
5 - Next Page
6 - Delete Event
7 - More Softkeys→*SMPTE*
8 - Sort

Real Time Programs
1 - Select Program
2 - Time
3 - Days of Week
4 - Macro
5 - Label
6 - Delete Program
7 - More Softkeys→*RTC 2*
8 - Return → *Setup*

Real Time Programs 2
1 - Insert Program
2 - Copy Program
3 - Move Program
4 - Previous Page
5 - Next Page
6 -
7 - More Softkeys→*RTC*
8 - Sort

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