User's Guide

For

Spark 4D

Compulite R&D
Version 2.0
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Table of Contents

Part 1 - General

Part 2 - Basic Editing

Part 3 - File Management and Printing

Part 4 - Playback

Part 5 - Advanced Topics

Part 6 - System Configuration and Patching

Part 7- Communication Protocols

Part 8 - Appendices

CHAPTER 1
INTRODUCTION

This User's Guide contains 30 chapters and 4 appendices.

The User's Guide is divided into 8 parts.

Part 1 - General

- **Chapter 1 Introduction**
- **Chapter 2 General Operation**
  A concise overview of operational features, such as the Editor, Playback Devices, Soft Keys, Display Formats, and On Line Help.
- **Chapter 3 Displays**
  Descriptions of the different displays available in Spark 4D and operating instructions for Display control.
- **Chapter 4 Quick Start**
  This chapter provides operating instructions for the most basic functions on Spark 4D. Its purpose is to provide quick instruction to operators familiar with lighting consoles.

Part 2 – Basic Programming

- **Chapter 5 Selecting and Editing Channels and Scrollers**
  Operating instructions for basic channel and scroller selection, advanced selection sequences, and assigning dimmer and frame values.
- **Chapter 6 Selecting and Editing Spots**
  Operating instructions for basic moving light (spot) selection, advanced selection sequences, spot parameter selection, and assigning parameter values.
- **Chapter 7 Programming Memories**
  Basic programming functions, including using the Call function, how to convert memories to editor groups, assigning Fade Times, programming in Blind mode, and inserting memories.
- **Chapter 8 Memory Modification**
  Operating instructions for basic memory modification, quick modification for memories assigned to playback devices using the STORE STORE function, and Delta tracking modification.
- **Chapter 9 Libraries**
  Operating instructions for programming, modifying, and using Libraries.
- **Chapter 10 Loops & Links**
  Programming memories with Loops to run as Chasers on the controllers or on the crossfader. Linking non-sequential memories.

Part 3 – File Management and Printing

- **Chapter 11 Data Storage, Retrieval, & Printing**
  How to record and Load show files from the Hard Disk and from floppy diskettes, navigating the Hard Disk, printing options.

Part 4 - Playback

- **Chapter 12 The A/B Crossfader**
  Making assignments to the A/B crossfader, playback using automatic Go commands or manual operation, and automatic Rate control.

- **Chapter 13 Controllers & Chasers**
  Assigning memories, groups, and Chasers to the Controllers. Using the automatic Go and manual playback operations. Rate control for Chasers.
- **Chapter 14 Control Priority**
  A description of Spark 4D's default control and using LTP.

Part 5 – Advanced Topics

- **Chapter 15 Snap**
  Store 'snapshots' of all playback device assignments and their fade status. Snaps are analogous to preset pages for Controllers. Spark 4D supports 99 Snaps.
- **Channel 16 Part Qs**
  Programming memories with parts. Each Part can have unique delay and fade times.
- **Chapter 17 Macros**
  Spark 4D supports up to 999 Macros. Operating instructions for programming Macros blind, in the Macro menu, or live using the Teach macro function.
- **Chapter 18 Groups**
  Program groups for quick channel and spot selection. Spark 4D supports 999 Groups.
- **Channel 19 Palettes**
  Programming Palettes and using Palettes for quick editing. Palettes are a non-tracking database for spot parameter values, scroller frame values, and channel intensity.
- **Chapter 20 Q-Lists**
  Arrange your memories in Q-Lists for efficient playback. Spark 4D supports 100 Q-Lists.

Part 6 – Advanced Topics

- **Chapter 21 Effects**
  Modifying pre-programmed Effect Palettes, programming custom Effects, and Effects playback,
- **Chapter 22 Autochase**
  Programming chaser steps with preset chase patterns.
- **Channel 23 Event**
  Program events to operate multiple assignment and playback commands. Events can be operated when assigned to memories sequencing on the A/B crossfader, in the editor, or using SMPTE.

Part 6 – System Configuration and Patching

- **Chapter 24 System Configuration**
  General system Configuration in Service Tools and using operator definable system parameters in the System Parameters menu.
- **Chapter 25 Channel and Scroller Patching**
  The Channel Patch provides functions for soft patching dimmers and channels, assigning dimmer curves, assigning proportional levels to dimmers, examining patch assignments. The Scroller Patch provides easy functions for setting up frames, assigning control channels to scrollers, and copying scroller set ups.
- **Chapter 26 Spot Management and Patching**
  The Mix Output menu provides functions to patch moving light type to control numbers, assign DMX output addresses, define device profiles.

Part 7- Communication Protocols

- **Chapter 27 MIDI**
  Enable MIDI communication and edit MIDI codes in the MIDI menu. The MIDI synch option allows a second lighting console to synchronize crossfade operations with the main console.

- **Chapter 28 SMPTE**
  Assign SMPTE time codes to Events using the live Teach function and enable Spark 4D for automatic operation using SMPTE transmission.
- **Chapter 29 DMX Input**
  Patch DMX Input channels to operate local console channels or macros.
- **Chapter 30 Ethernet**
  A short introduction to Ethernet as used by Spark 4D.

Appendices

- **Appendix A Service Tools**
  Operating instructions for disk formatting, the Hardware diagnostics tool, and software upgrade functions in Service Tools.
- **Appendix B Master/Slave.**
  Instructions on how to set up 2 lighting consoles in a Master/Slave configuration. Master/Slave works in Playback tracking or Hardware tracking modes.
- **Appendix C Dimmer Status and Patch 999**
  A description of the Dimmer Status reports available when using CMX protocol with Compulite Dimmers. Instructions for editing Patch 999, which allows logical channel patching.
- **Appendix D Panel Layout**
  A short description of each panel key arranged in alphabetical order.

Common Terms

Three major capabilities are basic to the all lighting consoles: Editing, Playback, and Patching.

Editing is the ability to select channels/spots and assign intensity, scroller, and spot parameter values, recording the resulting stage picture as a memory or cue. All functions related to the playback structure of the show, such as event assignments, snaps, loops, and links are part of the editing functions.

Playback is the ability to replay all the show data that you have created while editing.

Patching includes all of the patching functions which instruct the system in how to communicate with conventional projectors, color scrollers, intelligent moving lights, or other DMX512 protocol elements that are controlled by the lighting console.

Here a few terms common to Compulite consoles.

- Channel - The control channel for DMX512 devices, which are not moving devices. These include conventional projectors, color scrollers, smoke machines, etc.
- Delta - A tool for memory modification.
- Erase - Delete selected data.
- Frame - Scroller frame.
- Intensity - Dimmer intensity of channels and spots.
- Libraries - Gobo, Color, and Position libraries form a database used when programming memories.
- Memory - is analogous to cue. The group in the editor, comprising the lighting state on-stage, is stored as a memory. Memories are then played back.
- Modify - Change stored information and fade rates.

- Parameters - The attributes of moving devices.
- Present or active (in the editor) - Channels and spots that are displayed in white. Everything present/active in the editor is included when recording a memory.
- Q List - Q Lists are independent entities. Each Q List can contain memories numbered from 0.1 to 999.9.
- Selected (in the editor) - Channels and spots that are displayed in red and therefore can be assigned intensity or scroller values.
- Spot – Moving light
- Store - Save the information in the editor.
- Value - The numerical value assigned to a parameter or a dimmer.

Playback terms

- End Stop - When crossfaders or the controllers are at either 0% or 100%.
- Go - Initiate an automatic crossfade, controller fade, or chaser run.
- Hold - Stop any fade or chaser in progress.
- Multifade - Initiate a fade to the next memory in sequence before the fade in progress is complete.
- Off the End Stop- When the crossfaders or the controllers are at more than 0% or less than 100%.
- Rate - The rate at which channels and spots fade in or out during a crossfade. The rate at which a chaser runs.
- Sequence - The numerical sequencing of the memories on the A/B or C/D crossfaders.
- Step - Manually moving from the current memory to the next memory of a chaser.

Text Conventions

- Panel **[KEYS]** are in square brackets, all caps, and bold.
- Commands on the **<Soft Keys>** appear in pointed brackets and bold.
- *Messages* are in *italics*.
- # refers to a number entered on the numeric keypad.
- Command line refers to the sequence of keystrokes executed and displayed in the gray line at the bottom of the display monitor. The keystrokes in the command line are represented in *italics*.
- Prompt line refers to *prompts* occurring in menus; these are *italicized*.
- Desk, console, and system are used interchangeably.

Using this Guide

Getting Started

If you are using the system for the first time, you may should consult Chapter 24 System Configuration, Chapter 25 Channel Patching, and Chapter 26 Spot Management and Patching.

New users

If you are new to lighting consoles or are unfamiliar with Compulite consoles, familiarize yourself with the information in chapters 2 – 14. These chapters provide general information and give you the building blocks to program and modify memories (cues), and play them back. Chapters 21 – 27 deal with advanced functions.

Experienced users

If you have experience with lighting consoles, are familiar with Compulite consoles, or are just plain impatient use Chapter 4 Quick Start and the on-line Help.

Output Level Conventions

Spark use the HTP (Highest Takes Precedence) convention for conventional channels. Scroller frames and spot parameters are subject to a rigid control hierarchy.

The consoles can be configured to work in LTP (Latest Takes Precedence) mode. Consult Chapter 16 Control Priority for more information.

The Editor always overrides any other control devices.

CHAPTER 2
GENERAL OPERATION

The Editor Section

Spark 4D contains 2 separate editors whose operation is identical. Each editor can hold different active and selected channels and spots.

Each editor can be configured differently, maintaining its configuration when switching between editors. The items included are:

- Display Status
- Number default selection
- Last channel selection
- Last spot selection
- Last stored memory
- Default QList

[EDITOR] toggles between Editor 1 and Editor 2. The editor status is displayed above the command line. Example: if you are currently working in editor 2, Editor 2 is displayed on a white field and Editor 1 is displayed in dark red letters

Editing keys are used to:

- Select channels
- Select spots
- Assign intensity and parameter values
- Program memories
- Manipulate the display.
- Assign memory attributes such as Loops, Links, and Part Qs.

Most keys are single purpose keys. Some keys however access two different functions. The function in the lower half of the key is accessed using the **[SHIFT]** key.

The editors work in live or blind modes.

The numeric keypad is used for number selections. Some numeric selections may be done on the Soft Keys.

Keystrokes appear in the yellow command line at the bottom of the display.

Spots and channels that are selected in the editor appear in red. Spots and channels that appear in red are may be assigned parameter and intensity values.

Spots and channels that appear in white are present in the editor, but not currently selected. They are included in any memory that is recorded.

Keystrokes appear in the gray command line at the bottom of the display.

The editor operates in Live and the Blind modes. In Live mode any alterations made to the stage picture are visible on stage. In Blind mode, memories are programmed or modified without any interruption of the active stage picture.

F keys

The Function (F) keys are multi-purpose soft keys, generally used while working in menus. When the system is not in menu mode, **F1-F5** offer immediate access to macros 1-5. **F6** accesses all the rest of the macros. In menu mode these keys access the convenient menu functions and options. These keys are also used for Delta application and editing SMPTE time codes.

Programming memories

Memories are programmed by selecting channels and assigning intensity values or selecting spots and assigning parameter values, then storing the resulting stage picture.

Each memory may be programmed for the following information:

- Fade in and out time, from 'cut' to 999.9 seconds.
- Delay, wait in and wait out time, from 'cut' to 999.9 seconds.
- An automatic follow-on memory created by using the loop function.
- Loops containing any number of memories.
- Links between non-sequential memories.
- Event assignments that automatically operate multiple functions
- Parts
- Text

Editor color key

Color	Status
Red field	Spots and channels selected in the current editor. Spots and channels displayed in red can be assigned intensity levels and parameter values.
White field	Spots and channels that are present in the current editor. When storing an editor group as a memory the spots and channels displayed in white and red are included in the memory.
Dark red numbers on a black field	Spots and channels present in the second editor.
Dark blue	Spots and channels selected under memory modification (see Chapter 8 Modifying Memories).

Editor error trapping

Spark 4D has efficient error trapping, meaning that you cannot go too far wrong. An illegal key press is immediately recognized. If you make a mistake the system displays messages such as *Illegal Number* or *Invalid Sequence***.**

To get rid of this message and continue working, press the correct key. The correct keystroke clears the error and allows the operation to continue.

Clearing the editor

You can clear the editor by pressing either **[RESET]** or **[CLEAR]**.

Using RESET

Press **[RESET]** once to fade out the channels and spots in the editor in Default Fade Time. The Default Fade Time can be modified in the System Parameters menu. (See Chapter 24 - System Configuration).

Press **[RESET]** twice to bump out the channels and spots in the editor.

Using CLEAR

[CLEAR] works as a regressive clear function.

Press **[CLEAR]** once- the command line clears, leaving only the selection mode (channel, spot, or memory).

Press **[CLEAR] [CLEAR]** - the output of selected channels and spots (displayed in red) are cleared.

Press **[CLEAR] [CLEAR] [CLEAR]** - the selection mode is cleared from the command line. The editor is now idle.

Parameter Control

Parameters are assigned values by either selecting a parameter on the Soft Keys in Param mode and assigning a value using the numeric keypad or by using the wheels.

Using the wheels obviates selecting the parameter, as it is automatically selected when its wheel is moved. When you select a parameter on the Soft Keys in param mode, the appropriate wheel jumps to the wheel bank for the selected parameter.

[**STEP UP]** increments continuous parameters by bits and mixed or discrete step parameters by steps. **[STEP DOWN]** decrements continuous parameters by bits and mixed or discrete step parameters by steps.

The wheels

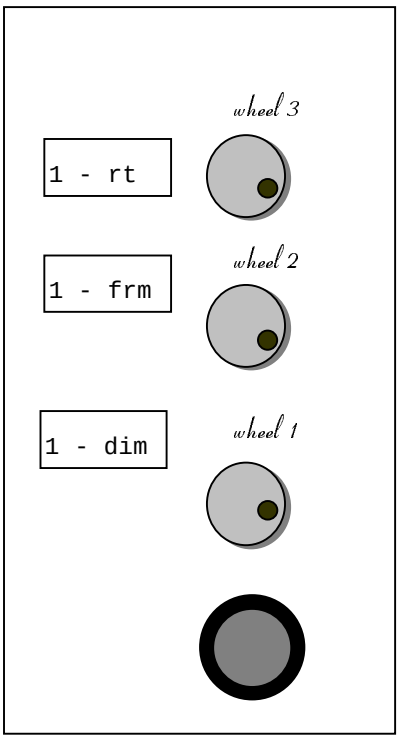
The wheels operate in a 'non-collapsing' mode, meaning that the relative difference of the values between different spots and channels is preserved when the spots and channels are faded up or down.

Example: The editor contains spot or channel 1 at 75% intensity and spot or channel 2 at 85%. Select both of the spots (channels) and begin to wheel up. Spot/channel 2 reaches full intensity when spot/channel 1 is at 90%. If you continue moving the wheel until spot/channel 1 is at full and then you fade both spots/channels down, spot/channel 1 will begin the fade first. The 10% difference in the spots'/channels' intensities is always maintained.

The above example uses the dimmer parameter, however the explanation is valid for all the parameters.

Spark 4D's control panel has 3 horizontal parameter wheels, numbered Wheel 1, Wheel 2, and Wheel 3.. When editing channels or when the editor is idle, the wheel assignments are: Wheel 1 - ***int*** intensity, : Wheel 2 - ***frm*** frame, Wheel 3 - ***rate*** chaser or A/B rate. For

editing spots the wheels are organized into 9 Wheel Banks. Parameters can be assigned to more than one wheel.



To move from one parameter wheel bank to the next use **[WHEEL+]** or **[WHEEL—]**.

A/B Crossfader

The A/B crossfader is the playback crossfader of the system.

Memories crossfade, sequencing in numerical order, when either an automatic Go command is received or the crossfade is performed manually.

Fades are executed automatically (by pressing **[GO]**), according to prerecorded fade rates, or by manual movement of the crossfader. The crossfade rate can be overridden at any point in the fade progression by using the rate wheel.

The A/B crossfader area of the console consists of: the A fader and the B fader, an LED display for each fader that shows their current assignments, assignment keys and control keys.

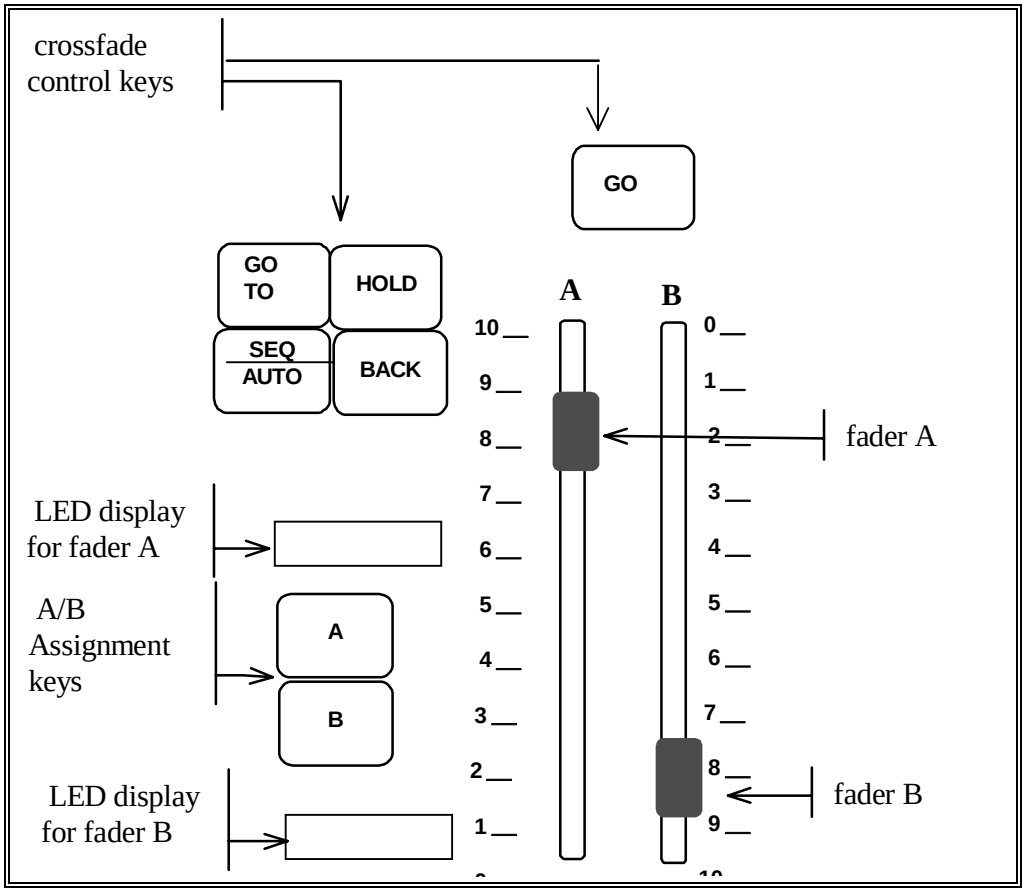


Figure 1 The A/B crossfader area

The Playback area of the Stage display (display formats 1,3,5,7) provides information as to the current status of the A/B crossfader.

The X-Fade Exam is a display dedicated to the A/B crossfader and is generally used during playback. (see Chapter 3 – Displays)

The A/B crossfader supports Part Qs, memory loops, links, and Event assignments.

Controllers

Spark 4D has 20 controllers. Each controller has an associated Soft Key/ Bump Button and colored LED.

The controllers accept groups of channels and/or spots, memories, Chaser, and effect assignments. The controller position determines the output level of the controller assignments.

Controllers can also be assigned to submaster the controller banks, the A/B crossfader, and DMX Input or as inhibit submasters for channels/spots.

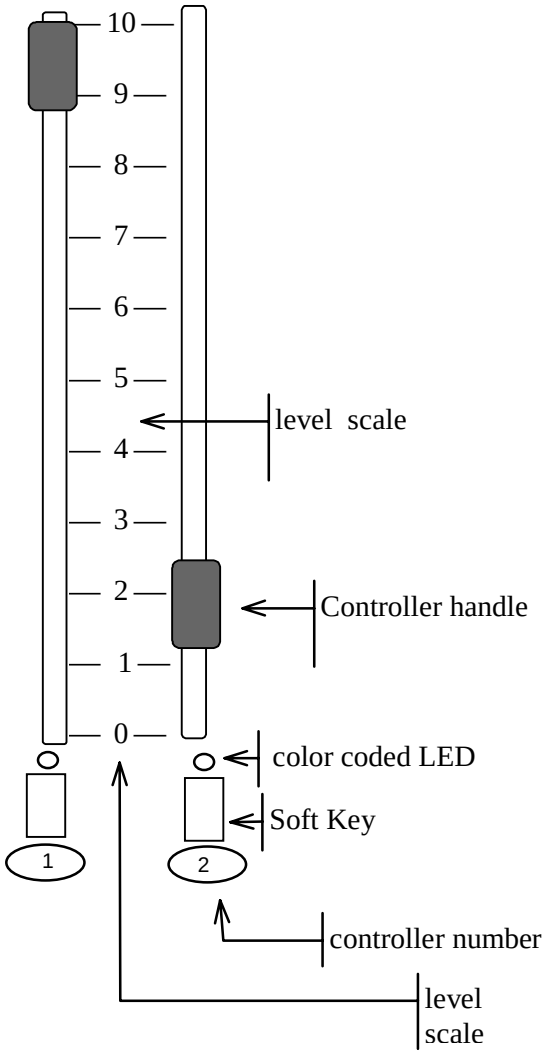


Figure 2 Controllers

In Assign mode the Soft Keys are used as assignments keys, to flash assignments, for automatic fades, and for chaser control.

Colored LEDs provide information about the type of assignment and the fade status of the Controllers/Soft Keys. Example: Controller 1 is assigned a chaser. The chaser is on hold (not running). The LED under the controller blinks red. When the chaser is running the LED is red and does not blink. If you are stepping through the chaser, the LED is orange.

Soft Keys

The Soft Keys have 5 modes.

Mode	What the Mode does
Assign mode	Allows the assignment of groups of channels/spots, memories, or chasers to controllers. A fade function, fades the controller assignment up and down. The Soft Keys are also used for Go commands and to flash the assignment. 10 simultaneous chaser assignments can be made. Chaser are assigned in hard run mode or soft run mode and are easily switched from one mode to the other. There is a special dedicated chaser display. Controllers can be assigned as inhibitive submasters or can submaster the upper bank of controllers, lower bank of controllers, A/B, and DMX Input channels.
Group mode	Direct access to 40 Groups for quick editing selection.
Macro mode	Direct access to 40 Macros.
Snap mode	Direct access to 20 Snaps with 2 snap functions modes - non-forcing (additive) and forcing (override)
Effect mode	Access the Effects Editor on the Soft Keys
Palette mode	Direct access to 40 Palettes.
Parameter mode	When active (LED on) the Soft Keys provide parameter selection when spots are selected. This is enabled as default. This key can be toggled to enable or disable.

Assigning the default mode

The Soft Key default mode is assigned by a double hit on **[ASSIGN]**, **[SNAP],** or **[MACRO]**.

Assigning a temporary mode

You can temporarily change the Soft Key mode with a single hit on any of the mode keys. The temporary mode is valid until the one of the Soft Keys is pressed; then the Soft Keys return to the current default mode. Temporary modes are displayed on the LED display preceded by an asterisk (*).

Example: The current default mode is assign. You want to go, temporarily, to macro mode in order to operate macro 11. Press **[MACRO]** (**SK11**). The Soft Key mode returns to Assign mode.

Some modes have a secondary function that is accessed by pressing **[SHIFT]**.

Mode	SHIFT function
Assign	• Fade memory or group assignment from the controller level to FL or to 0. • Manual stepping for chaser assignment.
Group	Access Groups 21 - 40
Macro	Accesses macros 21 - 40.
Snap	Operates snap in forcing (override) mode.

Using the Soft Keys for playback control

In Assign mode the Soft Keys have 4 operational modes:

1. Flash mode is the default function for group and memory assignments. Pressing the Soft Key bumps the controller assignment from its current level to full.

   Chaser Go/Hold is the default for chaser assignments. Pressing the Soft Key starts the chaser. Pressing it while a chaser is running stops and blacks out the chaser. The **[SHIFT]** accesses the Go Controller operation, an automatic fade of the controller assignment.

2. **LATCH** When active (LED on) the Soft Keys are on/off keys for memory and grp assignments. Latch may be used in conjunction with either of the **SOLO** keys.

3. **SOLO** When this is active, pressing a Bump Button blacks out the output from all of the controllers except the selected one. May be used in conjunction with the latch function.

4. **– SOLO** When this is active, pressing a Bump Button blacks out the output of the selected controller only. May be used in conjunction with the latch function.

Color code for Soft Key LEDs

Mode/Assignment	Color	Explanation
Macro mode	Orange	There is a recorded macro corresponding to the Soft Key.
Snap mode	Orange	There is a recorded snap corresponding to the Soft Key.
Group mode	Orange	There is a recorded Group corresponding to the Soft Key number
Assign mode	Green	When there is a group, memory, or submaster assignment present.
Chaser assignment	Red blink	Chaser on Hold
	Red solid	Chaser running
	Orange	Step

It is possible to examine all controller assignments in the Assign, Macro, and Snap modes: Press **[EXAM]** and the **Soft Key**.

In order to use the exam function the mode must be default mode and not a temporary mode.

General Master

The General Master controls the overall dimmer output of the console.

The General Master fader has a blackout key, which turns off all dimmer outputs in the system. The GM blackout key can be disabled in the System Parameters menu.

The level of the General Master is displayed in the upper right corner of the display. The maximum level of the GM can be set to 100 or 200, in Service Tools/Config sys/F3.

Channels can be removed from General Master control. This is useful when using scrollers and DMX devices such as smoke machines. (See Chapter 26 Channel and Scroller Management)

Menus

Menus provide tools for Patching, defining System Parameters, , Memory Management, Macros, and other special functions. The F (Function) keys are used to access the options and functions in each menu. Easy to follow prompts guide you through all menu functions. Once you have opened the selected menu, you will notice that the functions of the F keys change according to the type of task currently being addressed.

Accessing menus

Keypresses	Results/Comments
1. Press **[MENU]** to view the menu list.	
2. Enter a menu by either pressing the appropriate F key, displayed at the bottom of the screen. Or Select the number of the menu, as it appears in the numbered list and press **[ENTER]**	Once in the selected menu, you will notice that the functions of the soft (F) keys change according to the type of task currently addressed.

The prompt line asks all the relevant questions to guide you through the different tasks and functions.

If you make an error entering information while in a menu **F6 Restart** usually returns to the beginning of the command chain. If you have made an error entering a number selection, pressing **CE** usually clears the error.

Number selections in the menu mode are entered on the numeric keypad of the console or, in some cases, the alphanumeric keyboard. Text is typed on an alphanumeric keyboard.

Many of the different menus have more than 5 functions available. It is generally assumed that if you do not see the function under discussion, you will page until you see the option. To view the next page of functions press: **F6 More Function**

Spark 4D contains the following menus:

Menu	Purpose
1. Channel Patch	Dimmer management includes soft patch, assigning dimmer curves, defining proportional patch per dimmer, exchanging dimmers, enabling or disabling General Master control. and testing channels or dimmers. Patching for DMX input. Examining patching for dimmers, channels, and scrollers.
2. Load	Load show files from a floppy disk. All the data contained in a show file can be loaded or selected parts, such as Libraries only and Macros only..
3. Memory Operations	Rename, copy, and delete memories. Copy profile fade times and clear the console's memory.
5. Record	Recording Spark 4D's memory contents to a floppy disk or to the hard disk. File management.
7. Printer	Generate hard copy of show data.
8. System Parameters	General system information is displayed. There are options that you can redefine to customize the system.
9. Macro	Create, modify, and delete macros. Assign macros to DMX input channels.
10. Effect	Create Effects using channels and spots with different chase patterns. Edit, delete, and copy Effects.
11. Test	Test channels. Test dimmers regardless of their channel soft patch.
13. Spot Patch	Create homogenous beam movement, for moving lights, regardless of the physical orientation of the device. . This menu does not appear if the system is not configured for spots.
14. Delete Play/Act	Delete show files from a floppy disk.
19. Mix Output	Moving Light management includes control number patching, assigning output addresses, customizing device definitions, create a moving device definition library, and load/record moving device definitions in device files. This menu does not appear if the system is not configured for spots.
20. Scroller	Assign control channels to scrollers, fine tune frame set ups, enable the dark gel option. This menu does not appear if the system is not configured for scrollers.
21. Event	Program Events that trigger multiple playback events in the system.
22. Master/Slave	Connect 2 consoles for Master/Slave operation.
23. MIDI In/Out	Enable keys and controllers for MIDI communication. Edit default MIDI codes. Program macros of MIDI command strings. Enable or disable the MIDI Synch function.
25. Autosave	Manually trigger the Autosave function to save the current memory contents. Restore the data contained in an Autosave file created earlier, delete Autosave generations, lock and unlock Autosave generations, abort the Autosave, append comments.
26. Network Settings	Assign IP addresses, ID numbers, and mapping the network settings for Ethernet communication.

Some of the F key functions may be carried out on the keypad as in editing:

F Key in menu	KEYPAD
Thru	**[→]**
Channel	**[CHANNEL]**
Store	**[STORE]**
Memory	**[MEMORY]**
Next	**[+]**
Previous	**[-]**

Exiting the menu mode

Pressing **[RESET]** exits the menu mode and resets the menu you have just exited. Press once to return to menu list. The second press returns you to stage display.

[MENU] also exits the menu mode. Pressing this key exits the menu you are working on without, in most cases, resetting the menu editor.

If for example, you are busy in the Spot Patch menu and you must temporarily exit the menu, exit by pressing **[MENU]** returning to stage display. When you want to return to the Spot Patch menu, press **MENU** to return to the point from which you exited the Spot Patch menu and continue working.

You can exit the following menus without resetting the menu editor:

- Channel Patch
- Macro
- Spot Patch
- Mix Output
- Scroller Patch

Text & the Alphanumeric Keyboard

Text is typed on the alphanumeric keyboard.

You can add text to macros, memories, to show files when recording to the diskette, to snaps, events, libraries, controller group assignments, and even leave a note for the second shift crew.

Operating instructions for adding text to the above mentioned items are included in the sections dealing with those subjects.

A page of text

One page is available for text typed on the alphanumeric keyboard. This is useful for recording any notes about special rigging, color changes during interval, cue synopsis, any special comments pertaining to the show, etc.

If the blue text page contains text it is the first display to come up when the system is turned on. This makes a convenient place to leave notes and messages for the next shift crew.

To create a page of text:

Keypresses	Results/Comments
1. Press **[TEXT] [TEXT]**	A blank blue screen is displayed. This is the text page.
2. Type the text on the alphanumeric keyboard	
3. Press [**STORE]**	

➢Note

If there is text on the Text p age, you can access the page by pressing Insert on the alphanumeric keyboard.

Erasing text

The **[ERASE]** key is used to erase text.

Example: Delete the text from the Text page.

Keypresses	Results/Comments
1. Press **[TEXT]**	
2. Press **[TEXT]**	The blue Text page is displayed/
3. Press **[ERASE]**	

Using the text keyboard for programming

The text keyboard can be used to program memories. .

The keyboard equivalents are:

a – text	o – on	S – status
b – block	p – part	T – delta
c – channel	q – memory	@ - intensity
d - page down	r - rem dim	^ - except
e – effect	s – store	[- +@
f – full	t – time	] - — @
g – mask	u - page up 2	Bs – CE
h – help	v - (not used)	spacebar – clear
i - (not used)	w – wait	% - flash
j - (not used)	x – exam	& - +1 store
k – link	y - (not used)	> - →
l - loop l – loop	z – zero	Tab – stage
m – menu	E – event	Del – erase
n – snap	F – frame	Esc - reset During editing, after inserting text to memories, etc. use ESC to exit text mode.

Locking/unlocking the keyboard

The alphanumeric keyboard has a lock to prevent unintentional editing. Activate the lock by pressing **ALT A**. Unlock the keyboard for editing functions by pressing **ALT A** again. This lock does not affect the functioning of the alphanumeric keyboard when **TEXT** has been selected on the console.

➢Note

To use the Print Screen function on the text keyboard, you must first "unlock" the keyboard.

Navigating the cursor

The cursor is used in menu 26, Service Tools, and for navigating on the track sheet.

↑ is accessed by pressing **[SHIFT] [8]**.

↓ is accessed by pressing **[SHIFT] [2]**.

← is accessed by pressing **[SHIFT] [4]**.

→ is accessed by pressing **[SHIFT] [6]**.

Getting Help

On-line help contains a short description of each of the keys and the important key sequences. When the help window is open, pressing a key on the console only displays its help and does not execute its function.

Keypresses	Results/Comments
1. Press **HELP**	A window opens in the middle of the display screen.
2. Press any key you would like to know more about.	A short explanation and any relevant keystroke sequences are displayed.
3. You can continue in Help by pressing another key.	
4. To exit help, press **HELP** again.	

➢**Note**
When the Help window is open the console keys are disabled!

System Status

You can check the status of connected peripherals from Spark 4D's panel. The peripherals include the Submaster Wing, the Macro Extension Keyboard, the Remote Control, the Wire/less Remote Control, and the alphanumeric keyboard. You are notified if Spark 4D's battery is getting low.

Color key for System Status

Color	What it means
Blue	Device installed and functioning correctly.
Red	Fault
White	Not installed

What to do in case of disconnection

If a peripheral is physically disconnected or there is a communication problem a red blinking S, appearing in the command line, notifies you that there is a problem. You can turn off the blinking S by going to the System Status window and selecting **F2 Ignore**.

Keypresses	Results/Comments
1. Press **[•]**	The System Status window opens. The peripheral devices status is displayed.
2. Press F1 and select the device	
3. Press **F2 Ignore**	
4. Press **[STAGE]** or **[CLEAR]** to return to the editor.	

Disabling a device

You can also disable any device connected to the console.

Keypresses	Results/Comments
1. Press **[•]**	The System Status window opens. The peripheral devices status is displayed.
2. Press F1 and select the device	
3. Press **F3 Disable**	*Disabled* appear in red next to the device.
4. Press **[STAGE]** or **[CLEAR]** to return to the editor.	

➢Note

When the alphanumeric keyboard is locked it is designated as Disabled in the System Status window.

If the Submaster Wing is disconnected from the console, the output from the Wing is moved to the editor and the Status error message blinks in the command line. The assignments to the Submaster Wing are retained. If you reconnect the Submaster Wing, the situation is the same as prior to the disconnect. However, if you go to the System Status window and tell the console to ignore or disable the Submaster Wing, all of the assignments on the Wing are released.

CHAPTER 3
DISPLAYS

This chapter includes:

All the parameters of the system are displayed on a video display monitor. There are 9 display formats to chose from.

The area at the top of the screen is reserved for messages, Blind mode flag, MIDI status, and the General Master level. The area at the bottom of the screen houses the command line, a clock, and the last stored memory or the last memory entered into the editor. The command and message areas are common to all of the display formats.

Color coded displays in the Stage display view helps you differentiate between the different output sources for channels and spots

Display Control

The following keys are used for display control:

Key	What it does
[STAGE]	Access display format options. Return to the Stage Display from most Exam displays.
[PAGE UP]	Go to the next page.
[PAGE DN]	Go to the previous page. Access this key using **[SHIFT]**.
[PAGE UP]	Go to the next page of spots. Access this key using **[SHIFT]**.
[BIG]	Toggle between Big spots' (spots with more than 22 parameters, like the Martin PAL)2 parameter pages for. Access this key using **[SHIFT]**.
[PARAM]	When active (LED on) the Soft Keys are parameter selection keys.
[MENU]	Toggles the display between the Menu list and Stage mode.
[+]	Go to the next item. Example: Go from memory 2 exam to memory 3 exam.
[-]	Go to the previous item. Example: Go from memory 3 to memory 2 exam.

Display Formats

0. Channel display only. The display includes scroller frames. The color of the channel or scroller number displayed depends on the origin of the data, whether it derives from the A/B crossfaders, a controller, the editor, or tracking.
1. Channel and playback. The playback display includes controller status and A/B status.
2. Spot display only. The appearance of the display depends on what size and how many spots appear in the configuration. The color of the spot number displayed depends on the origin of the data, whether it derives from A/B playback crossfaders, a controller, the editor, or tracking.
3. Spots and playback. The playback display is identical to option 1.
4. Spots and channels. The channels include scroller frames.
5. Channels, spots, and playback.
6. X-fade Exam shows the incoming and outgoing memories, a list of the next memories in sequence, controller/chaser status, chaser assignments, A/B fade rate, and previous memory on A/B.
7. X-fade and playback.
8. X-fade and spots.

In addition to the 9 main display options, the `Status Window' section of display formats offers further display configurations.

Selecting display formats

When the system is configured for spots and channels, there are up to 9 display options. When the system is not configured for spots there are 4 display options available. The display option framed in red is the current display.

Keypresses	Results/Comments
1. Press **[STAGE]**	The display format options are shown on the CRT.
2. Enter the number of the display you want on the numeric keypad.	The display jumps to the selected format.

or

Keypresses	Results/Comments
1. Press **[STAGE]**	The display format options are shown on the monitor.
2. Press **F1** until the display format that you want is framed in red.	
3. Press **[STAGE]**	The display jumps to the selected format.

Customizing the display format

There are 7 additional options for customizing the display formats. The options appear in the Status Window to the right of the display options.

Keypresses	Results/Comments
1. Press **[STAGE]**	
2. Press **F2** to move the cursor to your selection.	The cursor points to the options.
3. Press **F3**	The option is selected, highlighted in the Status Window. The display format options are updated with the selected status.

Selection	What it does
Stage Scrlr	Create a special display area for scroller information. The basic channel display will no longer show frame information, but scroller channels will still be marked with an 's'. Under the channel display, a special scroller display will show the scroller channel number, the dimmer intensity (if any), and the frame status.
Assign channels	Selected and assigned (channels used in memories) channels are displayed in sequential order. Example: Select channels 1, 5, 10, 15, and if the assign channels option is active that is how they will appear on the screen. In the default format the display would look like this: 1 5 10 15.
Jump display	The display automatically jumps to the page where the selected channel appears.
SQZ (squeeze) display	This option is available only if the stage scrlr option is active. This provides more lines for displaying channels.
SQZ spots	Applies to window 5 only. Choosing this option limits the channels to 10 channels a line.
Auto display	When the display format is just channels (display formats 0 and 1) the display jumps to the spot display when spots are selected. When the display format is just spots (2 and 3), the display jumps to the channel display when channels are selected.
Active Channel	When Active Channel is selected all channels with an intensity assignment are displayed. This display is very fluid and changes according to the current channel output. When Active Channel is in use Assign Channel and Jump are automatically deselected. .

The Stage Display

The display format for both channels and spots are format 4, and 5.

Channels

The channel number, intensity, and frame number (if the channel number also serves a scroller) are shown. Channel displays are display formats 0, 1, 4, and 5.

Spots

Spot displays are display formats 2, 3, 4, 5, and 8. The spot display depends on the number and size of spots in the system configuration.

Each spot is shown as a vertical column and all spot parameters are displayed in the column. The parameter numbers are displayed at the left side of the column. Parameter names are displayed when a spot is selected.

The color of the parameter value displayed depends on the origin of the data; whether it derives from A/B playback crossfaders, a controller, the editor, tracking or from a library.

Spot Parameters

X and Y (pan and tilt) display the coordinates of the spot's mirror or a yoke's position coordinates.

Dim is the level of the unit's dimmer.

The "p" numbers represent the spot parameters as defined in the Mix Output menu

Examples of parameter names:

- ir - iris
- mg - magenta
- gb - gobo position
- vl - velocity. The speed at which the mirror moves
- cw - color wheel

The parameter names are displayed on the spot area of the Stage display and on the LED display for wheels. When a spot is selected and [PARAM] is active (LED on) the Soft Keys go automatically to Parameter mode. The parameter names displayed on the controller display and may be used to select parameters.

Special Intellabeam and Cyberlight parameter operation modes are represented by icons. See Chapter 6 - Selecting and Editing Spots.

The Playback Display

The Playback Display is available on display formats 1, 3, 5, and 7.

The playback display shows the A/B crossfader status. The information on the crossfader includes the current and incoming assignments, the fade rate, loop information, and the Auto status for Event operation. There is a dynamic display of a running crossfade.

When the 20 controllers are in Assign mode the level of the controllers in percentage and the type of assignment are displayed.

Assignment	Display
Memory	Memory number QList number Memory text
Grp	grp Text
Chaser	First and last memories of the chaser assignment Soft chaser is marked with an 's'
Submaster	Sub

When the Soft Key mode is Group, Macro or Snap the controller display area is labeled according to the mode. The first 5 characters of the text for the Macros and Snaps are displayed.

Messages and Commands

Messages appear at the top of the screen on the Stage display:

- Messages
- The Blind mode flag
- MIDI status
- MIDI synch status
- Grand Master level
- SMPTE time code
- The Teach Macro flag

The gray line at the bottom of the screen houses:

- The command line - The command line echoes the keypresses and contains up to 40 characters.
- The clock
- Delta flag
- The current Q List
- The last memory recorded (L) or entered (E) into the editor.

Output Color Key

The color key for channels/spots is:

Color	Output source and status
Red	Selected channels/spots, active in the editor, that are addressable by the wheel or keypad.
White	Channels/spots that are present in the editor, but not selected. Channels appearing in white are included when storing a memory.
Green	Scroller frame values appear in green when the scroller is selected or active in the editor.
Dark blue	A memory entered to the editor for memory modification..
Light brown	Output deriving from a controller.
Light blue	Output deriving from the A/B playback.
Gray	Tracking of spot parameters and scrollers. DMX Input channels.
Yellow	Match. This only appears in special circumstances. When the editor level of a channel or spot that has been stored using STORE STORE is different than the level of the output source. Example: Channel 1 is output from controller 1. The controller level is 25%. Channel 1 was selected in the editor at Full intensity then stored. The editor does not release channel 1. So as not to cause a jump in the light on stage. the editor retains channel 1 at Full intensity displayed in yellow. Moving the controller 1 to match the editor level releases the channel from editor control.

To view the view the color code Press **[HELP]**. Press **[HELP]** a second time to exit.

The X-Fade Exam Display

The X-Fade Exam appears in display formats 6, 7, and 8. This display shows a short memory list of the next few memories sequencing on the A/B crossfader.

Bar graph representations of the A/B crossfader dynamically display the progress of a crossfade. In display format 6 there is an expanded chaser display.

Exam Displays

There are 2 types of Exam displays: strong displays and weak displays.

Weak displays are cleared by any subsequent keypress.

Strong displays remain on the screen and you can continue to work keeping the display on view. An example of a strong display is the selected channel exam. Example: you can exam channel 1 and then perform a memory range modification while viewing channel 1 exam.

Press **[STAGE]** to exit strong exam displays.

Exam	What is displayed
Free channels exam	A list of the channels not used in any memory.
Selected channel exam	The memories in which the selected channel appears, intensity and frame assignments.
Track sheet	Tracks channels through memories...
Free spots exam	A list of spots not used in any memories.
Selected spot exam	The memories in which the selected spot appears and the parameter values in each memory.
Memory list	A sequential list of all recorded memories, including loop, link, fade time information, text, and assigned Events. You view the memory list from the first page or start from a selected memory.
Specific memory exam	The spots with parameter values, channels with intensity/frame values, time assignments, parts (if used) and text for the selected memory.
Q List exam	A list of all of the Q Lists, the number of memories in the Q List, the numerical range of memories, and the total crossfade time.
Specific Q List	The memory list for the selected Q List.
Effect list	A list of the effects including the loop assignment, the pattern, and how many steps in the effect.
Specific Effect	The information for the selected effect.
Library list	A list of the recorded Libraries, including any text.
Specific library	The spots, parameter values and text included in the selected Library.
Snap list	A list of the Snaps and text.
Specific snap	The playback device assignments recorded in the selected Snap.
Events	The Event list, including assigned SMPTE time codes.
Controller assignments	Information pertaining to the assignment on the selected controller.

Sequences for accessing the exam displays can be found in the discussion of the different functions.

CHAPTER 4
QUICK START

This chapter includes:

Setting Up Spark 4D

Configuring Spark 4D

Patching

- Patching dimmers to channels
- Patching scrollers to channels
- Patching and addressing moving spots
- Creating homogeneous beam movement

Selecting Channels & Spots

- Selecting channels & assigning intensity
- Selecting channels & assigning intensity
- Selecting spots & assigning parameter values

Programming Memories

Playback Memories on A/B

Playback chasers

Recording a Show File

Setting Up Spark 4D

1. Connect the alphanumeric keyboard and the monitors to the appropriate ports on the back panel.
2. Connect the DMX and (if present) S-Mix leads to the output ports.
3. Plug the power cable into a power source.
4. Press and hold the **[CE]** and **[CLEAR]** keys while switching on the console.
5. Release the **[CE]** and **[CLEAR]** keys. Spark 4D goes through its boot up process and finally displays the main Service Tools menu.
6. The next step is configuring Spark 4D.

Configuring Spark 4D

You configure Spark 4D for the number of moving lights, dimmers and channels, and scrollers you are running. The instructions below treat this subject at its simplest level. For more information see Chapter 24 System Configuration.

1. Looking at the main Service Tools menu, press **[F3 Config System]**.
2. Enter the number of spots in each size category (size refers to the number of DMX channels used by the device), number of channels, dimmers, and scrollers that you will be running.
3. Press **[F6 Enter & exit]**.
4. Press **[F6 Store configuration]**.
5. Switch off Spark 4D.
6. Switch on Spark 4D.
7. When the main Service Tools menu is displayed, press **[F1 Cold Start]**.

Patching

All of the menus have easy to follow prompts that guide you through the various functions.

Patching should be done before recording any memories.

Spark 4D has 4 Patch menus:

- Channel Patch (menu 1) - Soft patch dimmers to channels, assign dimmer curves, enable/disable General Master control.
- Scroller Patch (menu 20) - Patch scrollers to control channels, determine dark gel assignments, fine tune gel string placement.
- Mix Output menu (menu 19) - Moving light management.
- Spot Patch (menu 13) - Flip and exchange the x and y axes of the mirror movement to create homogeneous beam movement.

Patching dimmers to channels

1. Go to the Channel Patch menu.
2. Press **[F1 Assign Dimmer]**.
3. Enter a dimmer number in answer to the prompt.
4. Press **[F3 To Channel]**.
5. Enter a channel number in answer to the prompt.
6. Press **[F1 Store]**.

See Chapter 25 - Channel and Scroller Patching, for further information.

Patching scrollers to channels

1. Go to the Scroller Patch menu.
2. Select a scroller by entering the scroller number on the numeric keypad or by using the arrow keys to move the cursor (the colored bar) to the scroller you want.
3. Press **[F1 To Channel]**.
4. Enter the channel number in answer to the prompt.
5. Press **[F1 Store]**.

See Chapter 25 - Channel and Scroller Patching, for further information.

Patching and addressing moving spots

1. Go the Mix Output menu.
2. Select the type of moving light you are using from the Device List. If the moving you are using does not appear in the Device List you can define it yourself. When you define a device yourself, consult the manufacturer's specifications. Device definitions can be stored to disk. See Mix Output menu.
3. Assign spot numbers to the selected device.
4. Assign Output Addresses to the spot numbers.
5. Exit the Mix Output menu.

See Chapter 26 - Spot Management, for further information.

Creating homogeneous beam movement

1. Go to the Spot Patch menu.
2. Press **[F1 Patch Position]**.
3. Select the spot you want to adjust. You can select a range of spots.
4. Press **[F1 Convert To]**. The dimmer of the selected spot is turned on.
5. Select one of the movement options (1-8). You can use the trackball to check your selection.
6. If you have selected a range of spots use **[F3 Advance]** to move to next spot.
7. Press **[F1 Store]**.

See Chapter 26 - Spot Management, for further information.

Selecting Channels & Spots

Selecting channels & assigning intensity

1. Press **[CHANNEL]**.
2. Select the channel number on the numeric keypad.
3. Use the dimmer wheel or press **[FULL]**, **[ON]**. You can also press **[@]** and assign an intensity on the numeric keypad.

See Chapter 5 - Selecting & Editing Channels and Scrollers, for more information.

Selecting scrollers & assigning frames

1. Press **[CHANNEL]**.
2. Select the channel number on the numeric keypad.
3. Optional - Assign dimmer intensity.
4. Use wheel 1 to scroll the gel ribbon or press **[FRAME]** and assign a frame number on the numeric keypad or

See Chapter 5 - Selecting & Editing Channels and Scrollers, for more information.

Selecting spots & assigning parameter values

1. Press **[SPOT]**.
2. Select the spot number on the numeric keypad.
3. Use the parameter wheels to assign values or select parameters on the Touch screen and enter a value using the numeric keypad.

See Chapter 6 - Selecting & Editing Spots, for more information.

Programming Memories

1. Select channels using the numeric keypad.
2. Assign intensity using the dimmer wheel or press **[@]** and assign an intensity value using the numeric keypad.
3. Select spots using the numeric keypad.
4. Assign parameter values. Use the parameter wheels or select a parameter on the Touch Screen and assign a value on the numeric keypad. (Use the **[STEP UP]** and **[STEP DOWN]** keys for discrete and mixed step parameters).
5. Select a scroller channel.
6. Assign a scroller frame using the parameter wheel 1 or press **[FRAME]** and assign the frame using the numeric keypad.
7. Press **[MEMORY]** or press **[=]**. (See Special Functions in Chapter 24.)
8. Enter the memory number using the numeric keypad.
9. Make fade time assignments by selecting the time in, time out, wait in, wait out, or delay and entering the time assignment on the numeric keypad.
   Press **[TIME]** for time in.
   Press **[TIME] [TIME]** for time out.
   Press **[WAIT]** for delay.
   Press **[WAIT] [WAIT]** for wait in.
   Press **[WAIT] [WAIT] [WAIT]** for wait out.
10. Press **[STORE]**.
11. Press **[RESET]** to clear the editor or continue editing without resetting the editor.

See Chapter 7 - Programming Memories, for further information.

Playback Memories on A/B

1. Select a memory by pressing **[MEMORY]** and the memory number.
2. Press **[A]** or **[B]**. It is recommended to assign the memory to the inactive fader; if the fader is at A assign the memory to B, if the fader is at B assign the memory to A.
3. Move the fader so the memory is active on stage. **[SEQ]** is automatically enabled.
4. The next memory is now on board.
5. Press **[GO]** to begin the crossfade from the active memory to the memory on board.

See Chapter 12 - The A/B Crossfader, for further information.

Playback chasers

1. Chasers are played back on the controllers.
2. Select a range of memories. If the first memory has a loop assignment, you select the first memory only.
3. Select the chaser playback mode by pressing **[HARD]** or **[SOFT]**.
4. Press the bump button, for one of the controllers, to assign the chaser. The bump button LED flashes red.
5. Press the controller' **[Bump Button]** to start the chaser.

See Chapter 13 – Controllers & Chasers, for further information.

Recording a Show File

1. Press **[MENU] [5] [ENTER]** to go to the Record menu.
2. Press **[F1 Play/Act]**.
3. Enter a number for the show file using the numeric keypad.
4. Optional - press **[F2 Text]** and type a label on the alphanumeric keyboard.
5. Press **[F1 Record]**.
6. Press **[F1 Yes]**.

See Chapter 11 - Data Storage and Retrieval.

CHAPTER 5
SELECTING AND EDITING CHANNELS & SCROLLERS

This chapter includes:

Selecting channels

- Changing the number default selection
- Selecting a single channel
- Selecting multiple nonsequential channels
- Selecting a range of channels
- Excluding channels from the range selection
- Reselecting the last channel selection
- Grabbing channels in the editor and on-stage

Assigning intensity levels

- Assigning dimmer levels using @
- Repeating an intensity assignment

Releasing a channel from the editor.

Selecting and Editing Scrollers

- Assigning frame values on the numeric keypad

Selecting Channels

Single channels, groups of non-sequential channels, and ranges of sequential channels can be selected. There are several series of keystrokes to select one or more than one channel at a time. These keystrokes may be combined in any way lending great versatility to channel selection.

There are special selection sequences that grab channels in the editor together with channels active on stage.

Wheel 1 is used for intensity levels and wheel 2 is used for scroller frame selection. Intensity and scroller frames may also be assigned on the numeric keypad.

If the Number Selection default is channel, it is unnecessary to press **[CHANNEL]** before selecting the first channel number. The Number Selection default appears in gray at the left of the command line.

Changing the number default selection

When the editor is idle and the number default selection is channel, the first number pressed is recognized as a channel selection. The number default selection can also be Spot or Memory.

Keypresses	Results/Comments
1. Double hit on **[CHANNEL]**	*Chann.* appears on a gray field in the command line.

Selecting a single channel

Keypresses	Results/Comments
1. Press **[CHANNEL]**	Skip this step if Channel the number default selection.
2. Enter the channel number on the numeric keypad.	The selected channel is displayed in the command line.
3. Press **[+]** or **[—]** to continue channel selection.	

When a new channel is selected, the previous selection is displayed in white to indicate its presence in the editor. The newly selected, currently active channel number appears in red and may be assigned a dimmer level and scroller frame.

Selecting multiple nonsequential channels

Keypresses	Results/Comments
1. Press **[CHANNEL]**	Skip this step if Channel the number default selection.
2. Enter the channel number on the numeric keypad.	The selected channel is displayed in the command line.
3. Press **[CHANNEL]**	This acts as an “and” key.
4. Enter the channel number on the numeric keypad.	The first channel selected is displayed in red on the channel display. The selected channel is added to the command line.
5. Repeat steps 3 and 4 as required.	Each time **[CHANNEL]** is pressed the channels in the previous selection are displayed in red in the editor.

Selecting a range of channels

Keypresses	Results/Comments
1. Press **[CHANNEL]**	Skip this step if Channel the number default selection.
2. Enter the first channel of the range on the numeric keypad.	The selected channel is displayed in the command line.
3. Press **[→]**	This singles a range selection.
4. Enter the last channel in the range, on the numeric keypad.	The range of channels is displayed in the command line.

Reselecting the last channel selection

For editing speed Spark offers a sequence that reselects the last of group of channels that were selected (displayed in red) in the editor.

1. Press **[CHANNEL]**	
2. Press **[•]**	The last channel, group of channels, or range selection is appears in red.

➢**Note**

Even if your last selection was spots, the keypresses described above reselect your last channel selection.

Grabbing channels in the editor and on stage

The are some specialized channel selection key sequences that allow you to grab channels that are in the editor and "on stage" (their output derives from a playback device).

In the examples below, channels 1, 5, 8, and 20 are in the editor.

- **[CHANNEL] [5 → → 8]** selects channels 5 and 8. If there are channels within the selected range, whose output originates from A/B or the controllers they are also selected when using this sequence.
- **[CHANNEL] [→ →]** selects all the channels present in the editor and on stage. The command line displays: *chan from editor & stage*. This selection tool is useful when universally modifying all the channels contained in a memory. Example: you want to add 10% to all the intensity assignments in memory 1. The keypress sequence is: **[MEMORY] [1] [CHANNEL] [→ →] [dimmer wheel]**.
- **[5] [→ →]** selects channels 5, 8, and 20 and any channels on-stage.
- **[CHANNEL] [1 →]** selects all the channels (from channel 1 to the last channel) in the system.
- **[CHANNEL] [1 → 8]** selects all the channels included in the range. Note: This selection is different than **[CHANNEL] [1 → → 8]** which, in our example, selects channels 1, 5, and 8.

Assigning Intensity Levels

The following keys are used for intensity assignments:
[@] and the numeric keypad.
[FULL] assigns 100% intensity to the dimmer.
[ZERO] forces the channel to 0%.
[ON] (accessed with the **SHIFT** key) assigns 50%. This value is may be changed in the System Parameters menu.
Dimmer wheel

Only channels displayed in red can be assigned intensity levels.

When a new channel is selected, the previous selection is displayed in white to indicate its presence in the editor. The newly selected, active channel number appears in red.

Assigning dimmer levels using @

When using **[@]** a single digit, entered on the numeric keypad, is understood as a whole decimal number (4 is 40%, 6 is 60%, etc.). If subdecimal intensity assignments, use the dot (4.5 = 45%, etc.).

If the system is defined 'USA' enter 45 on the keypad to obtain 45% and enter 60 on the keypad to obtain 60(see Chapter 24 System Configuration)

Example: Assign 70% intensity to channel 5.

Keypresses	**Results/Comments**
1. Select channel 5.	
2. Press **[@]**	*int* appears in the command line after the channel selection and channel 5 is displayed in red.
3. Press **[7]** Press **[70]** If the system is defined as USA.	*70* is displayed under the channel number on the channel display.
4. Press **[@]** and enter a new value again to change the intensity assignment.	

Example: Assign 73% intensity to channel 5.

Keypresses	**Results/Comments**
1. Select channel 5.	
2. Press **[@]**.	*int* appears in the command line after the channel selection and channel 5 is displayed in red.
3. Press **[7] [•] [3]** Press **[7]** and **[3] i**f the system is defined as USA.	*73* is displayed under the channel number on the channel display.
4. Press **[@]** and enter a new value again to change the intensity assignment.	

Repeating an intensity assignment

You copy the last intensity assignment to a new channel selection.

Example: Assign 33% to channel 1 and repeat the level assignment to channel 8.

Keypresses	Results/Comments
1. Select channel 1.	
2. Assign 33% intensity level using the dimmer wheel.	You can also assign the level on the numeric keypad.
3. Press **[CHANNEL] [8]**	
4. Select channel 8.	
5. Press **[•]** (dot)	33% is assigned to channel 8.

Releasing a Channel from the Editor

Select channels and remove them from the editor. The channel/s can be bumped out or faded out.

Keypresses	Results/Comments
1. Select the channel/s.	
2. Press **[RELEASE]**	The channels fade to 0% and are released from the editor.

Keypresses	Results/Comments
1. Select the channel/s.	
2. Press **[ERASE]**	The channels bump out and are released from the editor.

Selecting and Editing Scrollers

If you have taken advantage of the Scroller Patch (see Chapter 25), scrollers are addressed by the channel number of the lighting fixture on which they are mounted. The channel display shows a small 's' to the right of channel number, indicating that this channel is a two parameter channel; One parameter being intensity and the other the scroller frame number.

The channel area of the stage display shows the channel and associated scroller information. Underneath the intensity level, the current frame position of the scroller is shown.

Color code for scroller channels

Color	What it means
Dark gray	Tracking
Red	Scroller channels selected in the editor. The frame value is displayed in green.
White	Scroller channels present in the editor. The frame value is displayed in green.
Blue or orange	Scroller channels output from A/B or controllers. The frame value is displayed in green.

Assigning frame values on the numeric keypad

Frames can be assigned using the numeric keypad or **Wheel 2**. If you use the wheel to assign frame values, it is not necessary to press **[FRAME]**. Partial frames can also be entered on the numeric keypad. Examples: **[FRAME] [1] [•] [6]** or **[FRAME] [11] [•] [8]**.

When using the numeric keypad:
If the system is configured for at least 10 frames, you must enter frame 1 as **01**.
If the system is configured for at least 20 frames, you must enter frame 2 as **02**.
If the system is configured for at least 30 frames, you must enter frame 3 as **03**.

In the example below channel 5 is the control channel. Assign frame 11.

Keypresses	**Results/Comments**
1. Select channel 5.	
2. Optional–assign intensity.	
3. Press **[FRAME]**	The frame value is displayed in green, meaning that the scroller is selected in the editor and is ready for a value assignment
4. Enter **11** on the numeric keypad.	
5. To assign a different frame value, press **[FRAME]** again and select a frame number.	

➢Note

Instead of step 5 **[+]** and **[-]** can be used to go to the next or previous scroller frame.

CHAPTER 6
SELECTING AND EDITING SPOTS

The subjects included in this chapter are:

Igniting spots

- Igniting DMX Spots
- Igniting S-Mix, L-Mix spots, High End
- Ignition exam

Selecting spots

- Changing the number selection default
- Selecting a single spot
- Selecting multiple spots
- Recalling the last spot selection
- Selecting spots in the editor and on stage
- Spot display control

Mix editing of spots

Spot parameters

- Parameter wheels
- Types of parameters
- Selecting parameters and assigning values
- Returning to home values
- Copying parameter values

Releasing spots/parameters from the editor

Parameter mode assignments for Cyberlight and Intellabeam

Igniting Spots

Most moving devices have a control channel for functions such as igniting the lamp, extinguishing the lamp, resetting the device, and fan control.

This control channel is known as ignite and is included in the device definition. The ignition sequences depend on what function you are requesting and on the ignition channel's definition.

For more information on defining the ignition control, see Chapter 26 Spot Management.

Igniting DMX spots

Sending the default value

Keypresses	Results/Comments
1. Select spots.	
2. Press **[IGNITE ON]**	
3. Press **[ENTER]**	The default value as defined in the device definition is transmitted. The duration of the transmission depends on the time as defined in the device definition.

Sending a value other than the default value.

Example: To send a Reset command to a Studio Color device, send the value 64.

Keypresses	Results/Comments
1. Select spots.	
2. Press **[IGNITE ON]**	
3. Enter 64 on the keypad.	
4. Press **[ENTER]**	The Reset command is transmitted to the device. The duration of the transmission depends on the time as defined in the device definition.

Igniting L-Mix and High End protocol spots

The definition for L-Mix spots is factory configured and may not be changed.

Ignition values for Intellabeam and Cyberlight

Reset and turn on the lamp:

Keypresses	**Results/Comments**
1. Select spots.	
2. Press **[IGNITE ON]**	The device resets itself and the lamp is struck.

Turn off the lamp:

Keypresses	**Results/Comments**
1. Select spots.	
2. Press **[IGNITE OFF]**	The lamp is extinguished.

Ignition values for L-Mix spots

Strike the lamp:

Keypresses	**Results/Comments**
1. Select spots.	
2. Press **[IGNITE ON]** and press 1 on the keypad.	The lamp is struck

Extinguish the lamp:

Keypresses	**Results/Comments**
1. Select spots.	
2. Press **[IGNITE ON]** and press 0 on the keypad.	The lamp is extinguished.

For Coemar Nats only

Reset the device:

Keypresses	**Results/Comments**
1. Select spots.	
2. Press **[IGNITE ON]** and press 2 on the keypad.	The device resets itself.

Ignition exam

The Ignition Exam display shows the ignition status of the spots. The last value transmitted is displayed.

Keypresses	Results/Comments
1. Press **[IGN ON]** and **[EXAM]**	The Ignite Exam is displayed.

The Ignition Exam looks like this:

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

Color Key for the Ignition Exam table:

Color	What it means
Gray	DMX spots
Yellow	High End
Blue	DMX spots with discrete step ignition definition

Selecting Spots

Spots are edited by selecting spot parameters and assigning values to the parameters. Parameter values are assigned using the parameter wheels and the numeric keypad.

There are a variety of selection sequences for quick and easy selection.

Selected spots appear in red on the Stage display. All parameter value assignments are carried out on selected spots, spots appearing in red.

When a spot number is selected, all the parameter names and numbers appear. The spot number selected appears in the command line after *Spot*.

When **[PARAM]** is enabled (LED on) parameters can be selected using the SKs.

The parameter names of the selected spots are shown on the spot display and, if **[PARAM]** is enabled, on the controller SK display. If you are working in the Mix Editing mode (See System parameters menu - Chapter 24 System Configuration). The parameter names are not displayed on the Stage display. The parameter names of the first type in the spot selection are displayed on the controller SK display.

You can program groups for instant selection of frequently used groups of spots. See Chapter 18 Groups.

Changing the number default selection

When the number default selection is spot, When the editor is in idle, the first number you press is recognized as a spot selection. The number default selection can also be Channel or Memory.

Keypresses	Results/Comments
1. Double hit on **[SPOT]**	*Spot* appears on a gray field in the command line.

Selecting a single spot

Keypresses	Results/Comments
1. Press **[SPOT]**	Skip this step if the default number selection is Spot.
2. Enter the desired spot number on the numeric keypad.	The parameter names of the selected spot/s are displayed and they also appear on SK controller display if **[PARAM]** is enabled.

To continue spot selection, **[+]** and **[—]** may be used to increment or decrement the active spot number.

When a new spot is selected, the previous selection is now displayed in white to indicate its presence in the editor. The newly selected, currently active spot number appears in red and all of its parameters may be addressed.

Selecting multiple spots

There are several series of keystrokes to select one or more than one spot at a time. These keystrokes may be combined in any way lending great versatility to spot selection.

[SPOT] [#] Select a single spot.

[SPOT #] [SPOT #] [SPOT #]... Select non-sequential spots.

[SPOT] [# → #] Select a range of spots.

Any permutations of spot selection may be used. For example: **[1 → 3] [SPOT 8] [SPOT 10] [SPOT 22 →24]**. These possibilities make spot selection very flexible.

Recalling the last spot selection

For editing speed Spark offers a sequence that reselects the last of group of spots that were active in the editor.

Keypresses	Results/Comments
1. Press **[SPOT]**	
2. Press **[•]**	Spots that were selected previous to the last press on **[RESET]** are selected and appear in red. They can now be edited as usual.

Selecting spots in the editor and on stage

There are some specialized spot selection key sequences that allow you to grab spots that are in the editor and "on stage" (their output derives from a playback device).

In the examples below, spots 1, 5, 8, and 20 are present in the editor.

- **[SPOT 5] [→ →] [8]** selects spots 5 and 8. If there are spots within the selected range, whose output originates from A/B or the controllers they are also selected when using this sequence.
- **[SPOT] [→ →]** selects all the spots present in the editor. If there are spots whose output originates from A/B or the controllers they are also selected when using this sequence. The command line displays: *spot from editor & stage →*. This selection tool is useful when universally modifying all the spots contained in a memory. Example: you want to add 10% to all the intensity assignments in memory 1. The keypress sequence is: **[MEM 1] [SPOT] [→ →] [int wheel.]**
- **[SPOT 5] [→ →]** selects spots 5, 8, and 20. If there are spots, from spot 5 and up, whose output originates from A/B or the controllers they are also selected when using this sequence. The command line displays: *spot → & stage →*.
- **[SPOT 1] [→]** selects all the spots (from spot 1 to the last spot) in the system.
- **[SPOT 5] [→ 8]** selects all the spots included in the range.

➢Note

When using the above sequences the spot selections follow the rules of Mix Editing - see below.

Spot display control

The number of spots displayed depends on the system configuration - how many spots and how many parameters each type of spot has.

To go to the next or previous spot display, press **[PAGE UP]** (above **[ALL]**)

Big spots, such as Martin PAL 1200, have more than 2 pages of parameters. The key **[BIG]** toggles between the 2 pages.

Mix Editing of Spots

The 'mix editing of spots' option appears in the System Parameters menu (see Chapter 24 System Configuration). This determines whether spots of different types are included when a range of spots is selected or if only one type of spot in the selected range will be addressed in the editor.

If the mix editing of spots option is active (toggled to Yes) and you select a range of spots, the entire selection is addressable in the editor. If, however, the Mix Editing of spots option is toggled to No, only one type of spot is selected. The type of selected spot is determined by the last selection in the range.

Example: Spots 1→ 4 are Intellabeams, spots 5→ 8 are Martins, and spots 9→ 16 are Goldenscans. If the mix edit option is 'on' and you select spots 1→ 12 all the spots are selected in the editor. If the mix edit option is 'off', however, only the Goldenscans (9 -16) will be selected. If the range selection was 1→ 8, only the Martins will be selected.

Spot Parameters

Each parameter has a name and a number. Once you have selected a spot, a group of spots, or a range of spots, the parameter names appear next to the parameter numbers in the spot display. The controller Soft Keys become parameter selection keys if **[PARAM]** is enabled. The Controller display shows the Soft Keys and their corresponding parameter.

Parameters are assigned values using either the parameter wheel or selecting a parameter and assigning a value on the keypad.

Parameter wheels

The 3 horizontal wheels and the trackball control all parameters. When a spot is selected the current wheel bank and the parameters assigned to that bank are displayed on the wheels' LED displays. Using the wheel, you can assign a value to parameters with no further selection.

After pressing **[RESET]** the parameter wheels default to Bank 1. If **[RESET]** has not been pressed the wheels remain at the last Back selection.

The wheel bank and parameter assignments appear next to the parameter name on the Spot Display. 1, 2, or 3 lines corresponding to wheels 1, 2, and 3 represent the wheel bank.

Wheel bank control keys are:

[WHEEL +] - go to the next bank of parameters.

[WHEEL -] - go to the previous bank of parameters. Access this key with **[SHIFT]**.

Types of parameters

There are 3 types of parameters:

1. **Continuous parameters** are assigned values zr - FL on the numeric keypad or using parameter wheels.
2. **Discrete steps** are usually defined for gobo and color wheel parameters. Each color or gobo is 1 step. A gobo wheel containing 6 gobos will be defined as a discrete parameter with 6 steps.
3. **Mixed step** parameters have continuous control between discrete steps. This type of parameter is often used when 2 parameters share a DMX channel. Example: zr - 50% is dimmer zr - FL and 51% - FL is strobe slow to fast. In this case the parameter is divided into 2 steps.

Selecting parameters and assigning values

Selecting parameters

The **[PARAM]** key controls the Soft Key parameter display. The default is **[PARAM]** enabled (LED on), allowing the Controller Soft Keys to function as parameter keys. When **[PARAM]** is enabled the Soft Keys automatically go to Parameter mode on spot selection. The SK parameter selections are displayed on the controller display.

When this key is disabled (LED off), Soft Key parameter selections are not displayed when spots are selected. Return the display by pressing **[PARAM]**.

Turning on the dimmer

There are a few ways to turn on the dimmer of the selected spots:

- Press **[FULL]**.
- Press **[ON]**.
- Use the dimmer wheel.
- Press **[@]** and assign an intensity level using the numeric keypad.
- Pressing **[ZERO]** forces the dimmer to 0%.

Assigning values to continuous steps

Continuous parameters wheel up from 0 to Full. Continuous parameter values are displayed as a number from zr - FL.

Assigning parameter values using the numeric keypad

Keypresses	Results/Comments
1. Select spots.	The controller SK display shows the parameter selections. If you do not see the parameter display, press **[PARAM]**.
2. Press the SK for the parameter selection.	The parameter name is shown on a red field on the Stage Display and the assigned parameter wheel jumps to the correct wheel bank. The bank number and parameter name are displayed in the LED wheel window.
3. Enter the parameter value on the keypad.	Examples of value assignments: 5 (is 50%), 7.5 (is 75%). If the system is set to USA system (see Chapter 24 System Configuration) enter a 2-digit number. Examples: 50 (for 50%) 75 (for 75%).

Assigning a value using the wheel

Example: assign 65% to a continuous parameter

Keypresses	Results/Comments
1. Select spots.	The controller SK display shows the parameter selections. If you do not see the parameter display, press **[PARAM]**.
2. If necessary press **[WHEEL +]** or **[WHEEL -]** until the parameter is displayed in the LED window.	
3. Turn the parameter wheel until the value reaches *65*.	The parameter name is shown on a red field on the Stage Display

Assigning values to discrete steps

Discrete parameters are composed of steps, which increment by one step at a time.

Example: Gobo wheels are usually discrete step parameters, enabling easy selection of each gobo. Martin PAL's static gobo wheel is defined as an 11 step discrete parameter. When using the parameter wheel to assign the gobo, the gobo wheel moves from gobo to gobo, with no stops in between.

Discrete parameters are displayed as a single digit preceded by an icon. Thus step 1 is displayed like this:  . Step 11, like this:  .

Discrete parameter values may be assigned using the wheel, the SKs, the numeric keypad, and **[STEP UP]** or **[STEP DN]**.

Assign a discrete step using the Step keys

Example: You have selected Martin PAL's gobo wheel (param 6). You want to assign step 2.

Keypresses	**Results/Comments**
1. Select spots.	The controller SK display shows the parameter selections. If you do not see the parameter display, press **[PARAM]**.
2. Press the SK for parameter selection.	
3. Press **[STEP UP]** or **[STEP DN]**	Each press on these keys either increments or decrements the current value by 1 step.

Assigning a value to a discrete step using the numeric keypad

Example: You have selected Martin PAL's gobo wheel (param 6). You want to assign step 2.

Keypresses	**Results/Comments**
1. Select spots.	The controller SK display shows the parameter selections. If you do not see the parameter display, press **[PARAM]**.
2. Press the SK for parameter selection.	
3. Press **[2]** on the numeric keypad.	Enter a double digit if there are more than 9 steps. Example: for step 1 press 01.

Assigning a value to a discrete step using the Soft Keys

Example: You have selected Martin PAL's gobo wheel (param 6). You want to assign step 2.

Keypresses	Results/Comments
1. Select spots.	The controller SK display shows the parameter selections. If you do not see the parameter display, press **[PARAM]**.
2. Press the SK for parameter selection.	
3. Press and hold **{SHIFT]**	The SK display shows the corresponding steps.
4. Press SK 2	

Assigning values for mixed steps

Mixed steps parameters are divided into discrete steps with continuous control between the steps.

Example: GoldenScan's dimmer control channel controls both the dimmer and the shutter (strobe). Spark controls this as 2 mixed steps; step 1 and step 2 controls the strobe. The continuous control within step 1 controls the dimmer and the continuous control within step 2 controls the strobe rate.

Mixed steps are displayed in #.# format; step 1 at 60% is 1.6, step 2 at full is 2.f. The number after the decimal point represents the percentage of the step; each step has a range from 0 to full.

The **[STEP UP]** and **[STEP DOWN]** keys move from step to step. Within each step there is continuous control via the parameter wheel.

Assigning a mixed step value using the numeric keypad

Example: assign step 2 at full to Golden Scan's color wheel parameter (p2).

Keypresses	Results/Comments
1. Select spots.	The controller SK display shows the parameter selections. If you do not see the parameter display, press **[PARAM]**.
2. Press the SK for the parameter selection.	
3. Press **[2** to assign step 2 to the parameter.	
4. Press **[•] [FULL]**	The parameter value for p2 shows 2.f.

Assigning a mixed step value using the wheels

Example: assign step 2 at 30% to Golden Scan's color wheel parameter (p2).

Keypresses	Results/Comments
1. Select spots.	The controller SK display shows the parameter selections. If you do not see the parameter display, press **[PARAM]**.
2. Press the SK for the parameter selection.	
3. Press **[STEP UP]** or **[STEP DOWN]** to reach step 2	
4. Wheel until reaching 2.3.	The parameter value for p2 shows 2.3.

Or

Keypresses	Results/Comments
1. Select spots.	The controller SK display shows the parameter selections. If you do not see the parameter display, press **[PARAM]**.
2. Press the SK for parameter selection.	
3. Press and hold **{SHIFT]**	The SK display shows the corresponding steps.
4. Press SK 2	
5. Move the wheel until reaching 2.3.	The parameter value for p2 shows 2.3.

Returning to home values

Home values for parameters are included in the spot definition. Home values are usually neutral assignments, such as no color, no gobo, shutter/iris open, dimmer on, etc.

Home values are defined in the Device Definition in the Mix Output menu.

There are 3 keys used to "home" parameter values: **[HOME]**, **[CL1],** and **[CL2]**.

Assigning home values

Use **[HOME]** to home all of the parameters. SK 20 is used as the **[HOME]** key. *Home* is displayed on the controller display when the SKs are in Parameter mode.

Keypresses	Results/Comments
1. Select spots.	
2. Press controller 20's SK.	All parameters are assigned home values, as preset in the device definition.

Clearing parameter values

[CL1] and **[CL2]** also reference the home values, assigning the preset value to the parameters included in the clear functions. The default for CL1 usually includes all of the color parameters and for CL2 usually includes all of the gobo parameters.

Parameters may be included or excluded from the clears In the Mix Output menu/Define Device. (See Chapter 26)

Keypresses	Results/Comments
1. Select spots.	
2. Press **[CL 1]** or **[CL 2]** Access using **[SHIFT].**	Returns the parameters defined under **CL1** and/or **CL2** to their home values.

Copying parameter values

[COPY] permits copying parameter values from one spot to one or more spots.

All parameters or selected parameters may be copied from one spot to another. This function is extremely useful when creating libraries especially with devices using color mixing. Set the color for one of the spots and copy the parameter values to the others.

Parameters may be copied from the editor, memories, or libraries.

Copying from the editor

Example: Copy parameter values from spot 1 to spot 5.

Keypresses	Results/Comments
1. Press **[SPOT][[5]**	Select the spot number to which you will be copying the parameters.
2. Select parameters (optional)	If you do not select specific parameters the values of all the parameters are copied.
3. Press **[COPY]**	Select the copy function. *Copy from* appears in the command line.
4. Press **[1]**	You are copying from spot 1.
5. Press **[ENTER]**	Executes the copy function. You can now continue editing.

Copying from a spot in a memory

Keypresses	Results/Comments
1. Select spots.	Select the spot number to which you will be copying the parameters.
2. select parameters (optional)	If you do not select specific parameters the values of all the parameters are copied.
3. Press **[COPY]**	Select the copy function. *Copy from* appears in the command line.
4. Select the memory.	
5. Select the spot you are copying from.	
6. Press **[ENTER]**	Executes the copy function. You can now continue editing.

You can also copy from Libraries. See Chapter 9.

Releasing Spots/Parameters

Releasing a spot from the editor

While editing spots for memory programming, you might want to release a spot or a parameter of a spot from the editor so it will not be included in the memory.

Keypresses	Results/Comments
1. Select the spot number.	A group or a range of spots can be selected.
2. Press **[RELEASE]**	The spot is released and its parameter values revert to tracking or the values output from a playback device.

Releasing a parameter from the editor

Note that if you release a parameter from the editor and then continue to record a memory, the released parameter is included in the memory if the dimmer of the spot is on and the *Store tracking if dimmer On* function is active. The *Store tracking if dimmer On* is disabled in the System Parameters menu.

Keypresses	Results/Comments
1. Select spots	
2. Press the SK parameter key to select parameters.	
3. Press **[RELEASE]**	The parameter values revert to tracking or the values output from a playback device.

Parameter mode assignments for Cyberlight and Intellabeam

Certain parameters of Intellabeam and Cyberlight have multiple operation modes (such as a color wheel which can have a half color, rotation, etc.). Modes are represented by an additional icon displayed after the parameter value. Access to the parameter modes is through the SKs after parameter selection.

These parameters are:

- Static gobo (p6) - Cyberlight and Intellabeam.
- Shutter (p 8) - Cyberlight and Intellabeam.
- Rotating gobo (p13) - Cyberlight only.
- Color wheel (p 14 for Cyberlight; p2 for Intellabeam)

When you select one of these special parameters the operation modes are displayed on the controller display in Param mode. Press the SK corresponding to the operation mode that you want and continue as usual.

➢Note

To access the steps for parameters with special modes press and hold **[SHIFT]**.

The operating modes for the static gobo (p6) are:

ICON/FUNCTION MODE
»; fast crossfade (jump in crossfade)
≈; proportional crossfade (fade in crossfade).
← ; direction of gobo wheel rotation
→ ; direction of gobo wheel rotation
(=); gobo shake fast. Cyberlight only.
(-); gobo shake slow. Cyberlight only.

The operating modes for the shutter (p8) are:

ICON/FUNCTION MODE
→ ; strobe speed
<> ; indicates shutter open
◂ ▸; indicates shutter closed

The operating modes for the rotating gobo (p 13 Cyberlight only) are:

ICON/FUNCTION MODE
»; fast crossfade (jump in crossfade)
≈; proportional crossfade (fade in crossfade).
← ; direction of gobo wheel spin
→ ; direction of gobo wheel spin
∝ ; set the angle of the gobo in the gobo holder

The operating modes for the color wheel (p2 Intellabeam; p14 Cyberlight) are:

ICON/FUNCTION MODE
>> full color with fast crossfade
~ full color with proportional crossfade
← ; direction of color wheel spin
→ ; direction of color wheel spin
half color with fast crossfade
half color with proportional crossfade

CHAPTER 7
PROGRAMMING MEMORIES

This chapter includes:

Programming Memories

Memories are programmed by assigning a number to the editor group of channels and spots and storing the lighting state.
Fade, wait, and delay times can be assigned to each memory. Other memory attributes are Loops, Links, and Parts.

Select spots and channels and assign intensity/parameter values in the editor. Store the resulting lighting state as a memory. Programming using the editor can be done in live or blind mode. (Refer to Chapter 4 and Chapter 5 for information about channel, scroller, and spot selections and values assignments.)

The keys **[=]**, **[STORE**], **[+STORE]**, **[MEMORY]** and are used for programming memories.

[=] After creating a lighting start, pressing [=] signals the console that you are ready to record the ediotr group is a memory. After **[=]** is pressed the console waits for a memory number. Memory is displayed in the command line. **[MEMORY]** is used instead of **[=]** when the system is confiugred as USA System (see Chapter 22 – System Configuration /Service Tools/Config Sys).

[STORE] After assigning a memory number to the editor group press **[STORE]** to save the memory. All channels and spots remain in the editor, displayed in white. You can continue editing the lighting state to form the next memory.

[+STORE] This key can be used instead of **[STORE]**. Do not enter a memory number. This key increments the last stored memory number by the increment as defined in the System Paraemters menu (see Chapter 22 System Configuration). Example: If the default increment is 1 and the last recorded memory is 20, the memory recorded by pressing **[+STORE]** is 21. If the defautl increment is 5 and the last recorded memory is 20, the memory recorded by pressing **[+STORE]** is 25.

The key sequence **[=] [+] [STORE]** enters the next memory number; the last stored memory plus 1.

After storing a memory the participating spots and channels remain in the editor until **[RESET]** is pressed. You can continue programming memories using the channels and spotgs in the editor or you can reset the editor and start with a clean slate.

Groups or memories assigned to controllers, or the A/B crossfader can be used as building blocks to construct a lighting state. In this case, the lighting state is entered into the editor using the Call function. The group in the editor is then assigned a memory number and stored. (See Chapters 12 to find out how to assign groups and memories to Controllers.)

Memories can contain both spots and channels. For simplicity's sake, programming memories with spots, memories with channels, and memories with scrollers are discussed separately.

When you store a memory Spark 4D generates a confirmation message. If the memory number that you assigned to the lighting state is already used, the message *Memory Exists* is displayed.

Displays

When you store a memory Spark 4D generates a confirmation message: *Memory # Stored*.

If the memory number that you assigned to the lighting state is already used, the message *Memory Exists* is displayed.

The last memory stored is displayed at the right of the command line preceded by *L*.

The last memory is temporarily replaced when a memory converted to an editor group. Ins tead of *L #, E#* is displayed.

Programming with Channels

Example: select channel 1, assign 45% intensity, and record as memory 1.

	Keypresses	**Results/Comments**
1.	Press [**CHANNEL**] **[1]**	*channel 1* appears in the command line.
2.	Press **[@]**	If you use the {dimmer} wheel skip this step and step 3.
3.	Press **[4] [•] [5]**	Entering 4 on the keypad results in an intensity assignment of 40%. Use the · (dot) to enter intensity less than a round 10. Example: 4.5 is an intensity of 45%. If system is configured for USA enter the intensity number without the decimal point (e.g. enter 45).
4.	Press **[=]**	*Memory* appears in the command line. If the system configuration is for USA you can press **[MEMORY]** instead of **[=]**.
5.	Press **[1]**	Select the memory number.
6.	Press **[STORE]**	The message *Memory 1 Stored* is displayed. The channels are retained in the editor, but are no longer selected. They are displayed in white.
7.	Continue editing or press **[RESET]**	

If you attempt to record to a memory number that is already in use, the message *Memory Exists* is displayed.

If you do not want to overwrite the existing memory:

1. Enter a different number.
2. Press **[STORE]**.

To overwrite the existing memory:

1. Press **[STORE]** again.

Programming with Scrollers

The example below uses the numeric keypad to assign the frame number. You can, however, address the scroller using the Frame wheel (wheel 2). Using the wheel obviates pressing **[FRAME]**.

Example: Select scroller channel 10, set the dimmer level to 100%, set the scroller frame at 2, and record as memory 2.

Keypresses	Results/Comments
1. Select channel 10	
2. Press **[FULL]**	Channel 10's dimmer is at 100%.
3. Press **[FRAME]**	If you elect to assign the frame value using the wheel, skip steps 3 and 4.
4. Enter **02** on the numeric keypad.	Enter the frame number as 2 digits.
5. Press **[=]**	*Memory* appears in the command line. If the system configuration is for USA you can press **[MEMORY]** instead of **[=]**.
6. Enter **2** on the numeric keypad	
7. Press **[STORE]**	The message *Memory 2 Stored!* is displayed. The editor is not cleared.

Programming with Spots

To program a memory using spots, you must select the spots and assign a values to the parameters. Selected parameters are recognized by the parameter name displayed in white on a dark red field. The values of selected parameters are change using the appropriate parameter wheel or other value assignment keys. Parameters that are active in the editor (but not selected) are signaled by the parameter name appearing in black on a light red field.

Example: Memory 3 consists of spot 1. The parameter values will be assigned as follows: x 45, y 68, dim 55%, P1 iris Fully open, P6 gobo 5

Keypresses	**Results/Comments**
1. Select Spot 1.	
2. Move the int (dimmer) wheel until 55 is reached.	Spot 1 is displayed in red.
3. 	Use the trackball to position the pan and tilt.
4. Press the SK for **ir** (the Iris parameter is usually SK 1) and assign a parameter value on the numeric keypad.	The iris parmeter is displayed on a dark red field.
5. Press the SK for the gobo parameter.	The gobo parmeter is displayed on a dark red field.
6. Assign a parameter value using the numeric keypad, the **[STEP UP]** or **[STEP DOWN]** keys, or use the parameter wheel.	
7. Press **[=]**	The word *Memory* appears in the command line. If the system configuration is for USA you can press **[MEMORY]** instead of **[=]**.
8. Enter **3** on the numeric keypad.	All of the parameter names are displayed on a light red background.
9. Press **[STORE]**	*Memory 3 Stored* is displayed. The editor is not cleared. The spots remain in the editor but are not selected. To continue programming memories, select spots.

The example above assumes that the dimmer and iris parameters are continuous parameters and the gobo paraemter is a discrete step parameter. The parameters of the spot that you have chosen to work with might be defined differently. See Chapter 6 – Selecting and Editing Spots for instructions on assigning parameter values to the different types of parameters.

➢Note

If a spot is not responding properly, make sure that the velocity parameter (if there is a velocity/movement parameter present) is set at more than zero and the shutter or iris, if present, is open.

Storing spot parameters from tracking

The *Store Tracking If Dimmer On* switch in the System Parameters menu controls whether all the spot parameters are stored in a memory or only the selected parameters are stored. (See Chapter 22 System Configuration)

When this option is enabled, all parameters are included when storing a memory if the dimmer of the selected spot is assigned an intensity above 0%. This ensures that any parameters you do not directly address will be recorded into the memory instead of remaining in tracking only and causing confusion later on. When disabled, only the selected parameters are stored in the memory. This is useful if, for instance, you want to store color parameters only when programming color chases.

➢Tip

Use Teach Macro to make a macro that enables or disables this function, so you have it handy on the console. (See Chapter 21 – Macros)

Using the Copy Function

The Copy function allows you to copy channel intensity assignments, scroller frame assignments, and spot parameters from values in the editor and from values stored in memories. Spot parameter values can also be copied form libraries (see Chapter 14 – Libraries).

Do not copy parameters values from one type of spot to another type of spot.

Copying channel intensities from the editor

Example: Copy the intensity value assigned to channel 5 to channels 20 – 25. The example below assumes that channel 5 has an intensity in the editor.

Keypresses	Results/Comments
1. Select channels 20 → 25.	These are the target channels.
2. Press **[COPY]**	*Copy from* appears in the command line.
3. Select channel 5.	Select the channel being copied from.
4. Press **[ENTER]**	Channel 5's intensity assignment is copied to channels 20 – 25

Copying channel intensities from a memory

Example: Copy the intensity value assigned to channel 5 in memory 3 to channels 20 – 25.

Keypresses	Results/Comments
1. Select channels 20 – 25.	Select the target channels.
2. Press **[COPY]**	*Copy from* appears in the command line.
3. Select memory 3.	
4. Select channel 5.	Select the channel being copied from.
5. Press **[ENTER]**	The intensity assignment is copied to selected channels.

Copying scroller frames from the editor

Example: Copy the frame assigned to scroller channel 5 to scroller channels 20 – 25. The example below assumes that channel 5 is assigned a frame value in the editor.

Keypresses	**Results/Comments**
1. Select channels 20 → 25.	Select the target channels.
2. Press **[FRAME]**	
3. Press **[COPY]**	*Copy from* appears in the command line.
4. Select channel 5.	Select the channel being copied from.
5. Press **[ENTER]**	The channel 10's intensity assignment is copied to channels 20 – 25

Copying scroller frames from a memory

Example: Copy the frame assignment to scroller channel 5 in memory 3 to scroller channels 20 – 25.

Keypresses	**Results/Comments**
1. Select channels 20 – 25.	Select the target channels.
2. Press **[FRAME]**	
3. Press **[COPY]**	*Copy from* appears in the command line.
4. Select memory 3	
5. Select channel 5.	Select the channel being copied from.
6. Press **[ENTER]**	The channel 5's intensity assignment is copied to channels 20 - 25

Copying all spot parameters from the editor

Example: Copy all the parameter values from spot 10 to spot 4.

Keypresses	**Results/Comments**
1. Select spot 4.	
2. Press **[COPY]**	*Copy from* appears in the command line.
3. Press 10 on the numeric keypad to select spot 10.	
4. Press **[ENTER]**	The editor values are copied from spot 10 to spot 4.

Copying selected spot parameters from the editor

Example: Copy the gobo parameter values assigned to spot 10 in the editor 1 to spot 4.

Keypresses	Results/Comments
1. Select spot 4.	
2. Press the SK for gobo.	To copy more than 1 parameter, press as many parameter selections as necessary.
3. Press **[COPY]**	*Copy from* appears in the command line.
4. Press 10 on the numeric keypad to select spot 10.	
5. Press **[ENTER]**	The editor values are copied from the selected parameter/s in spot 10 to spot 4.

Copying spot parameters from a memory

Example: Copy all the parameter values from spot 10 in memory 1 to spot 4.

Keypresses	Results/Comments
1. Select spot 4.	
2. Press **[COPY]**	*Copy from* appears in the command line.
3. Select memory 1	Select the memory containing the spot from which you want to copy.
4. Press 10 on the numeric keypad to select spot 10.	
5. Press **[ENTER]**	The values are copied from spot 10 in the selected memory to spot 4.

Copying selected parameters from a memory

Example: Copy the gobo parameter from spot 10 in memory 1 to spot 4.

Keypresses	Results/Comments
1. Select spot 4	
2. Press the SK for gobo.	The selected parameter is displayed in red.
3. Press **[COPY]**	*Copy from* is written in the command line.
4. Select memory 1	
5. Press 10 on the numeric keypad to select spot 10.	
6. Press **[ENTER]**	The selected parameter values are copied from spot 10 in the selected memory to spot 4.

Sequential Memory Programming

Storing a memory does not, as you have seen, automatically clear the editor. This permits building memories sequentially, using the channels and spots left in the editor to program the next memory..

Example: Program a memory with channel 1. After storing the memory channel 1 is retained in the editor. Now program the next memory by adding a few channels to the current editor.

Keypresses	**Results/Comments**
1. Select channel 1 and assign intensity.	
2. Press **[=] [1] [STORE]** to store the memory.	Channel 1 remains in the editor.
3. Select channels 8 → 10.	
4. Assign intensity values.	When the wheel is moved the selected channels are displayed in red.
5. Press **[+1STORE]** Or Press **[=] [2] [STORE]**	

➢**Note**
The channels and spots that are selected in the editor (displayed in red) remain selected after storing a memory using **[+1STORE]**.

Programming a Blackout Cue

Blackout cues are created by recording a memory when the editor is empty. This can be done in live or blind mode.

In the Memory List in the text column, blackout cues are automatically given the texzt 'Blackout'.

When you examine blackout memories the message *This Memory is a Blackout'* is displayed.

Example: Record memory 8.5 as a blackout.

Keypresses	**Results/Comments**
1. Press **[RESET]**	All spots and channels are cleared from the editor and the editor is in idle mode.
2. Press **[=] [8] [•] [5]**	
3. Press **[STORE]**	

Using the Call Function

The Call function allows you to merge all or part of the console's output in the editor and store it as a memory. Merged output becomes an editor group. This editor group can be further modified or instantly recorded as a new memory.

Some ways to use the Call function are:

- When your lighting state consists of an assignment on a crossfader and some spots and channels in the editor, you can merge the output from the crossfader and the editor and store as a memory.
- Use memory or group assignments on the faders and controllers as building blocks to create lighting state, merge the output from the different playback devices and store as a memory.
- Merge the output from selected playback devices only and store as a memory.
- Merge the entire output or selected output and continue by modifying the editor group thus formed.
- Merge DMX input

After storing the editor group resulting from pressing **[CALL]**, the participating channels and spots may be either released from the editor or retained in the editor. Basically, the editor retains control of channels and spots that will cause a change in the current lighting state if they are released. this occurs when the channel or spot is active in the editor only or if it has been called to the editor from a playback device and modified. Spots and channels that have been called into the editor from a playback device (A/B and controllers) and have not been modified are released from the editor after **[STORE]** is pressed because this does not cause a change in the lighting state.

If you want to remain in the current lighting state, after storing the merged output created through Call, assign the new memory to the crossfader and press **[RESET]**. If you want to revert to the lighting state previous to storing the merged output just press **[RESET]**.

This discussion presumes that a memory or group is assigned to crossfader. See Chapter 11 for assigning memories and groups to crossfaders.

Using Call to store the current lighting state

Assume that the console's output is a memory active on A. After making some modifications the lighting state you decide to give the resulting stage picture a different name.

Keypresses	Results/Comments
1. Assign a memory to A and move the both crossfader handles to the top end stop.	
2. Press **[CALL]**	*Call* appears in the command line.
3. Select channels/spots in the memory on A. Modify values. Select new channels/spots and assign values.	
4. Select a memory number on the numeric keypad.	Once a memory number is entered, the entire board output is merged in the editor. *Memory* appears in the command line and the console is waiting for a memory number.
5. Press **[STORE]**	The new memory is stored. The editor is not released in order to retain the stage picture.

➢Tip

If appropriate, you can use press **[+] [STORE]** (store to the next number) or **[+STORE]** (store according to the +Store increment in the System Parameters menu) instead of steps 3 and 4.

Using Call and controller assignments

You can use Controller assignments as building blocks to create a lighting state and record the lighting state as a memory. (See Chapter 12 for information about assigning memories and groups to Controllers).

Example: A three-color cyclorama wash is assigned to Controllers 1 - 3. By combining the 3 colors at different levels, you create the desired color. You now want to record this as memory 5. There is no other output from any other playback device or from the editor.

Keypresses	Results/Comments
1. Create a lighting state using the controller assignments.	
2. Press **[CALL]**	*Call* appears in the command line.
3. Press **5** on the keypad.	*Memory* appears in the command line.
4. Press **[STORE]**	The message: *Mem 3 Stored* is displayed. The editor is released.

➢Note

Editor values are never overriden by values entering the editor via call. Example: Channel 1 is active on a controller at 80%. It is also in the editor at 35%. When channel 1 enters the editor as a result of using Call, the value from the controller is ignored and the editor value (35%) remains active. This is also true when the channels or spots are called from A/B.

Merging selected output sources

Pressing the key associated with a specific output source calls the assignment to the editor. More than one selection may be pressed in sequence. After collecting all the output, store the result using the usual memory recording procedure.

Use this function when you only want to Call some of the active playback devices.

Example: A three-color cyclorama wash is assigned to controllers 1 – 3. By combining the 3 colors at different levels, you create the desired color. . There are also active assignments on A, and controllers 11 - 15. You want to record only the cyclorama wash, output from controllers 1, 2, and 3, as memory 5.

Keypresses	Results/Comments
1. Press **[CALL**	
2. Press the SK for controller 1	The output from controller 1 is turned into an editor group.
3. Press the SK for controller 2.	The output from controller 2 joins the editor group.
4. Press the SK for controller 3.	The output from controller 3 joins the editor group.
5. Press **[=] [5]** or **[MEMORY] [5]**	
6. Press **[STORE]**	The merged output from controllers 1, 2, and 3 are stored as memory 5. The editor is retained.

Editing after Call

All of the output merged in the editor is available for further editing. The editor is not released after storing the memory.

Keypresses	Results/Comments
1. Press **[CALL]**	
2. Press **[ENTER]**	All active output is merged as an editor group.
3. Select and modify chans/spots.	
4. Press **[=] [#]**or **[MEMORY] [#]**	Set the system to memory record mode and select a number.
5. Press **[STORE]**	The editor is not released.

Calling A/B

When the A/B is split (A is off its end stop and so is B) using Call brings the the sum of the crossfader to the editor.

Example: Crossfader A is at 50% and the output of A is channels 1 → 5 at 35%. Crossfader B is at 60% and the output of B is channels 33 → 40 at 25%.

Keypresses	**Results/Comments**
1. Press **[CALL]**	
2. Press **[A]**	The sum of the output of crossfaders A and B becomes a group in the editor. Therefore, the editor now contains channels 1 → 5 at 35% and channels 33 → 40 at 25%.

Merging the output from both editors

Channels and spots in the inactive editor are not included when **[CALL]** is pressed. To include the contents of the inactive editor, you must select the inactive editor.

Example: Editor 1 is active. Store a memory containing the spots and channels in Editor 1 and Editor 2.

Keypresses	**Results/Comments**
1. Press **[CALL]**	The channels and spots in Editor 1 are displayed in white. Editor 2 is displayed in the background in red.
2. Press **[EDITOR]**	The contents of Editor 1 is also displayed on a white field.
3. Enter a memory number on the keypad.	
4. Press **[STORE]**	

➢Tip

If you use this method of programming often make a Macro: **[CALL] [EDITOR]**.

Call and the General Master

There is an additional Call function using the General Master level. The discussion below assumes that the maximum G.M. level is set to 100%, if the maximum G.M. level is set to 200% the same rules still apply.

When the General Master is less than 100% and you press **[CALL]**, the console output enters the editor forced to the General Master level. You can store the result as a memory.

This function can be used only when merging the entire output. It cannot be used when merging the output from selected playback devices.

Programming a new memory using the G.M. level

Example: Mem 1 contains channels 1 thru 7 @ Full. Channel 9 is assigned to controller 5. Mem 1 is on A, at its upper end stop, and active on stage. Controller 5 is at 50%; therefore the output on channel 9 is 50%. Move the General Master to 50%. The G.M. display is now red and shows 50%.

Keypresses	Results/Comments
1. Press **[CALL]**	
2. Press **[→]**	The G.M. is forced to 100%; the G.M. level is displayed in red and flashes. The console is waiting for a memory number.
3. Enter a memory number and press **[STORE]**	Referring to the above example, the memory will be channels 1 thru 7 @ 50 and channel 9 @ 25. The G.M. returns to its true level and is no longer forced to 100%. If there were any channels/spots in the editor, they are not released so as not to cause a sudden change in the stage picture.

➢Note

When you are storing to a new memory number or a memory that is not active on board, the editor clears, and the forcing 100% of the G.M. is canceled, i.e. the G.M. is at 50%.

Storing to the currently active memory

Example: Memory 1 is active on A. You want to modify memory 1 by adding all the other active asignments and reducing the intensity levels by 20%.

Keypresses	Results/Comments
1. Set G.M. level to 80%.	
2. Press **[CALL]**	Enables the call function.
3. Press **[→]**	The G.M. is forced to 100%; the G.M. display is displayed in red and flashes.
4. Enter the 1 on the keypad.	
5. Press **[STORE]**	The message *Memory 1 on Board* is dsplayed.
6. Press **[STORE]**	The message *Memory 1 Stored* is displayed. The G.M continues flashing.

➢Note

When you are storing to the active memory and the fader handle is not at its full limit, the G.M. remains at forced 100% and the editor is not cleared. To avoid a jump in the light return the fader its Full end stop, return the G.M. to 100%, and clear the editor.

Examining Memories, Channels, & Spots

[PAGE UP] and **[PAGE DN]** page the channels in the Exam.

[PAGE UP] (for spots) pages the spots in the Exam.

Use **[+]** and **[—]** to view the next or previous memory, channel, or spot.

Press **[STAGE]** to exit Exam displays and return to the current display format.

Examining memories

There are two memory Exams available: the Memory List and selected memories.

The Memory List is a sequential list of memories in the current default QList.

Examining selected memories shows the channels/spots in the memory. Part, loop, and time assignments.

Viewing the memory list

The Memory List shows Loop, Link, and time assignments. The text column displays any text labels for the memory, Part Qs, and Event assignments. The character before each memory shows the generic contents of the memory:

C The memory contains conventional channels (including scrollers) only.
S The memory contains spots (moving devices) only.
***** The memory contains spots and conventional channels.

Keypresses	**Results/Comments**
1. Press **[MEMORY]**	
2. Press **[EXAM]**	The Memory List is displayed starting from the first memory.
3. Press **[PAGE DN]** to page through the memory list.	

You can exam the Memory List beginning from any memory. Example: View the Memory List starting from memory 55.

Keypresses	**Results/Comments**
1. Press **[MEMORY]** and enter 55 on the keypad.	
2. Press **[→]**	
3. Press **[EXAM]**	The Memory List is displayed starting from memroy 55.
4. Press **[PAGE UP]** or **[PAGE DN]** to page through the memory list.	

Examining a selected memory

Keypresses	Results/Comments
1. Press **[MEMORY]**	
2. Select the memory you want to examine	
3. Press **[EXAM]**	The display includes spots and parameter values, channels with intensity and scrollers, fade times, part assignments, text, and QList.
4. Press **[+]** or **[-]** to view the next or previous memory.	The intensity levels are color coded to show the change from the previously examined memory. The color code is displayed at the bottom of the Exam screen: yellow – intensity increased brown - intensity decreased orange – no change

Examining channels

There are 4 different channel displays:

- Free channels - Channels not used in any memories
- Assigned channels - Channels used in memories
- Selected channels – A list of the channel assignment in memories and its intensity, and scroller levels.
- Track sheet - Tracks all the channels through all the memories.

Viewing free assigned channels

Keypresses	Results/Comments
1. Press **[CHANNEL]**	
2. Press **[EXAM]**	A list of channels that are not used in any memory is displayed.
3. Press **[EXAM]**again	A list of channels used in the memories is displayed.

Viewing a selected channel

Keypresses	Results/Comments
1. Press **[CHANNEL]**	
2. Enter the channel number on the numeric keypad.	
3. Press **[EXAM]**	A list of the memories where the channel appears and its the intensity and scroller frames (if present) is displayed.
4. Press **[+]** or **[-]** to view the next or previous channel.	

Viewing the tracksheet

Use **[PAGE UP]** and **[PAGE DN]** and the arrow keys to move around this display.

Keypresses	Results/Comments
1. Press **[CHANNEL]**	
2. Press **[MEMORY]**	
3. Press **[EXAM]**	The track sheet is displayed starting from the first assigned channel and the first memory.

You can also view the track sheet beginning from a selected channel.

Keypresses	Results/Comments
1. Press **[CHANNEL]** and enter a number on the keypad.	
2. Press **[MEMORY]**	
3. Press **[EXAM]**	The track sheet is displayed starting from the selected channel.

Other sequences are:

[CHANNEL] [#] [→] [MEMORY] [EXAM]

[CHANNEL] [#] [→] [#] [MEMORY] [EXAM]

[CHANNEL] [MEMORY] [#] [EXAM]

Examining spots

There are 2 spot exams:

- Free spots - is a list of spots not used in any memories
- Selected spot - – A list of the spot assignment in memories and parameter values.

Viewing free spots

Keypresses	Results/Comments
1. Press **[SPOT]**	
2. Press **[EXAM]**	A list of spots that have not been used in any memory is displayed.

Viewing selected spots

Keypresses	Results/Comments
1. Press **[SPOT]**	
2. Enter the spot number.	
3. Press **[EXAM]**	Memories containing the spot and its parameter values are displayed.

➢Note

If library assignments are present, the library number is displayed. If you want to view the absolute parameter values of library assignments in the memory, press **[EXAM]** twice.

Text for Memories

You can attach text label to memories, thus creating a 'cue sheet'. This text can be a short cue line, a page number, a score reference number, etc. You can enter approximately 40 characters.

Example: You want to add a text label to Memory 25.

Keypresses	Results/Comments
1. Select memory 25.	
2. Press **[TEXT]**	*Text* appears in the command line.
3. Type *'house lights up. interval'*	All typing is done on the alphanumeric keyboard.
4. Press **[STORE]**	The text is displayed in the last column in the Memory List.

Programming in Blind Mode

In addition to the 2 live editors, Spark 4D contains a blind editor.

When switching to Blind mode the channels and spots present in the live editor are captured and displayed in blind mode.

If the channels and spots captured from the live editor are not required in the blind editor press **[RESET]**, while in blind mode, to release them from the blind editor. This does not affect the live stage output, as it only clears the blind editor and not the live editor.

During blind editing, any modification done to the channels and spots that were transferred from the live editor does not affect the same channels and spots that are still present in the live editor

Example: program memory 7 in blind mode with channels 2 - 8.

Keypresses	**Results/Comments**
1. Press **[BLIND]**	*BLIND*, on a red field, is displayed in the top center of the screen.
2. Select channels 2 → 8.	
3. Assign intensity values	
4. Press **[=[7]**	
5. Press **[STORE]**	
6. Press **[BLIND]**	Exit blind mode. The stage output reappears in the display. The blind editor is not cleared.

Resetting the blind editor

Exiting Blind mode does not clear the Blind Editor. All channels and spots active in Blind mode are retained in the Blind editor until the blind editor is reset.

Keypresses	**Results/Comments**
1. Before exiting Blind mode, press **[RESET]**	The channels and spots present in the blind editor are released.

➢Note

When copying spot parameters from the editor in Blind mode, they are copied from the Blind editor.

Fade Times

Time-in, time-out, delay, wait-in, and wait-out times may be assigned to memories.

All fade times are counted from the Go command on the A/B crossfader.

If no time assignments are recorded, the editor automatically assigns the Memory Default Time, as defined in the System Parameters menu.

If no time-out assignment is made the memory fading out will automatically adopt, as fade out time, the fade in time of the incoming memory.

Example: if memory 4 has a 6 count time-in assignment and memory 3 has no time-out assignment; memory 3 will fade out in 6 counts when crossfading from memory 3 to memory 4.

Press **[0]** or **[•]** for a CUT (bump) fade time.

Use **[•]** to enter fractional times like 1.5 seconds, 0.5 seconds, etc.

The keys used to assign fade times are:

[TIME] and **[WAIT]**

PRESS	TIME ASSIGNMENT
[TIME]	**Time – in** When a go command is received, all the channels/spots fading to a higher intensity begin their fade. The fade takes place in the assigned time.
[TIME] [TIME]	**Time – out** When a go command is received, all the channels/spots fading to a lower intensity begin their fade. The fade takes place in the assigned time.
[WAIT]	**Delay** Delay applies to the entire crossfade. The same effect can be achieved by assigning both a wait-in and wait-out time.
[WAIT] [WAIT]	**Wait – in** When a go command is received, all the channels/spots fading to a higher intensity begin to count the assigned wait time before beginning their fade.
[WAIT] [WAIT] [WAIT]	**Wait – out** When a go command is received, all the channels/spots fading to a lower intensity begin to count the assigned wait time before beginning their fade.

Assigning fade times while programming memories

Example: Store memory 7 with fade times.

Keypresses	Results/Comments
1. Create a stage picture	
2. Press **[=] [7]**	
3. Press **[TIME] [6]**	The message *Memory 7 Stored* is displayed and *time-i* is displayed in the command line. The incoming spots/channels in memory 7 will fade up in 6 seconds.
4. Press [**TIME] [8]**	*time-o* is displayed in the command line. The spots/channels fading to a lesser intensity, when crossfading between memory 6 and memory 37 take 8 seconds to complete their fade.
5. Press **[WAIT] [WAIT] [2]**	*wait-in* is displayed in the command line. The incoming spots/channels in memory 7 will wait 2 seconds before beginning their fade.
6. Press **[WAIT] [2]**	*wait-o* is displayed in the command line. The spots/channels fading to a lesser intensity, when crossfading between memory 6 and memory 7, will wait 2 seconds to beginning their fade.
7. Press **[STORE]**	The message *Memory 7 Stored* is displayed.

You can assign a Delay time instead of steps 5 and 6

➢**Tip**
If you have neglected to enter the fade time assignments before pressing [STORE]:

1. Press **[TIME]** or **[WAIT]**. The command line displays the last recorded memory number. Enter the desired fade time.
2. Press **[STORE]** and record the memory with its time assignments.

Assigning fade times to a range of memories

Identical fade times can be assigned to a range or a group of memories

Example: Assign a 10 second time-in to memories 1 → 6.

Keypresses	Results/Comments
1. Select memories 1 → 6	
2. Press **[TIME]**	***time-i*** is displayed in the command line.
3. Enter 10 on the numeric keypad.	
4. Press **[STORE]**	The new fade time assignments are stored to the selected range of memories.

Assigning fade times to non-sequential memories

Identical fade times can be assigned to a group of non-sequential memories.

Example: Assign 10 seconds time-out to memories 2, 6, and 8.

Keypresses	Results/Comments
1. Press **[MEMORY] [2]**	
2. Press **[MEMORY] [6]**	The memory list is displayed and the selected memories appear on a red field.
3. Press **[MEMORY] [8]**	
4. Press **[TIME] [TIME]**	*time-o* appears in the command line. Stage display is now on view.
5. Enter 10 on the numeric keypad.	
6. Press **[STORE]**	The new fade time assignments are stored to the selected memories.

Modifying time assignments

The example below shows how to modify a time-in assignment. Other time assignments use the same procedure; just press the time assignment keys the requisite number of times until the unit you need appears in the command line

Keypresses	Results/Comments
1. Select a memory or a range or a group of memories.	
2. Press **[TIME]**	The time assignment is displayed in the command line.
3. Assign a new time value.	
4. Press **[STORE]**	Store the new fade time information.

Converting Memories to Editor Groups

Memories can be converted to groups in the editor and used as building blocks for new memories.

The key sequences for converting a memory to an editor group are dictated by whether the editor is empty or not.

The intensity and parameter values in memories converted to an editor group overwrite any editor values for channels and spots in common. Example: You are converting memory 1 to an editor group. In memory 1 channel 5 is at 80%. Channel 5 is ain the editor at 35%. When you convert memory 1 to an editor group, channel 5 receives the 80% intensity level from the memory.

Converting a memory when the editor is empty

Example: Convert memory 4 to a group in the editor, edit, and store the lighting state as memory 5.

Keypresses	**Results/Comments**
1. Select memory 4.	
2. Press **[ENTER]**	The contents of mem 4 (spots and parameter values, channels and intensity/scroller assignments) are converted to group in the editor. The channels/spots are displayed in white. Notice that after pressing **[ENTER]**, *Memory 4* disappears from the command line. This assures that you are working on an editor group and not a memory. The last memory display is rplaced by the memory entered. *E #* is displayed to the right of the command line.
3. Select and edit channels and spots.	
4. Press **[=]**	*Memory* is in the command line.
5. Enter 5 on the numeric keypad.	
6. Press **[STORE]**	The message *Memory 5 Stored* is displayed.

More than one memory can be selected and converted to an editor group.

Example: Convert memory 4, 5, 6, and 7 to a group in the editor, edit, and store the lighting state as memory 5. Notice that you must select each memory and not use the range selection sequence.

Keypresses	Results/Comments
1. Press **[MEMORY] [4]**	
2. Press **[MEMORY] [5]**	The memory list is displayed and the selected memories appear on a red field.
3. Press **[MEMORY] [6]**	
4. Press **[MEMORY] [7]**	
5. Press **[ENTER]**	The contents of mem 4 (spots and parameter values, channels and intensity/scroller assignments) are converted to group in the editor.
6. Select and edit channels and spots.	
7. Press **[=]**	*Memory* is in the command line.
8. Enter 5 on the numeric keypad.	
9. Press **[STORE]**	The message *Memory 5 Stored* is displayed.

Converting a memory to a group when the editor is active

If the editor is active you must use a slightly different key sequence.

Parameter and intensity values from the converted memory override the values for spots/channels currently active in the editor.

Example: You want to use memory 2 as a building block to create memory 6. Memory 2 is spots 2 - 6 with the iris at 65%. Spots 2 - 6 with the iris at 50% are present in the editor and displayed in red.

Keypresses	Results/Comments
1. Press **[ENTER]**	The spots selected in the editor (highlighted in red) turn white indicating that they are present, but not addressable until selected again.
2. Select memory 2.	
3. Press **[ENTER]**	The selected memory is converted to an editor group. The iris values for the selected spots are forced to 65%.
4. Continue editing the group of spots and channels.	
5. Press **[=] [6]**	
6. Press **[STORE]**	The message *Memory 6 Stored* is displayed.

Inserting a Memory

Insert memories using the dot (•).

Example: Insert a memory between memories 3 and 4.

Keypresses	**Results/Comments**
1. Create a lighting state.	
2. Press **[=]**	*Memory* appears in the command line.
3. Press **[3 [•] [5]**	
4. Press **[STORE]**	Memory 3.5 is inserted between memories 3 and 4.

➢**Tip**
If the memory being inserted between memories 3 and 4 is an outgrowth of 3 (for instance), create your lighting state by using the sequence **[MEMORY] [3] [ENTER]**, edit, and then follow steps 3 – 4.

Memory Operations in the Editor

Memories can be copied, renamed, and erased in the editor or in the Memory Operations menu. These operations cannot be carried out on memories that are assigned to controllers or A/B cannot be erased even if the playback device is not active. You must free the assignment before attempting to copy, rename, or echanged a memory.

Renaming and exchanging memories

You can give a new number to a memory if the new number is not in use. If the new number is in used by another memory, the memories are exchanged.

Time assignments, Event assignments, and Parts remain intact.

Example: Rename memory 5 as memory 10. At present there is no memory 10.

Keypresses	**Results/Comments**
1. Select memory 5.	
2. Press **[=]**	*Change to* → appears in the command line.
3. Press [**MEMORY] [10]**	
4. Press **[STORE]**	The message *Memory 10 Stored* is displayed. The contents of memory 5 have been renamed as memory 10. Memory 5 no longer appears in the memory list.

Exchanging memories switches the contents of 2 memories.

Example: Memory 5 is channel 5 @ 30. Memory 10 is channel 10 @ Full. when the memories are exchanged Memory 5 is channel 10 @Full and memory 10 is channel 5 @ 30.

Keypresses	Results/Comments
1. Select memory 5.	
2. Press **[=]**	*Change to* → appears in the command line.
3. Press [**MEMORY] [10]**	
4. Press **[STORE**	The message *Memory 10 Stored* is displayed. The contents of memory 5 and memory 10 are exchanged.

Copying memories

You can copy the contents of a memory to a new memory..

Only the spots, channels, and their value are copied. This does not copy time assignments, Parts, or Event Assignments.

To copy a memory including any time assignments and Event Assignments, perform the copy function in the Memory Operations menu.

Example: Copy memory 2 to memory 8.

Keypresses	Results/Comments
1. Select memory 2.	
2. Press **[ENTER]**	The channels and spots with their intensity/parameter values appear as an editor group.
3. Press **[=]**	
4. Enter 8 on the numeric keypad.	
5. Press **[STORE]**	Only the contents of the memory (channels, intensity assignments, scroller values, spots and their parameter values) are copied.

➢**Note**
If the new memory number that you have selected is in use, the message *Memory Exists* is generated. You can overwrite by pressing **[STORE]** again.

Erasing memories

Single memories, non-sequential groups of memories, and a range of memories can be erased.

Memories that are assigned to controllers or A/B cannot be erased even if the playback device is not active. You must free the assignment before erasing the memory.

The system always asks for confirmation when erasing memories.

Erasing a single memory

Keypresses	Results/Comments
1. Press **[MEMORY]** and enter the memory number on the numeric keypad	Select the memory that you want to delete.
2. Press **[ERASE]**	The message *Are You Sure??* is displayed.
3. Press **[ERASE]**	The message *Memory(s) Deleted* is displayed.

Erasing a group of non-sequential memories

Keypresses	Results/Comments
1. Press **[MEMORY]** and enter the memory number on the numeric keypad	
2. Repeat step 1, selecting all the memories for erasure.	The memory list is now displayed. The selected memories appear on a red field. Repeat this step as many times as needed.
3. Press **[ERASE]**	The message *Are You Sure??* is displayed.
4. Press **[ERASE]**	The message *Memory(s) Deleted* is displayed.

Erasing a range of sequential memories

Keypresses	Results/Comments
1. Select a range of memories.	
2. Press **[ERASE]**	The message *Are You Sure??* is displayed.
3. Press **[ERASE]**	The message *Memory(s) Deleted* is displayed.

The Memory Operations menu

The Rename, Copy, Exchange, and Delete memories are functions that may be carried out in the Memory Operations menu as well as in the editor.

The Memory Operations menu is, menu number 3.

The memory list is displayed in this menu, so all the necessary information for carrying out these different functions is available on screen.

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The memory list is displayed in this menu, so all the necessary information for carrying out these different functions is available on screen.

Use **[PAGE UP]** and **[PAGE DN]** to page the Memory List.

The behavior of these functions, in the editor and in the Memory Operations menu is basically identical except for the copy memory operation.

Renaming memories

Individual memories or a range of memories can be renamed.

Renaming a memory transfers all the information, including all channel, scroller, spot, parameter, time, text Parts, Loops, and Event Assignments.

Renaming or copying a memory clears any link assignments.

Example: Rename the range of memories 1 - 10 as memories 101 - 110.

Keypresses	Results/Comments
1. **[F1] Rename Memory**	The prompt *Rename memory #* appears.
2. Enter 1 on the numeric keypad.	
3. Press **[F2] Thru Memory**	You can press **[→]** on the console panel instead of **[F2]**. The console prompts for the last memory in the range selection.
4. Enter the last memory of the range, in this example – 10.	
5. Press **[F1] As Memory #**	The prompt *As memory #* appears.
6. Enter 101 on the numeric keypad.	Enter the first number of the new range.
7. Press **[F1] Store**	The system asks for confirmation of the store command with the prompt *Are you sure?*
8. Press **[F1] Yes**	A window opens at the bottom of the screen, showing the results of the rename function. Memory numbers 1 → 10 no longer appear in the Memory List.

Copying a memory

This function copies the contents from the selected memory to a new memory number. The new memory is a replica of the original memory; all memroy attributes are copied except Links. You can copy single memories or a range of memories. To copy memory 1 to memory 100, 2 to 101, and 3 to 102, enter only memory 100 when answering the prompt for the new memory number. The system automatically copies the range of memories in sequential order.

Copying a range of memories that includes sub-decimal retains the sub-decimal format. Example: copying the range of memories 2, 3, 3.5, and 6 to memory 10, results in memories 10, 11, 11.5, and 12.

Keypresses	**Results/Comments**
1. Press **[F2] Copy Mem**	The prompt *Copy mem #* appears.
2. Enter the number of the memory you want to copy.	
3. Optional – select a range of memories.	
4. Press **[F1] To Mem #**	You are prompted to enter the new memory number.
5. Press **[F1] Store**	The prompt *Are You Sure ???* appears.
6. Press **[F1] Yes**	The results are displayed.

Deleting memories

Delete single memories or a range of memories.

Keypresses	**Results/Comments**
1. Press **[F3] Delete**	The system prompts you for a memory number.
2. Enter the number on the keypad.	
3. Optional – select a range of memories.	
4. Press **[F1] Store**	The prompt *Are You Sure ???* appears.
5. Press **[F1] Yes**	The memories are deleted.

Deleting all memories

The Clear Console option deletes all memories. Be sure to record the current memories if you want to save them.

Keypresses	**Results/Comments**
1. Press **[F5] Clear Console**	A reminder to record your show is displayed.
2. Press **[F1] Yes**	All the memories are deleted and you are returned to the Main Menu screen.

Selecting Channels and Spots– Advanced Selection Functions

There are some functions that allow you to easily select to channels and spots from memories or channels and spots participating in the stage picture.

Selecting channels and spots from memories

You can select channels and spots stored in memories, turning them into an editor group. This function is a selection function only and does NOT grab the intensity or parameter value assignments.

After selecting the channels and spots, you can then assign parameter values, dimmer levels, or frame assignments. If spots and channels selected using this method are active in the editor, the editor values are retained.

When the selection contains both channels and spots, the dimmer wheel affects both types of fixtures.

When the selection contains two types of spots, the selection follows the rules for mix editing. You can use this selection method with one memory or a group of memories.

Example: Memory 2 consists of spot 1, spot 5, spots 30-42, and channels 1 - 4.

Keypresses	Results/Comments
1. Press **[GROUP]**	
2. Press **[MEMORY]**	
3. Enter 2 on the keypad.	
4. Move the dimmer wheel.	The spots/channels are now displayed in red. At this point, only the dimmer parameter is active. All other parameter values are derived from the tracking.
5. Continue editing	When editing is complete you can record the editor group as a memory.

Selecting from sequential memories

Example: select the spots and channels in memories 1 - 3, assign values, and store the result as memory 8.

Keypresses	**Results/Comments**
1. Press **[GROUP]**	
2. Press **[MEMORY]**	
3. Select memories 1 → 3	
4. Move the dimmer wheel	The channels and spots from memories 1 → 3 are displayed in red in the editor and are assigned intensity.
5. Continue editing (optional)	
6. Press **[=] [8]**	
7. Press **STORE**	The message *Memory 8 Stored* is displayed.

Selecting from non-sequential memories

Example: Select the channels and spots in memories 1, 5, and 10.

Keypresses	**Results/Comments**
1. Press **[GROUP]**	
2. Press **[MEMORY] [1]**	
3. Press **[MEMORY]**	The channels and spots in memory 1 are displayed in red,
4. Enter 5 on the keypad.	
5. Press **[MEMORY]**	The channels and spots in memory 5 are displayed in red,
6. Enter 10 on the keypad.	
7. Move the dimmer wheel.	The channels and spots in all the selected memories are assigned intensity.

Visible

This function selects the channels and spots that have an intensity assignment in the editor or are output on an active playback device. After the selection you can modify intensity and parameter values.

Example:

Editor	Stage	Press VISIBLE
Chan 1 Full	Chan 25 @ 30	The selection is:
Chan 10 @ 0	Chan 28 @ 0	Channels 1, 10, 25, 28, and 35.
Chan 12 – no assignment	Chan 35 Full	Spots 1, 8, and 12.
Spot 1 dimmer 50	Spot 12 Full	
Spot 5 dimmer zr		
Spot 8 dimmer Full		

Note that an intensity assignment of 0 for channels is considered an intensity assignment and is, therefore, selected.

Visible works both in live and blind modes. In live mode pressing **[VISIBLE]** selects all of the channels and spots with an intensity assignment in the editor or output from a playback device.

In blind mode, pressing **[VISIBLE]** selects all of the channels and spots in the editor that have intensity assignments.

Selecting all output

When the editor and playback device outputs include channels and spots *Visible Spot & Chann* is written in the command line.

When the editor and playback device outputs includes channels *Visible Chann* is written in the command line.

When the editor and playback device outputs includes spots only *Visible Spot* is written in the command line.

➢**Note**
You can select **[VISIBLE]** only when the command line is clear.

Keypresses	Results/Comments
1. Press **[ENTER]**	Skip this step if the command line is clear.
2. Press **[VISIBLE]**	All channels and spots with intensity assignments originating either in the editor or a playback device are selected in the editor.
3. Use the wheels for editing, press **[@]** and enter a value on the keypad, or store as a memory.	

Selecting a range of channels or spots

Example: Channels 1 – 25, 30 – 35, and 55 – 65 are either active in the editor or active on a playback device. Select the active channels within the range 20 – 60.

Keypresses	**Results/Comments**
1. Press **[ENTER]**	Skip this step if the command line is clear.
2. Press **[CHANNEL]**	Skip this step if the Number Default selection is Chan
3. Select channels 20→60.	
4. Press **[VISIBLE]**	Channels 20 – 25, 30 – 35, and 55 – 60 are selected in the editor.

Example: Spots 1 – 6, 12– 24, and 28 – 32 are either active in the editor or active on a playback device. Select the active spots within the range 20 – 35.

Keypresses	**Results/Comments**
1. Press **[ENTER]**	Skip this step if the command line is clear.
2. Press **[CHANNEL]**	Skip this step if the Number Default selection is Chan
3. Select channels 20→35.	
4. Press **[VISIBLE]**	Spots 20 – 24 and 28 – 32 are selected in the editor.

Using groups

You can make further selections of visible channels and spots using Groups. For more information about Groups see Chapter 15.

Keypresses	**Results/Comments**
1. Press **[ENTER]**	Skip this step if the command line is clear.
2. Press **[GROUP]**	
3. Select the Group .	
4. Press **[VISIBLE]**	All spots and channels in the editor and output from a playback device and included in the Group are selected in the editor.

Using memories

You can use memories as the database for selecting some of the visible channels and spots.

Selecting channels and spots

You can select channels/spots that derive from a memory. The proportional relation of the assigned values is retained.

Keypresses	Results/Comments
1. Press **[MEMORY]**	
2. Enter the memory number on the keypad.	
3. Press **[VISIBLE]**	All relevant spots and channels are selected.
4. Use the wheels values.	Proportionality is maintained.

Selecting channels/spots and assigning memory values

The following sequence allows you select the visible channels and spots deriving from the selected memory and assign their dimmer and parameter values as they appear in the memory.

Keypresses	Results/Comments
1. Press **[MEMORY]**	
2. Enter the memory number on the keypad.	
3. Press **[VISIBLE]**	All of the viable spots and channels, in the editor and output from a playback device, are selected.
4. Press **[ENTER]**	The dimmer and parameter values that appear in the selected memory are assigned to the selected spots and channels.

Exams for visible

Viewing a tracksheet of visible channels

You can view a track sheet for all of the visible channels.

Keypresses	Results/Comments
1. Press **[VISIBLE]**	
2. Press **[CHANNEL]**	
3. Press **[MEMORY]**	
4. Press **[EXAM]**	A tracksheet for the visible channels is displayed.

Copying

You can copy the dimmer and parameter values from memories to the visible spots and channels.

Keypresses	**Results/Comments**
1. Select channels or spots.	
2. Press **[VISIBLE]**	
3. Press **[COPY]**	
4. Press **[MEMORY]**	
5. Enter the memory number on the keypad.	
6. Press **[ENTER]**	The values from the memory are assigned to the selected channels and spots that are currently active.

Programming with Libraries

Spark 4D has 3 categories of libraries: Position, Color, and Gobo. Libraries are a database of presets that are useful tools when programming memories. Use of position libraries is particularly important since updating libraries globally updates the data contained in memories that use these libraries.

For full instructions on how to program and use libraries see Chapter 14 – Libraries.

CHAPTER 8
MODIFYING MEMORIES

This chapter includes:

Basic Memory Modification

Basic memory modification is calling a stored memory the memory to the editor, modifying, and storing the memory again. This function may also be executed in blind mode.

Channels and spots under memory modification are displayed in dark blue. The selected memory number remains in the command line.

Keypresses	Results/Comments
1. Select the memory for modification.	
2. Press **[CHANNEL]** or **[SPOT]**	The memory is live on stage unless you are working in Blind editing. The channels and spots contained in the selected memory are displayed in dark blue.
3. Select channels/spots and modify	
4. Press **[STORE]**	If the modified memory is not present in any other location on the board, such as A/B or a controller, the message: *Memory # Stored* is displayed. To clear the editor press **[RESET]**.

If the memory that you are attempting to store is assigned somewhere on the board, the message: *Memory On Board* is displayed.

Press **[STORE]** again to overwrite the memory. The editor clears when the memory is stored.

If you have converted a memory to an editor group (see Chapter 7 Programming Memories) you can store to the same memory number.

Example: Modify memory 1.

Keypresses	Results/Comments
1. Select memory 1.	
2. Press **[ENTER]**	Memory 1 is converted to a group in the editor. *E1* is displayed instead *L#* (Last memory stored).
3. Modify the group.	
4. Press **[=]**	*Memory* is added to the command line.
5. Press **[ENTER]**	*1* appears in the command line, referencing *E*.
6. Press **[STORE]**	The message *Memory 1 Stored* is displayed.

Recalling last memory selection

Keypresses	Results/Comments
1. Press **[MEMORY]**	
2. Press **[•]**	Your last memory selection is reselected.

Using STORE STORE

To work through this section see Chapter 12 the A/B Crossfader. You need to know how to assign memories to A/B.

STORE STORE modifies memory and group assignments on the active playback devices, giving Spark 4D the ability to quickly modify an entire lighting picture even if the look is composed of different playback assignments. (See Chapters 12 and 13 for assigning memories and groups to playback devices.)

The most prevalent use of the STORE STORE method is modifying memories on the A/B crossfader after the basic memories have been recorded. STORE STORE also allows you to update all active controller and crossfader output.

When there are channels and spots in the editor pressing **[STORE]** opens the STORE STORE window. This window shows where, to which playback devices, the information in the editor will be stored. The affected playback devices are displayed in blue.

The STORE STORE function also provides options to create Delta and update libraries (see Chapter 9 – Libraries).

STORE STORE modes

STORE STORE has two different modes. The toggle *Store to first active fader*, in the System Parameters menu, determines the mode.

1. *Store to the first active fader: yes*
   The editor contents are stored to the first active playback fader or controller. The system first looks at the A/B crossfader and then controllers beginning at controller 1.
2. *Store to the first active fader: no*
   The store is executed wherever relevant.
   Example: channel 2 is present in the active memory on A/B and also active in controller assignments for controllers 1 and 8. Channel 2 is present in the editor at 80%. The editor value for channel 2 is stored in A/B and controllers 1 and 8 when the store command is confirmed.

➢Note

When using **[STORE] [STORE]**, new channels and spots (channels and spots not assigned to any of the output sources) are stored to the first active playback device only.

Storing to the first active playback device

The example below modifies the memory or group active on crossfader A. The STORE STORE mode is, *Store to the first active fader* toggled to Yes.

Keypresses	Results/Comments
1. Assign a memory or a group to A. Press **[MEMORY] [#] [A]** To assign a group: select channels/spots and assign values, then press **[A]**	The memory number is displayed in the LED display for fader A. *grp* is displayed for a group assignment.
2. Select channels and spots for modification.	
3. Assign intensity and parameter values.	
4. Press **[STORE]**	The STORE STORE window opens. The assignment on fader A is displayed on a red field. The message *Are you sure?* is displayed.
5. Press **[STORE]**	The window closes and the editor is stored, in this example, to the assignment on A.

Storing to the all playback devices

The example below modifies the memories active on crossfader A, on controller 6, and controller 10. Each assignment includes channel 100. The STORE STORE mode, *Store to the first active fader* is toggled to No.

Keypresses	Results/Comments
1. Assign a memory to A: Press **[MEMORY] [#] [A]** Assign memories to controllers: Press **[MEMORY] [#] [ASSIGN] [SK 6] [MEMORY] [#] [SK10]**	The memory number is displayed in the LED display for fader A. The LEDs for controllers 6 and 10 is red and the assignment is appears on the controller display.
2. Make sure that the faders for A, controller 6, and controller 10 are at 100%.	
3. Select channel 100 and assign intensity.	
4. Press **[STORE]**	The STORE STORE window opens, showing the assignments on A, controller 6, and controller 10 on a blue field.
5. Press **[STORE]**	The window closes and the editor is stored to all assignments displayed in blue.

Storing to selected playback devices

Keypresses	Results/Comments
1. Select channels and spots assign intensity and parameter values.	
2. Press **[STORE]**	The STORE STORE window opens showing all of the active assignments on the playback devices.
3. Select where you want the store to occur by pressing, **[ASSIGN] [A]** or **[ASSIGN] [B]** to store to the crossfader. To store to a controller press **[ASSIGN]** and the controller **[SK]**.	The playback device, displayed in the store window, turns blue when pressed. This means that the data in the editor has been stored to the assignment on selected playback device. More than 1 playback device can be selected.
4. Press **[CLEAR]** to return the editor to idle.	

➢**Note**
To store to more than 1 controller assignment, you must press **[ASSIGN]** between each selection.

Using Delta

Delta stores modifications of spot parameter values, channel intensity, scroller frame, and library assignments to apply to memory modifications. For information about Delta and Libraries see Chapter 9 – Libraries.

The Delta function facilitates memory modifications that track through entire sections of a show or modifications executed over a range of memories. This function is extremely versatile, as there are a number of ways to create and apply Delta memory modification.

A Delta can be created using basic memory modification. A Delta created through memory modification appears as both relative and absolute. Both the absolute and the relative values can be used when applying delta for memory modification. Channels and spots that are added to the memory have absolute values only. A Delta created via memory modification can be used for delta tracking. Delta tracking tracks modifications through all or selected memories.

A Delta programmed in the editor can be used to modify single memories or a range of memories. It cannot be used for Delta tracking. A Delta programmed in the editor or using STORE STORE has absolute values only.

Storing a Delta is offered as an option in the STORE STORE function. Delta programmed via STORE STORE has both absolute and relative values. It cannot be used for Delta tracking.

One delta can be present in the system. If a Delta exists it is signaled by the word *Delta* that appears in red in the lower right section of the command line. Once a delta is created it is preserved until a command is given to create a new delta or it can be erased.

When the Delta is empty, the first memory modification automatically stores a Delta. If there is a Delta in the system you can choose to replace the current delta with a new delta or leave the current Delta intact.

When the Delta is empty, the first memory modification automatically stores a Delta. If there is a Delta in the system you can choose to replace the current delta with a new delta or leave the current Delta intact.

Programming a delta using memory modification

Deltas that are created using memory modification have both absolute and relative values When examining this type of Delta, the source memory of the delta is displayed at the top of the screen. If an additional spot is modified or added to the source memory, these modifications are added to the Delta. .

Example: Memory 20 contains spot 1 with color wheel at 2. It will be modified by assigning 4 to the color wheel for spot 1 and adding channel 2, that is not contained in the memory (a "new" channel), at 30% dimmer intensity.

Keypresses	Results/Comments
1. Select memory 20.	
2. Select spot 1.	The spots in memory 20 appear in dark blue on the spot display.
3. Using the color parameter wheel set the value at 4.	
4. Select channel 2.	
5. Press **[@] [3]** (If the system is configured as USA enter 30.)	
6. Press **[STORE]**	The modification of memory 20 is stored and automatically creates a delta. The word *Delta* appears in red at the bottom right of the display screen.

Replacing a delta with a new delta

When a Delta is present, you can chose to overwrite with a new Delta or preserve the existing Delta. The key sequence below is using the same example as above.

Keypresses	Results/Comments
1. Select memory 20.	
2. Select spot 1.	The spots in memory 20 appear in white on the spot display.
3. Using the color parameter wheel set the value at 4.	
4. Select channel 2.	
5. Press **[@] [3]**	
6. Press **[DELTA]**	A window opens instructing you to press **[STORE]** to overwrite the existing Delta or press **[CE]** to exit the Delta store option.
7. Press **[STORE]**	The modifications to memory 20 are stored and a new delta is created.

Programming a delta in the editor

You can create a delta in the editor that is independent of memory modification. Using this method there Delta contains absolute values only.

Example: Program a Delta for spot 1 parameter values.

Keypresses	Results/Comments
1. Select spot 1 for editing.	A range or a group of spots can be selected.
2. Assign parameter values.	
3. Press **[=]**	
4. Press **[DELTA]**	Designates this group of spots as a delta.
5. Press **STORE**	If there is Delta in the system, the message *Delta Exists* is displayed. To overwrite, press **[STORE]** again. If you want to preserve the existing delta, press **[CLEAR]**.

Programming a delta via store store

The STORE STORE window, that shows the location of the memories affected by the modification, offers the option of programming a Delta. A Delta programmed using the STORE STORE option has absolute values only.

Keypresses	Results/Comments
1. Select channels and spots and modify.	
2. Press **[STORE]**	The STORE STORE window opens.
3. Press **[F5] Delta**	
4. Press **[STORE]**	The modifications are stored to the playback device assignment and as a Delta.

Examining delta

The Delta exam shows the contents of the delta and F key options that are used when applying delta for memory modification.

Keypresses	Results/Comments
1. Press **[DELTA**	The modified spots/channels are displayed with their modifications If the Delta was programmed via memory modification, the source memory is displayed at the top of the screen.
2. Press **[DELTA]** a second time to toggle to the relative Delta page.	A relative Delta is created only when the Delta was programmed via memory modification

The Relative Delta is displayed in brown if the value is negative and in yellow if the value is positive.

In absolute Delta exam, the value ***er*** on a blue field appears in Delta exam for channels or scrollers erased from the memory. In relative Delta exam, the value ***rl*** on a red field appears

in Delta exam for channels or scrollers erased from the memory. When this Delta is applied the channel, spot, or scroller with the value ***er*** is erased from the target memory.

Applying delta

Delta modifies memories by assigning the values in the delta to spots and channels in the selected memories.

When applying the delta for memory modification, the F keys supply up to 6 different options.If the Delta contains only absolute values, options F3 and F4 are available. If the Delta contains absolute and relative values, options F1 though F4 are available.

F1 **Relative**	This option is available when the Delta is a result of memory modification or saving the delta during STORE STORE. Applying a Relative Delta modifies values according to the relative amount of change in the source memory. Choosing this option modifies the parameter and intensity values of a spot or channel, already present in the target memory, relative to its present value. Example 1: The Relative Delta is zoom - 50. Applying this to a memory where the spot is set at zoom 80 results in the zoom parameter having a value of 30. Example 2: The Relative Delta is channel 1 –50. Applying this to a memory where channel 1 is at 30 results in a negative intensity. The console releases this channel from the memory.
F2 **Relative + New**	Applying a Delta under this selection modifies spot parameters, channel intensities, and frame assignments in the target memories, using the value of the relative delta and adds new information to the selected memories. “New” refers to spots, channels, and scrollers that are not present in the memory being modified. "New" values are absolute only.
F3 **Absolute**	Applying a Delta using this option modifies value assignments by assigning the absolute delta value. Choosing this option applies only to spots, channels, and scrollers already present in the target memories.
F4 **Absolute + New**	This option modifies value assignments by assigning the absolute delta value and adding spots, channels, and scrollers that are new to the target memory.
F5 **Lib #**	Applying this option assigns the Libraries in the Delta. See Chapter 9 – Libraries.
F6 **TEST**	Preview the memory live on-stage with the Delta modifications. To return to editor press **[F6] [CLEAR]** or **[STAGE]**. Press **[STORE]** to apply the Delta modifications.

Non-tracking modification

One memory, a range of sequential memories, or a group of non-sequential memories may be selected for modification.

Keypresses	Results/Comments
1. Select the memory or range of memories.	
2. Press **[DELTA]**	The Delta exam display appears.
3. Choose one of the options.	
4. Press **[STORE]**	A *Wait* message may be displayed. When the modification is complete, the range of memories is displayed.

Automatic delta tracking

Automatic tracking is only applicable when the Delta was programmed via memory modification. Attempting to use the Delta tracking mode when the Delta was not created through memory modification results in the message: *Incorrect Delta Mode*.

When a Delta has been created through memory modification, the number of the modified (source) memory appears at the top of the screen in delta exam.

Modification of memories using the Delta Tracking mode can be applied to a specific range of memories or an unspecified range of memories.

Important! The modification tracks through until the parameter of the spot or the intensity of the channel being modified changes in a target memory.

Example: Apply **F4 Absolute + New** to memories using the following Delta, which is the result of modifications to memory 20.

spot 1	cw	cw
spot 2 (new)	gobo	6
channel 5	dimmer	45%

Apply **F4 Absolute + New.** This means that the absolute values in the Delta modify the values in the target memories. Spots or channels contained in the delta that new to the target memories, (in this case spot 2), are added to the memories. If you do not choose the **+ new** option spot 2 will not be added to memories where it does not originally appear.

Tracking is applied from the memory following source memory to the last memory.

Keypresses	Results/Comments
1. Press **[MEMORY]**	Delta tracking begins from the memory in which delta was created.
2. Press**[→]**	
3. Press **[DELTA]**	*Track* appears in the command line.
4. Press **[STORE]**	If there are a lot of memories to track through, a *Wait* message may be displayed. When the delta tracking modification is complete, the range of memories modified is displayed.

The following table shows the result of Delta tracking using the example described above.

Memory 20 (original Source memory)	spot 1	color wheel	2	**Memory 20 (after modifying**	spot 1	cw	6
	spot 3	gobo	6		spot 2 (new)	gobo	6
					spot 3	gobo	6
	channel 5	dimmer	FL		channel 5	dimmer	45%

original data				**after delta tracking**			
memory	**Spot**	**parameter**	**value**			**param**	**value**
memory 21	spot 1	color wheel	2	memory 21	spot 1	color wheel	6
	spot 2	gobo	3		spot 2	gobo	6
	spot 3	gobo	1		spot 3	gobo	1
	Channel 5	dimmer	FL		channel 5	dimmer	45%
memory 22	spot 1	color wheel	2	memory 22	spot 1	color wheel	6
					spot 2	gobo	6
	spot 3	gobo	1		spot 3	gobo	1
	channel 5	dimmer	50%		channel 5	dimmer	50%
memory 23	spot 1	color wheel	1	memory 23	spot 1	color wheel	1
					spot 2	gobo	6
	spot 3	gobo	6		spot 3	gobo	1
	channel 5	dimmer	FL		channel 5	dimmer	FL
memory 24	spot 1	color wheel	4	memory 24	spot 1	color wheel	4
	spot 2	gobo	3		spot 2	gobo	6

Testing the delta

You have the option of testing the application of a Delta to a memory before storing.

Keypresses	Results/Comments
1. Select the memory to be modified with Delta.	
2. Press **[DELTA]**	The memory is displayed with the Delta modifications. *Memory # Modified by Delta* is displayed at the top of the screen.
3. Press F6 Test	The memory with the modifications is entered to the editor and is live on stage.
4. Pressing **[STORE]** stores the memory with the Delta modifications. Pressing **[F6 Test]** to exit the test.	

Erasing delta

You may want to erase an existing delta in order to create a new delta.

Keypresses	Results/Comments
1. Press **[DELTA]**	
2. Press **[ERASE]**	The Delta flag disappears and the Delta is empty.

Modifying delta

It is possible to directly modify a delta.

1. Press **[DELTA]**	The Delta exam is displayed.
2. Select the channels/ spots and modify.	
3. Press **[STORE]**	The new information is stored in the existing Delta.

➢Note

If the Delta you are modifying was created using memory modification (therefore having both absolute and relative values), the relative values always relate to the value in the source memory. Example: the delta derives from memory 2. In memory 2 the original value for channel 2 was Full. The delta was created when channel 2 was modified to 50%, therefore the delta consists of an absolute value of 50 for channel 2 and a relative value of –50. If you modify the delta, assigning 75% to channel 2, the delta will contain an absolute value of 75% and the relative value is updated to –25%.

Using Memory Range Modification

Use this function to modify channel intensity and scroller assignments over a range of memories.

The examples below modify single channels, however a range of channels may also be selected.

You may want to display the Selected Channel exam (see Chapter 5 Selecting and Editing Channels and Scrollers) when working with this function.

➢Note
This function cannot be used with spots.

Modifying a channel over a range of memories

Keypresses	Results/Comments
1. Select a range or a group of memories.	
2. Select the channel/s for modification.	
3. Modify intensity using the dimmer wheel for proportional modification or **[@]** for absolute modification.	
4. Press **[STORE]**	The message *Memory # → # Stored* is displayed.

Modifying a scroller assignment

You can modify a single scroller value, a range of scrollers, or a non-sequential group of scrollers.

Keypresses	Results/Comments
1. Select a range or a group of memories.	
2. Select the channel/s and frame/s for modification.	
3. Use the frame wheel or press **[FRAME]** and assign a value on the keypad.	
4. Press **[STORE]**	The new data is stored to all of the memories in the selected range.

Adding a new channel to a range of memories

Keypresses	Results/Comments
1. Select a range of memories.	
2. Press **+**	*New* appears in the command line.
3. Select the channel number and assign intensity using the wheel or the keypad.	A range of channels may be selected.
4. Press **STORE**	The new channel/s are stored in the selected memories.

Releasing channels from a range of memories

Keypresses	Results/Comments
1. Select a range of memories.	
2. Select the channel/s.	
3. Press **ZERO**	
4. Press **STORE**	The selected channel/s are released from the selected memories.

Releasing scrollers from a range of memories

Keypresses	Results/Comments
1. Select a range of memories.	
2. Select the scroller channels	
3. Press **FRAME**	
4. Press **ZERO**	
5. Press **STORE**	The scroller values are released from the selected memories.

Releasing Channels, Spots, Scrollers

This function can be used in Live or Blind mode.

Releasing spots

Using the sequence below spots can be released from 1 memory or a range of memories.

Keypresses

1. Select a single memory, a group of memories, or a range of memories.
2. Select the spot you want to release.
3. Press **[RELEASE]**
4. Press **[STORE]**

Releasing channels

Use the following sequence to release channels and scrollers from 1 selected memory.

Keypresses

1. Select a memory.
2. Select the channel you want to release.
3. Press **[ZERO]**, use the dimmer wheel and wheel down to 0%, or press **[RELEASE]**
4. Press **[STORE]**

Releasing scrollers

Keypresses

1. Select a memory.
2. Select the scroller channel.
3. Press **[FRAME]**
4. Press **[RELEASE]**
5. Press **[STORE]**

CHAPTER 9
LIBRARIES

This chapter includes:

Overview

Libraries are a programmable tracking database for moving lights of preset position, color, and gobo assignments. After you have programmed your libraries, you then apply libraries when programming or modifying memories. Using libraries contributes greatly to editing speed, allowing you to quickly assign the presets gobo or color to selected spots. Changes or updates in a library track through all library assignments in memories.

There are 3 different library categories: Position, Color, and Gobo. You can program up to 99 libraries in each category. Any number of spots can be included in a library.

Libraries are spot specific. In other words, you cannot use a library assignment for spot 1 to edit spot 2. It is expedient to program a library including all of the spots that you think will be used in a certain position.

When using the libraries to program memories, you apply the library to the selected spots only. Example: You have created a position library with 6 spots that light the soloist. The lighting state that you are building only requires 2 of the spots. You select the spots and assign the required library.

The dedicated library keys are:

POSITION Position libraries 1 - 99 are stored and retrieved the numeric keypad. Position libraries include x and y.

COLOR Color libraries 1 - 99 are stored and retrieved using the numeric keypad. Parameters included in the color libraries are: p1, p2, p3, p4, and p14. Access **[COLOR]** using the **[SHIFT]** key.

GOBO Gobo libraries 1 - 99 are stored and retrieved using the numeric keypad. Parameters included in the gobo libraries are: p5, p6, p7, p13, and p15. Access **[GOBO]** using the **[SHIFT]** key.

IN LIB Notify the system that you are storing a library.

➢Note

You may exclude parameters from libraries in the Mix Output menu/define device (see Chapter 24 Spot Management and Patching).

Color code for Libraries

Libraries are color coded on the monitor displays.

Library	Color
Position	light red
Color	dark red
Gobo	orange

Programming a Library

Any number of spots can be included in a library, however you may use only part of the library when programming memories with libraries. For example, Position library 5 includes spots 1 → 24. When programming a certain memory you can apply the library information to spots 1, 3, 5, and 7 only. Example: Program position library 5.

Keypresses	**Results/Comments**
1. Select spot/s	
2. Position the beam.	Use the trackball, wheels, or the numeric keypad to assign the x/y values. Repeat the procedure for as many spots as desired.
3. Press **[IN LIB]**	
4. Press **[POS]**	
5. Press **5** on the keypad	*Pos. 5* appears in the command line.
6. Press **[STORE]**	*Stored!!* appears in the command line and the message *Library P-05 Stored* is displayed. If a library exists the warning Library *Exists. Update?* is displayed. Press **[STORE]** again to update the library. Or Press **[CLEAR]**, enter a new number, and press **[STORE]**.

Program Color or Gobo Libraries by following the same procedure.

➢Note

When programming Libraries you can use **[+]** and **[-]** to enter a Library number. Pressing **[+]** or **[-]** references the last Library programmed or modified and selects the next of previous Library number.

Pressing **[+]** or **[-]** works cyclically - If the last Library edited was Library 99, pressing **[+]**selects Library 1. If the last edited Library is Library 1, pressing **[-]** selects Library 99.

The last stored Library is displayed in red in the Library Exam. Pressing **[+]** or **[-]** references the Library displayed in red.

Example: You have just stored Position Library 5.
[SPOT] [# → #] [trackball] [IN LIB] [POS] [+] [STORE] stores Position Library 6.

This function works per Library category. Example: You edited Position Library 5. Next you edited Color Library 10. The sequence:
[SPOT] [# → #] [trackball] [IN LIB] [POS] [+] [STORE] stores Position Library 6.

Erasing any Library returns the reference point to the first Library. Example: You have Color Libraries 1 → 20. Your last edited Color Library is Color Library 10, displayed in red in the Library Exam. Erase Color Library 5. Now Color Library 1 is displayed in red in the Library Exam and has become to the reference point for the sequences described above.

Text for Libraries

You can label Libraries for easy identification. The text appears in the Library List.

Example: Label Position library 5.

Keypresses	Results/Comments
1. Press **[POS]**	The Library List is displayed.
2. Select 5 on the keypad.	The library category and number appear in the command line.
3. Press **[TEXT]**	
4. Type text on the alphanumeric keyboard	
5. Press **[STORE]**	The message *Library # Stored* is displayed. The text in the Library List.

Examining Libraries

You can examine the contents of each Library or view the Library List for each category. The Library List exam is a "strong" exam. Since no keypress bumps out this exam you can keep it on view while you continue editing.

Viewing the library list

Keypresses	Results/Comments
1. Press **[GOBO]**, **[COLOR]**, or **[POSITION]** to select the category.	
2. Press **[EXAM]**	The Library List in the selected category is displayed.
3. Press **[PAGE UP]** to page the Library exams.	
4. Press **[STAGE]** to exit exam.	

Examining a selected library

This is a "weak display"; any keypress (except those used to view next and previous libraries) bumps the display back to the Stage display.

Keypresses	Results/Comments
1. Press **[GOBO]**, **[COLOR]**, or **[POSITION]**	
2. Enter the library number on the numeric keypad.	
3. Press **[EXAM]**	The spots and parameter values for the selected library are displayed.
4. View the next or previous library by pressing **[+]** or **[-]**	

Programming Memories with Libraries

The advantage of programming memories using libraries wherever possible, is that library updates track through all of the memories that contain those library assignments.

Example: Assign position library 06 to spots 6 - 13 and store as memory 4.

Keypresses	**Results/Comments**
1. Select spots 6 – 13	
2. Press **[POSITION]**	
3. Enter 6 on the numeric keypad.	The library number is displayed in white on a red field.
4. Continue editing.	
5. Press **[= 4]**	
6. Press **[STORE]**	The message *Memory 4 Stored* is displayed.

➢Note

The message *Library Empty* is displayed when the library does not contain the selected spots.

Viewing library assignments in memories

When you examine a selected memory (**[MEMORY#] [EXAM]**), library assignments are displayed on a light red field.

To view the absolute value in the library, press **[EXAM]** again.

Copying from a Library

You can copy the library values of the selected spot to any other spot. Only the values from the library are assigned to the selected spot, the library itself is not assigned.

Example: Copy the value for spot 6 in Gobo library 18 to spot 8.

Keypresses	**Results/Comments**
1. Select spot 8	Select the target spot.
2. Press **[COPY]**	The prompt *Copy from* appears in the command line.
3. Press **[GOBO]**	
4. Enter **18** on the keypad.	
5. Select spot 6	Select the spot being copied from.
6. Press **[ENTER]**	The Gobo values in the library are assigned to spot 8.

Editing Libraries

Libraries can be modified in the editor or updated during the STORE STORE function.

In the examples below, Gobo library 6 is modified.

Modifying a library

You can modify the parameter values for spots in the library.

Keypresses	Results/Comments
1. Press **[GOBO]**	
2. Select **6** on the numeric keypad.	
3. Press **[SPOT]**	All the spots in the library are displayed in the editor.
4. Select spots and modify parameters.	
5. Press **[STORE]**	The message *Library G- 06 Stored* is displayed.

Adding spots to a library

Example: Add spots to Gobo library 6.

Keypresses	Results/Comments
1. Select spot/s.	
2. Assign values.	
3. Press **[IN LIB]**	
4. Press **[POSITION]**	
5. Enter **6** on the numeric.	The library number is displayed in the command line.
6. Press **[STORE]**	The message *Library P – 06 Stored* is displayed.

Or

Keypresses	Results/Comments
1. Press **[POSITION]**	
2. Enter the library number.	
3. Press **[SPOT]**	All the spots in the library are displayed in the editor.
4. Select new spot/s.	
5. Assign parameter values.	
6. Press **[STORE]**	The message *Library P – # Stored* is displayed.

Removing spots from a library

Example: Remove spot 3 from position library 6.

Keypresses	Results/Comments
1. Press **[POSITION]**	
2. Select **6** on the keypad.	The library number appears in the command line.
3. Press **[SPOT]**	All of the spots in Position library 6 are displayed in the editor.
4. Enter 3 on the keypad.	More than one spot can be selected.
5. Press **[RELEASE]**	
6. Press **[STORE]**	The message *Library P – 06 Stored* is displayed.

Updating a library using STORE STORE

You generally use the STORE STORE function when storing modifications to memories active on playback devices (see Chapter 9 – Modifying Memories). The STORE STORE window displays options using the F keys. Among these options are library updates. The available options depend on the contents of the playback device assignments.
Example: The spots in the memory on A contains position and color libraries. When **[STORE]** is pressed the following options are displayed:

- F1 All libraries
- F2 Position library
- F3 Color library
- F3 Gobo library

If the spot that you have modified has a library assignment, you can update the spot's library values when confirming the store command.

Example: Memory 2 is active on A. The memory contains spots 3 - 6 with Position library 3 and Gobo library 5. You modify the position of spots 3 - 6.

Keypresses	Results/Comments
1. Select spots 3 - 6.	
2. Modify their position.	
3. Press **[STORE]**	The STORE STORE window is displayed.
4. Press **F2 POS** and **F3 Gobo**	
5. Press **[STORE]**	The modifications are stored to memory 2. Position library 3 and Gobo library 5 are updated.

➢Note

If you do not choose to update the libraries, the new values are stored in the memory. The new values have no association to libraries.

Erasing a Library

Spot parameters with library assignments retain the parameter value when the library is erased. Example: Erase Gobo library 9.

Keypresses	Results/Comments
1. Press **[GOBO]**	
2. Select 9 on the numeric keypad.	
3. Press **[ERASE]**	Spark 4D asks: *Are You Sure???*
4. Press **[ERASE]**	The message: *Library G-09 Erased* is displayed.

Programming a Delta with Libraries

A Delta for applying libraries may be programmed. The example below shows how to program a Delta that is used to assign Position library 1 to the selected spots. The spots must, of course, be part of the library.

Keypresses	Results/Comments
1. Select one or more spots.	
2. Press **[POSITION]**	
3. Enter 1 on the keypad.	
4. Press **[=]**	
5. Press **[DELTA]**	
6. Press **[STORE]**	When the Delta is applied to a memory, Position library 1 is assigned to the selected spots.

Library Test Menu

The Library Test menu is menu 27. The Library Test menu compares the values contained in libraries with the actual values in memories with library assignments. If any inconsistencies are detected a report is generated. The report shows a list of memories, the QList they appear in, and the spots with Library assignments in those memories whose Library values do not match the values in the Libraries themselves.

The test report is per Library category and is displayed in this format:

Position Lib		
QL	**Mem**	**Spots**

If the report is more than 2 pages long, press **[ENTER]** to page.

You can print the reports using Print Screen.

Keypresses	**Results/Comments**
1. Go to the Library Test menu.	
2. Press **F1 Start Test**	A report is generated.
3. If the report is longer than 1 page, press **[ENTER]** to view the next page.	

Chapter 10
LOOPS & LINKS

This chapter includes:

Loops

- Programming an automatic continuous Loop
- Programming a manual continuous Loop
- Programming a finite Loop
- Programming an autofollow Loop
- Programming a follow-on cue
- Erasing Loop assignments
- Erasing an autofollow Loop assignment

Links

- Programming a Link between 2 memories
- Programming Links among a group of memories
- Erasing a Link assignment
- Viewing Links

Loops

The Loop function strings together a series of numerically sequential memories for repetitive playback. Loops may contain any number of memories.

Loops are played back on the A/B fader and are assigned to controllers as chasers. Part Qs and Event assignments in Loops are supported only when the Loop is played back on the A/B crossfader.

Loop information is displayed in the Memory List, the crossfader playback area of the Stage Display, and the X-Fade Exam display

There are 6 types of Loops:

Type of Loop	What it does
Automatic continuous Loop	The Loop runs an infinite number of times. The crossfades from memory to memory are automatic.
Manual continuous Loop	The Loop runs an infinite number of times, but each memory waits for a go command.
Manual Loop	A manual Loop advances from memory to memory by a manual Go command for each memory within the Loop.
Finite Loop	The Loop is programmed to run a specified number of times.
Auto follow Loop	A second Loop is Linked to the preceding finite Loop.
Follow-on cue	A single Loop between memories creates a follow on cue.

Delay time is useful with Loops. Assigning a delay time to a memory in a Loop determines how long the previous memory remains on-stage before crossfading to the next memory in the Loop.

To select a range of memories:
Press **[MEMORY] [#] [→] [#]**.

Programming an automatic continuous Loop

An automatic continuous Loop runs continuously on its playback fader assignment until some action is taken (see Chapter 12 The A/B Crossfader and Chapter 13 Controllers)

Example: Program a Loop from memory 12 to 16

Keypresses	**Results/Comments**
1. Select memory 12	The Loop begins with crossfade to memory 12.
2. Press **[→]**	
3. Select the last memory in the Loop.	
4. Press **[LOOP]**	The memory range and *Loop* appear in the command line.
5. Press **[STORE]**	The Memory List displays a dash (-), denoting an automatic continuous Loop.

➢Note

If the memory already has a Loop assignment, the warning message *Loop Exists* appears. To override, simply press **[STORE]** once more.

Programming a manual continuous Loop

A manual continuous Loop advances from memory to memory by a manual Go command for each memory within the Loop. When the last memory of Loop is reached, the next Go command crossfades to the first memory of the Loop. This is analogous to stepping through a sequence of memories assigned to a chaser (See Chapter 13 – Controllers & Chasers).

Keypresses	**Results/Comments**
1. Select a range of memories	
2. Press **[LOOP]**	
3. Press **[LOOP]**	An asterisk (*) appears next to *Loop* In the command line denoting a manual continuous Loop.
4. Press **[STORE]**	Store the assignment. An asterisk (*) is displayed in the Memory List next to the initial memory of the Loop.

Programming a manual Loop

A manual Loop advances from memory to memory by a manual Go command for each memory within the Loop. When the last memory of Loop is reached, the next Go command crossfades to the first memory of the Loop. This is analogous to stepping through a sequence of memories assigned to a chaser (See Chapter 13 – Controllers).

Keypresses	Results/Comments
1. Select a range of memories	
2. Press **[LOOP]**	
3. Press **[→]**	*1* appears next to *Loop* In the command line denoting a manual Loop.
4. Press **[STORE]**	Store the assignment. An asterisk (*) is displayed in the Memory List next to the initial memory of the Loop.

Programming a finite Loop

Finite Loops run the allotted number of times and then stop. When a finite Loop running on A/B completes its run, the next Go command crossfades to the memory following the Loop sequence. When the finite Loop is assigned as a chaser, it runs the allotted number of times and stops. The next Go command for the chaser activates the Loop again.

Up to 250 Loops are allowed.

Example: Assign a Loop to run 5 times and then stop.

Keypresses	Results/Comments
1. Select a range of memories	
2. Press **[LOOP]**	
3. Enter 5 on the keypad.	Specify that the selected range of memories Loops 5 times before stopping.
4. Press **[STORE]**	The number of Loops is displayed in the Memory List next to the initial memory of the Loop.

Programming an autofollow Loop

An autofollow Loop is a Loop Linked to a preceding finite Loop. It begins its Loop when the finite Loop is complete. The second Loop in the autofollow Loop sequence can be any type of Loop.

Example: After memories 1 through 5 complete their final Loop, memories 6 through 10 will begin their Loop without any action on part of the board operator.

Keypresses	**Results/Comments**
1. Program a finite Loop for memories 1 → 5.	
2. Program any type Loop for memories 6 → 10.	
3. Select memory 1	
4. Press **[LOOP]**	
5. Press **[+]**	The command line reads *Auto Loop*.
6. Press **[STORE]**	The warning message *Loop Exists* is displayed
7. Press **[STORE]**	The icon >> >> is added to the Loop information.

Programming a follow-on cue

Utilize the Loop function to create a follow on cue. The Loop assignment automatically fades to the next memory in sequence.

Example: Program memory 12 as a follow-on to memory 11. Pressing **[GO]** crossfades to memory 11. Upon completion of the fade, the crossfade to memory 12 begins automatically. When memory 12 completes its fade the Loop sequence is complete.

Keypresses	**Results/Comments**
1. Select memory 11.	
2. Press **[LOOP]**	
3. Press **[STORE]**	*1* is automatically assigned as the Loop assignment for memory 11.

Erasing Loop assignments

Keypresses	Results/Comments
1. Select the first memory of the Loop.	
2. Press **[LOOP]**	
3. Press **[ERASE]**	The message *Memory # Stored* is displayed. If the Loop is assigned, the message *Memory On Board* is displayed; press **[ERASE]** again to confirm the command.

Erasing an autofollow Loop assignment

This cancels only the autofollow Loop, leaving the basic Loop assignment intact.

Keypresses	Results/Comments
1. Select the first memory of the autofollow Loop assignment.	
2. Press **[LOOP]**	
3. Press **[+]**	*Loop Auto follow* is displayed in the command line.
4. Press **[ERASE]**	Both memory ranges retain their Loop assignments. The Link between them is canceled.

Link

This function allows Linkage of two or more memories to playback sequentially regardless of numerical sequence. Linked sequences are supported on the A/B crossfader.

An example of the use of Links is when a range of memories, used as a chaser is assigned to run on a controller. You do not want this range of memories functioning as a chaser to sequence on the A/B crossfader. Link the memory immediately preceding the chaser sequence and the memory immediately following the chaser sequence.

Example: Memory 20 is linked to memory 31. Memory 31 follows memory 20 skipping any memories recorded between these two memories. Memory 32 continues the sequence after memory 31.

When a Link and a Loop are assigned to the same memory, the Llink overrides the Loop.

Programming a Link between two memories

Example: Link memories 20 and 30.

Keypresses	**Results/Comments**
1. Select memory 20	
2. Press **[LINK]**	
3. Select memory 30.	
4. Press **[STORE]**	If the memory already has a Loop assignment, the warning message *Loop Exists* appears. To override, simply press **[STORE]** once more. In Memory List, 30 is in the Link column under the for memory 20.

Programming a Link among a group of memories

Example: Link memories 1, 10, 3, and 12.

Keypresses	**Results/Comments**
1. Select memory 1.	
2. Select memory 10	The Memory List is displayed. Selected memories appear on a red field.
3. Select memory 3	
4. Select memory 12	
5. Press **[LINK]**	Creates a Llink from mem 1 to mem 10 to mem 3 to mem 12.
6. Press **[STORE]**	The Links are displayed in the Memory List.

Erasing a Llink assignment

Keypresses	Results/Comments
1. Select memory with the Link assignment.	
2. Press **[LINK]**	Select the Link function.
3. Press **[ERASE]**	The Link assignment is canceled. *Memory # Stored* is displayed.

Viewing Links

Keypresses	Results/Comments
1. Press **[LINK]**	
2. Press **[EXAM]**	The Memory List is displayed exactly as it is programmed to run on playback.

CHAPTER 11
DATA STORAGE, RETRIEVAL, & PRINTING

This chapter includes:

Navigating through the Hard Disk

The default drive of the system is C and the root directory is ACT. The current drive and directory are displayed at the top of the screen.

When navigating the hard Disk, you are working under the Change directory option. In this mode there is always a directory highlighted in blue.

If you are at beginning of the directory tree, journeying to a directory that contains the file you want to load or to record a file in a selected directory is straightforward.

Keypresses	**Results/Comments**
1. Go to the Load or Record menu.	The directories and files are displayed.
2. Press **F3 Change Dir**	
3. Use the arrow keys to place the cursor on the directory.	
4. Press **F1 Enter**	

Navigating to a “higher” directory

To navigate back to a “higher” directory you must always return to the previous layer by selecting <Up Dir>. <Up Dir> is the first line displayed in the directory or subdirectory list.

Example: You are currently in Opera//Home/Troupe A/Program A. You want to go to Opera/Home/Troupe B/ Program b.

This is your directory tree:

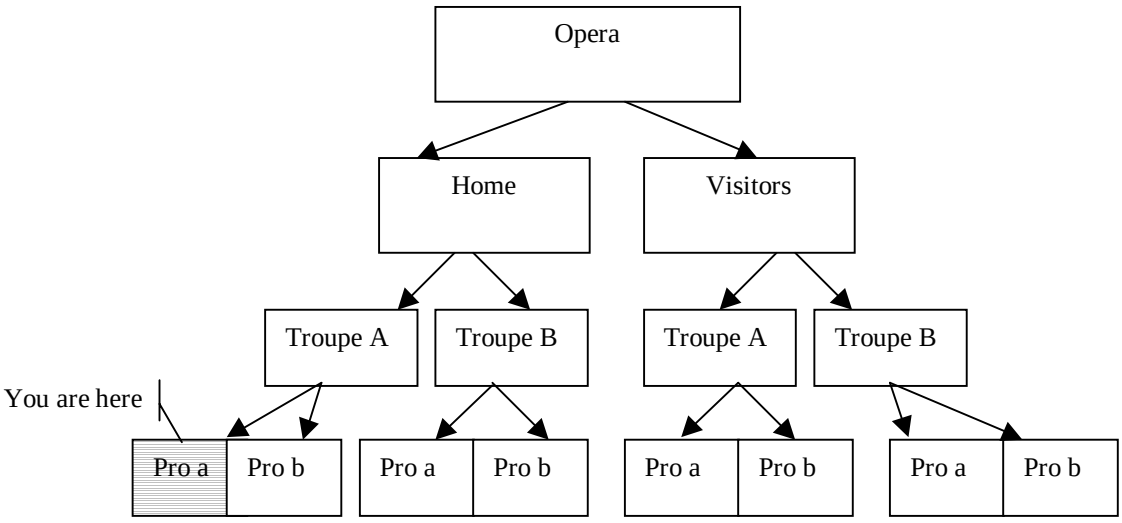


Figure 1 Navigating the Hard Disk

Keypresses

1. Press **F3 Change Dir**
2. Use the arrow keys to place the cursor on the <Up Dir> line.
3. Press **F1 Enter**

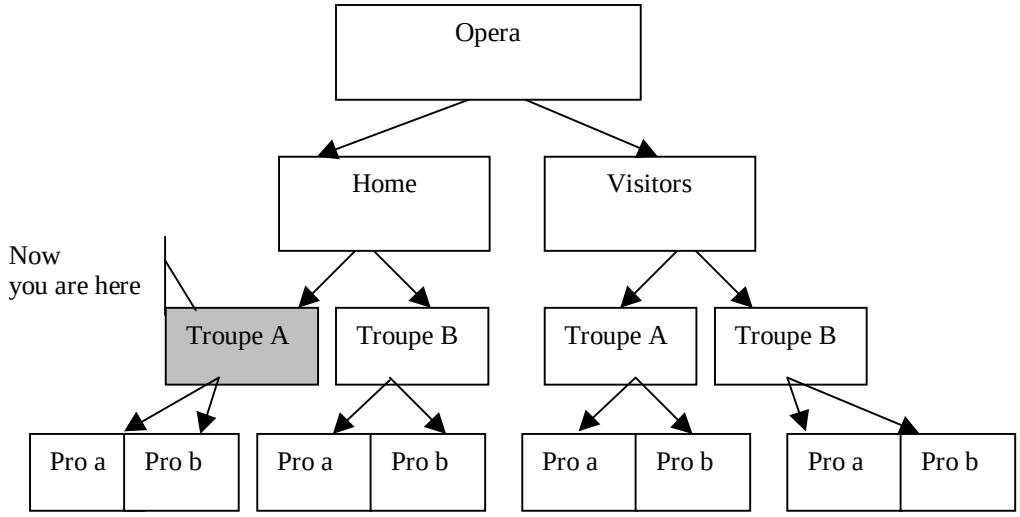


Figure 2 Navigating the Hard Disk

Keypresses

1. Use the arrow keys to place the cursor on the <Up Dir> line.
2. Press **F1 Enter**

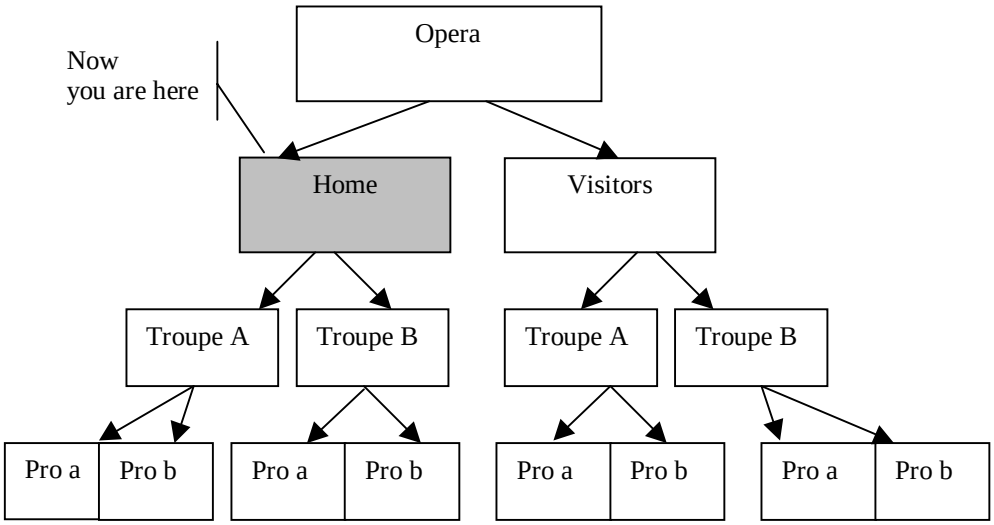


Figure 3 Navigating the Hard Disk

To continue navigating to the directory Troupe B, as per the example:

3. Press **F1 Enter**
4. Move the cursor to directory Troupe B and press **F1 Enter**.
5. Move the cursor to directory Pro b and press **F1 Enter**.
6. Now press **F5 Remain Here**. Continue by selecting the show file in directory Troupe B if you are in the Load menu or record a new show file in this directory if you are in the Record menu.

Returning to the Root directory

Return to the root directory from any of the other directories by pressing **F4 Return to Root**. .

If this option is not displayed, press **F3 Change Dir** and **then F4 Return to Root.**

In the example above, if you want to return to the Opera directory from your beginning position, pressing **F4 Return to Root** bumps you to the Opera directory.

Creating Directories

You may want, for example, a different directory for each of the performing groups that use your venue.

Keypresses	Results/Comments
1. Enter the Record menu.	The directories and files are displayed.
2. Press **F4 Make New Dir**	A prompt asking for the name of the new directory appears.
3. Type the name of the new directory on the alphanumeric keyboard.	There is space for 8 characters.
4. Press **F1 Enter**	The new directory is displayed.

Creating additional subdirectories

Example: Since the dance company Steps often performs at your venue, you have created a directory called *Steps*. This company performs a few different programs.

You can create subdirectories in the *Steps* directory called *program A*, *program B*, and *program C*. In each subdirectory you can save the show file for the dances included in the program.

Keypresses	Results/Comments
1. Press **F3 Change Dir**	
2. Use the arrow keys to highlight the directory.	
3. Press **F1 Enter**	
4. Press **F5 Remain Here**	
5. Press **F4 Make New Dir**	A prompt asking for the name of the new subdirectory appears.
6. Type the name of the sub directory on the alphanumeric keyboard.	
7. Press **F1 Enter**	You are now working in the new subdirectory.

Recording Show Files

Shows are recorded in the Record menu, menu number 5.

The entire contents of the console memory (including memories, patch, channel patch, scroller assignments, macros, libraries, etc.) are recorded onto the hard disk and onto a floppy diskette. Each show file is given a number. The file number is usually written in this format: ###.#.

A text label may be attached to the file number. A date and time stamp is automatically appended to the show file.

F2 Print acts as "Print Screen" and prints the current drive/directory display.

Recording a show file to the hard disk

The default directory is C:\act. If you want to record the show file in a different directory, you must change directories if you have not already done so.

If you are recording over a play number already in use: *Play Exists* is displayed. If you want to overwrite the data recorded on that play number press **F1 YES** again to confirm the command.

Keypresses	Results/Comments
1. Enter the Record menu.	The directories and files are displayed.
2. Press **F3 Change Dir**	
3. Use the arrow keys to highlight the directory you want to record to.	
4. Press **F1 Enter**	
5. Press **F5 Remain Here**	This notifies the system of your intention to continue working in the selected directory
6. Press **F1 Play/Act**	A prompt for the show file number is displayed.
7. Enter the show file number on the numeric keypad.	The show file can be up to 3 whole digits and a decimal number. Examples: 333.1, 28.2, 1.5, 0.3. A time and date stamp is automatically included.
8. Press **F2 Text** and type text on the alphanumeric keyboard.	This is optional.
9. Press **F1 Store**	The message *Are you sure?* is displayed.
10. Press **F1 Yes**	A progress bar is displayed while the disk drive is active. When the recording is complete, the message *Record Complete* is generated.

Recording a show file to the floppy disk

2Mb are available for show data. To make sure that Spark 4D automatically compresses the show file when recording to 1.44Mb diskettes, *Compress data on diskette*, in the System Parameters menu (see Chapter 24 – System Configuration), must be toggle to Yes.

If you are recording over a play number already in use: *Play Exists* is displayed. If you want to overwrite the data recorded on that play number press **F1 YES** again to confirm the command.

Keypresses	**Results/Comments**
1. Enter the Record menu.	The directories and files are displayed.
2. Insert a formatted diskette to the disk drive	Diskettes can be formatted on a PC or in Service Tools.
3. Press **F5 Change Drive**	
4. Select drive A:/	The contents of the diskette are displayed. If there is no diskette in the disk drive or if the diskette is damaged the system will display the message *Bad Diskette*.
5. Press **F1 Play/Act**	The prompt *Enter Play # In Format xxx.x* is displayed.
6. Use the numeric keypad to enter the play number.	If you enter a single digit the system will add .0. For example: If you enter 1 on the keypad the play number will be recorded as 1.0.
7. Press **F2 Text** (optional)	Text can be typed on the alphanumeric keyboard. When recording, the system automatically appends the date and time of the recording to the play number.
8. Press **F1 Store**	The system enters the record mode and asks *Are You Sure**?***
9. Press **F1 Yes**	If the diskette is write protected the message will read *Diskette Protected*. Correct the error and continue. When recording is complete the message *Record Complete* displayed.

Autosave

The Autosave function creates backup files that contain all of the current data. This enables you to restore the state of the system, including memories, Libraries, Macros, Snaps, etc.

Autosave is triggered automatically when the Autosave option in the System Parameters menu is enabled. Autosave creates backup files at 15-minute intervals and after 20 Store commands.

A progress bar is displayed when the console is Autosaving. There is no interruption to the console's operation.

You may also operate Autosave manually through the Trigger Autosave function in the Autosave menu (menu 25).

Autosave files are stored on the hard disk in a special directory, called Autosave. The Autosave directory is automatically created when the first Autosave occurs.

Autosave files are accessible only through the Autosave menu. The functions available are:

- Restore (load) an Autosave file
- Delete all Autosave files
- Trigger Autosave
- Lock or Unlock Autosave files.
- Abort Autosave

Determining the number of files saved

Each generation of a backup file is automatically given an identification number.

The ID numbers range from 1 - 999. When 999 is reached the number is reset to 1.

The number of files saved on the hard disk is determined by the entry for *Autosave # of Generations* in the System Parameters menu. The maximum number of generations is 8. Example: If you have programmed the system to save 4 generations the fifth generation of the Autosave file is given ID number 5 and generation 1 is deleted.

Warning! Each generation requires 2 Mb of hard Disk space.

Keypresses	Results/Comments
1. Enter the System Parameters menu.	
2. Use the arrow keys to select *Autosave # of Generations*.	
3. Press **F1 Enter**	The item is now highlighted in red.
4. Select the number of generations.	This number determines how many generations of backup files generated by the Autosave function are saved. The maximum number is 8.
5. Press **F1 Store**	The Autosave function is automatically enabled.

Disabling the Autosave function

When the Autosave function is disabled, no automatic Autosaves occur and it is not possible to manually trigger an Autosave in the Autosave menu.

Keypresses	**Results/Comments**
1. Enter the System Parameters menu.	
2. Use the arrow keys to select *Autosave # of Generations*.	
3. Press **F1 Enter**	The item is now highlighted in red.
4. Press **F3 Inactive**.	*Inactive* appears next to *Autosave # of Generations*.

Enabling the Autosave function

If you have disabled the Autosave function you restore the function by either assigning a number for Autosave generations or using the procedure described below. When the Autosave function is enabled an Autosave is triggered automatically. You can also manually trigger an Autosave in the Autosave menu.

Keypresses	**Results/Comments**
1. Enter the System Parameters menu.	
2. Use the arrow keys to select *Autosave # of Generations*.	
3. Press **F1 Enter**	The item is now highlighted in red.
4. Press **F2 ACTIVE**.	The number of generations appears after *Autosave # of Generations*.

Manually triggering an Autosave

An Autosave can be manually triggered. This option is available in the Autosave option under the Autosave Menu.

1. Enter the Autosave menu.	
2. Press **F3 Trigger Autosave**	While an Autosave is in progress a blue flag is displayed at the top of the screen.

Restoring (loading) Autosave files

You can restore a previous state of the system by loading an Autosave file.

Restoration can be accomplished only if the system configuration and software versions are identical to those in the Autosave files. If there is a discrepancy, a warning window opens and displays the differences. You must correct the discrepancy if you want to continue.

Restoring a previous generation erases all the current data.

Keypresses	Results/Comments
1. Enter the Autosave menu.	
2. Press **F1 Restore**	
3. Enter the generation number.	
4. Press **F1 Restore**	The message All *current data will be lost, Are you sure?* is displayed.
5. Press **F1 Yes**	The message *Restoring* is displayed. When complete, the message *Please Warm Start* is displayed.
6. Switch off Spark 4D.	
7. Power up.	The restored generation is now present in Spark 4D's memory and you can continue working as usual.

Locking Autosave files

Autosave generations can be locked to protect them from deletion. Locked files are stored on the hard disk until they are unlocked and deleted.

Keypresses	Results/Comments
1. Enter the Autosave menu.	
2. Press **F4 Lock/Unlock**	
3. Enter the generation number.	Select the generation number that you want to protect.
4. Press **F3 Comment**	This is optional.
5. Type your comment on the alphanumeric keyboard.	
6. Press **F1 Lock**	Locked generations are displayed in gray.

Unlocking locked Autosave files

Keypresses	Results/Comments
1. Enter the Autosave menu.	
2. Press **F4 Lock/Unlock**	
3. Enter the generation number.	Select the generation number that you want to unlock.
4. Press **F2 Unlock**	The unlocked generation can now be deleted from the hard disk.

Deleting all generations of Autosave files

The delete function deletes all of the unlocked generations. If you want to save some of the generations, lock them before executing the delete function.

When the system software has been changed, you must delete all Autosave generations. /

Keypresses	Results/Comments
1. Enter the Autosave menu.	
2. Press **F2 Delete All**	The system prompts for a confirmation command.
3. Press **F1 Yes**	All of the unlocked generations are deleted. The locked generations remain on the display.

Loading show files

The Load menu, menu 2, manages loading show files stored on the hard disk and the floppy disk.

Load options

You may choose to load only portions of the show file.

This is a very versatile function, saving much editing time by allowing different shows to share a common patch or mix output, transferring libraries and macros from show to show, etc. The different options are:

F1 All	All of the data contained in the show file is loaded.
F2 Patch Only	Load the patch tables only. Patch tables include Spot Patch, Channel Patch (including the DMX Input Patch), and Scroller Patch.
F3 QLists Only	Loads all memories from all QLists.
F4 From QList	Load memories from one or more selected QLists.
F5 Macro Only	Load only the macros.
F6 F1 Library Only	Choosing this option allows selecting **F1** All Libraries, **F2** Position Libraries, **F3** Gobo Libraries, or **F4** Color Libraries.
F6 F2 Mix Device Only	Load the mix device table only. Transferring the device table from show to show saves entering all the pertinent information again. Note that only the device table is loaded and not any patch assignments or output addresses.

➢Note

Shows that were recorded on Spark can be loaded to Spark 4D. Only memories are loaded. Snaps, Macros, and Events (Auto Assignments) are ignored. Also, device definitions compatible with Spark 4D must be loaded separately.

Load Warning messages

If there are memories assigned to playback devices (on board) while loading, memories whose numbers are identical to the memories on board are **NOT** loaded. There is a series of warning messages when there are assigned memories.

Type of Load	Message
All diskette or All QLists	*WARNING!! Memory/memories on board!*
One or a range of QLists	*WARNING!! Memory/memories from QList range on board!*
All libraries	*WARNING!! Memory/memories with Libraries on board!*
Position libraries only	*WARNING!! Memory/memories with Position Library on board!*
Gobo libraries only	*WARNING!! Memory/memories with Gobo Library on board!*
Color libraries only	*WARNING!! Memory/memories with Color Library on board!*

Selecting a show file from the hard disk

When entering the Load menu, the active directory is the last selected directory. If this directory does not contain the show that you want to load you must change directories.

Keypresses	**Results/Comments**
1. Enter the Load menu.	
2. Press **F3 Change Dir**	Skip this step if the directory you want is displayed.
3. Use the arrow keys and select the directory.	Skip this step if the directory you want is displayed.
4. Press **Enter**	Skip this step if the directory you want is displayed.
5. Press **F5 Remain Here**	Skip this step if the directory you want is displayed.
6. Press **F1 Play/Act**.	A prompt requests the play number.
7. Using the numeric keypad, enter the show file number.	
8. Press **F1 All Diskette** or select one of the other Load options.	
9. Press **F1 Yes**	While the system is loading a progress bar is shown in the upper right corner of the screen. The Memory List Exam is displayed when the load is complete. If you have made an error in entering the play number, the message *Bad Play Number* appears. Start again and enter the correct play number.

➢Note

When there is a show already in the console and loading another show file, selecting the Load All option, does not erase Macros, Libraries, and Events if the new show does not contain them.

Selecting a show file from the floppy disk

You must switch to drive A:\ if you have not already done so.

1. Press **F1 Play/Act #**	A prompt requests the play number.
2. Enter the show file numbe.	
3. Press **F1 All Diskette** or select another Load options.	
4. Press **F1 Yes**	A progress bar is shown in the upper right corner of the screen. The Memory List Exam is displayed when the load is complete. An error in the play number generates the message *Bad Play Number*. Start again and enter the correct play number.

Loading QLists

You can load QLists as they are recorded in the show file.

Example: Your show file contains QLists 1, 2, 20, and 30. You want to load the Q-Lists exactly as they appear in your show file.

Keypresses	Results/Comments
1. Enter the Load menu.	
2. If you are loading from the hard Disk go to the directory containing the show file.	
3. Press **F1 Play/Act**	Spark 4D prompts for the show file number.
4. Enter the show file using the numeric keypad.	
5. Press **F4 From QList #**	Spark 4D automatically enters the number of the Q List that is the current default QList. You can change this now.
6. For this example, make sure that you are loading to Q-List 1.	
7. Press **F2 Thru QList #**	Spark 4D prompts for the last QList in the range.
8. For this example, enter 30 at the prompt.	
9. Press **F1 Start at QList #**	Spark 4D automatically enters the number of the Q List that is the current default QList. You can change this now.
10. For this example, make sure that you are loading to QList 1.	
11. Press **F1 Load**	The message *Are you Sure?* is displayed.
12. Press **F1 Yes**	QList 1 is loaded as QList 1, QList 2 is loaded as QList 2, QList 20 is loaded, and QList 30 is loaded as QList 30.

Loading to a selected QList

You can load all the memories from a QList, a selected range of memories from a Q-List, or a range of Q-Lists while renaming the Q-Lists.

Example: Load Q Lists 1 – 6 as Q Lists 91 – 96. The default QList is QList 1.

Keypresses	**Results/Comments**
1. Enter the Load menu.	
2. Go to the correct drive or directory.	
3. Press **F1 Play/Act**	Spark 4D prompts for the show file.
4. Enter the show file number.	
5. Press **F4 From QList**	Spark 4D automatically enters the default Q List number.
6. Press **F2 Thru Q list #**	
7. Enter 6 on the numeric keypad.	
8. Press **F1 Start at Q list #**	Spark 4D prompts for the target Q-List.
9. Enter 91 on the numeric keypad.	
10. Press **F1 Load**	The message *Are you Sure?* is displayed.
11. Press **F1 Yes**	All of the memories in Q List 1 – 6 are loaded to Q Lists 91 – 96.

Example: Load a range of memories from Q-List 1 as Q-List 21

Keypresses	**Results/Comments**
1. Enter the Load menu.	
2. Go to the correct drive or directory.	
3. Press **F1 Play/Act**	Spark 4D prompts for the show file.
4. Enter the show file using the numeric keypad.	
5. Press **F4 From QList**	Spark 4D automatically enters the default Q List number.
6. Press F3 Mem # and enter the first memory of the range.	
7. Press F2 Mem # and enter the last memory of the range.	
8. Press **F1 To Q list #**	Spark 4D prompts for the target Q-List.
9. For this example, enter 21 on the numeric keypad.	
10. Press **F1 Load**	The message *Are you Sure?* is displayed.
11. Press **F1 Yes**	All of the memories in Q List 1 – 6 are loaded to Q Lists 91 – 96.

Warning Difference

If the show file was recorded under a system configuration different than the current one, the **WARNING DIFFERENCE** window is displayed when you attempt to load the show.

The **WARNING DIFFERENCE** window displays the current system configuration, the configuration read from the hard disk or the diskette, and the show file. A list of all the tables (Scroller Table, Channel Patch, Spot Patch, Mix Output Patch, and Input Patch) is also displayed. The Patch tables are affected when loading under Warning Difference. You can choose how to handle loading the Patch tables, see below.

As a rule of thumb, if the item is larger in the show data than it is in the current system configuration, then **clear** and **don't load** are the choices. If the item is larger in the current system configuration than the on the disk then **merge** and **don't load** are the options.

Keypresses	**Results/Comments**
1. Use **F2** ↑↓ to select options.	
2. Use **F3** to toggle between the choices **Merge/Clear** and **Don't Load**.	
3. Press **F1 LOAD**	The load operation is executed.

Don't Load None of the information contained in the show file pertaining to the specific patch table is loaded. Example: the configuration in the show files is 512 channels. The current system configuration is 420 channels. No information from the Channel Patch is loaded. The default Channel Patch will be present after the load is complete.

Clear When the configuration recorded in the show file is larger than the Spark 4D's current configuration, the extraneous data is cleared. Example: the configuration in the show files is 512 channels. The current system configuration is 420 channels. All channels and related soft patch greater than 420 channels is not loaded.

Merge When the configuration recorded in the show file is smaller than the Spark 4D's current configuration, the data contained in the show file is merged into the current configuration. Example: the configuration in the show files is 376 channels. The current system configuration is 420 channels. All channels and related soft patch up to channel 420 is loaded.

➢Note

It is always expedient to load The System Configuration (see appendix A Service Tools - Disk Operations) before loading show files and avoid loading under WARNING DIFFERENCE, as differences in the toggles in Special Functions and the entries in Special Numbers also influence the console's function.

Deleting Show Files And Directories

Delete Play/Act is menu number 14.

Use this menu to delete show files recorded on the hard or floppy disk and to delete directories from the hard disk.

Deleting a show file

Keypresses	Results/Comments
1. Go the Delete Play/Act menu.	
2. Select the drive and directory containing the show file for deletion.	
3. If working in the hard disk, Press **F5 Remain Here**	
4. Press **F1 Play/Act**	The prompt asks for the show file number.
5. Select the file number.	
6. Press **F1 Delete**	The message *Are you sure?* is displayed.
7. Press **F1 Yes**.	The show file is deleted.

Deleting a directory

You can delete a directory only if the directory is empty. Before attempting to delete a directory you must delete all of the show files and subdirectories.

Keypresses	Results/Comments
1. Go to the Delete Play/Act menu.	
2. Select the drive and directory containing the show file for deletion.	
3. Press **F4 Delete Dir**	
4. Use the arrow keys to select the directory.	
5. Press **F1 Delete**	The message *Are you sure?* is displayed. If the directory is not empty an error message is displayed.

Printing

The Printer menu is menu number 7. It is suggested to print for documentation purposes and a printout is a lifesaver if your disk is damaged.

Printing options

Options	What it prints
F1 Memory sheet	This is the memory list (cue sheet) displayed as Memory Exam. The memories are listed in numerical order, with fade times, text, Part assignments, and Events.
F2 Memory/s contents	Single memories, a range of memories, or all the memories may be printed. The printout contains the memory number, all spots and parameters assignments, all channels and intensity assignments, scroller assignments, fade times, part times, and text.
F3 Macro	Print all of the macros.
F4 Free Channels	Channels that are not used in any of the memories.
F5 Channel Patch	Print the Channel patch table.
F6 F1 Tracking Sheet	Print the tracking of channel assignments in memories – the display shown when requesting **[CHANNEL] [MEMORY] [EXAM]**.
F6 F2 Effect/s	Print the list of Effects.
F6 F3 Lib Position	Print all or some of the libraries. Either the contents of the selected libraries or a track sheet can be printed.
F6 F4 Lib Gobo	Print all or some of the libraries. Either the contents of the selected libraries or a track sheet can be printed.
F6 F5 Lib Color	Print all or some of the libraries. Either the contents of the selected libraries or a track sheet can be printed.

Using Print Screen

Pressing **Print Screen** on your text keyboard prints what is currently displayed.

Unlock the text keyboard by pressing **Alt a**.

Programming a print command macro

You can program a macro that works as Print Screen.

Keypresses

1. Go to the Macro menu (menu 9).
2. Press **F1 Create**.
3. Select the macro number.
4. Press **F6** and **F4 Print**
5. Press **F1 Store Macro**.

CHAPTER 12
THE CROSSFADER

This chapter includes:

Overview

The A/B crossfader is a split crossfader, which accepts memory assignments, loop assignments, and editor group assignments. All crossfader assignments can include both channels and spots.

A and B each have an LED display that shows the current and incoming memories.

When both A and B are at the top end stop, A is the active fader at 100%. When both A and B are at the bottom end stop, B is the active fader at 100%. When A and B are not at the end stops they both influence the output.

Memories are played back in numerical sequence. When **[SEQ]** is enabled (LED on) memories are played back in sequential order. The crossfader supports links between non-sequential memories.

Crossfades can be executed manually, by moving the faders, or automatically. The crossfade rate derives from the fade time assignments in the memories. The crossfade rate can be manually overridden with the Rate wheel.

The automatic crossfade commands include Go, GOTO (multifade), Backfade, and Hold. The crossfaders support Part Qs and Auto Event assignments (see Chapter 16 Part Qs and Chapter 23 Event).

Displays

Information pertaining to the A/B crossfader appears in the Playback Display. The Playback display is part of display formats 1, 3, 5, and 7. The information includes:

- The current memory
- The next memory
- Q-List information (see Chapter 20 Q-Lists)
- Loop information
- Fade time assignments
- Fade Rate status
- Auto Event status
- Dynamic display of fade progress.

An expanded crossfader display is available on the X-Fade Exam (display formats 6, and 7). The X-fade Exam format is usually used during playback. The display includes:

- A bar graph that tracks the fade's progress
- A list of the next memories
- Previous memory
- Loop information
- Fade Rate status
- Controller/Chaser status.

Assigning Memories to the Crossfader

The A/B crossfader accepts assignments of memories and editor groups.

When you assign a memory **[SEQ]** and the Auto Assign function are automatically enabled; the LED for **[SEQ]** is on and the Auto Assign Led is on. When the assignment is an editor group **[SEQ]** and Auto Assign are not functional.

[SEQ] can be manually disabled and enabled.

When you assign a memory or an editor group to the active fader (the fader that is at 100%), the memory becomes active immediately. It is recommended to assign the memory to the fader that is not active to avoid bumping in a memory as this can cause lamp burnout.

Example: Assign memory 1 to A. B is the active fader.

Keypresses	**Results/Comments**
1. Set both faders at their bottom end stop (B is active).	
2. Select memory 1.	
3. Press **[A]**	*1* appears on A's LED display.
4. Press **[GO]** or move the faders manually.	A crossfade from blackout to memory 1 occurs. **[SEQ]** and **[AUTO]** function are automatically enabled; the LED for **[SEQ]** is on and the Auto Assign Led is on.

You can also assign memories by using **[GO TO]**. Depending on the key sequence used this method fades the memory in 1 second (default fade time), in the fade time recorded for the selected memory, or in selected fade time.

Fade to the assignment in 1 second:

Keypresses	**Results/Comments**
1. Select a memory.	
2. Press **[GO TO]**	The selected memory is faded to the active fader in 1 second fade. **[SEQ]** and **[AUTO]** function are automatically enabled; the LED for **[SEQ]** is on and the Auto Assign Led is on.

Fade to the assignment in recorded fade time:

Keypresses	**Results/Comments**
1. Select a memory.	
2. Press **[TIME]**	
3. Press **[GO TO]**	The selected memory is faded to the active fader. The fade rate is according to the time assignments in the selected memory. **[SEQ]** and **[AUTO]** function are automatically enabled; the LED for **[SEQ]** is on and the Auto Assign Led is on.

Fade to the assignment in selected fade time:

Example: Assign memory 1 to the free fader in an 8 second fade.

Keypresses	Results/Comments
1. Select memory 1.	
2. Press **[TIME]**	
3. Press **[8]** on the numeric keypad.	
4. Press **[GO TO]**	The selected memory is faded to the active fader. The fade rate is according to the time selected. **[SEQ]** and **[AUTO]** function are automatically enabled; the LED for **[SEQ]** is on and the Auto Assign Led is on.

Assigning Editor Groups

You can assign the channels and spots in the editor to A or B. The LED display shows *grp* when the assignment is the editor group.

You can fade to the grp assignment by manually moving the faders or by pressing **GO**.

Important! The selected (displayed in red) channels and spots are assigned. If there are no selected (red) spots and channels the entire editor is assigned.

Example: Channels 1 – 6 at Full are in the editor, displayed in white. Channel 10 at Full is selected in the editor, displayed in red. If you now assign to A/B, only channel 10 is assigned. If you want to assign channels 1 – 6 also, press **[ENTER]** before assignment.

Keypresses	Results/Comments
1. Select channels/spots and assign values.	
2. Press **[A]** or **[B]**	*Grp* is displayed in the LED window for A or B. The channels and spots appear in blue on the Stage display.

Freeing assignments

When an assignment is freed, the output of the spots and channels in the assignment blacks out .If they are active in the editor or on a controller their output bumps to the level determined in that assignment.

Example: Free the assignment from A.

Keypresses	Results/Comments
1. Press **[FREE]**	The message *Assign Key Expected* is displayed.
2. Press **[A]**	The assignment is released. The channels and spots released from A black out or if they are active in the editor or on a controller output at the level of that assignment.

Free both A and B:

Keypresses	**Results/Comments**
1. Press and hold **[FREE]**	The message *Assign Key Expected* is displayed.
2. Press **[A]** and then press **[B]**	The assignments are released. The channels and spots released from A black out or if they are active in the editor or on a controller output at the level of that assignment.

➢**Note**

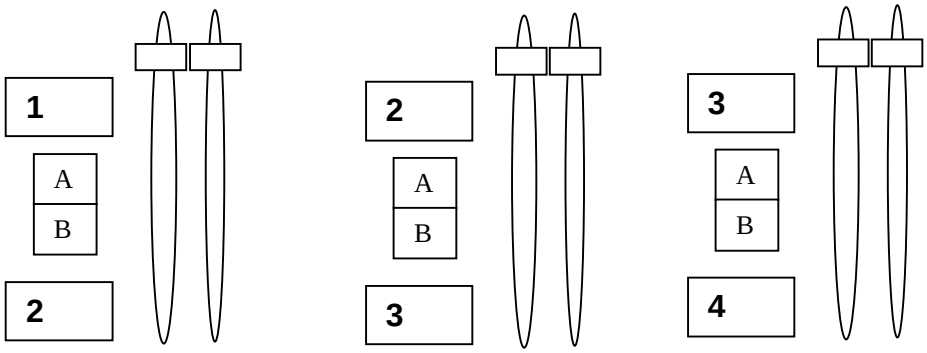
[SEQ] is disabled when the memory assignment on either A or B is freed.

[SEQ] and **[AUTO]** are disabled when the assignments from both A and B are freed.

Sequencing Memories

The **[SEQ]** key must be enabled (LED on) for memories to sequence on the crossfaders. Memories sequence numerically or according to Link assignments.

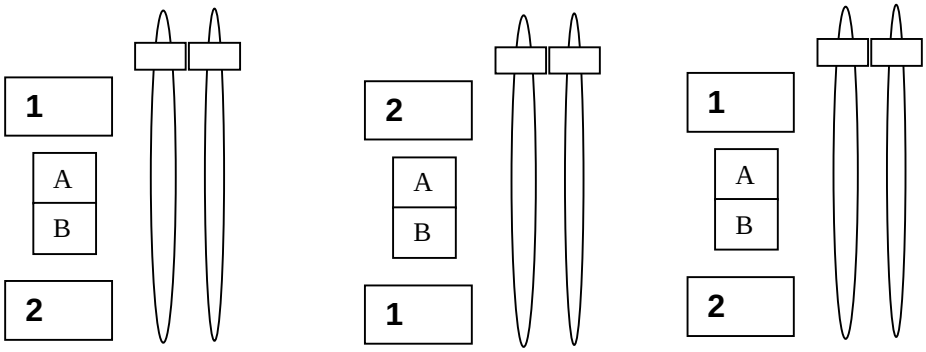
[SEQ] enabled: Original assignment After 1st crossfade After 2nd crossfade



Sometimes you might want to disable the memory sequencing. The sequencing function can be manually disabled by pressing **[SEQ]**. When disabled the LED is off. All crossfades now take place between the assignments on A and B.

Example: Memory 1 is assigned to A and memory 2 is assigned to B. You want memory 1 to remain assigned opposite memory 2 even after crossfading to memory 2. Disable **[SEQ]**

[SEQ] disabled: Original assignment After 1st crossfade After 2nd crossfade



Playback

The keys used for playback control are grouped around the crossfaders.

Key	Function or Command
[A]	Press to assign a memory or an editor group.
[B]	Press to assign a memory or an editor group.
[GO]	Pressing **[GO]** initiates a crossfade to the incoming assignment. The duration and look of the fade depends on the fade times of the incoming memory. While a crossfade is in progress, the LED is on.
[GO TO]	Pressing **[GOTO]**, in the middle of a crossfade, begins an immediate fade to the next memory. Example: if there is a crossfade in progress from memory 1 to memory 2, pressing **[GOTO]** begins a crossfade to memory 3. This is called a multifade. During a multifade, m*ult* is displayed in the LED window. You can press this key more than once in succession.
[BACK]	You can press this key more than once in succession.
[HOLD]	Pressing **[HOLD]** halts a crossfade at any point in its progress. When the crossfade is on Hold, the LED of the **[GO]** key flashes.
[SEQ]	When enable (LED on) memories assigned to the crossfader automatically sequence in numerical order. When disabled (LED off) manual and automatic crossfaders are between the current assignments and the memories do not sequence.
[AUTO]	When active (Auto Assign LED on) Events assigned to memories operate as the memory sequences on the A/B crossfader. When not active (Auto Assign LED off) Events assigned to memories do not operate.

Automatic Go

Pressing **[GO]** initiates a crossfade between the currently active assignment and the assignment “on board” (incoming assignment):

Incoming assignment	Fade time
A memory	Assigned fade times
grp	Default Fade Time in the System Parameters menu
no incoming assignment	Default Fade Time in the System Parameters menu

Important! When the faders are off their end stops the automatic Go command does not work, The error message *Go has no time* or *Go direction?* Is displayed. To perform an automatic fade, you must manually return the faders to the end stop.

Exiting a continuous automatic or manual loop

When you are running a continuous automatic (infinite) loop or a continuous manual loop on A/B you must manually exit the loop.

Keypresses	Results/Comments
1. Press **[MEMORY]**	
2. Press **[GO TO]**	An immediate crossfade to the memory following the loop is initiated. The crossfade occurs in the recorded memory time.

➢**Tip**
Make a macro for this key sequence to provide a single press exit from loops.

Modifying the Fade Rate

You can manually take over the fade rate during a fade with the crossfaders and the rate wheel or preset a fade rate using the rate wheel.

The default fade rate is the fade times recorded in the incoming assignment. The default is displayed as *MEM* on the playback display.

Moving the crossfaders manually

When a fade is in progress you can change the fade rate by manually "capturing" the fade.

Keypresses	Results/Comments
1. Press **[GO]**	
2. Move the faders until you overtake the fade.	When you have captured the fade the LED on **[GO]** is extinguished.
3. Continue moving the faders until the fade is complete.	

Using the Rate Wheel

You can use the Rate wheel to modify the fade time. Using the rate wheel allows you to override the rate of a fade in progress or preset a modified rate time. Modified rate times remain in force for all crossfades as long as the **[RATE A/B]** key is enabled.

The Rate wheel's range is from 'cut' to 'hold'.

As long as the LED of the key is on, the wheel accesses the fade rate.

Keypresses	Results/Comments
1. Press **[A/B RATE]**	The key's LED is on. The fade rate in the Playback display is shown on a blue field.
2. Use the Rate wheel (wheel 3) to modify the crossfade rate.	The modified rate fade is appears in percentage on the Playback display.

Returning to MEM time

Keypresses	Results/Comments
1. Press **[A/B RATE]**	The key's LED goes off. The fade rate is displayed on a gray background.
2. Press on **[GO]** or **[BACK]**	The crossfade is executed in memory time. *MEM* is displayed on the Playback display.

Split crossfaders and moving lights

When the crossfaders are split (for example, A is on 30% and B is on 60%), spots and scrollers are controlled differently than channels. Channels are always on a Highest Takes Precedence basis. Fader A controls spots and scrollers.

If A is the active fader (both A and B at the upper end stop), moving fader B does **not** affect the spots and scrollers. Moving fader A, fades spots and scrollers from the values in the assignment on A to the values in the assignment on B. Continuous parameters fade. Discrete step and mixed step parameters jump when the A fader is moved off its end stop.

Example: Fader A is the active fader. Spot 5 is output from A and all parameters have a value of FL. the incoming memory (on B) also contains spot 5 with all parameter values at 50. Move fader A from its end stop. The parameter values fade from FL to 50 (the value in the incoming memory).

If B is the active fader (both A and B at their lower end stop), moving fader B fades parameters to their values in assignment A.

LookAhead/ForceBlack

The Look Ahead/Force Black features enable spot parameter and scroller changes that take place during crossfades to occur under blackout.

Two functions comprise this feature: Look Ahead and Forced Black Tracking.

LookAhead/ForceBlack operates on the crossfaders (A/B and C/D) only. In the case of conflict between A/B and C/D, A/B takes precedence.

The LookAhead/ForceBlack feature compares the incoming memory to the memory active on the crossfaders (the outgoing memory).

LookAhead identifies elements in the incoming memory that are defined in the LookAhead Mask (see below). When the memory contains a parameter defined in the LookAhead Mask the parameter is automatically faded or jumped to the value in the incoming memory under 2 conditions:

1. The dimmer is not active
2. The values are different in the incoming memory.

When the fade to the incoming memory begins the elements are already at the correct value, thus avoiding changes under an active dimmer.

Slow elements (scrollers, pan, and tilt) fade during the dimmer blackout. Fast elements (all spot parameters except pan and tilt) jump to their incoming values as soon as their dimmer reaches zero. Slow elements fade at the rate set in *LookAhead /ForceBlack/Fade Rate* in the System Parameters menu.

LookAhead Overview

The console identifies "Parameter Move" memories. A Parameter Move memory is an incoming memory where a spot parameter value or a scroller frame is different from the value in the previous memory and the spot's or channel's dimmer is active in the incoming memory, the outgoing memory, or both. In other words, a crossfade to the next memory where a visible change, due to an active dimmer, occurs in spot parameters and scroller frames.

Use the LookAhead feature to insert a memory that blacks out the dimmer of the changing elements. The parameter or frame changes while the dimmer is blacked out.

Example: In memory 1 channel 3 is at Full and frame 1. In memory 2 channel 3 is at Full and frame 8. Insert the LookAhead memory (memory 1.5); memory 1.5 is automatically looped to memory 2 and memory 2 is assigned a delay time if necessary. When channel 3's dimmer reaches 0%, during the fade to memory 1.5, the scroller changes to frame 8. When the change is complete the fade to memory 2 begins.

The LookAhead feature can also work automatically. LookAhead identifies memories where the element's dimmer is dark and automatically changes the frame or spot parameter value in accordance with the incoming memory.

Example: In memory 1 channel 3 is at Full and frame 1. In memory 2 channel 3 is at 0%. In memory 3 channel 3 is at Full and frame 8. Memory 2 is identified as a LookAhead memory; when the fade to memory 2 is complete, the scroller fades to frame 8 in preparation for memory 3.

Parameter Move memories are flagged in the Memory List by a circular arrow when the moving element is included in the LookAhead Mask (see below for LookAhead Mask.)

In specific memory exams the Parameter Move elements are displayed on a yellow field.

Moving elements (elements fading under an active dimmer) are displayed on a yellow field when the memory preceding the parameter move memory is modified under memory Modification.

➢Note

Parameter Move elements with Part assignments are ignored by LookAhead even if they included in the LookAhead Mask. You can use this feature to temporarily exclude elements that are in the LookAhead mask by assigning them a Part.

Configuring the console for LookAhead/ForceBlack

LookAhead /ForceBlack/Fade Rate, a switch in the System Parameters menu, enables and disables the LookAhead and ForceBlack features. The default is LookAhead/ForceBlack disabled (off). You have the option of enabling LookAhead only, ForceBlack only, or both.

The default is LookAhead and ForceBlack disabled. This affects the playback only. The moving elements are still marked and LookAhead memories can be programmed. When ForceBlack is disabled you can still force a blackout before pressing Go.

When Enabled (On) the default fade rate is 50. The fade rate is the rate of the percent of change per second that the scroller or parameter move takes within the blackout. The default LookAhead and ForceBlack fade rate is 50.

➢Tip

If scrollers are moving too fast lower the LookAhead rate.

When *Autoloop LookAhead Cues* is toggled to Yes, the memory immediately following a LookAhead memory is automatically assigned as a follow-on cue and receives a Delay time. Automatically entered Delay times re preceded by a red *A* in the Memory List. The default is Auto Loop Yes.

If toggled to No, you must program the follow-on cue and enter the Delay time manually.

The Delay time is determined by the amount of time that it takes the moving element to arrive at its new value, referencing the LookAhead Rate in the System Parameters menu.

LookAhead Mask

The LookAhead Mask defines the elements (spot parameters and scrollers) that are taken into consideration when applying the LookAhead/ForceBlack feature.

The default LookAhead Mask contains all scrollers that are assigned channels.

Spot parameters must added manually.

Elements can be added to or removed from the LookAhead Mask.

The LookAhead Mask is saved with the show file.

Adding elements to the LookAhead Mask

Keypresses	Results/Comments
1. Select spots and parameters or select channels	
2. Press **[LookAhead]**	The message *Store/Erase Expected* is displayed.
3. Press **[STORE]**	The LookAhead Mask is displayed. The next keypress bumps out of this display.

You can also use Filters to define the LookAhead Mask

Keypresses	Results/Comments
1. Press **[FILTER]** and enter a Filter number on the keypad.	
2. Press **[LookAhead]**	The message *Store/Erase Expected* is displayed.
3. Press **[STORE]**	The elements active in the Filter are stored in the LookAhead Mask. The LookAhead Mask is displayed. The next keypress bumps out of this display.

Examining the LookAhead Mask

Keypresses	Results/Comments
1. Press **[LookAhead]**	
2. Press **[EXAM]**	

Removing elements from the LookAhead Mask

Keypresses	Results/Comments
1. Select spots and parameters or channels.	
2. Press **[LookAhead]**	The message *Store/Erase Expected* is displayed.
3. Press **[ERASE]**	The LookAhead Mask is displayed. The next keypress bumps out of this display.

Inserting a LookAhead memory

You can manually insert LookAhead memories.

LookAhead memories must be assigned memory numbers. Example: Insert a LookAhead memory between memories 1 and 2. You can enter 1.1 for the LookAhead memory. If you do not enter a number when storing a LookAhead memory the console automatically assigns a memory number. If you insert a LookAhead memory between memories 1 and 2 the console assigns 1.5 to the LookAhead memory. If inserting a LookAhead memory between memories 1 and 3 the console assigns 2 as the LookAhead memory.

When the partial blackout (LookAhead) memory is inserted manually it appears in the Memory List preceded by an *L*.

When manually inserting LookAhead memories a Delay time is automatically assigned to the incoming memory.

The switch *Autoloop LookAhead Cues* in the System Parameters menu enables or disables automatic looping of a LookAhead memory to the next memory. Enabled is the default setting.

The system also automatically assigns a delay time to the memory following a LookAhead memory. The console calculates this delay time. The delay time is assigned to allow enough time for the change to the new scroller or parameter value. If the LookAhead memory is erased the Delay time is erased also,

Example: Memory 1 has channel 3 Full at frame 1. Memory 2 has channel 3 Full at frame 8. There are no memories between memories 1 and 2.

Keypresses	Results/Comments
1. Select memory 1	
2. Press **[LookAhead] [LookAhead]**	Elements included in the LookAhead memory are displayed in dark blue.
3. Press **[STORE]**	The message *Memory 1.5 Stored* is displayed. There is now a loop from memory 1.5 to memory 2. Memory is automatically assigned a delay time.

You can also select a memory number for the LookAhead memory.

Keypresses	Results/Comments
1. Select memory 1	
2. Press **[LookAhead] [LookAhead]**	Elements included in the LookAhead memory are displayed in dark blue.
3. Press **[=]**	*Memory* is written on the command line.
4. Enter a number on the numeric keypad.	
5. Press **[STORE]**	The message *Memory # Stored* is displayed. There is now a loop from memory the new LookAhead to the next memory.

Inserting LookAhead memory for some of the elements

You can insert a LookAhead memory for only some of the elements contained in the LookAhead Mask.

Example: Insert a LookAhead memory for some of the elements between memories 1 and 2.

Keypresses	Results/Comments
1. Select memory 1	
2. Select channels or spots and parameters.	The elements that you select must be included in the LookAhead Mask.
3. Press **[LookAhead] [LookAhead]**	Elements included in the LookAhead memory are displayed in dark blue.
4. Press **[STORE]**	The message *Memory 1.5 Stored* is displayed. There is now a loop from memory 1.5 to memory 2. Memory is automatically assigned a delay time.

Examining a memory for LookAhead activity

You can examine memories for LookAhead activity. The exam shows you which elements are included in the LookAhead memory.

Keypresses	Results/Comments
1. Select memory 1.5 (LookAhead memory)	
2. Press **[EXAM]**	The regular memory exam in displayed.
3. Press **[LookAhead**]	The elements participating in LookAhead are flagged with *La*.
4. Use [+] and [-] to view next or previous memories.	LookAhead information is displayed.

➢Note

If the memory you are examining does not have any LookAhead activity, the message *No LookAhead Activity* is displayed.

ForceBlack Overview

When you have 2 consecutive memories with spot parameter or scroller changes under active dimmers and no LookAhead memory separating the memories, you can use **[ForceBlack]** to force a LookAhead type operation

Forced Black Tracking divides the crossfade between the memories into 3 parts:

1. The dimmer fades down. The elements under consideration remain at their outgoing values.
2. The dimmer is held at 0%. The elements jump or fade to the values of the incoming memory.
3. The dimmer fades up. The elements remain at the values of the incoming memory.

ForceBlack can be executed on the fly or a memory can be permanently designated as ForceBlack memory. Memories designated as ForceBlack are flagged with an *F* in the Memory List.

ForceBlack references the LookAhead Mask, operating only on the elements contained in the Mask.

Using ForceBlack

ForceBlack can be used just before pressing **[GO]** for A/B or C/D. Memories can be designated as ForceBlack memories.

ForceBlack does not change the overall fade time of the memory. The down fade and the up fade of the dimmer during ForceBlack are equally divided.

➢Note

Elements with Part assignments do not respond to ForceBlack. If the dimmer has a Part assignment none of the elements in the spot respond to ForceBlack.

Instant ForceBlack

Keypresses	Results/Comments
1. Press **[ForceBlack]**	The message *Go/Exam Expected* is displayed.
2. Press **[GO]**	The dimmers for the elements in the LookAhead Mask go to 0, the element fade/jump to their incoming value, the dimmers fade to their incoming value.

Designating a ForceBlack memory

Keypresses	Results/Comments
1. Select the memory	You can select a range or a group of memories.
2. Press **[ForceBlack]**	
3. Press **[STORE]**	An *F* flags this memory in the Memory List

Removing ForceBlack

Keypresses	Results/Comments
1. Select the memory.	You can select a range or a group of memories.
2. Press **[ForceBlack]**	
3. Press **[ERASE]**	The *F* flag is erased and the memory no longer crossfades under the ForceBlack operation.

CHAPTER 13
CONTROLLERS AND CHASERS

Overview

Spark 4D has 20 Controllers. Each controller has a colored LED and a Soft Key/Bump Button.

In Assign mode, controllers accept group, memory, spot parameter, and up to 10 chaser assignments. The Soft Key/Bump button functions as an Assign key.

Controllers can be assigned as inhibitive submasters.

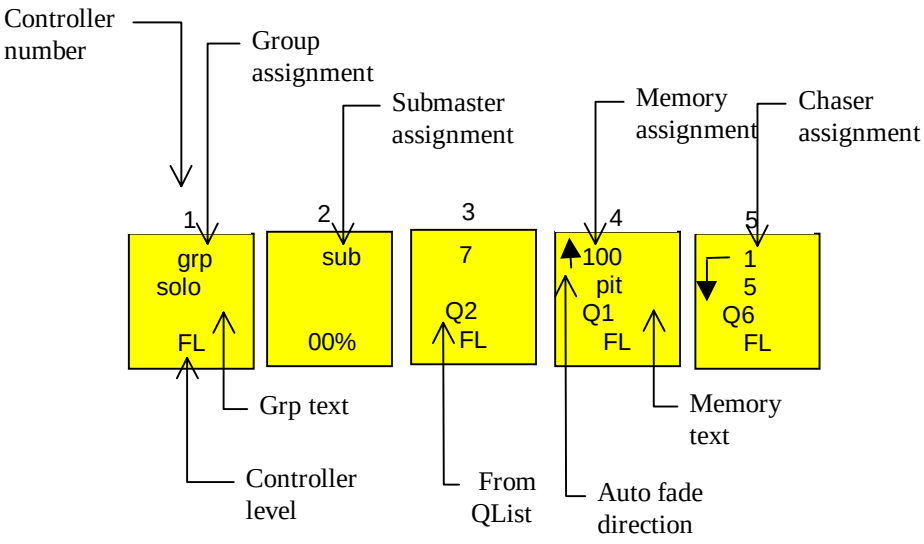
Group and memory assignments can be faded manually or given an automatic Go command. Chasers playback in hard run mode or soft run mode.

Output from the controllers appears in orange on the Stage display.

Displays

The Playback display, in display formats 1,3,5, and 7, has an area for Controller display.

When the default mode is Assign, the controller display may look like this:

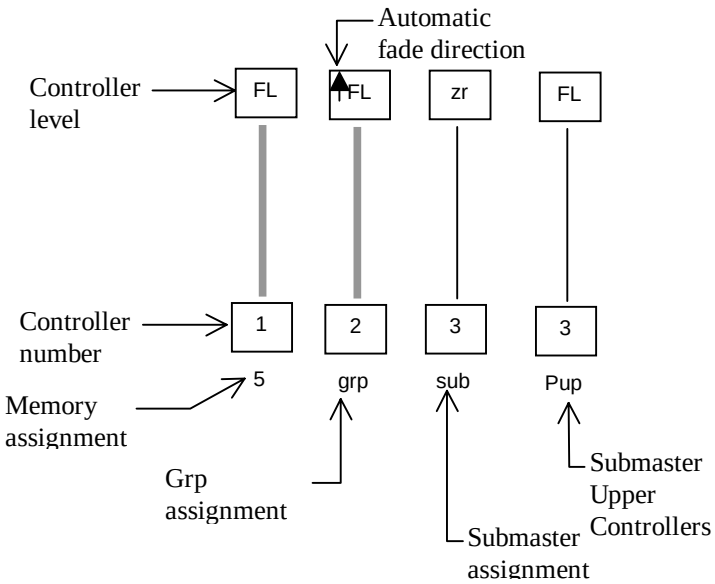


Information pertaining to the Controllers is displayed on the monitor.

Type of assignments	**Contents**	**On monitor**
Group	One or more spots One or more channels Spots and channels Selected spot parameters	grp text
Memory	Single memory assignments	the memory number QList memory text
Submaster	One or more spots and channels	sub text
Chasers	A range of memories Chaser run mode	the current and incoming memory the run mode run status

The XFade Exam, display format 6, also contains Controller display.

It looks like this:



Color code for the XFade Exam controller display:

What	Display color
Controllers 1 – 5 and 11 – 15	Blue
Controllers 6 – 10 and 16 – 20	White
Assignments to odd number controllers	Red
Assignments to odd number controllers	White
Automatic fade of controller assignment	Red on a gray field with an arrow indicating direction.
Automatic fade on Hold	Gray on a red field with an arrow indicating direction.

Assign mode

A double hit on **[ASSIGN]** changes the default Soft Keys function to Assignment mode. Assign mode allows you to assign groups of channels/spots, memories, or masks to controllers. The discussion of the Assign mode assumes that the Soft Key mode is Assign either as the default mode or temporary mode.

Assigning ranges of memories, channels, and spots to sequential controllers bumps out current assignments.

Controller LEDs

The color coded LEDs differentiate between grp, memory, submaster assignments, and chaser assignments.

Assignment	LED
Grp	Green
Memory	Green
Sub	Green
Chaser on Hold	Blinking Red
Chaser Running	Red
Chaser in Step mode	Orange

Control priority for spots

The control priority for spot assignments on controllers is controller 1 is the "strongest" and controller 20 is the "weakest". This means that if the same spots are assigned to controller 20 and controller 1 and both of the controllers are off their end stops, the output from controller 1 is active on stage.

Assigning Memories

Memory assignments can be faded manually or automatically.

Example: assign memory 4 to controller .1

Keypresses	**Results/Comments**
1. Select memory 4.	
2. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
3. Press controller 1's SK.	Controller 1's LED is green. The memory number appears on the controller display.

Assigning a range of memories to sequential controllers

Example*:* assign memories 30 - 35 to controllers 6 - 11.

Keypresses	**Results/Comments**
1. Select memories 30 → 35.	
2. Press **[ASSIGN**	The message *Assign Key Expected* is displayed.
3. Press controller 6's SK.	Memory 30 is assigned to controller 6, memory 31 to controller 7, etc.

Assigning an unspecified range of memories to sequential controllers

Example: Assign memory 17 to controller 7, memory 18 to controller 8, memory 19 to controller 9, until all the available controllers have been assigned.

Keypresses	**Results/Comments**
1. Select Memory 17 as the starting memory.	
2. Press **[→]**	It is unnecessary to select the last memory in the range, as this cannot exceed the number of controllers.
3. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
4. Press the controller 7's SK.	Memory 17 is assigned to controller 7, memory 18 to controller 8, and so on finishing with memory 30 assigned to controller 20.

Assigning Groups

Group assignment can be channels, spots, or channels and spots.

Channels and spots in the editor, and selected spot parameters can be assigned to controllers.

When channels and spots are assigned without specifying a dimmer intensity; you can fade the dimmer of the channel or spot from 0% (or the current output) to Full.

Channels and spots may be assigned with a specified dimmer intensity. In this case, the specified dimmer intensity is reached when the controller is at 100%.

Continuous parameters assigned to controllers fade from tracking or output. Discrete and mixed parameters jump to the controller value.

Assigning channels

Example: Without specifying intensity assign channels 30 - 35 to controller 6.

Keypresses	Results/Comments
1. Select channels 30 – 35	
2. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
3. Press controller 6's SK.	The controller LED is lit (green) and *grp* appears on the controller display. Raising the controller fades the channels their the current output to Full.

Adding a channel to a grp

Example: Add channel 36 to the group of channels already assigned to controller 6.

Keypresses	Results/Comments
1. Select channel 36	
2. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
3. Press controller 6's SK.	Channel 36 is added to the group of channels already resident in controller 6

➢Note

If a channel/spot is added or removed from a memory assigned to a controller, the assignment becomes a group of channels/spots. The original memory remains unchanged.

Removing a channel from a grp

Example: remove channel 34 from the group of channels resident in controller 6.

Keypresses	Results/Comments
1. Select channel 34.	
2. Press **[ZERO]**	
3. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
4. Press controller 6's SK.	Channel 34 is removed from the group on controller 6.

Assigning a channel with a specified intensity

Only selected channels, spots, and spot parameters are assigned. Selected items appear in the editor in red. If the editor contains some spots and channels displayed in white and some spots and channels displayed in red, only the red channels/spots are assigned to the controller.

If you want to assign all of the spots and channels appearing in the editor, press **[ENTER]** before assigning.

Example: Assign channel 1 at 45% and channels 3 - 8 at 50% to controller 7.

Keypresses	Results/Comments
1. Select channel 1.	
2. Press **[**@4.5 or use the dimmer wheel	
3. Select channels 3 → 8	
4. Press **[ON]**	The editor now contains channel 1 @ 45 and channels 3 → 8 @ 50. (Access **[ON]** with **[SHIFT]**)
5. Press **[ENTER]**	All the channels are displayed in white.
6. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
7. Press controller 7's SK.	When controller 7 is raised to its upper limit channel 1 is output at 45% and channels 3 → 8 at 50%.

Assigning a range of channels to sequential controllers

Example: Assign channel 40 to controller 8, channel 41 to controller 9, channel 42 to controller 10, channel 43 to controller 11, until all the controllers from 8 until the last available controller have been assigned with single channels.

Keypresses	**Results/Comments**
1. Select channel 40	
2. Press **[→]**	
3. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
4. Press controller 8's SK.	Channel 40 is assigned to controller 8, channel 41 to controller 9, channel 42 to controller 10, etc. *Grp* is shown on the controller display.

Assigning spots

Spot assignments can include all of the parameters or only selected parameters. Raising a controller crossfades from the stage output or tracking and to the controller assignment.

Continuous parameters fade from the current output or tracking to the controller value. Discrete and mixed step parameters jump to the controller assignment value when the controller is moved off its end stop.

The parameter values are taken from the editor, controllers, A/B, or tracking.

Example: Assign spots 1 - 6 to controller 4.

Keypresses	**Results/Comments**
1. Select spots 1 → 6	
2. Assign parameter values (optional).	
3. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
4. Press controller 8's SK.	Raising the fader initiates a crossfade from the current output to the controller assignment. *Grp* is shown on the controller display.

Assigning selected parameters

Parameters can be selected for controller assignments. Parameter assignments behave as described above.

Keypresses	**Results/Comments**
1. Select spots 6 → 8.	The Soft Keys access the spot.
2. Press the Soft Key to select parameter 2.	
3. Assign parameter values (optional).	
4. Press **[ASSIGN]**	The message *Assign Key Expected* is displayed.
5. Press the SK for controller 4	The parameter value is taken from tracking, the editor, A/B output, or controller output.

Assigning scrollers

The keypresses used to assign scroller channels to Controllers influence the scroller behavior when fading the assignments. The System Parameters toggle *Jump on Fade yes/no* (see Chapter 24) also influences behavior of scroller assignments.

Assignment Sequence	**Jump on Fade**	**Move controller from 0%**	**Fade controller to 0%**
[CHAN #] [FRAME] [ASSIGN] [SK]	Yes	Scroller jumps to the last frame.	Scroller jumps to tracking or output from a playback device
	No	Scrolls from 1 to the last frame.	Scrolls to tracking or output from a playback device
[CHAN #] [FRAME] [#] [ASSIGN] [SK]	Yes	Jumps to the assigned frame.	Scroller jumps to tracking or output from a playback device
	No	Scrolls to the assigned frame.	Scrolls to tracking or output from a playback device
[CHAN 3] [@] [#] [FRAME] [#] [ASSIGN] [SK]	Yes	Dimmer fades up. Scroller jumps to the assigned frame.	Dimmer fades down. Scroller jumps to tracking or output from a playback device
	No	Dimmer fades up. Scrolls to the assigned frame.	Dimmer fades down. The frame scrolls to tracking or output from a playback device

Adding text to a group assignment

Text can be added to group assigned to controllers. The text is displayed in Controller Exam and Snap Exam.

Keypresses	Results/Comments
1. Press **[TEXT]**	The command line reads: *Press TEXT or Assign Key!*
2. Press the controller's SK.	The command line reads: *Pot # Text*
3. Type on text keyboard.	
4. Press **[STORE]**	The message *Memory Pot Stored* is displayed.

Erasing the text

Keypresses	Results/Comments
1. Press **[TEXT]**	The command line reads: *Press TEXT or Assign Key!*
2. Press the controller's SK.	The command line reads: *Pot # Text*
3. Press **[ERASE]**	The text is erased from the group assignment.

Examining a Controller Assignment

You can examine controller assignments directly.

Example: Examine the assignment on controller 7.

Keypresses	Results/Comments
1. Press **[EXAM]**	
2. Press controller 7's SK.	The controller number, type of assignment and assignment text is displayed at the bottom of the screen. The assignment's channels and spots are displayed.
3. Press **[STAGE]** to exit Exam mode.	The display returns to the current display format.

Freeing Controller Assignments

The console automatically exits Free mode after freeing one controller assignment. Holding down **[FREE]** allows you to free multiple assignments before exiting Free mode.

Example: Release the assignment on controller 7.

Keypresses	**Results/Comments**
1. Press **[FREE]**	The message displayed is *Assign Key Expected*
2. Press controller 7's SK.	

Freeing multiple controller assignments

Keypresses	**Results/Comments**
1. Press and hold **[FREE]**	The message displayed is *Assign Key Expected*
2. Press as many SKs as desired.	

Freeing all controller assignments

Keypresses	**Results/Comments**
1. Press **[FREE]**	The message displayed is *Assign Key Expected*
2. Press **[→]**	Releases all controller assignments.

Using 'Go Controller'

You can initiate an automatic fade for grp and memory assignments. The fade occurs regardless of the controller level. The direction of the fade appears on the controller displays.

Controller Position	**What happens**
Controller at 0%	Assignment fades to Full. Initiating a fade after the assignment has already faded to Full reverses the fade direction.
Controller at 100%	Assignment fades to 0%. Initiating a fade after reaching Full reverses the fade direction.
Controller at a level other than 0% or 100%	Assignment fades to Full. Initiating a fade after the assignment has already faded to Full reverses the fade direction. The fade completes at the controller level.

When an assignment has been faded with the 'Go Controller' method, the controller does not control it anymore. To regain control you must move the controller handle to recapture the assignment.

Example: You initiated a fade with the controller handle at 50%. The assignment faded to Full and is displayed as such on the Stage display. If you move the controller handle to 0, the assignment remains at Full. You must move the controller handle to Full regain control.

Keypresses	**Results/Comments**
1. Press **[ASSIGN]**	Skip this step if the SK default mode is Assign.
2. Press **[SHIFT]**	*Go/Stp* is shown on the controller display under the mode.
3. Press a **[SK]**	The controller assignment fades according to the table above.
4. To stop and hold the fade press **[SHIFT]** and **[SK]**	
5. To restart the fade press **[SHIFT]** and **[SK]**	

➢Note

More than one controller can fade at the same time. Press **[SHIFT]** followed by any number of Soft Keys.

Fade times with Go Controller

A memory assignment fades up according to its recorded time-in and down according to its recorded time-out. If there is no time-out assignment the memory fades down according to its time-in.

If a memory has a wait-in assignment the fade begins after the assigned wait time. During the wait period *Wait* is displayed in gray on a red background on the Controller display.

If a memory has a wait-out assignment the fade automatically begins a reverse fade after the assigned wait-out time. During the wait period *Wait* is displayed in gray on a red background on the Controller display. Example: Memory 1 fade times are time-in 5 and wait-out 3. The controller handle is at 0%. Initiate a fade. The memory fades to Full in 5 seconds, waits 3 seconds and fades back to 0 in 5 seconds.

A group of channels/spots fades in the Default Memory Time.

Chasers

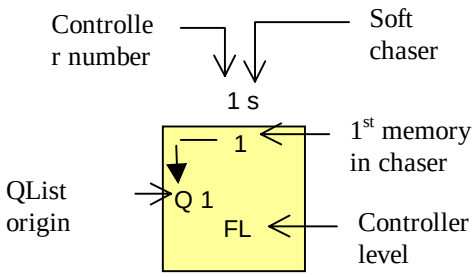
Chasers can run on 10 controllers simultaneously. Chasers are assigned as "hard" chasers or "soft" chasers. Hard chasers automatically step from memory to memory in 1/10 of recorded memory time. Soft chasers fade from memory to memory in recorded memory time. Chasers run automatically or can be stepped through manually. Chasers can also be run using Sound-to-Light input.

Chasers are assigned to controllers in Assign mode.

There are two displays that provide chaser information. The assign mode display shows all of the chaser assignments. The dedicated chaser display provides more detailed information pertaining to chaser status.

Chaser displays

Chasers on the controller (Assign) display

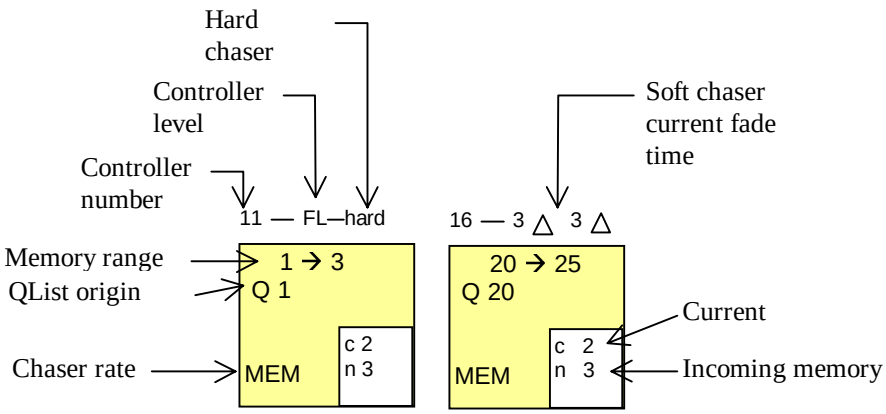


If the assignment is a soft chaser a small s appears next to the controller number. If the assignment is a hard chaser nothing is displayed. When the chaser is on hold the controller number is displayed in red on a black field. When the chaser is running the controller number is displayed is black on a red field.

Viewing the Chaser display

There is a dedicated Chaser display available.

Access the dedicated Chaser display by a double hit on **HARD**. There are 10 squares provided for chaser display. Return to the controller display with a double hit on **[ASSIGN]**.



Assigning chasers to controllers

You can assign a memory loop or a range of memories as a chaser. When assigning a memory loop as a chaser, select only the first memory of the loop.

Memory loops that are automatic continuous loops keep running until some action is taken to stop them.

Memory loops that are manual continuous loops behave like automatic continuous loops.

Memory loops that are finite loops run the specified number of times and then stop.

Memory range assignments behave like automatic continuous loops.

Example: Assign memory loop 5 → 8 as a hard chaser to controller 7.

Keypresses	Results/Comments
1. Select memory 5.	
2. Press **[HARD]**	The command line: *Hard Assign Key Expected*.
3. Press the controller 7's SK.	The controller LED blinks red indicating a chaser assignment on hold.

Example: Assign memory loop 5 → 8 as a soft chaser to controller 7.

Keypresses	Results/Comments
1. Select memory 5.	
2. Press **[SOFT]**	The command line: *Soft Assign Key Expected*.
3. Press the controller 7's SK.	The controller LED blinks red indicating a chaser assignment on hold.

Example: Assign memory range 5 → 8 as a hard chaser to controller 7.

Keypresses	Results/Comments
1. Select memories: **[MEMORY] [5 → 8]**	
2. Press **[HARD**	The command line: *Soft Assign Key Expected*.
3. Press the controller 7's SK.	The controller LED blinks red indicating a chaser assignment on hold.

Example: Assign memory range 5 → 8 as a soft chaser to controller 7.

Keypresses	Results/Comments
1. Select memories.	
2. Press **[SOFT]**	The command line: *Soft Assign Key Expected*.
3. Press the controller 7's SK.	The controller LED blinks red indicating a chaser assignment on hold.

You can also assign 10 whole memory numbers to a chaser by selecting the first memory only. Example: Assign memories 21 → 29 as a soft chaser.

Keypresses	Results/Comments
1. Select 21	
2. Press **[SOFT]**	The command line: *Soft Assign Key Expected*.
3. Press the controller SK.	The controller LED blinks red indicating a chaser assignment on hold.

➢Note

If there are intermediate memories in this range (memory 21.5, 22.5, etc.) they are included in this chaser.

Playing back chasers

Chaser playback can be either automatic or manual step mode.

When a running chaser is put on hold it stops and the dimmer of the spots/channels participating in the chaser are blacked out.

When a chaser is running and the controller handle is at 0% all parameters except dimmer are output. For dimmer output the controller handle must be above 0.

Giving a Go command

You can manually fade the dimmer by giving the Go command and then brining up the controller level.

Keypresses	Results/Comments
1. Press the **[SK]** to start the chaser.	The controller LED stops blinking and is solid red. The controller display and chasers displays also indicate the chaser status.

Giving a Hold command

Keypresses	Results/Comments
1. Press the **[SK]** to stop the chaser.	Stopping the chaser blacks out and releases all the parameters participating in the chaser. The output control for those parameters reverts to the next active control source.

Stepping through the chaser

Keypresses	Results/Comments
1. Press and hold down **[SHIFT]**	*Go/Stp* is displayed on the controller display.
2. Press the **[SK]**.	The chaser advances 1 step. The LED is orange. The controller number is orange.
3. Press the **[SK]** to advance to the next step.	

Exiting the step mode

Keypresses	Results/Comments
1. Press the **[SK]**	The chaser runs automatically. The controller LED is solid red.

Or

Keypresses	Results/Comments
1. Double hit the **[SK]**	The chaser is put on hold. The controller LED blinks red indicating a chaser on hold.

Modifying the chaser rate

The chaser rate can be modified on the fly. The modified chase rate can be stored.

The chaser rate is displayed on the dedicated Chaser display (see Chaser display page 13-13) It is recommended to have the Chaser display on view when modifying chase rates.

Use the Rate wheel (wheel 3) to modify the Chaser Rate. The rate is displayed in percentage. Turning the wheel clockwise increases the rate, the maximum rate being ‘cut’. Turning the wheel counterclockwise slows the rate, the lowest value being ‘hold’.

More than one chaser may be modified at the same time.

Keypresses	Results/Comments
1. Press **[RATE CHASE]**	The LED of the key is lit, indicating that the rate wheel is now active. The message *Assign Key Expected* is displayed.
2. Press the **[SK]** for the chaser you are going to modify.	The current chase rate, as shown on the Chaser display, now appears on a blue field
3. Move the Rate wheel	The modified rate is displayed in percentage on a blue field on the Chaser display.

➢Note

To modify the Chase Rate for more than one chaser at the same time, press as many SKs as desired. The current rates for all selected chasers are displayed on blue fields, meaning that the Rate wheel accesses all selected chasers.

Modifying the rates for additional chasers

If you want to continue and modify the Chase Rate of another chaser without changing the rate of the chaser you have just modified, you must re-select **[CHASE RATE]**.

Example: Change the Chase Rate for the chaser running on controller 7 to 20%. Then change the Chase Rate for the chaser running on controller 8 to Cut.

Keypresses	Results/Comments
1. Press **[RATE CHASE]**	The LED of the key is lit, indicating that the rate wheel is now active.
2. Press controller 7's **[SK]**.	The current chase rate, as shown on the Chaser display, now appears on a blue field
3. Turn the Rate wheel counterclockwise until the display shows 20%.	The modified rate is displayed in percentage on a blue field on the Chaser display.
4. Press **[RATE CHASE]**	The new Chase rate is displayed in blue on a gray field; it is no longer selected.
5. Press **[RATE CHASE]**	The LED of the key is lit, indicating that the rate wheel is now active.
6. Press controller 8's **[SK]**	The current chase rate, as shown on the Chaser display, now appears on a blue field
7. Turn the Rate wheel clockwise until the display shows 'Cut'.	

Storing the modified chase rate

You can store the modified chase rate. The modified rate is stored to the specific memory loop or memory range.

Keypresses	Results/Comments
1. Press **[RATE CHASE]**	The LED of the key is lit, indicating that the rate wheel is now active.
2. Press **[SK]** for chaser.	The current chase rate, as shown on the Chaser display, now appears on a blue field
3. Modify the chase rate using the Rate wheel.	
4. Press **[STORE]**	The **[RATE CHASE]** LED is extinguished and the Chase Rate reverts to the normal display.

Returning to memory rate

Keypresses	Results/Comments
1. Press **[RATE CHASE]**	The LED of the key is lit, indicating that the rate wheel is now active.
2. Press the **[SK]**	The current chase rate is displayed on a blue field
3. Turn the Rate wheel until the display shows MEM.	The modified rate is displayed in percentage on a blue field on the Chaser display.
4. Press **[RATE CHASE]** to exit the function.	MEM is displayed in blue.

Fading in chasers

You can assign a fade in time for chasers using the Chase Fade option.

Keypresses	Results/Comments
1. Select the first memory of the chaser loop.	
2. Press and hold **[SHIFT]** and press **[TIME-IN/OUT]**	*Chase Fade* is displayed in the command line
3. Press **[STORE]**	The chaser fades up in the assigned Chase Fade time.

Assigning Controllers as Submasters

The Submaster option operates in Assign mode. It provides inhibit submasters for memories, channels, and spots. Controllers can also be assigned to submaster the upper bank of controllers, the lower bank of controllers, the A/B crossfader, and DMX input.

Assigning controllers as inhibit submasters

Controllers may be designated as inhibit submasters, submastering channels or spots.

Memories can also be assigned to an inhibit submaster, however the assignment is recognized as a group and submasters the channels/spots included in the group. .

Keypresses	**Results/Comments**
1. Select the channels/spots for assignment.	
2. Press **[SUBM]**	
3. Press the **[S.K.]** for submaster assignment.	*Sub* is displayed on a gray field.

Assigning submasters for playback devices

Controllers can be assigned to submaster the upper controllers, the lower controllers, the A/B crossfader and DMX input. **[U/L/X]** provides the submaster playback devices option. Access this key using **[SHIFT]**.

Submaster the Upper Bank of controllers

Keypresses	**Results/Comments**
1. Press **[U/L/X]**	*Submaster UPPER (1→ 10) controllers* is displayed in the command line.
2. Press the **[S.K.]** for submaster assignment.	*Sub 1 → 10* on a red field is displayed on the Controller display. *Pup* is displayed on the XFade Exam.

Submaster the Lower Bank of controllers

Keypresses	**Results/Comments**
1. Press **[U/L/X] [U/L/X]**	*Submaster LOWER (11→ 20) controllers* is displayed in the command line.
2. Press the **[S.K.]** for submaster assignment.	*Sub 11 → 20* on a red field is displayed on the Controller display. *Pdn* is displayed on the XFade Exam.

Submaster the A/B Crossfader

Keypresses	Results/Comments
1. Press **[U/L/X] [U/L/X] [U/L/X]**	*Submaster A/B* is displayed in the command line.
2. Press the **[S.K.]** for submaster assignment.	*Sub A/B 10* on a red field is displayed on the Controller display. *A/B* is displayed on the XFade Exam.

Submaster DMX Input

Any number of the DMX Input channels can be assigned to the Submaster. The default is all DMX Input channels.

Keypresses	Results/Comments
1. Press **U[U/L/X] [U/L/X] [U/L/X] [U/L/X]**	*Submaster DMX input→ #* is displayed in the command line.
2. Optional – enter a number other than the default.	
3. Press the **[S.K.]** for submaster assignment.	*Sub I #* on a red field is displayed on the Controller display.

Sound-to-Light

To use the Sound-to-Light feature, your board must have the Sound-to-Light option installed.

Plug a sound source into the Audio connector on Spark's back panel. The connector uses 3 pin XLR connectors.

Sound-to-Light operates memory, group, and chaser assignments on controllers. Each pulse operates 1 step of the chaser or flashes the memory or group assignment.

The Sound-to-Light must be enabled to allow controller response. Sound-to-Light response can be enabled or disabled for all or some of the controllers.

Sound-to-light assignments are stored in snaps and thus recorded with the show data.

You can make a macro to enable and disable Sound-to-Light for.

Sound-to-Light display

A controller that is listening to sound-to-light has a musical note icon on the controller display and, if the assignment is a chaser, on the chaser display.

When the sound-to-light function is assigned to a controller, the musical icon is red. When triggered the icon changes colors.

Turning on sound-to-light

Selected or all controllers respond to Sound-to-Light. Controllers can be enable for Sound-to-Light only when there is an assignment present.

Programming 1 controller to respond

Keypresses	Results/Comments
1. Assign a group, a memory, or a chaser to a controller.	
2. Press **[S/L ON]**	
3. Press the controller Soft Key that will respond to sound-to-light signals.	A controller that is listening to sound-to-light has a musical note icon on the controller display.

Programming all controllers to respond

Keypresses	Results/Comments
1. Press **[S/L ON]**	
2. Press **[→]**	A musical note icon is displayed for all controllers.

Programming selected controllers to respond

Example: Program controllers 1 → 8.

Keypresses	Results/Comments
1. Press **[S/L ON]**	*S/L On* appears in the command line.
2. Press the **SK** for controller 1.	
3. Press **[→]**	
4. Press the **[SK** for controller 8.	A musical note icon is displayed for controllers 1 → 8.

Example: Program controllers 1, 3, 12, and 15.

Keypresses	Results/Comments
1. Press **[S/L ON]**	*S/L On* appears in the command line.
2. Press the **SK** for controller 1.	
3. Press the **SK** for controller 3.	
4. Press the **SK** for controller 15.	A musical note icon is displayed for controllers 1, 3, 12, and 15.

Turning off Sound-to-Light

To turn off the Sound-to-Light function, use the key sequences described above. Press **[S/L OFF]** instead of **[S/L ON]**. Access **[S/L OFF]** with the **[SHIFT]** key.

Controller response

Memory and group assignments

Sound-to-light triggers a flash for a group or memory assignment. Each time a pulse within the response range is transmitted the controller assignment flashes. The light remains on as long as the sound-to-light pulse falls within the tone response range. When the pulse is outside of the response range the light output returns the level determined by fader position.

Chasers

Chasers operation is identical to step operation. The initial response activates step 1 of the chaser; the next pulse triggers step 2, and so on. Both hard and soft chasers are responsive to sound-to-light.

To temporarily stop a chaser from responding

1. Press the **[SK]** as if you are putting the chaser on Hold.
2. To re-instate the chaser's response, press the **[SK]** again as if you are giving the Go command.

A chaser that is enabled for Sound-to-Light operation cannot be operated manually. If you want to take over the chaser operation, you must disable the Sound-to-Light for that controller.

Fading to New Memory and Chaser Assignments

You can execute assignments of memories and chasers to controllers through timed fades. The controller level determines the maximum output. **The controller handle must be at more than 0%**.

If there is an assignment present on the controller, a crossfade occurs between the levels in the incoming memory or group and the outgoing levels. If there is no assignment, the selected memory fades from 0% to the controller level; if the controller is at Full the memory fades from 0 – Full, if the controller is at 50% the memory or group fades from 0 – 50%, if the controller is at 0% there is no discernable fade.

Fade times

There are 3 options for the fade time when fading memories or chasers to controllers.

If no time is indicated, the fade occurs in Default Fade Time. Default Fade Time is 2 seconds. This can be changed in the System Parameters menu.

1. The fade occurs in stored memory time if **[TIME]** is pressed after memory selection. In this case all time assignments (time in, time out, wait in, wait out, and delay) are obeyed.
2. A special, one-time fade time may be entered, by pressing **[TIME]** and assigning a time.

Fading memories

You can select and fade a single memory or a sequential range of memories in Default Fade Time, stored memory time, or selected time.

Example: Fade to memory 6 in Default Fade Time.

Keypresses	**Results/Comments**
1. Select memory 6.	
2. Press and hold **[SHIFT]** and press the **[SK]**	The selected memory fades in Default Fade Time.

Example: Fade to memory 6 in stored memory time.

Keypresses	**Results/Comments**
1. Select memory 6.	
2. Press **[TIME]**	
3. Press and hold **[SHIFT]** and press the **[SK]**	The selected memory fades in according to the fade time stored in the memory, obeying all time assignments.

Example: Fade to memory 6 in 30 seconds.

Keypresses	Results/Comments
1. Select memory 6.	
2. Press **[TIME]**	
3. Enter 30 on the numeric keypad	
4. Press and hold **[SHIFT]** and press the **[SK]**	The selected memory fades in the selected time.

When fading a range of memories, the memories fade on sequential controllers.

Example: Fade to memories 1 → 6 in recorded memory time.

Keypresses	Results/Comments
1. Select memories 1 → 6	
2. Press **[TIME]**	
3. Press and hold **[SHIFT]** and press the **[SK]**	Memories are assigned to sequential controllers. Each memory fades in its own recorded time.

Example: Fade to memories 1 → 6 in 30 seconds.

Keypresses	Results/Comments
1. Select memories 1 → 6	
2. Press **[TIME]**	
3. Enter 30 on the numeric keypad	
4. Press and hold **[SHIFT]** and press the **[SK]**	Memories are assigned to sequential controllers. All memories fade in the selected time.

Fading chasers

You can fade from a running chaser to another chaser, fade to a memory within the chaser, or to a memory.

Fading from a running chaser to a new chaser

If you designate the new chaser as a hard chase, the new chaser bumps out the previous chaser and begins you running. If you assign the new chaser as a soft chaser, a crossfade occurs between the previous chaser and the first memory in the new chaser.

Keypresses	**Results/Comments**
1. Select the first memory of a loop or a range of memories.	
2. Optional – Press **[TIME]** (for a fade in memory time) or **[TIME #]** (for a fade in selected time.)	If no preference is indicated, the fade occurs in Default Fade Time.
3. Press **[HARD]** or **[SOFT]**	
4. Press and hold **[SHIFT]** and press the **[SK]**	The new chaser fades in.

Fading to a memory within a running chaser

You can initiate a fade to a memory contained within the running chaser. A fade to the selected memory occurs and the chaser continues running from that point.

Example: Memory loop 5 →10 is running on a controller. Initiate a fade to memory 8.

Keypresses	**Results/Comments**
1. Select memory 8.	
2. Press and hold **[SHIFT]** and press the **[SK]**	The chaser fades from its current memory to memory 8 and continues running from memory 8.

Fading from a chaser to a memory

You can exit a chaser by fading to a memory. You can fade to the memory in Default Fade Time, memory time, or selected time.

Keypresses	**Results/Comments**
1. Select a memory that is not included in the chaser.	
2. Optional – Press **[TIME]** (for a fade in memory time) or **[TIME #]** (for a fade in selected time.)	If no fade time preference is indicated, the memory fades in Default Fade time (2 sec.)
3. Press and hold **[SHIFT]** and press the **[SK]**	The chaser fades from its current memory to memory to the selected memory.

CHAPTER 14
CONTROL PRIORITY

This chapter includes:

Playback Control Priority

Control priority determines which playback devices control the output. The control priority affects spot parameters and scrollers. Channels always operate in HTP (Highest Takes Precedence) mode.

Spark 4D's playback devices work under a rigid control priority hierarchy or in LTP (Latest Takes Precedence) mode. Control priority refers to playback devices only. The editors always have priority.

Playback Device	Control Hierarchy
Controllers/chasers 1 – 20	The control priority is descending from controller 1 with controller 20 having the lowest priority.
Crossfader A/B	A/B always has the lowest control priority. All controllers override the output from A/B.

In the example below all the listed playback devices are active.

Example of hierarchical Control Priority:

Playback Device	Assignment	Current output
Controller 1	spot 1 gobo 6	spot 1 gobo 6
Controller 8	spot 1 gobo 2 spot 2 cw 2	none spot 2 cw 2
A/B	spot 1 gobo 4 spot 2 cw 5	none none

Following the example above: If you take controller 1 to 0 the output becomes spot 1 gobo 2 (from controller 8) and spots 1 & 2 at cw 2 (from controller 8). Now bring controller 8 to 0 and controller 1 to full. Spot 1 is output with gobo 6 spot 2 with cw 5.

You can exploit this function to change, for example, the gobo or color for a chaser running on a lower priority playback device. Taking the example above, let's say that a position chase with gobo 4 is looping on controller 6. By assigning a different gobo to controller 1 you can change the gobo look of the chaser.

LTP Playback Mode

LTP (latest Takes Precedence) control priority means that instead of adhering to a rigid control hierarchy, the last controller or fader activated has the highest control priority. Faders and controllers participate in the LTP control mode. Actions on the A/B and C/D crossfaders do not influence the control priority.

When the LTP function is enabled Spark 4D works in the LTP mode. When the LTP function is disabled the default control priority is the usual hierarchic structure.

Actions that change the control priority stack

- Moving a controller.
- Initiating an automatic fade of controller assignments by pressing **[SHIFT] [SK]**.
- Automatic Go or Step for chaser assignment.
- Pressing a Bump Button.

Enabling LTP control mode

In the System Parameters menu - *Latest Takes Precedence* determines whether the console works in LTP or the default control priority.

Keypresses	**Results/Comments**
1. Press **[MENU] [8] [ENTER]**	You are now in the System Parameters menu.
2. Use the **[F2]** or **[F3]** (the arrow keys) to place the cursor on *Latest Takes Precedence*.	
3. Press **[F1] Enter**	
4. Press **[F1] On**	The flag *LTP On* appears in red under the controller area on the Playback display.

Disabling LTP control mode

Keypresses	Results/Comments
1. Press **[MENU] [8] [ENTER]**	You are now in the System Parameters menu.
2. Go to the System Parameters menu.	
3. Use the **[F2]** or [**F3]** (the arrow keys) to place the cursor on *Latest Takes Precedence*.	
4. Press **F1 Enter**	
5. Press **F2 Off**	The *LTP* flag disappears from the Playback display. Spark is now working in default priority.

➢**Tip**
You can make a macro, using Teach Macro, for single press access to enable and disable LTP.

Viewing the control priority

The Control Priority is displayed on the first help screen. When LTP is disabled the Control Priority does not change. When LTP is enabled the Control Priority display changes according to rules described above.

To view the current Control Priority:

1. Press **[HELP]**

CHAPTER 15
SNAP

This chapter includes:

Overview

Snaps are analogous to preset scenes. They are 'snapshots' of all playback device assignments.

Snaps record A/B crossfader assignments and all types of controller assignments for instantaneous recall. Snaps are recorded by making assignments to the crossfaders and controllers and then recording the Snap. Snap stores *all* of the assignments, so be sure that you have no extraneous crossfader or controller assignments.

Example of the use of Snaps: assume you are running a show with 10 songs. 6 chasers are used in each song. Assign the chasers for song number 1 to the controllers and record Snap 1. Free the assignments, assign the chasers for song 2, and record Snap 2, etc. During the show, use the snaps to assign the chasers when switching from song to song.

Snaps 1 - 20 can be operated via the controller Soft Keys in Snap mode (see below) or the editor. Snaps 21 - 99 are operated via the editor only.

The assignment type and run mode information is also recorded in the Snap. The run mode information is displayed in the Snap Exam. The mode is generally represented by letters.

Spot assignments to the Remote Control Unit trackball are also saved in Snaps.

Programming a Snap

Example: Snap 9 is:
Memory 1 on A. **[SEQ]** on.
Memories 15 → 20 Soft chaser on controller 1.
Memories 25 → 30 Soft chaser controller 2.
Channel 10 on controller 11.
Channel 25 on controller 12.

Keypresses	Results/Comments
1. Select memory 1 and press **[A]**	
2. Press **[SEQ]**	
3. Select memories 15 → 20	
4. Press **[SOFT]** and assign to controller 1.	
5. Select memories 25 → 30	
6. Press **[SOFT]** and assign to controller 2.	
7. Select channel 10. Assign to controller 11.	
8. Press **[SNAP]**	*Snap* is displayed in the command line.
9. Press **9** on the keypad.	
10. Press **[STORE]**	If Snap 9 already exists, the message *Snap Exists* appears. To overwrite press **[STORE]** again.

➢**Note**
Instead of steps 9 and 10 you can press **[+STORE]**.

Adding Text to Snaps

Text labels can be attached to snaps.

Keypresses	Results/Comments
1. Press **[SNAP]**	*Snap* is displayed in the command line.
2. Enter the Snap number on the numeric keypad.	
3. Press **[TEXT]**	
4. Type the text on the alphanumeric keypad.	
5. Press **[STORE]**	Text for Snaps is displayed in all Snap exams. The first 5 characters are displayed on the Controller display in Soft Key Snap mode

Examining Snaps

There are 2 Snap Exams. The Snap List is a list of all the Snaps with their text labels. Selected Snap Exams show all the playback device assignments stored in the Snap and their run modes.

Viewing the snap list

Keypresses	Results/Comments
1. Press **[SNAP]**	*Snap* is displayed in the command line.
2. Press **[EXAM]**	A list of the snaps and any textual notes is displayed. This is a strong Exam display.

Examining a selected snap

Keypresses	Results/Comments
1. Press **[SNAP]**	*Snap* is displayed in the command line.
2. Select the snap on the numeric keypad	
3. Press **[EXAM]**	All information for the selected snap is displayed.
4. Press **[+]** or **[-]** to exam the next or previous Snap.	

Or

Keypresses	Results/Comments
1. Press **[EXAM]**	
2. Press **[SNAP]**	*Assign Key Expected* is displayed
3. Press the SK of the desired Snap.	
4. Press **[+]** or **[-]** to exam the next or previous Snap or press another SK.	

The run modes are represented by a letter.

Assignment Run mode	Represented by
Sequence on A/B	Q
Auto on A/B	A
Go chaser (the snap is recorded when the chaser is running)	G
Hard chase assignment	C
Soft chase assignment	1st memory number of chase assignment
Chaser in Step mode	S
Sound-to-Light	A musical note icon

Erasing a Snap

You can erase single snaps, a range of Snaps, all Snaps starting from a selected number, or all Snaps.

Erasing a single Snap

Keypresses	Results/Comments
1. Press **[SNAP]**	
2. Enter the Snap.	
3. Press **[ERASE]**	The message *Snap/s Deleted* is displayed.

Example: Erase snaps 3 → 12.

Keypresses	Results/Comments
1. Press **[SNAP]**	
2. Select the Snap range - Press **[3 → 12]**	
3. Press **[ERASE]**	The message *Snap/s Deleted* is displayed.

Example: Erase all Snaps starting from Snap 20

Keypresses	Results/Comments
1. Press **[SNAP]**	
2. Enter 20 on the keypad.	
3. Press **[→]**	
4. Press **[ERASE]**	The message *Snap/s Deleted* is displayed.

Example: Erase all Snaps

Keypresses	Results/Comments
1. Press **[SNAP]**	
2. Press **[→]**	
3. Press **[ERASE]**	The message *Snap/s Deleted* is displayed.

Operating Snaps

There are two snap operation modes: non-forcing (additive) and forcing mode.

Snaps never force an assignment to A/B. Assigning a memory or group to A/B using snap is permitted only when A/B is empty.

Snaps 1 – 20 can be operated using the SKs in Snap mode. All other Snaps are operated in the editor.

Operating non-forcing mode snaps

A non-forcing mode Snap affects only controllers that are at 0%. If a controller is off the end stop and assigned, its Snap assignment will "wait in the wings" until the fader is returned to 0%. When a Snap assignment is "waiting in the wings" a yellow asterisk is displayed next to the controller number and the fader number is yellow.

Example: In Snap 1 controller 8 has a group assignment. When the Snap is operated, controller 8 already has an assignment and is at 80%. All the Snap assignments execute (assuming the controllers are at 0%), except the assignment to controller 8; it waits until controller 8 to is returned to 0%, then waiting Snap is assigned

Keypresses	Results/Comments
1. Press **[SNAP]**	*Snap* appears in the command line.
2. Enter the snap number on the numeric keypad.	
3. Press **[ENTER]**	'Snaps' all the assignments recorded in Snap 1 into their playback devices providing the playback device is not controlling any current output.

Snaps 1 – 20 can be operated using the Soft Keys in Snap mode.

Keypresses	Results/Comments
1. Press **[SNAP]**	Skip this step if the SK mode is Snap.
2. Press the SK of the Snap.	'Snaps' all the assignments recorded in the selected Snap into their playback devices providing the playback device is not controlling any current output.

Operating forcing mode snaps

A forcing mode Snap affects all Controller assignments, regardless of their output level. Referring to the example above, the group assignment to controller 8 bumps out the assignment on controller 8 and is, of course, immediately active on-stage.

Unassigned Controllers in the Snap free current assignments regardless of their output level. Example: Controllers 1 – 8 are currently assigned. Some of the controllers are active and some are not. In the Snap controllers 1 – 8 have no assignments. When you operate this Snap in forcing mode the assignments on controllers 1 – 8 are freed.

A/B assignments are not influenced by Snaps operated in forcing mode.

Keypresses	Results/Comments
1. Press **[SNAP]**	*Snap* appears in the command line.
2. Press **[+]**	
3. Select the snap number on the numeric keypad.	
4. Press **[ENTER]**	'Snaps' all the assignments recorded in Snap 1 into place regardless of the playback devices' output status.

Snaps 1 – 20 can be operated using the Soft Keys in Snap mode.

Keypresses	Results/Comments
1. Press **[SNAP]**	Skip this step if the SK mode is Snap.
2. Press and hold **[SHIFT]**	*Snap +* is displayed under the SK mode.
3. Press the SK of the Snap.	'Snaps' all the assignments recorded in the selected Snap into place regardless of the playback devices' output status.

Using Snap to clear all assignments

You can use Snap to free controller and A/B assignments.

Keypresses	Results/Comments
1. Press **[SNAP]**	
2. Press **[0]**	*Snap Free all panel!!* is displayed in the command line. The message *Are you Sure?* is displayed.
3. Press **[ENTER]**	All playback device assignments are freed.

CHAPTER 16
PART Qs

This chapter includes:

Overview

Memories can be divided into 9 parts, part 0 through part 8. Each part can consist of a group of spots, spot parameters, and/or channels. Each part can be assigned its own time-in or wait- in time. A spot, parameter, or channel can be assigned to only one part.

You may assign all spot parameters or selected parameters to a part. For example, the gobo parameter of a spot may be assigned to a part, causing it to change after the rest of the spot's parameters have changed.

Spots and channels can be assigned to Parts while programming a memory or an existing memory can be divided into Parts.

Intensity and spot parameters, assigned to different parts, appear in different colors. To view the color code for parts, press **[PART]** when the editor is idle.

Part #	Color
0	no color
1	light green
2	light gray
3	dark blue
4	brown
5	light cyan
6	light violet
7	cyan
8	orange

Part Qs display

Channel intensity and spot parameter values that are assigned to Parts are appear on the Stage display according to the color code above.

Parts and their time assignments are displayed in the Memory List.

Examining a selected memory shows the color coded Parts and their time assignments at the bottom of the display.

In the XFade Exam a crossfade to a Part Q is dynamically displayed.

Programming Memories with Parts

Spots and channels can be given part assignments during the initial programming of the memory.

Only channels, scrollers, spots, and spot parameters that are selected (displayed in red) in the editor can be given Part assignments.

Channels and spots that are in the editor when storing a memory and have no Part assignment are assigned to Part 0.

Programming Parts with channels

Example: Program memory 1. Memory 1 contains channels 1 → 20. Channels 1 → 5 are assigned to part 1. Assign part 1 fade times; time-in 3 seconds, wait 2 seconds. Channels 6 → 10 are assigned to part 2.

Keypresses	**Results/Comments**
1. Select channels 1 → 5 and assign intensity.	
2. Press **[PART]** and enter 1 on the numeric keypad.	The intensity for channels 1 → 5 is displayed in green – the color code for part 1.
3. Press **[TIME]** enter 3 on the numeric keypad.	
4. Press **[WAIT]** enter 2 on the numeric keypad.	The Wait time is the amount of time part 1 will wait before beginning its up fade.
5. Select channels 6→ 10 and assign intensity.	
6. Press **[PART]** enter 2 on the numeric keypad.	The intensity for channels 1 → 5 is displayed in gray - the color code for part 2 .
7. Press **[TIME]** enter 8 on the numeric keypad.	
8. Press **[=]** enter 1 on the numeric keypad.	
9. Press **[STORE]**	The message *Memory 1 Stored* is displayed.

Programming Parts with scrollers

Example: Program memory 1. Memory 1 contains channels 1 → 20. Channels 1 → 5 are assigned to part 1. Assign part 1 fade times; time-in 3 seconds, wait 2 seconds. Channels 6 → 10 are assigned to part 2.

Keypresses	Results/Comments
1. Select channels 1 → 5 and assign intensity.	
2. Press **[PART]** and enter 1 on the keypad.	The intensity displayed in green – the color code for part 1.
3. Press **[TIME]** and enter 3 on the keypad.	
4. Press **[WAIT]** and enter 2 on the keypad.	The Wait time is the amount of time part 1 will wait before beginning its fade.
5. Select channels 6→ 10 and assign intensity.	
6. Press **[PART]** and enter 2 on the keypad.	The intensity is displayed in gray.
7. Press **[TIME]** and enter 8 on the keypad.	
8. Press **[=]** and enter 1 on the keypad.	
9. Press **[STORE]**	The message *Memory 1 Stored* is displayed.

Programming Parts with spots

Scrollers work in Part assignments only when the System parameters toggle *Scrl jump on fade* is toggled to No (see Chapter 24 System Configuration). Example: Program memory 2 and assign channels 1 → 5 at frame 6 to part 2.

Keypresses	Results/Comments
1. Select channels 1 → 5.	
2. Press **[FRAME]**	The scroller flag is displayed in red.
3. Assign frame 6	
4. Press **[PART]**. Enter 2 on the keypad.	The scroller frame appears in light gray
5. Press **[TIME]** and enter 3 on the keypad.	Assign an up fade time of 3 to part 1.
6. Press **[WAIT]** and enter 2 on the keypad.	Assign wait time: the amount of time part 1 will wait before beginning its fade.
7. Press **[=]** and enter 2 on the keypad.	
8. Press **[STORE]**	*Memory 2 Stored* is displayed.

Programming Parts with selected parameters

Specific spot parameters can be assigned Parts. Only parameters appearing in light or dark red can be assigned parts.

Example: Assign parameter 6 of spots 1 - 5 to part 1.

Keypresses	Results/Comments
1. Select spots 1 → 5.	
2. Select parameter 6 and assign a value.	
3. Press **[PART]** and enter 1 on the keypad.	Assign the selected parameter to part 1. A green dash is displayed next to the selected parameters.
4. Press **[TIME]** and enter 3 on the keypad.	Assign a fade of 3 counts to the selected parameter in part 1.
5. Press **[WAIT]** and enter 2 on the keypad.	Assign a wait time: the amount of time part 1 will wait before beginning its fade.
6. Press **[=]**and enter 1 on the keypad.	
7. Press **[STORE]**	The message *Memory 1 Stored* is displayed.

Dividing a Memory into Parts

Memories can be modified as Part Qs after they have been stored. This option works like Basic Memory Modification and may be done live or in Blind mode.

Keypresses	Results/Comments
1. Select memory 1	
2. Select channels 1 → 5.	The channels and spots are displayed in dark blue.
3. Press **[PART]]** and enter 1 on the keypad.	The intensity assignments of the selected channels are displayed in green.
4. Press **[TIME]]** and enter 3 on the keypad.	
5. Press **[WAIT]]** and enter 2 on the keypad.	
6. Select channel 4	
7. Press **[PART]]** and enter 2 on the keypad.	The intensity assignment of the selected channel is displayed in gray.
8. Press **[WAIT]]** and enter 8 on the keypad.	
9. Press **[STORE]**	Memory 1 is stored with the part assignments.

Adding a Part to a Memory

New channels and spots can be added as Parts to stored memories.

In the example below, part 3 consisting of parameter 2 spot 5 is added to the last recorded memory.

Keypresses	Results/Comments
1. Select spot 5.	
2. Select parameter 2.	
3. Assign a value to parameter 2.	
4. Press **[MEMORY]**	If no memory number is entered, the part is added to the last recorded memory. To add this part to another memory, enter a memory number at this point.
5. Press **[PART]** and enter 3 on the keypad.	
6. Assign a fade time.	
7. Press **[STORE]**	The message *Memory 1 Stored* is displayed.

➢Note

If the Part exists the message *Part Exists* is displayed. Press **[CLEAR]** to cancel or press **[STORE]** to overwrite the Part.

Modifying a Part

You can select one part of a memory for modification. When modifying a Part, only the channels/spots in the selected Part are live.

Example: Modify memory 1 by changing the intensity of channel 8 in part 5.

Keypresses	Results/Comments
1. Select memory 1.	
2. Select part 5	
3. Select channel 8.	The part is now active on-stage.
4. Press **[@]**and enter 6 on the numeric keypad.	60% intensity is assigned to channel 8.
5. Press **[STORE]**	The message *Memory 1 Stored* is displayed.

Removing channels/spots from a Part

To remove a channel or spot from a part, but retain it in the memory, reassign it to Part 0. Channels and spots can be reassigned to any Part.

Example: Remove spot 5 from its part assignment in memory 1.

Keypresses	**Results/Comments**
1. Select memory 1.	
2. Select spot 5.	The memory is now live on-stage.
3. Press **[PART]**	
4. Press **[ERASE]**	The message *Memory 1 Stored* is displayed.

Removing Part assignments

Removing a Part automatically assigns the channels and spots in the part to part 0.

Example: Remove Part 3.

Keypresses	**Results/Comments**
1. Select memory 1.	
2. Press **[PART]** Enter 3 on the keypad.	
3. Press **[ERASE]**	The message *Memory 1 Stored* is displayed.

Example: Remove all Part assignments.

Keypresses	**Results/Comments**
1. Select memory 1.	
2. Press **[PART]**	
3. Press **[ERASE]**	The message *Memory 1 Stored* is displayed.

Modifying time assignments

Example: Change the time assignment for part 5 in memory 1. This modification does not turn on the spots/channels in the selected part.

Keypresses	Results/Comments
1. Select memory 1.	
2. Select Part 5	
3. Press **[TIME]** or **[WAIT]**	The current time assignment is displayed on the command line.
4. Enter new time assignment	
5. Press **[STORE]**	The message *Memory 1 Stored* is displayed.

Using Parts as Editor Groups

Parts may be converted to editor groups by selecting a part assignment.

Example: Select the channels that are assigned to part 6 in memory 8.

Keypresses	Results/Comments
1. Select memory 8.	
2. Select Part 6.	
3. Press **[ENTER]**	The channels and spots in part 6 become a group in the editor.

Assigning Parts to Controllers

A part can be assigned to faders and controllers as a group.

Example: Assign part 3 from memory 2 to a fader or a controller

Keypresses	Results/Comments
1. Select memory 2.	
2. Select part 3.	
3. Press **[ASSIGN]**	The prompt *Assign Key Expected* is displayed.
4. Press a controller SK	The channels and spots from memory 2, part 3 are assigned as a grp to the controller.

Playing Back Parts

The A/B crossfader supports playback for Parts.

When **[GO]** is pressed all of the Parts start fading at the same time. If a Part has a wait time the Wait time begins counting when **[GO]** is pressed.

The XFade Exam displays the fade progression of an incoming Part Q.

CHAPTER 17
MACROS

This chapter includes:

Overview

A Macro is a collection of keystrokes. Spark 4D stores up to 999 Macros containing up to 40 keypresses each. Macros can include any keys on the board and are usually programmed as shortcut keys for any sequences or functions that are frequently used. Wheel or controller movements are not recognized by Macros.

Macros can be programmed blind in the Macro menu or live using the Teach Macro function. The Teach Macro option allows making Macros for menu functions.

Macros may be operated manually in the editor or using the SKs in Macro mode (for Macros 1 – 40 only) or triggered automatically via Events.

Macros can be embedded Events.

There are options in the Macro menu to create Macros for special functions. An example of a Macro for a special function is Print. When activated this Macro works as Print Screen does on an alphanumeric keyboard.

The system automatically prefixes a new Macro with the current SK mode. This ensures that the Macro operates in the mode in which it was recorded. This is especially important when Macros contain Soft Keys, since their function changes from mode to mode. After Macro operation the default mode returns to its original state.

Example: Macro is the current default mode. Macro 5 was programmed in Assign mode and consists of “go controller” commands; for instance, SK1, SK2. When the Macro was programmed ‘assign assign” was automatically assigned as the first entries in Macro 5. Obviously if this Macro had no mode assignment, operating it in Macro mode would trigger Macros 1 and 2, instead of initiating a fade of the assignments on controller 1 and controller 2. If desired, this prefix can be omitted by clearing the entries under the Modify Macro option in the Macro menu.

The Macro Menu

The Macro menu is menu number 9.

Macro programming in the Macro menu is blind. You do not see the results of the keypresses on stage.

The options available in the Macro menu are:
Create Macro.
Delete Macro.
Modify Macro.
Assign text to a Macro.
Assign Macros to DMX Input channels.
Store the last 40 keypresses as a Macro.

When you store a Macro it is added to the Macro list that appears in the Macro menu.

You can also view this list by pressing **[F6]** while in the editor.

[PAGE UP] and **[PAGE DN]** goes to the previous or next page in the Macro list.

Programming Macros

To select a Macro number, enter a 3-digit number on the keypad. Example: **003**, **030**, **and 300.**
You can also enter a 1 or 2 digit number on the keypad and finish the selection by pressing **[F1 Enter]**. Example: **[3] [F1 Enter], [30] [F1 Enter]**. Use F keys F1 – F5 for direct selection of numbers 1 – 5.

If you try to assign a Macro number that is already in use, the message *Macro Exists* is displayed. You can either press **[F6 Restart]** or begin the sequence again or press **[F1 Delete & Modify]** to overwrite the Macro.

You can exit the Macro menu in the middle of programming without losing your work by pressing **[MENU]**. Pressing **[MENU]** again returns you where you were.

For an example of a typical Macro see below. Macro 12 assigns the loop of memories 50 - 55 as a hard chaser to controller 5 and gives a Go command. It also gives a Go command to a chaser assigned to controller 3. (memories 70 - 80).

Keypresses	**Results/Comments**
1. Press **[MENU] [9] [ENTER]**	You are now in the Macro menu.
2. Press **F1 Create**	
3. Press **F6 Macro #**	The console prompts for the Macro number.
4. Press 012 on the numeric keypad or Press 12 and **F1 Enter**.	A blue window with the Macro number opens.
5. Press **[MEMORY] [50]**	Select the loop of memories for assignment.
6. Press **[HARD]**	The selection is added to the Macro.
7. Press controller 5's **SK**.	The selection is added to the Macro.
8. Press the controller's **SK**, which functions as a Go key.	The selection is added to the Macro.
9. Press controller 3's **SK** key.	The selection is added to the Macro.
10. Press **F1 Store Macro**	Macro 12 is stored and is displayed in the Macro list.

Modifying Macros

Modify Macros by deleting an erroneous entry or inserting a new entry. New entries are inserted in front of the cursor.

Keypresses	Results/Comments
1. Press **F3 Modify**	The prompt asks which Macro is to be modified.
2. Enter the Macro number.	A window opens displaying the selected Macro.
3. Use the arrows (**F2** and **F3**) to position the cursor over the error for deletion or the position for an additional keypress.	
4. If you are erasing an entry press **[CE]**. If you are adding a keypress, press it now.	
5. Press **F1 Store Macro**	The modified Macro is displayed in the Macro List.

Linking Macros

One Macro may be linked to another Macro. Linked Macros operate with a single keypress.

Linked Macros must be the last entry in the Macro sequence.

Example: Macro 12 is linked to Macro 50.

Keypresses	Results/Comments
1. Press **F1 Create**	
2. Press **F6 Macro #**	
3. Enter the Macro number on the keypad. In this case, 050.	
4. Execute desired keystrokes	Remember that up to 40 keystrokes are allowed and leave room for the linked Macro.
5. Press **F6 More Function**	
6. Press **F5 Macro #**	This option permits linking a Macro. *F6* is added to the Macro sequence.
7. Enter the Macro number on the keypad, in this case **012**.	
8. Press **F1 Store**	Operating Macro 50 selects Macro 12 operates it also.

Dedicated function Macros

Macros can be created for special system functions or for frequently used functions. These dedicated special functions are accessed under **F1 CREATE MACRO**.

They include:

- Load
- Record
- Print
- Memory dimmer
- Status

To program a Macro for the functions listed above:

1. Enter the Macro menu.
2. Press **F1 Create**.
3. Enter a Macro number in answer to the prompt.
4. Select the function pressing the appropriate F key.
5. Press **F1 Store Macro**.

Using special function Macros

Load

1. Select the Macro key designated as load.
2. Enter the play number of the show file you want to load. The current drive and directory are referenced.
3. Press the Load Macro again. While the loading function is active a *Wait* message appears. When the load is complete a message is displayed.

Record

A Macro key assigned as Record saves opening the record menu.

1. Select the designated Macro key. *Record* appears in the command line.
2. Enter a show file number.
3. Press the Record Macro again. The current show data is recorded as a show file.While the recording function is active a *Wait* message appears. The file is recorded to the current drive and directory. A message notifies you when the recording is complete.

Print

A Macro key assigned as Print can be used like Print Screen on the alphanumeric keyboard.

1. Go to the screen that you want to print.
2. Select the designated Macro key. Hearts run while the printer is working.

Memory Dimmer

When the Spark 4D or Micron 4D are teamed with the Compulite digital dimmers frame controller. The Memory Dimmer option provides a method for setting an emergency memory that takes over in case of a communication break.

To teach the dimmers the emergency memory stage picture, follow the instructions below. Please refer to the accompanying Dimmer literature for information on the communication break mode.

Enter the Macro menu and create a Macro (Macro 5, for example) as follows:

Keypresses	Results/Comments
1. Press **F1 Create Macro**	
2. Press **F5**	A window for Macro 5 opens.
3. Press **F6 F6** **F4 Memory Dimmer**	If this option is not visible, press **F6 More Function** to page through the options.
4. Press **F1 Store Macro**	Stores Macro 5 as the emergency memory.
5. Press **[RESET] [RESET]**	Leave the Macro menu and return to live mode.
6. Build a lighting state.	
7. Press **[=]**	Signals memory record mode. *MEMORY* appears in the command line.
8. Press **F5**	The word *Dimmer* appears in the command line after *Memory.*
9. Press **[STORE]**	The lighting state is now saved as a special preset that is activated if there is a communications break between the control board and the dimmers.

Status

This Macro allows you to view the Dimmer Status displays when working with bi-directional CMX Dimmer protocol.

1. Operate the Macro for Dimmer Status
2. Press **[PAGE UP]** or **[PAGE DN]** to view the different Dimmer Status display. See Appendix D Dimmer Status and Patch 999 for more information about the Dimmer Status displays.

Adding text to Macros

A text label, typed on the alphanumeric keyboard, may be added to a Macro. Text can be typed before the Macro is created or added to an existing Macro.

Macro Text is displayed in the Macro List, on the controller display in Macro mode, and in the Start Macro window.

Keypresses	Results/Comments
1. Go to the Macro menu.	
2. Press **F4 Text**	
3. Select a Macro.	The Macro number followed by a yellow text area is displayed.
4. Type the text	
5. Press **F1 Store**	If the Macro exists, the console asks for confirmation. If there is no such Macro the blue window opens and you can program a Macro now.
6. Press **F1 Store Macro**	.

Deleting Macros

Keypresses	Results/Comments
1. Press **F2 Delete**	The system prompts you to enter the Macro key.
2. Enter the Macro number.	
3. Press **F1 Store**	The Macro is deleted from the Macro list.

Last 40 keys

The system collects the last 40 key presses in an unnamed Macro. This information is especially useful if you have run into a problem, or suspect a bug, and wish to save the last keypresses that might have caused the problem. This “Macro” is constantly changing as it updates with each keypress.

Keypresses that come from the console are displayed in yellow. If you are using a Rigger or a Universal Remote Control (UWR) the keypresses are displayed in blue. This color code is displayed above the Last 40 Keys in the line labeled Devices.

In the editor, you can view the Last 40 keypresses may by pressing **[F6]**.

You can store the last 40 keys as a Macro.

Keypresses	Results/Comments
1. Go to the Macro menu.	
2. Press **F6 --> 40 Keys**.	
3. Assign a Macro number.	
4. Press **F1 Store**.	The Last 40 Keys Macro, as displayed at the head of the Macro List, is now empty.

Using Teach Macro

The Teach Macro function allows you to program Macros live, thus viewing the result of each keypress included in the Macro.

The Teach Macro function also allows you to program Macros for menu functions.

Access **[TEACH MACRO]** using the **[SHIFT]** key.

It is important to remember that Macros are a collection of keystrokes. Any manual fader or wheel movement is not included in a Macro.

Macros that are programmed using Teach Macro include the SK mode as described above.

The options in the Teach Macro window allow you to Store Macros, erase the Macro, and temporarily disable Macro recording.

The options are available on the F keys and are as follows:

F Keys	What they do
F1 (+1) STORE	The collection of keystrokes is stored as the last recorded Macro + 1.
F2 MACRO #	Use this to assign a Macro number and then press **F1 (+1) STORE** to store the Macro.
F3 TEXT	Press this key and then type text on the alphanumeric keyboard.
F4 DISABLE	Temporarily disable the Teach Macro function. Any keys pressed while the function is disabled will not be gathered into the Macro under construction. The Teach Macro flag is blinks and is displayed in dark blue while the function is disabled. Return to the Teach Macro function by pressing **[TEACH MACRO]** and **F4** to re-enable the function.
F5 ERASE	Clear all of the keystrokes already collected. Erasing the collected keypresses closes the Teach Macro function.
F6 EXIT	Close the Teach Macro window after enabling/disabling Teach Macro or after viewing the contents. **This does not store the Macro!**

You can view the Macro in progress without disabling the Teach Macro function.

1. Press **[TEACH MACRO].** The Teach Macro window opens.
2. Press **[TEACH MACRO]** or **F6 Exit**. The Teach Macro window closes.

Programming with Teach Macro

Keypresses	Results/Comments
1. Press **[TEACH MACRO]**	A window opens with the message *Enter key to start Teach Macro!*
2. Press **[ENTER]**	"Teach Macro [e]" appears at the top of the display. This flag flashes as long as the function is active.
3. Build the keystroke sequence for the Macro	All results are seen live on stage. Any key pressed while this function is active is included in the Macro.
4. Press **[TEACH MACRO]**	The Teach Macro window opens. The highest recorded Macro number is displayed in red at the bottom of this window.
5. Press **[F1 (+1)Store** or **[F2] [**enter a number**] [F1]**	

Operating Macros

Macros can be operated via Events (see Chapter 23 Events), operated using DMX input assignments (see Chapter 29 DMX Input), and triggered manually using the editor or the Soft Keys in Macro mode.

F1 - F5 provide direct single press access to Macros 1 - 5. The Macro operates when the key is pressed.

The SKs in Macro mode provide direct access to Macros 1 - 40.

Operating Macros Using Soft Keys

Macros 1 - 40 are automatically assigned to the controllers as they are programmed. There are 2 pages of Macros; page 1 accesses Macros 1 – 20 and page 2 accesses Macros 21 – 40.

When the SKs are in Macro mode, an orange LED indicates the presence of a Macro.

The display for Macro mode shows soft keys with Macros in orange. If the Macro has text, the first 5 characters appear in the space under the controller/SK. number. If the mode is temporarily Macro, the display shows the Macro list. This is identical to what appears if F6 is pressed when the editor is in idle. Page this list using **[PAGE UP]** and **[PAGE DN]**.

Using Soft Keys in Macro mode

Macros 1 - 40 are automatically assigned to the controllers as they are programmed. There are 2 pages of Macros; page 1 accesses Macros 1–20 and page 2 accesses Macros 21 – 40.

When the SKs are in Macro mode, an orange LED indicates the presence of a Macro.

The display for Macro mode shows soft keys with Macros in orange. If the Macro has text, the first 5 characters appear in the space under the controller/SK. number. If the mode is temporarily Macro, the display shows the Macro list. This is identical to what appears if F6 is pressed when the editor is in idle.

Operate Macros 1 - 20

Keypresses	Results/Comments
1. Press **[MACRO]**	The Macro List is displayed. Skip this step if the SK default mode is Macro unless you want to view the Macro List.
2. To operate Macro 6 press **[SK 6]**, Macro 12 **[SK 12]**, etc.	

Operate Macros 21 - 40

Keypresses	Results/Comments
1. Press **[MACRO]**	The Macro List is displayed. Skip this step if the SK default mode is Macro.
2. Press and hold **[SHIFT]**	Pressing **[SHIFT]** shows *21 – 40* under the Mode on the controller display.
3. To operate Macro 26 press **[SK 6]**, Macro 32 **[SK 12]**, etc.	

Operating Macros using the numeric keypad

When you select a Macro for operation, it is isolated in a window in the middle of the screen and the command line displays *Press F6 for start Macro!* in red. The Macro window closes automatically after 10 seconds. As long as the message is displayed in the command line you can press [F6] to operate the Macro. If you press any other key the Macro operation is aborted.

Keypresses	Results/Comments
1. Press **[F6]**	The Macro list is displayed. Page this list using **[PAGE UP]** and **[PAGE DN]**.
2. Enter the Macro.	Use 1, 2, or 3 digits. The Macro is displayed for 10 seconds. The command line reads *Press F6 for start Macro!*
3. Press **[F6]**	The Macro is triggered.

CHAPTER 18
GROUPS

This chapter contains:

Programming Groups

A Group is a frequently used selection of spots and channels. They are used for quick editing selections. You can program Groups by selecting the spots and channels or using the spots/channels comprising the current lighting state.

You can make 999 groups. Groups can be programmed in blind or live modes. Groups are recorded in the show file.

The first 5 characters of Group text labels are displayed on the Controller display in Group mode and in Group exams.

Programming groups in the editor

Only channels/spots displayed in red are included in the group.

Example: Program Group 12 consisting of spots 2, 4, 6, 8, and 10.

Keypresses	Results/Comments
1. Select spots 2, 4, 6, 8, and 10	
2. Press **[GROUP]**	*Group* is written in the command line.
3. Enter 12 on the numeric keypad.	
4. Press **[STORE]**	The message G*roup 12 Stored* is displayed. The LED for controller 12 is orange.

➢Note

If there is already a Group stored on the selected number, the message *Group Exists. Update?* is displayed.

To update the Group press **[STORE]**.

If you do not want to modify the existing Group press **[CE]** and enter another number.

Programming groups from current lighting state

You can program a group including all the spots/channels currently active or use the Special Selection functions to select only some of the spots/channels participating in the stage picture.

Example: program group 12 that includes all the channels in the editor and active on-stage.

Keypresses	**Results/Comments**
1. Press **[CHANNEL]**	
2. Press **[→][→]**	The command line reads: *Channel from editor & stage*.
3. Press **[GROUP]**	All channels included in the current output are displayed in red.
4. Enter 12 on the numeric keypad.	
5. Press **[STORE]**	The message *Group 12 Stored* is displayed. The LED for controller 12 is orange.

You can include only some of the spots/channels participating in the stage picture in the Group.

Example: the stage picture consists of spots 5 - 12. You want to exclude spot 8 from Group 12.

Keypresses	**Results/Comments**
1. Press **[SPOT]**	
2. Press **[→][→]**	The command line reads: *Channel from editor & stage →*.
3. Press **[EXCEPT] [8]**	Channel 8 will not be included in the Group.
4. Press **[GROUP]**	
5. Enter 12 on the numeric keypad.	
6. Press **[STORE]**	The message *Group 12 Stored* is displayed. The LED for controller 12 is orange.

Programming an empty group

You can also program empty groups. These groups can be labeled and then filled in later as needed.

Example: Program group 12 as an empty Group to be filled in later.

Keypresses	Results/Comments
1. Press **[GROUP]**	
2. Enter 12 on the keypad.	
3. Press **[STORE]**	The message *Store Empty Group*? Is displayed
4. Press **[STORE]**	The message *Group 12 Stored* is displayed.

Adding spots and channels to groups

Spots and channels can be easily added to existing groups.

Example: add spots 7-9 to group 1.

Keypresses	Results/Comments
1. Select spots 7 → 9	
2. Press **[GROUP]**	
3. Press **1**	
4. Press **[STORE]**	The message *Update Group?* is displayed.
5. Press **[STORE]** again	The message *Group 1 Stored* is displayed.

Erasing Groups

Example: Erase group 1. .

Keypresses	Results/Comments
1. Press **[GROUP]**	
2. Press **1**	
3. Press **[ERASE]**	The message *Are you sure?* is displayed.
4. Press **[ERASE]** again	The message *Group # Erased* is displayed.

Examining Groups

The Group Exam display shows the spots and channels included in the selected Group. If text is attached, it is also displayed.

Once you have examined the Group, you can continue by pressing the + and — keys to view the next or previous group.

You can also view a list of groups.

Examining a selected group

Keypresses	Results/Comments
1. Press **[GROUP]**	
2. Enter a Group number on the numeric keypad.	
3. Press **[EXAM]**	The display shows the spots, channels, and text in the selected group.
4. Press **+** or **–** to view the next or previous group.	

Viewing the group list

Keypresses	Results/Comments
1. Press **[GROUP]**	
2. Press **[EXAM]**	A list of groups and their text labels is displayed.
3. Press **[STAGE]** to exit this exam.	

Labeling Groups

You may want to label Groups. The label is displayed when examining a selected group and viewing the Group List. The first 5 characters of the label are displayed on the Controller display in Group mode.

Keypresses	Results/Comments
1. Press **[GROUP]**	
2. Select a group, entering a number on the numeric keypad.	
3. Press **[TEXT]**	
4. Type the text on the alphanumeric keyboard.	
5. Press **[STORE]**	The full text appears on the individual Group exams.

Erasing text

Keypresses	Results/Comments
1. Press **[GROUP]**	
2. Select a group.	
3. Press **[TEXT]**	
4. Press **[ERASE]**	The message *Group # Stored* is displayed.

Selecting Groups

When you select a Group the spots and channels assigned to those groups are displayed in red in the editor. Use the dimmer wheel to bring up the dimmers of all the selected spots/channels or select specific spots/channels from the group for intensity or for parameter value assignments.

When the Group contains both spots and scroller channels, the wheels default to spot parameters. To address scroller frames, press **[FRAME]** and assign scroller frames using the numeric keypad.

Selection Sequences for Groups:

[GROUP #] [wheel]

[GROUP # [→ #] [wheel

[GROUP # [→ #] [EXCEPT #] [wheel]

[GROUP] [MEM #] [wheel] – this is a special sequence that turns spots and channels in the selected memory into a Group selection. The dimmer and parameter values in the memory are ignored; spots and channels only are selected. You can store this selection as a Group.

You can also access Groups 1 – 40 on the Soft Keys in Group mode.

Keypresses	Results/Comments
1. Press **[GROUP]**	Skip this step if Group is the NSK mode. The orange LEDs indicate Groups.
2. Press one of the **SKs** for Groups 1 – 20. Press **[SHIFT]** to access Groups 21 – 40.	The spots and channels in the Group are selected and displayed in red.

Releasing spots and channels from the selection

If you want to use only part of the group that you have selected, you can release spots and channels from the selection.

Keypresses	Results/Comments
1. Select a group.	
2. Press **[EXCEPT]**	
3. Press **[CHANNEL]** or **[SPOT]** and enter the channel or spot numbers on the keypad.	The result of releasing spots/channels is apparent only after the dimmer wheel or parameter wheel has been moved.

You can release spots/channels from the editor after they are selected through a Group by using another group.

Example: Group 1 contains spots 1- 10, group 2 contains spots 6 and 7. You want to select the spots in group 1 except spots 6 and 7.

Keypresses	Results/Comments
1. Press **[GROUP]**	
2. Enter the Group number on the numeric keypad or select a Group using the SKs.	
3. Press **[EXCEPT]**	The spots in Group 1 are selected in the editor.
4. Press **[GROUP]**	
5. Enter the Group number on the numeric keypad or select a Group using the SKs and assign intensity.	Spots 6 and 7 are not included in the selection.

CHAPTER 19
PALETTES

This chapter includes:

Overview

Palettes are a non-tracking database of spot parameter values, channel intensity values, and scroller frame values. Spark 4D supports 999 Palettes.

Palette information for spot parameters is stored per spot type. Example: Cyberlight spots and Superscan Zoom are selected in the editor and have parameter value assignments. Any Palette stored will contain values for Cyberlight spots and Superscan Zoom fixtures. The information stored for a spot type can be applied to all spots of that type.

Spot types reference the ID number included in the spot definition in the Mix Output menu.

Channel information is per channel and scroller information is per scroller channels. Example: Storing a Palette from the editor. The editor is channel-1 – 6 @ 80%. Scroller channels 101 – 106 at scroller frame 12. Therefore the Palette can be applied to channels 1 → 6 and 101 → 106.

Palettes are stored and retrieved using the SKs in Palette mode or using the numeric keypad.

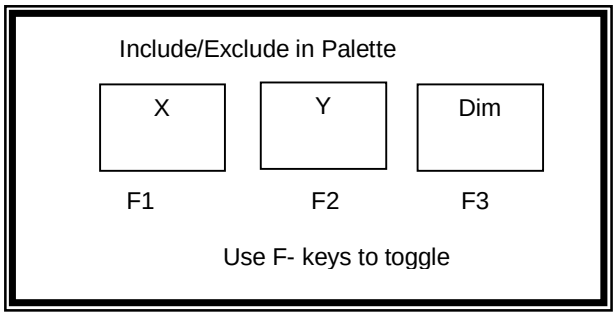
Palettes are stored with the show file and in a separate Palette Only file. Palettes may be loaded independently of show files.

Programming a Palette for spots

If more than one spot type is in the editor, the parameter values of the first spot number of that type are stored in the Palette.

A window, that opens when storing Palettes, gives you the option of including or excluding the X, Y, and Dimmer parameters when storing the Palette.

The window looks like this:



The color key for this window:

Color	What it means
Blue	Include the parameter in the Palette
Gray	Do not include the parameter in the Palette

Example: Program Palette 6.

Keypresses	Results/Comments
1. Select spots/channels and assign values.	Repeat the procedure for as many spots/channels as desired.
2. Press **[PALETTE]**	
3. Enter 6 on the keypad.	
4. Press **[STORE]**	The Include/Exclude window opens.
5. Optional - change the settings in the Include/Exclude option.	
6. Press **[STORE]**	The message *Palette 6 Stored* is displayed.

Text for Palettes

Add text labels to Palettes for easy identification. The text appears in the Palette list

Keypresses	Results/Comments
1. Press **[PALETTE]**	
2. Enter the palette number on the keypad	Select the Palette that you want to label.
3. Press **[TEXT]**	
4. Type text on the alphanumeric keyboard.	
5. Press **[STORE]**	The text appears next to the Palette number in the Palette list display.

Examining Palettes

You can examine the contents of each Palette or view a Palette list.

The Palette list exam is a “strong” exam. Since no keypress bumps out this exam you can keep it on view while you continue editing.

If the Palette list is more than 1 page, use **[PAGE UP]** for paging.

Viewing the Palette list

Keypresses	Results/Comments
1. Press **[PALETTE]**	
2. Press **[EXAM]**	A list of Palettes is displayed. The display shows the generic contents of the Palette-spots, channels, and scrollers and text.

Examining a selected Palette

This is a "weak display"; any keypress (except those used to view next and previous Palettes) bumps the display back to the Stage display.

If the Palette contains spots and channels press **[→], [PAGE UP]**, and **[PAGE DN]** to page for channels or spots

Keypresses	Results/Comments
1. Press **[PALETTE]**	
2. Enter a Palette number on the keypad.	
3. Press **[EXAM]**	The contents of the Palette are displayed.
4. View the next or previous Palette by **[+]** or **[-]**.	

Modifying Palettes

There are 2 ways to modify palettes.

You can modify a Palette by adding the editor to the Palette. This method begins with selecting the spots, parameters, channels, or scrollers and adding them to the Palette.

You can also use direct Palette modification, which begins by selecting the Palette.

➢Note

If the Palette does not contain the channel, scroller, or spot type it is added. If the Palette does contain the channel, scroller or spot type the information is overwritten.

Modifying parameter values

Keypresses	Results/Comments
1. Press **[PALETTE]**	
2. Enter the Palette number on the keypad	
3. Press **[SPOT]** or **[CHANNEL]** and select the spot or channel	The contents of the Palette enter the editor.
4. Modify the value.	
5. Press **[STORE]**	The Include/Exclude option is displayed.
6. Optional – change the settings in the Include/Exclude option.	
7. Press **[STORE]**.	The message *Palette # Stored* is displayed.

Adding to a Palette

Keypresses	Results/Comments
1. Select channels/spots and assign values.	
2. Press **[PALETTE]**	
3. Enter the Palette number on the keypad	
4. Press **[STORE]**	The Include/Exclude window opens.
5. Optional – change the settings in the Include/Exclude option.	
6. Press **[STORE]**	The message *Update Palette info?* is displayed.
7. Press **[STORE]**	The message *Palette 10 Stored* is displayed.

Adding new parameters

Example: Add a new parameter to Palette 10.

Keypresses	Results/Comments
1. Press **[PALETTE]**	
2. Enter the Palette number on the keypad	
3. Press **[SPOT]** or **[CHANNEL]** and select the spot or channel	The contents of the Palette enter the editor.
4. Modify the value.	
5. Press **[=]**	
6. Press **[PALETTTE]**	
7. Press **[STORE]**	The Include/Exclude option is displayed.
8. Press **[STORE]**	The message *Update Palette Info?* Is displayed.
9. Press **[STORE]**.	The message *Palette # Stored* is displayed.

Removing elements from a Palette

Example: Remove a spot parameter from Palette 10.

Keypresses	Results/Comments
1. Press **[PALETTE]**	
2. Enter 10 on the keypad.	
3. Select a spot.	Palette contents enter the editor.
4. Select the parameters that you want to delete.	
5. Press **[RELEASE]**	
6. Press **[STORE]**	The Include/Exclude window opens.
7. Press **[STORE]**	The message *Palette 10 Stored* is displayed.

Example: Remove a channel from Palette 10.

Keypresses	Results/Comments
1. Press **[PALETTE]**	
2. Enter 10 on the keypad.	
3. Select the channels that you want to delete.	Palette contents enter the editor.
4. Press **[RELEASE]**	The channel fades to 0%.
5. Press **[STORE]**	The Include/Exclude window opens.
6. Press **[STORE]**	The message *Palette 10 Stored* is displayed.

Example: Remove a scroller from Palette 10.

Keypresses	Results/Comments
1. Press **[PALETTE]**	
2. Enter 10 on the keypad.	
3. Select the channel whose scroller you want to delete.	Palette contents enter the editor.
4. Press **[FRAME]**	
5. Press **[RELEASE]**	
6. Press **[STORE]**	The Include/Exclude window opens.
7. Press **[STORE]**	The message *Palette 10 Stored* is displayed.

Erasing a Palette

Example: Erase Palette 10

Keypresses	**Results/Comments**
1. Select Palette 10	
2. Press **[ERASE]**	The system asks: *Are You Sure?*
3. Press **[ERASE]**	The message: *Palette 10 Erased* is displayed.

Example: Delete Palettes 1 → 10

Keypresses	**Results/Comments**
1. Press **[PALETTE]**	
2. Press **[1 → 10]** on the keypad.	
3. Press **[ERASE]**	The system asks: *Are You Sure?*
4. Press **[ERASE]** again.	The message: *Palette/s Erased* is displayed.

Applying Palettes

Spot information is applied per type of spot. Channel information is applied per channel. Scroller information is applied per scroller.

Example: Palette 10 contains information for spots Goldenscan and Superscan Zoom, channels 1 – 10, and scrollers 101 – 110. The editor selection is spots 1 → 1-Superscan Zooms, channels 1 – 6, and scrollers 101 – 106; the Palette information is applied to the editor selections.

Keypresses	**Results/Comments**
1. Select spots, select channels, and scroller channels.	
2. Press **[PALETTE]**	
3. Enter 10 on the keypad.	The parameter, intensity, and scroller frame information is assigned to the selections in the editor if the spot type is identical to the spot in the Palette and the selected channels and scrollers are included in the Palette.

Palette files

Palettes are an integral part of shows and thus are automatically stored and loaded with show files. The Palette information in show files includes spot, channels, and scroller information. Palette files archived in the show files may be loaded separately using the Palettes Only option in the Load menu.

You can also record and load Palettes in dedicated Palette files that are not linked to any specific show.

Palettes from show files and dedicated palette files may be loaded into any range of Palettes, not necessarily the range they were recorded on. They may also be partially loaded. Using this option you may construct your Palettes from several show files and Palette files.

Recording dedicated Palette File s

The Palette file includes all of the Palettes in the system at the time of the recording. Only spot information is recorded. Channel and scroller information is not included in dedicated Palette files.

Dedicated Palette files are flagged with an *L* in the file list.

Keypresses	Results/Comments
1. Go to the Record menu.	
2. Press **F6 More…** and **F1 Palette File**	Palette files are displayed. You are prompted for a file number.
3. Enter a file number.	
4. Press **F2 Text** and type a label for the file. (optional)	
5. Press **F1 Record**	The message *Chan & Scroller information will not be stored in file* is displayed. A confirmation request is also displayed.
6. Press **F1 Yes**	

Loading Palettes from show files

Keypresses	Results/Comments
1. Go to the Load menu.	
2. Enter the show file number	
3. Press **F6 More** and then press **F3 Palettes Only**	
4. Press **F1 All Palettes** or select specific Palettes.	
5. Press **F1 Load**	The message *Are You Sure?* is displayed.
6. Press **F1 Yes**	All Palettes in the file are loaded as they appear in the file; Palette 1 as Palette 1, Palette 2 as Palette 2, etc.

Loading Dedicated Palette files

Keypresses	Results/Comments
1. Go to the Load menu.	
2. Press **F6 More** and then press **F1 Palette Files**	Palette files stored in the current directory are displayed. They are preceded by an *L*.
3. Enter the Palette file number	
4. Press **F1 All Palettes** or **F2 Palette #** and select Palettes.	
5. Press **F1 Load**	The message *Are You Sure?* is displayed.
6. Press **F1 Yes**	All Palettes in the file are loaded as they appear in the file; Palette 1 as Palette 1, Palette 2 as Palette 2, etc.

Loading some of the Palettes

The following discussion applies to Palettes loaded from show files and dedicated Palette files.

You can load only some of the Palettes contained in the file.

Example: The Palette file contains Palettes 1 – 20. You want to load Palettes 5 through 11 starting at Palette number 1.

Keypresses	Results/Comments
1. Go to the Load menu.	
2. Press **F6 More** and then **F1 Palette Files**	Palette files in the current directory are displayed.
3. Enter the file number at the prompt.	
4. Press **F2 Palette #**	The prompt *Palette # to Load:* is displayed.
5. Enter **5** at the prompt.	
6. Press **F2 Thru Palette #**	You are prompted for a Palette number.
7. Enter **11** at the prompt.	
8. Press **F2 To Palette #**	The prompt *Start at Palette #* is displayed.
9. Enter **11** at the prompt.	
10. Press **F1 Load**	You are prompted to confirm the command.
11. Press **F1 Yes**	Palette 5 is loaded as 1, Palette 6 as 2, Palette 7 as 3, etc.

You can load Palettes to different Palette numbers than appear in the file.

Example: The Palette file contains Palettes numbered from 1 – 20. You want to load them as Palettes 21 – 40. When loading this file, you request that the load begin at Palette 21.

Keypresses	Results/Comments
1. Go to the Load menu.	
2. Press **F6 More** and then **F1 Palette Files**	
3. Enter the file number at the prompt.	
4. Press **F1 All Palettes**	
5. Press **F2 To Palette #**	The prompt *Start at Palette #* is displayed.
6. Following the example above, enter number **21**.	
7. Press **F1 Load**	You are prompted to confirm the command.
8. Press **F1 Yes**	A message is displayed when the load is complete.

CHAPTER 20
Q-LISTS

This chapter includes:

Overview

Q-Lists are independent entities. Each of the 100 Q-Lists can contain memories numbered from 0.1 to 999.9.

You can use Q-Lists to organize your show. Example: The dance company you are lighting has 3 dances on the program. Store the memories for dance 1 in Q-List 1, store the memories for dance 2 in Q-List 2, and store the memories for dance 3 in Q-List 3. Another example: the band has 20 songs. Store the memories for each song in separate Q-Lists. This makes it very easy to organize your playback when the songs are not performed in the same order every night.

Q-List functions are:

- Select Q-Lists
- Change the default Q-List
- Store the editor group to Q-Lists other than the default Q-List

The default Q-List is Q-List 1. All memories are stored to the default Q-List unless otherwise instructed. The default Q-List is displayed in the lower right on the monitor. The LED for the NSK of the default Q-List flashes when the NSK mode is Q-List.

Each editor can be assigned different default Q-Lists. The default Q-List assigned to each editor is retained when switching between editors. Example: the default Q-List for Editor 1 can be Q-List 5, while the default Q-List for Editor 2 can be Q-List 10.

Loops can be embedded within Q-Lists.

Assignments to the crossfader and controllers may originate from different Q-Lists. Example: You can assign memory 1 from Q-List 1 to the A/B crossfader, memory 100 from Q-List 5 to controller 10, and memory 65 from Q-List 50 to controller 15.

The source Q-List source memories is displayed in the Playback display, XFade exam, snap exams, Events assignments, and memory exams.

Storing Memories in Q-Lists

Storing the editor group as a memory always stores to the current default Q-List. If the default Q-List is 5, the memory is stored in Q-List 5. Memories can also be stored to a Q-List other than the default Q-List.

Keypresses	Results/Comments
1. Select and edit spots and channels.	
2. Store as a memory 3.	The memory is stored to the default Q-List.
3. Press **[Q-LIST]**	
4. Select 3	
5. Press **[MEMORY]**	
6. Select 10 on the numeric keypad.	
7. Press **[STORE]**	The message Q3 *Memory 10 Stored* is displayed. It is stored to Q-List 3.
8. Press **[Q-LIST]**	
9. Select 5	
10. Press **[MEMORY]**	
11. Select 12 on the numeric keypad.	
12. Press **[STORE]**	The message Q5 *Memory 12 Stored* is displayed. It is stored to Q-List 5.

Examining Q-Lists

The general Q-List display shows a numerical list of the existing Q-Lists.

Viewing a list of Q-Lists

The Q-List exam display shows the number and range of memories, text, and the time. The time is the total playback time (taking into account time-in and delay assignments) of all of the memories in the Q-List.

Keypresses	Results/Comments
1. Press **[Q-LIST]**	
2. Press **[EXAM]**	The Q-Lists are displayed. The red asterisk (*) preceding a Q-List indicates the current default Q-List.

Viewing a selected Q-Lists

Use this sequence if you want to view a Q-List other than the default Q-List.

Keypresses	Results/Comments
1. Press **[Q-LIST]**	
2. Enter the Q-List number on the keypad.	
3. Press **[EXAM]**	The Memory List of the selected Q-List is displayed.

Changing the Default Q-List

The default Q-List of the system is Q-List 1. The default Q-List can be changed at anytime. The default Q-List is changed in the editor.

Example: the default Q-List is Q-List 1. Change the default to Q-List 2.

Keypresses	Results/Comments
1. Press **[Q-LIST]**	
2. Select the Q-List, for this example press **[2]**.	
3. Press **[ENTER]**	The *Q-List 2* and the last memory of the *Q-List* are displayed. All memories stored are added to the default *Q-List*. Memories can also be added to other *Q-List*s. See Storing Memories in Q-Lists, page 20-3.

Assigning memories from different Q-Lists to playback devices

You can assign memories from Q-Lists other than the default Q-List to playback devices.

The assignment sequences are similar to the regular assignment syntax, with the addition of the Q-List number.

Assigning to the crossfader

When you assign a memory from a Q-List to the crossfaders the memory sequence remains within the assigned Q-List.

When you examine the A/B assignment, the memory number and the *Q-List* are displayed. Q-List numbers are also displayed on the Playback display and the XFade exams.

Example: The default Q-List is 1. Assign memory 5 from Q-List 3 to A/B.

Keypresses	Results/Comments
1. Press **[Q-List]**	
2. Press **[3]** on the keypad	*Q-List 3* is written in the command line.
3. Select memory 5.	
4. Press **[A]** or **[B]** or **[GO TO]**	Memory 5 from Q-List 3 is assigned to the A/B crossfader. The next memory in sequence is the next memory in Q-List 3.

➢**Note**
If you do not specify a Q-List the assignment is from the default Q-List.

Assigning to controllers

Example: Assign memory 5 from Q-List 3 to controller 16. Select the Q-List on the NSKs.

Keypresses	Results/Comments
1. Press **[Q-LIST]**	
2. Press **[3]** on the keypad	
3. Select memory 5	
4. Press **[ASSIGN]**	*Assign Key Expected* is displayed.
5. Press the assignment SK for controller 16.	Memory 5 from Q-List 3 is assigned to controller 16.

CHAPTER 21
EFFECTS

This chapter includes:

Overview

The Effects Editor provides you with the tools to edit the pre-programmed Effects Package or program your own custom Effects.

Effects can contain any number of spots, channels, or scrollers. All Effect attributes are parameter specific. Example: You can assign different Offsets to parameter 6 in spot 1, parameter 6 in spot 2, and parameter 6 in spot 3.

The spot selection order determines the order in which Effects with an Offset is executed. Example: If the spot selection was 1 → 12, spot 1 is the first spot to respond, spot 2 is the next, etc. If the spot selection was 12 → 1, spot 12 is the first spot to respond, spot 11 is the next, etc. This is also valid for non-sequential spot selections, such as spot 5, spot 7, spot 4, spot 8, etc.

Effects can be stored as a memory or as an Effect Template.

Effect Templates are used as a database and can be applied to any number and any type of spots. Effect Templates are numbered from 1 - 999.

Effect Templates are stored in show files. They can be recorded and loaded as separate files also.

Effects are programmed live or off line with the aid of CompuCAD, WYSIWYG and other lighting CAD programs.

Effects are played back on the crossfader, the controllers, or in the editor.

Spark 4D comes with pre-programmed Effects. The Effects are stored on the Hard Disk. The prefix 'E' is attached to Effects files. You will probably want to edit the pre-programmed Effects changing Effect attributes such as Rate and Size.

The wheels and the Effect attribute keys comprise the Effects Editor. The Soft Keys are used to select Effect attributes.

Effect attributes are displayed on the monitor and the wheels' LED displays.

Attribute values are assigned using the wheels or the numeric keypad.

Channels and scrollers can be assigned Effects. All Effect parameters operate on channels and scrollers as they do for spot parameters.

Accessing the Effects Editor

There is a special Effects Editor for programming and modifying custom or canned Effects. When the Effects Editor is active the wheels and Effect Attribute keys (the controller Soft Keys) control the Effect attributes.

The keys used when working in the Effects Editor are:

[EFFECT] (Shift on the **[PART]** key) opens the Effects Editor

[EFFECT] changes the Soft Key mode to Effects. It is also used to store Effects.

The Soft Keys for Primitive and Effect attribute selection, paging parameters, and exiting the Effects Editor.

[SHIFT] to return the Soft Keys temporarily to Parameter mode for parameter selection.

In the instructions below it is assumed that if the current Wheel Bank does not contain the Effect attribute under discussion you will page the Wheel Banks until the attribute is displayed in on of the wheel LED displays.

The Effects Editor display shows the selected spots/channels and their parameters, their Effect attributes, a list of Effect attributes, a list of Primitives, and the Time Cycle meter.

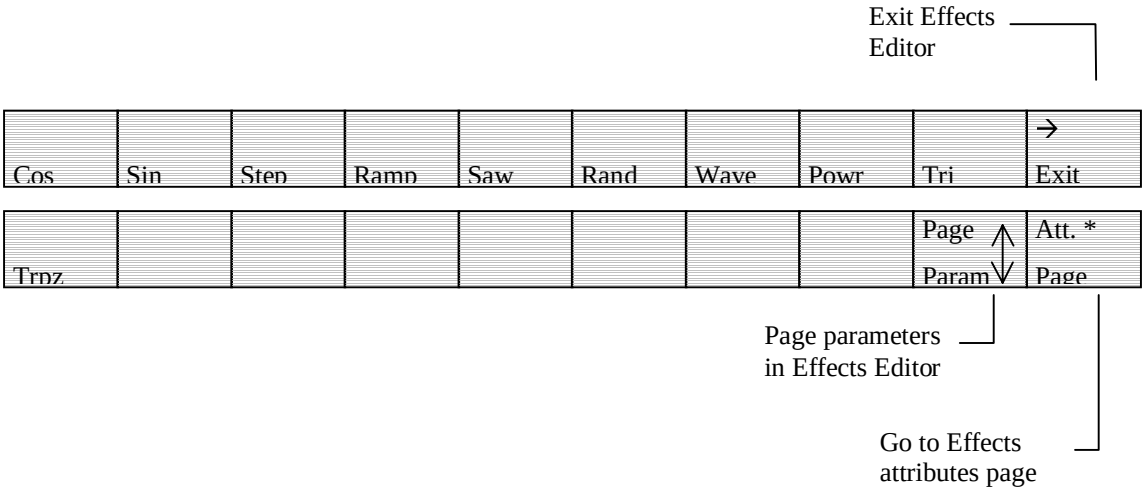
In the Effects Editor, the selected spot parameters appear on a dark red field. All Effect attributes assigned to the last 5 selected parameters are displayed. The active attribute is displayed on a red field. Parameters with no Effect attribute assignments show the parameter tracking value.

Entering the Effects Editor automatically turns on the dimmers for the selected spots. If channels are not assigned an intensity, 0% is the Base value for the channel.

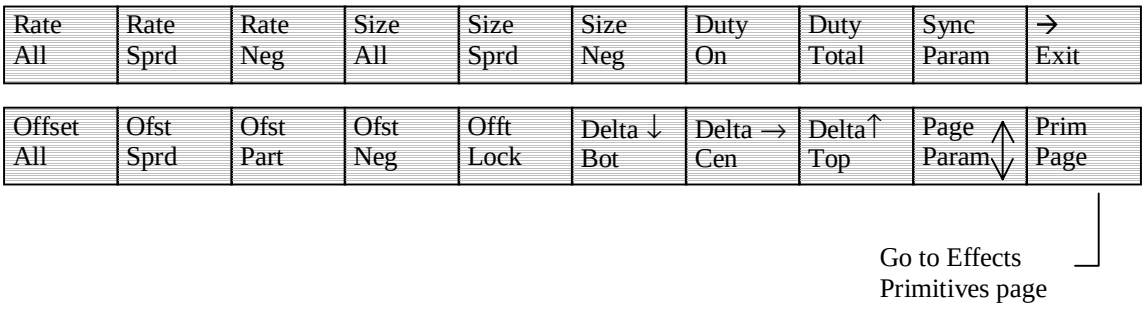
Keypresses	**Results/Comments**
1. Select spots and parameters or channels	The Effects Editor is displayed only when parameters are selected.
2. Press **[EFFECT]**	The Effect Editor is displayed in the controller display.

The Soft Keys pages for the Effects Editor are arranged as shown in the following illustration.

Primitives Page



Attributes Page



Paging in the Effects Editor

Each page of the Effects Editor displays 10 spots. If you have more than 10 spots with Effect assignments use **[PAGE UP]** and **[PAGE DN]** to page the spots. To page parameters use SK 19 Page Param.

Exiting the Effects Editor

In the Effects Editor, Soft Key 10 - **Exit**- exits the Effects Editor and returns to the Stage display.

Keypresses	Results/Comments
1. Press **[Exit]**	The Stage display is on the monitor. The Soft Keys return to the current SK mode.

Returning to the Effects Editor

You can easily return to the Effects Editor and select the channels/spots that are currently running in an Effect.

Keypresses	Results/Comments
1. Press **[EFFECT]**	
2. Press **[SPOT]** or **[CHANNEL]**	
3. Double hit **[EFFECT]**	The Effects Editor opens with currently running spots/channels selected.

Programming in the Effects Editor

While working in the Effect Editor, the keys **[ALL]**, **[HOME]**, **[CL1]**, and **[CL2]** for spots are operable.

Each Effect can contain spots, channels, and scrollers. When editing Effects that have all these elements, Spread Offset is assigned per element. Note that although an Effect can contain spots, channels, and scrollers each element must be edited separately.

Spot dimmers that are not active in the editor or on a playback device are automatically set to FL when entering the Effects Editor.

Example: Program an Effect for spot parameters

Keypresses	Results/Comments
1. Select spots	
2. Select a parameter	
3. Press **[EFFECT]**	The Effects editor opens
4. Assign a Primitive (see below) and edit the Effect attributes	
5. Press and hold **[SHIFT]**	The Parameter selection page is displayed.

Effects Editor Color Key

Color	Indicates
Blue	Selected spots
Dark Red	Selected channels
Green	Selected scroller frames

Assigning Primitives

Primitives are the Effect's basic movement. Different Primitives can be assigned to each parameter. Combining Primitives affords a quick way to create Effects.

Example: Create a clockwise circle by assigning Sine to x and Cos to y. Create a counterclockwise circle by assigning Cos to x and Sine to y.

Different primitives can be assigned to each parameter participating in the Effect.

As demonstrated in the table at the end of this chapter, combinations of primitives are used to program Effects.

A Primitive can be assigned at any point during Effect programming. You may find that you want to adjust the Base, assign Offset, and Rate values before assigning a Primitive.

For the Primitives page layout, see Primitives Page page 21-8

Keypresses	Results/Comments
1. Select spots	
2. Select parameters	
3. Assign a base value. You can also adjust any Effect attributes at this time.	
4. Press **[EFFECT]**	The Effect Editor is displayed on the monitor.
5. Select a Primitive.	The Effect operates immediately on assigning a Primitive.

Releasing a Primitive assignment

When you release a Primitive assignment the Effect is released. The subsequent parameter values depends on how the release was done. If you release an assignment in the Effects editor the parameter value is the Base value in the Effect. If you release the assignment in the Live editor the values are taken from tracking.

Example: Release the Primitive assignment on Spot 5, Y from within the Effects Editor.

Keypresses	Results/Comments
1. Select spot 5	Skip this step if the spot is selected
2. Select Y.	Skip this step if the parameter is already selected
3. Press **[RELEASE]**	The Primitive assignment is released. The selected parameter stays at its Base value. The display returns to the Stage display.

The Sine primitive

All Primitives operate from 0% - Full and back to 0%.

The Primitive Sin, however, begins at 50%, going from 50% to 0% to Full and back to 50%. This characteristic causes the Effect to "rest" at 50% when the Duty Cycle is not 1:1.

It is recommended to use Sin only in conjunction with Cos to program a Circle Effect.

Selecting Additional Parameters

If you want to include another parameter in the Effect, you must select the parameter using the parameter keys.

The example below assumes that you are in the Effect Editor.

Keypresses	Results/Comments
1. Press and hold **[SHIFT]**	The Soft Keys revert to Parameter mode.
2. Press a P key and release **[SHIFT]**	The Soft Keys change for Effect Editor operation. The selected parameter appears on a red field.
3. Assign a Base value to the parameter. Modify the Attribute values and assign a Primitive.	
4. Repeat steps 1 – 3 as necessary.	

➢**Note**

[X] and **[Y]** can be selected without leaving the Effects Editor.using their dedicated keys.

This key sequence can also be used to deselect parameters. Example: You have entered the Effects Editor after touching the trackball, which leaves both x and y selected. You only want to work with X in the Effects Editor so you must select X by pressing on the X parameter key.

Assigning Effects to channels

Channels have 1 parameter – the dimmer. The Effect is applied to the dimmer.

Keypresses	Results/Comments
1. Select the channels and assign intensity as a Base value (See Base page 21-8)	
2. Press **[EFFECT]**	The Effect Editor is active. The channel numbers are displayed on a red field, prefaced by *ch*.
3. Assign a Primitive and edit the rest of the Effect attributes.	The Effect is immediately active.
4. Edit the rest of the Effect attributes.	
5. Store as a memory, assign to a playback device, or store as an Effect .	When assigned to a controller, the Effect is active when the controller handle is off its bottom end-stop.

➢**Note**

The Effect attribute Offset Spread is especially useful with channels. You can use it together with **<Duty Tot> [•]** to program hard chasers.

Assigning Effects to scrollers

In the Effects Editor scroller channels are displayed in green and preceded by an *s*.

Keypresses	**Results/Comments**
1. Select the channels.	
2. Press **[FRAME]**. Optional – assign a frame value.	
3. Press **[EFFECT]**	The Effect Editor is active. The scroller channel number is displayed on a green field prefaced by *s*.
4. Assign a Primitive	T he Effect becomes active.
5. Assign a value to the Size attribute. (See Size page 21-8)	
6. Edit the rest of the Effect attributes.	
7. Store as a memory, assign to a playback device, or store as an Effect .	When assigned to a controller, the Effect is active when the controller handle is off its bottom end-stop.

Returning to the Effects Editor

If you exited the Effects Editor, it is very easy to reselect the spots or channels participating in the Effect and return to the Effect Editor.

Keypresses	**Results/Comments**
1. Press **[SPOT]** or **[CHANNEL]**	
2. Press **[EFFECT]**	The participating channels/spots are selected.
3. Press **[EFFECT]**	The Effect Editor is active. All parameters with effect attribute assignments are selected.

Effect Attributes

Effect Attributes can be divided into 2 categories - movement and time.

Movement Attributes	Time Attributes
Primitive	Rate
Base	Offset
Size	Duty Cycle
Delta	

Attributes that you are working on are displayed on a light red field in the Effects table.

Time attributes can be copied from one parameter to another.
See Copying timing attributes, page 21-8.

Base

The Base is the parameter value starting point reference for the Effect. The placement of the starting point is determined by Delta (see below).

Base is parameter and spot/channel specific. The Base can be changed in the Effects Editor.

The default Base is the parameter value in the live editor. The value can be an assigned value or from tracking. Base values can be changed within the Effect Editor. Libraries can be also be used to assign Base values.

➢Important!

When an Effect is stored as a memory, the Base is included. When an Effect is stored as an Effect the base is not retained.

Wheel 1 controls the Base. When entering the Effects editor, press **[WHEEL +]** to switch wheel 1 to Base control.

Editing Base Values

Changing the Base changes the starting point of the Effect.

Keypresses	Results/Comments
1. Select spots and parameters or channels.	
2. Press **[EFFECT]**	The Effect Editor is active
3. Press **[WHEEL+]**	Wheel 1 now controls the Base.
4. Turn the Base wheel Or Select a Library	The new Base value is displayed on the monitor on a red field. Base values derived from Libraries display the Library number.

Editing the Base for an Effect in playback

The following sequence is used when an Effect is running on a playback device.

Keypresses	Results/Comments
1. Select spots and parameter or channels.	
2. Press the parameter key and move the parameter wheel or assign a value on the keypad.	
3. Press **[STORE] [STORE]**	The new value is displayed on the monitor.

➢Note

Use the parameter wheel only to change the Base value while in playback. Entering a value on the numeric keyboard clears the Effect assignment.

Size

The Size determines how much movement takes place from the Base. The Size default is Zr or 50 or FL depending on the type of parameter. The movement in relation to the Base is influenced by the Delta.

Example: The Base is 50, Size is 50, Delta is C (center). The range of movement is Base +25 and Base – 25.

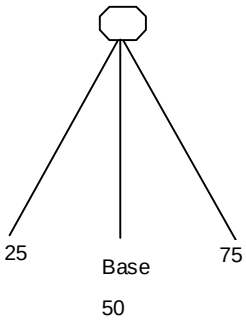


Figure 1 Size attribute with center Delta

Example: If the Base value is 30, Size 50, and Delta C, the upper value is 55 and the lower value is 5.

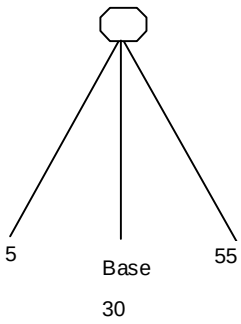


Figure 2 Size attribute with center Delta

Changing the Size

There are three Size options:

Option	What it does
Size All	Modify the absolute size equally for all selected parameters. **<Size All>** is the default selection.
Size Spd (Spread)	The Size modification can be "spread" relatively over the selected parameters in the selected spots. The assignment of the spread depends on the order of the spot selection.
Size Neg (negative)	Reverses the direction of the Effect.

Keypresses	Results/Comments
1. If your are not in the Effects Editor, select spot/s and parameter. If the Effects Editor is open select the spots and parameter if necessary.	Press **[SHIFT]** to access the Parameter page.
2. Press **[EFFECT]**	Skip this step if you are in the Effects Editor.
3. Press **<Att Page>**	
4. Press **<Size All>** or **<Size Sprd>**	Size values are displayed on a red field in the Effects Editor
5. Use the wheel or enter a value on the keypad.	

Resetting Size value

Keypresses	Results/Comments
1. If your are not in the Effects Editor, select spot/s and parameter. If the Effects Editor is open select the spots and parameter if necessary.	
2. Press **[EFFECT]**	Skip this step if you are in the Effects Editor.
3. Press **<Size All>** or **<Size Sprd>**	
4. Press **[0]**	Size resets to the value previous to the last modification.

➢Note

When the Size value was assigned using **<Size Spd>** and **<Size All>** each element is reset separately.
Example: Channels 1 – 4 were assigned Spread Size values – Size 0, 25, 50, and 75. Then 5% was added to the values using **<Size All>**.
Selecting **<Size All>** and resetting the Size value resets the values to 0, 25, 50, and 75.
Selecting **<Size Spd>** and resetting the Size values resets the Size for all the channels to 5 (the **<Size All>** value).

Assigning a negative size

Assigning a negative Size reverses the Effect.

Keypresses	Results/Comments
1. Press **[EFFECT]**	Skip this step if the Effects Editor is open.
2. Select a parameter	
3. Press **<Att Page>**	
4. Press **< Size Neg >**	A minus sign precedes the Size value. The Effect reverses.
5. Press **< Size Neg >**	Cancels the previous command.

Delta

Delta determines the starting point of the Effect.

You can select T (Top), C (Center), or B (Bottom).

The Delta icon is an arrow that separates the values in the Base row.

Delta icons

Delta	Icon
Top	↑
Center	→
Bottom	↓

Top Delta

Example: the Base is 50, Size is 50, Delta is T (Top).

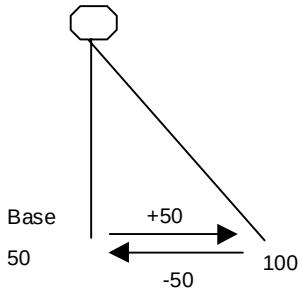


Figure 3 Top Delta

Bottom Delta

Example: the Base is 50, Size is 50, Delta is B (Bottom).

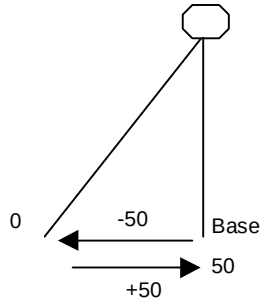


Figure 4 Bottom Delta

Center Delta

Center Delta is seen in the example for the Size attribute, see Size , page 21-8.

Changing Delta

The Delta options are B (bottom), C (center), and T (top).

Keypresses	Results/Comments
1. If your are not in the Effects Editor, select spot/s and parameter. If the Effects Editor is open select the spots and parameter if necessary.	
2. Press **[EFFECT]**	Skip this step if you are in the Effects Editor.
3. Press **<Att Page>**	
4. Press the SK for **Delta B**, **Delta C**, or **Delta T**	A red arrow flags the selection on the SK display and is displayed in the Effects Editor.

Rate

Rate is the speed at which an Effect is executed. Rate is parameter and spot specific; in one Effect different parameters can run at different rates.

Rates can be positive or negative. A negative rate causes the Effect to switch directions. Example: A circle effect is assigned a Rate of 50 and is running clockwise. Run the Effect counterclockwise by modifying the rate to –50.

The Rate assignment influences the time span of the Duty Cycle (see below).

The default Rate assignment is 200. The Rate change can be absolute for the selected parameters in the selected spots. The Rate change can be "spread" relatively over the selected parameters in the selected spots. The assignment of the spread depends on the order of the spot selection.

➢Note

Changing the Rate changes the Offset unless you lock the Offset. Locking the Offset protects it when the Rate is modified.

Changing the Rate

There are 3 Rate options:

Option	What it does
Rate All	Modify the default rate equally for all selected parameters. The default is **<Rate All>**.
Rate Spread	"Spd" enters a relative modification for each selected parameter according to the order of the spot selection.
Rate Neg (negative)	Assigning a negative Rate reverses the direction of the Effect.

Keypresses	Results/Comments
1. If your are not in the Effects Editor, select spot/s and parameter. If the Effects Editor is open select the spots and parameter if necessary.	
2. Press **[EFFECT]**	Skip this step if the Effects Editor is open.
3. Press **<Att Page>**	
4. Press the SK for **<Rate All>** or **<Rate Sprd**> and use the wheel or assign a value on the keypad.	The generic Rate or the relative Spread is displayed in the command line.

➢Note

Pressing **<Rate All> [•]** assigns Hold to the Rate. This stops the Effect.

Assigning a negative rate

A negative Rate value reverses the direction of the Effect.

Keypresses	Results/Comments
1. If your are not in the Effects Editor, select spot/s and parameter. If the Effects Editor is open select the spots and parameter if necessary.	
2. Press **[EFFECT]**	Skip this step if the Effects Editor is open.
3. Press **<Att Page>**	
4. Press **<Rate Neg>**	The direction of the Effect is reversed. A minus sign precedes the Rate value.
5. Press **<Rate Neg>**	The direction reverses again. The minus sign is no longer displayed.

Resetting the Rate

Keypresses	Results/Comments
1. Press **<Rate Spd>** or **<Rate All>**	
2. Press [0] on the keypad.	The Rate is reset.

➢Note

When the Offset value was assigned using **<Rate Sprd>** and **<Rate All>** each element is reset separately.
Example: Channels 1 – 4 were assigned Spread Offset values – Offset 0, 25, 50, and 75. Then 5% was added to the values using **<Rate All>**.
Selecting **<Rate All>** and resetting the Offset value resets the values to 0, 25, 50, and 75.
Selecting **<Rate Sprd>** and resetting the Offset values resets the Offset for all the channels to 5 (the **<Rate All>** value).

Default values for Rate, Size, and Delta

Attribute	Parameter Type	Default
Rate	All Types	200
Size	Continuous parameters, including channels	FL
Size	Discrete step parameters, scrollers, and mixed step parameters	0 (zero)
Size	X and Y	50
Delta	Continuous parameters, including channels. Not including X and Y	Top - If the Base value ≤ 50. Bottom - If the Base value is > 50
Delta	Discrete step parameters, scrollers, and mixed step parameters	Center
Delta	X and Y	Center

Offset

Offset controls when a spot begins its action within the time cycle.

The Offset attribute has 5 options:

Option	What it does
Offset All	Assign the identical offset to the selected parameters. If a Spread has been assigned "All" assignments preserved the proportionality.
Offset Spread	Assign a different offset value to the selected parameters; each spot begins the Effect at a different stage of the time cycle.
Offset Negative	Reverse the Offset order.
Offset Part	Divides the spots into groups relative to the Duty Cycle. The spots in each group operate at the same time.
Offset Lock	Locks the Offset value so that it is not changed when the Rate is changed.

Using Spread

Sprd (spread) assigns a different offset value to the selected parameters; each spot begins the Effect at a different stage of the time cycle. The spread assignment is determined by the K value. The K value is the delta for the Spread and is displayed in the command line. The

Offset values assigned to the parameters are a function of the K value and the number of spots.

Example: Pan (X) for spots 1 → 4 is selected. The Offset Spread K value is 3.

Spot	Offset Value
Spot 1	0
Spot 2	3
Spot 3	6
Spot 4	9

The assignment of the Spread depends on the order of the spot selection. If the spot selection was Spot 4 → 1, spot 1 receives value 9, spot 2 value 6, spot 3 value 3, and spot 4 value 0. In other words, spot 4 is the leading spot.

Keypresses	Results/Comments
1. If your are not in the Effects Editor, select spot/s and parameter. If the Effects Editor is open select the spots and parameter if necessary.	
2. Press **[EFFECT]**	Skip this step if the Effects Editor is open.
3. Press **<Att Page>**	
4. Press **<Ofst Sprd>**	
5. Turn the Offset wheel until +3K is displayed in the command line Or Enter 3 on the keypad	The Offset according to the K value is evenly divided among the selected spots.

Evenly Spread Offset

You can spread the Offset evenly over the selected spots with one keypress.

Example: Evenly spread the Offset over the Pan parameter for 10 spots.

Keypresses	Results/Comments
1. Select spots 1 → 10 and press **<X>**	
2. Press **[EFFECT]**	The Effect Editor opens.
3. Press **<Att Page>**	
4. Press **<Ofst Spd>**	
5. Press **[•]**	The Offset is evenly divided among the selected spots.

Using All

Offset All assigns an absolute Offset value to the selected parameters.

This is useful if you have assigned a Spread and want to add to the Spread value while retaining the proportionality.

Example: An Offset Spread of 4 is assigned to spots 1 → 6 parameter X. You want to retain the Spread Delta (the K value, in this case 4) but add 2 to the assigned Spread values.

Spot	**+4 K (Offset Spread)**	**Spread All 2**
1	0	2
2	4	6
3	8	10
4	12	14
5	16	18
6	20	22

Keypresses	**Results/Comments**
1. If your are not in the Effects Editor, select spot/s and parameter. If the Effects Editor is open select the spots and parameter if necessary.	
2. Press **[EFFECT]**	Skip this step if the Effects Editor is open.
3. Press **<Ofst All>**	
4. Enter 2 on the keypad.	

Advanced Example: Program an Effect for channels where groups of channels are on or off at the same time. Assume that you want to run groups of channels in a Step Effect. The groups are divided like this:
Group 1 – channels 1, 11, 21
Group 2 – channels 2, 12, 22
Group 3 – channels 3, 13, 23
Group 4 - channels 4, 14, 24
In this case you would use <Ofst All> to assign Offset 0 to Group 1, Offset 25 to Group 2, Offset 50 to Group 3, Offset 75 to Group 4.

Example: Assign the same Offset value to a group of channels.

Keypresses	Results/Comments
1. Select a group of channels and assign intensity.	
2. Press **[Effect]**	The Effect Editor is displayed.
3. Assign a Primitive	
4. Press **<Att Page>**	
5. Press **<Ofst All>** and assign a value using the keypad or the wheel.	The channels participating in the Effect have the same Offset.
6. Repeat steps 1 – 4 for each group of channels.	

Examples of Offset uses

Example: Program an Effect where 4 spots execute a Cancan.

Keypresses	Results/Comments
1. Select spots 1 → 4.	
2. Press **[Y]** Optional-assign Base value.	
3. Press **[EFFECT]**	The Effect Editor is active. Spots 1 → 4 are on. Y is selected, displayed on a red field.
4. Assign the primitive Saw	
5. Press the SK for **<Attribute Page>**	The effect attributes are displayed on the controller display. The Soft Keys can be used to select attributes.
6. Press **<Ofst Spd>**	
7. Turn the Offset wheel until reaching the value 25% or enter 25 on the keypad.	The Offset value assigned to each spot is: Spot 1 is assigned Offset 0% Spot 2 is assigned Offset 25% Spot 3 is assigned Offset 50% Spot 4 is assigned Offset 75%

Using Part

Parts divide the time of the Effect among the participating channels/spots. Parts are the relative offset of the participating units, which is a function of the number of spots/channels. Example: If there are 5 participating units the size of each Part is 20%. If there are 7 participating units the size of each Part is 14%. In general, the equation that determines the size of the Part is: 100 divided by the # of spots/channels.

The number of Parts also depends on the number of participating lighting units. If there are 7 units the number of Parts is 7, numbered 1 – 7. Part 0 and 7 are actually the reset of the offset; there is no division of Effect time among the units and all units perform the same action at the same time.

A general rule of thumb is: When spot parameters are assigned a Spread Offset they are always in motion. When spot parameters are assigned Prt values they move as a groups depending on the Part assignment and Duty Cycle.

The following example demonstrates the use of Parts with 7 channels.

Keypresses	**Results/Comments**
4. Select channels 1 → 7	
5. Press **[EFFECT]**	The Effects Editor opens.
6. Assign a primitive	The channels begin executing the Effect. All the channels are doing the same thing at the same time.
7. Press **<Att Page>**	Effect attributes are available on the SKs.

Adding a Part assignment changes the form of the Effect operation.

Keypresses	**Results/Comments**
1. Press **<Duty Tot>**	The Duty attribute appears on a red field.
2. Press **[•]**	The Duty Cycle is 1:7.

See below for information on the Duty Cycle. In general, using the example above, the channels continue executing the Effect but in 1/7 of the time. The channels "rest" in the remaining 6/7 of the Effect time. With the addition of Duty Cycle 1:7, each unit begins the Effect at 0% and completes it at 14%. Effect time can be viewed at the right of the screen:

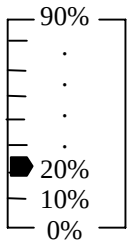


Figure 5 Effect time counter in the Effects Editor

Now we will add 1 Part.

Keypresses	**Results/Comments**
1. Press **<Ofst Part>**	*Offset Part 0* is displayed in the command line.
2. Press 1 on the keypad.	Each unit is assigned an offset that increases by 14%. Note that the first unit's offset remains 0. Part assignments appear as absolute numbers in the command line and as percentage on the LCD display. Now each unit moves while the others are resting.

The Offset with 1 Part looks like this:

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7
Offset	0	14	29	43	57	71	86

Now we will add 2 Parts.

Keypresses	**Results/Comments**
1. Press **<Ofst Part>**	*Offset Part 0* is displayed in the command line.
2. Press 2 on the keypad.	The Offset is 28%.

The Offset with 2 Parts looks like this:

	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7
Offset	0	29	57	86	14	43	71

Notice the big Offset jump between channel 4 and 5. The system preserves the 28% Offset (in this example 2 Parts) between channels. Following this logic, channel 5 receives 114%. The console translates 114% to 14%.

This situation changes the operation order of the channels running in the Effect, since the units operate in ascending Offset order (see chart below).

The chart below shows the Offset values for different Part assignments.

Chan / Part	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7
0	0	0	0	0	0	0	0
1	0	14	29	43	57	71	86
2	0	29	57	86	14	43	71
3	0	43	86	29	71	14	57
4	0	57	14	71	29	86	43
5	0	71	43	14	86	57	29
6	0	86	71	57	43	29	14
7	0	0	0	0	0	0	0

The Offset value determines the operational order of the lighting units. the chart below shows the order in which the units execute the Effect.

Order / Part	1	2	3	4	5	6	7
1	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7
2	Chan 1	Chan 5	Chan 2	Chan 6	Chan 3	Chan 7	Chan 4
3	Chan 1	Chan 6	Chan 4	Chan 2	Chan 7	Chan 5	Chan 3
4	Chan 1	Chan 3	Chan 5	Chan 7	Chan 2	Chan 4	Chan 6
5	Chan 1	Chan 4	Chan 7	Chan 3	Chan 6	Chan 2	Chan 5
6	Chan 1	Chan 7	Chan 6	Chan 5	Chan 4	Chan 3	Chan 2

➢Note

1. Parts 0 and 1 have no Offset and therefore operate identically.
2. Part 1 and Part 6 are mirror images of each other. This can be used to reverse the operational order of the Effect. Parts 2 and 5 and Parts 3 and 4 are also mirror images of each other.

Assigning a negative Offset value

A negative Offset value reverses the order of the spots in an Effect. Example: If your selection was spots 1 → 4, assigning a negative Offset causes the Effect to run starting at spot 4, as if your original selection was spots 4 → 1.

Keypresses	**Results/Comments**
1. Select spots and a parameter	
2. Press **[EFFECT]**	The Effects Editor opens.
3. Assign a Primitive now or after step 4.	The spots start executing the Effect.
4. Press **<Att Page>**	
5. Press **<Ofst Spd>** and assign an Offset value.	
6. Press **<Ofst Neg>**	The Offset reverses. A minus sign (-) precedes the Offset value. Warning: This can cause a jump in the Effect.
7. Press **<Ofst Neg>**	The Offset reverses to the original order again. Warning: This can cause a jump in the Effect.

Locking the Offset

Changing the Rate attribute automatically changes the value for the Offset attribute. You can protect the Offset value, while changing the Rate value, by locking the Offset.
Warning! Locking the Offset may cause a jump when the Rate wheel is moved.

Keypresses	**Results/Comments**
1. Press **<Ofst Lock>**	The Locked Offset is displayed on a gray field. If the Offset field is active it is displayed in red.
2. Move the Rate wheel or press the **<Rate Neg>**	The Offset value is locked while changing the Rate value.

➢Note

The Offset remains locked in the Effects Editor until manually released.

Resetting the Offset

Keypresses	Results/Comments
3. Press **<Ofst Spd>** or **<Ofst All>**	
4. Press 0 on the keypad.	The Offset value is reset.

➢**Note**

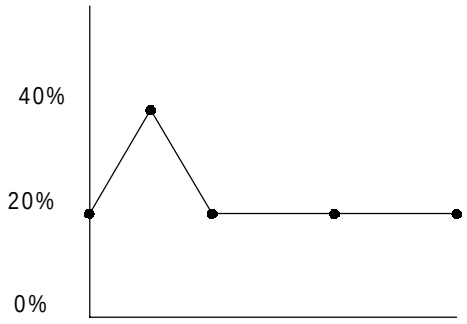
When the Offset value was assigned using **<Ofst Spd>** and **<Ofst All>** each element is reset separately.
Example: Channels 1 – 4 were assigned Spread Offset values – Offset 0, 25, 50, and 75. Then 5% was added to the values using **<Ofst All>**.
Selecting **<Ofst All>** and resetting the Offset value resets the values to 0, 25, 50, and 75.
Selecting **<Offset Spd>** and resetting the Offset values resets the Offset for all the channels to 5 (the **<Offset All>** value).

Duty Cycle

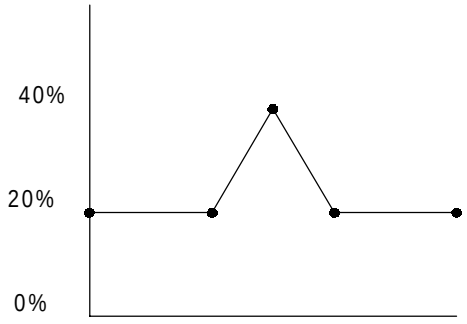
The Duty Cycle determines the speed or how many times a spot executes its assigned Effect within one Time cycle. Duty Cycle assignments also allow some spots to run while other spots are resting. In the Effect Editor, there is a dynamic meter that displays Time cycle, as an ascending scale of percentage (0% - 90%). When an Effect is running, an arrow points to the current percentage of the time progress.

The Duty Cycle is represented by two numbers. The first number, referred to as “On”, is the number of repeats within the time cycle. Tot (total), the second number, is the division of allotted time. The Duty Cycle default is 1:1.

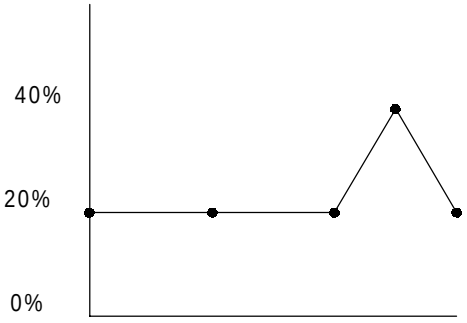
The following example is a 3 spot CanCan with Offset values 0%, 33%, and 66%, and Duty Cycle 1:3.



Spot 1
Primitve: Saw
Base 20%
Delta Top
Size 20%
Offset 0%
Duty cycle 1:3



Spot 2
Primitve: Saw
Base 20%
Delta Top
Size 20%
Offset 33%
Duty cycle 1:3



Spot 3
Primitve: Saw
Base 20%
Delta Top
Size 20%
Offset 66%
Duty cycle 1:3

Examples of Duty Cycle:

Duty Cycle	Rate	What happens
1:1	300	All spots complete 1 Effect within the allotted time period (300).
1:2	300	All spots complete 1 Effect in half the allotted time (150). During the remainder of the time cycle (150), the spots "rest".
2:2	300	All spots complete 1 Effect within the allotted time period (300). This is like Duty Cycle 1:1.
2:4	300	All spots complete the Effect twice in half the allotted time. During the remainder of the allotted time the spots "rest".
1:3	300	All spots complete 1 Effect in 1/3 the allotted time (100). During the remainder of the time cycle (200), the spots "rest".
3:6	300	All spots complete the Effect 3 times in half the allotted time (150). During the remainder of the cycle (150), the spots "rest".

Changing the Duty Cycle

General rule: The Total value must always be larger than or equal to the On value.

Keypresses	Results/Comments
1. Select spots and a parameter	
2. Press **[EFFECT]**	
3. Assign a Primitive now or after step 4.	
4. Press **<Att Page>**	
5. Press **<Duty On>** or **<DutyTot>**.	
6. Move the Duty wheel	The modified Duty Cycle is displayed.

A single press can assign the Duty Cycle according to the number of spots or channels in the selection.

Example: You have selected 10 spots. The default Duty Cycle is 1:1. You want to modify the Duty Cycle to 1:10.

Keypresses	Results/Comments
1. Select 10 spots and a parameter	
2. Press **[EFFECT]**	The Effects Editor opens.
3. Press **<Att Page>**	
4. Press **<DutyTot>**	
5. Press **[•]**	The modified Duty Cycle – 1:10- is displayed

Copying timing attributes for synchronization

Copying the timing attributes from a source parameter to a target parameter synchronizes the parameters running in the effect. The timing attributes are Rate, Offset, and Duty Cycle.

Example: While programming an effect, you have modified the Rate, Offset, and Duty Cycle for Pan (x). You continue programming the Effect, adding Tilt (y). You want to synchronize the timing of pan and tilt in the Effect; copy the timing attributes from x to y.

The instructions below assume that you are in the Effect Editor.

Keypresses	**Results/Comments**
1. Press **[Y]**	Select the target parameter.
2. Press **<Sync param>**	*Synch with* appears in the command line. The Soft Keys change to Parameter mode; parameters are displayed on the Soft key display.
3. Press **[X]**	Rate, Offset, and Duty Cycle values are copied from x to y.

Storing Effects as Memories

Keypresses	**Results/Comments**
1. Select spots/channels	
2. Go to the Effects editor; assign and edit Effects	
3. Press **[=]** and enter a number on the keypad.	Bump out of the Effects editor. *Memory* appears in the command line.
4. Press **[STORE]**	*E* in the Memory List flags Effect memories.

➢**Note**
Pressing **[+STORE]** for step 3 stores the Effect as a memory and does not bump you out of the Effect Editor.

Modifying Effects in memories

You can select all or some of the spots/channels for Effect modification.

Modifying all parameters

All parameters participating in the Effect are also selected in the following sequence.

This is useful for modifying the overall Rate of the Effect. Modifying the Effect Rate is applied proportionally to all selected parameters.

Example: The Effect Rate for parameter gb is 400. The Effect Rate for parameter cw is 200. Using the sequence below you can modify the Rate and preserve the relative difference between the Rates for parameter gb and cw.

Keypresses	Results/Comments
1. Select the memory.	
2. Press **[SPOT]** or **[CHANNEL]**	The contents of the memory are selected in the editor and displayed in blue.
3. Press **[EFFECT] [EFFECT]**	The Effects Editor opens. All participating spots/channels and spot parameters with Effect assignments are selected.
4. Modify the Effect	
5. Press **[STORE]**	The memory is stored with the modified Effect.

Modifying selected parameters

Keypresses	Results/Comments
1. Select the memory.	
2. Optional – select some spots in the memory.	If you do not select specific spots all of the spots are selected in the Effects Editor.
3. Select a parameter	
4. Press **[EFFECT]**	The Effects Editor opens. The attribute wheels are active for the selected parameter.
5. Modify the Effect	
6. Press **[STORE]**	The memory is stored with the modified Effect.

Releasing an Effect from a Memory

You can erase Effect assignments from all of the participating parameters or from selected parameters.

Example: There are Effect assignments on 4 parameters of the spots in memory 6. Release Effect attributes from all parameters in spots 1 – 4 in memory 6.

Keypresses	Results/Comments
1. Select memory 6	
2. Select spots 1 → 4	Memory 6 is the editor displayed in blue.
3. Press the **[EFFECT]**	The Effect Editor is active.
4. Press **[RELEASE]**	All Effect attributes are released. The display returns to Stage display.
5. Press **[STORE]**	The modified memory is stored. The values for parameters released from Effects, are the base values that were used in the Effect.

Example: Release Effect attributes from 1 parameter in spots 1 – 4 in memory 6.

Keypresses	Results/Comments
1. Select memory 6	
2. Select spots 1 → 4	Memory 6 is active displayed in blue
3. Press the SK for p1.	
4. Press **[EFFECT]**	The Effect Editor is active.
5. Press **[RELEASE]**	The Effect is released from the selected parameter. The display returns to Stage display.
6. Press **[STORE]**	The modified memory is stored. The value for parameter released from Effects, is the Base value that was used in the Effect.

Examining memories and Effects

The Base values are displayed differently when the values were assigned using Libraries or without Libraries.

Memories without Libraries

Keypresses	Results/Comments
1. Select the memory	
2. Press **[EXAM]**	Parameters with Effect assignments show *EF* on a blue field instead of a parameter value.
3. Press **[EXAM]** to view the base values.	

Memories with Libraries

Keypresses	Results/Comments
1. Select the memory	
2. Press **[EXAM]**	Parameters with Effect assignments show *EF* on a red field instead of a parameter value.
3. Press **[EXAM]** to view values.	
4. Press **[EXAM]** to view the Library number.	

Examining Effects

Keypresses	Results/Comments
1. Select the memory	
2. Press **[EFFECT]**	
3. Press **[EXAM]**	The Effect attributes and values are displayed. This exam display resembles the Effect Editor.
4. Press **[PAGE UP]** and **[PAGE DN]** to page spots/channel. Use **[PAGE UP]** to page parameters.	

Effect Templates

Any Effect that you have programmed can be stored as an Effect Template as well as a memory. Effect Templates are referred to as Effects.

Effects do not store the Base values from the editor. Only parameters participating in the Effect are stored in the Effect.

Pre-programmed and custom Effects can be stored on the hard disk and loaded as needed.

Use the **[EFFECT]** mode key when storing Effects.

Keypresses	Results/Comments
1. Program an Effect or modify an existing Effect	
2. Press **[EFFECT]** and enter a number on the keypad	
3. Press **[STORE]**	The message *Effect # Stored* is displayed.

Assigning text to an Effect

Keypresses	Results/Comments
1. Press **[EFFECT]** and enter Effect number on the keypad Or Press an SK to select Effects 1 – 40	
2. Press **[TEXT]**	
3. Type the text on the text keyboard	
4. Press **[STORE]**	Text for effects is displayed in the Effect list.

Erasing Effects

Keypresses	Results/Comments
1. Press **[EFFECT]** and enter the Effect number on the keypad Or Press an SK to select Effects 1 – 40.	
2. Press **[ERASE]**	The message *Erase Effect #?* is displayed.
3. Press **[ERASE]** again.	The message *Effect # Deleted* is displayed.

Examining Effects

You can view a list of Effects.

Keypresses	Results/Comments
1. Press **[EFFECT]**	
2. Press **[EXAM]**	The Effect list shows the number of the Effect, text, and how many spots/channels/scrollers are included in the Effect. If the Effect is linked to a (see below) it is also displayed.

Using Effects

All Effects are accessed by pressing **[EFFECT]** and entering an Effect number on the keypad. You can use either **[EFFECT]** key when using the numeric keypad. Effect 1 - 40 can be selected on the Soft Keys.

Effects are not spot or channel specific, so any Effect can be applied to any number or type of spots or channels.

Example: Effect 1 is the Cancan Effect as described in the Offset section. This Effect can be applied to any number of spots in a variety of ways. The Effect was recorded with a Sprd offset for 4 spots.

Obviously you should only apply a color or gobo Effect to spots that have identical color and gobo wheels. Otherwise it will not work correctly. Dimmer, pan, tilt, and iris Effects can usually be applied to spot types different than the original spot.

The Offset and Duty Cycle attributes are applied repetitively to the selected range of spots or channels.

Example: The Effect has 3 spots with an Offset assignment. If it is applied to 6 spots, spot 1 and 4, 2 and 5, 3 and 6 behave identically.

Keypresses	Results/Comments
1. Select spots or channels	
2. Go to SK Effect mode	Skip this step if the SK mode is Effect.
3. Press an SK or enter an Effect number on the keypad.	
4. Press **[ENTER]**	The Effect begins running.

Programming memories using Effects

You can use the Effect to program memories. The memory can then run on any Playback device or as an editor group.

Keypresses	Results/Comments
1. Select spots or channels	
2. Press **[EFFECT]**	
3. Press an SK or enter Effect #.	The Effect begins running.
4. Press **[=]** and assign memory number.	*Mem* appears in the command line.
5. Press **[STORE]**	The memory is prefaced by an *e* in the Memory List.

➢Note

You can use **[+STORE]** instead of steps 4 and 5.

Link Palettes and Effects

Palettes can be linked to Effects for quick programming of Effects that rely on specific Base values. Example: Palette 101 is a color Palette. Link Effect Palette 1 (a color parameter Effect) to Palette 101. Whenever Effect Palette 1 is assigned to a group of spots, the color values in Palette 101 are assigned as Base values for the Effect.

There is an additional column in the Effect Exam called Link Palette. The linked Palette number or *No Link* is displayed.

Keypresses	**Results/Comments**
1. Select an Effect	
2. Press **[Link]**	The command line reads: *Effect # Link to Palette*
3. Select a Palette	The Palette number or text is displayed in the command line.
4. Press **[STORE]**	The message *Effect # Stored* is displayed. The Effect Exam displays the links.

Erasing a Palette link

Keypresses	**Results/Comments**
1. Select the Effect Palette	
2. Press **[LINK]**	
3. Press **[ERASE]**	The message *Effect # Stored* is displayed.

Playing Back Effects

On the Crossfader

Memories or groups containing Effects can run on the crossfaders. The Effect begins running on the Go command.

On the Controllers

Raising and lowering the controller or fader handle fades the dimmer, rate, and size of the Effect.

Modifying the rate

Keypresses	Results/Comments
1. Assign an Effect memory to a controller.	
2. Press **[RATE CHASE]**	The LED is on, indicating that the Chase Rate function is active.
3. Press the SK where the Effect is running.	
4. Modify the rate with the Rate wheel.	The proportionality of the Effect Rate attributes assigned to different parameters in the Effect is preserved.
5. Optional- store the modified rate by pressing **[STORE]**	The message *Chs/Eff Rate Stored* is displayed. The Effect runs at the stored rate whenever it is assigned to a controller. The original rate is, not overwritten. When running the Effect in the editor or on the crossfaders, it runs at its original rate.

Stopping an Effect

Keypresses	Results/Comments
1. Press **[RATE CHASE]**	
2. Press and hold **[SHIFT]** and Press the SK where the Effect is running.	The Effect stops. It does not blackout.

➢**Note**

You can Call the stopped Effect and use it to record a memory. Only the current lighting state is stored as a memory. This memory has no Effect assignments.

Restarting an Effect

Keypresses	Results/Comments
1. Press **[RATE CHASE]**	
2. Press and hold **[SHIFT]** and press the SK where the Effect is frozen.	The Effect starts running.

Loading, Recording, and Deleting Effect Files

Effects are recorded and loaded as part of a show file.

You can also record and load Effects in dedicated Effect files that are not linked to any specific show.

Effect files are recorded or loaded automatically whenever a show containing Effect files is recorded or loaded. Effect files archived in the show files may be loaded separately using the Effects Only option in the Load menu. The procedure is the same as loading Libraries only, memories only etc.

When the Effect Files option is selected the list of Effect files stored in your current directory is displayed.

Effect play files and independent Effect files may be loaded into any range of effects, not necessarily the range they were recorded on. They may also be loaded partially; i.e. it's possible to load a range of effects from a file and not necessarily the whole file.

Once a file number has been entered, choose a range to load from and a range to load into and confirm. In this manner you may construct your Effecta from several show files and Effect files.

Examining Effect files

Effect files can be examined in the Load menu.

Effect files can be examined in the Load menu.

Effect files are recognized by the E that precedes the file number.

The Effect files option appears on the second page in the Load menu. Access by pressing **F6 More…** .

The keys **F4 Exam File** and **F5 Exam Effects** toggle the display on CRT 2 between the Effects in the Effect file and Effects already in the system.

Loading Effects from a show file

You can choose to load the Effects that are stored in a particular show.

You can choose to load only some of the Effects contained in the show. They can be loaded to any Effect number you choose.

Example: The Effect file contains Effects 1 – 20. You want to load Effects 1 → 8 starting at Effect number 1.

Keypresses	Results/Comments
1. Go to the Load menu.	
2. Press **F1 Play/Act #**	The system prompts for a show file number.
3. Enter the file number in response to the prompt.	
4. Press **F6 More…**and **F4 Effects Only**	
5. Optional – Exam the Effects File or the Effects in the system.	
6. Press **F2 Effect #**	The prompt *Effect # to Load:* is displayed.
7. Enter **1** at the prompt.	
8. Press **F2 Thru Effect #**	You are prompted for an Effect number.
9. Enter **8** at the prompt.	
10. Press **F2 To Effect #**	The prompt *Start at Effect #* is displayed.
11. Enter **1** at the prompt.	
12. Press **F1 Load**	You are prompted to confirm the command.
13. Press **F1 Yes**	

Recording dedicated Effect files

Whenever you record a show containing Effect , the Effect are stored with the show. You can also store Effect in dedicated Effect files. The Effect file includes all of the Effect in the system at the time of the recording.

Keypresses	**Results/Comments**
1. Go to the Record menu.	
2. Change directory if necessary	
3. Press **F6 More…** and **F2 Effect Files**	All of the Effect files in the open directory are displayed.
4. Enter a file number.	
5. Press **F2 Text** and type a label for the file (optional)	
6. Press **F1 Record**	The message *Are You Sure?* is displayed.
7. Press **F1 Yes**	When completed the message *Record Complete* is displayed.

Loading dedicated Effect files

Keypresses	**Results/Comments**
1. Go to the Load menu.	
2. Press **F2 Effect Files**	Effect files in the open directory are displayed.
3. Enter the file number at the prompt.	
4. Optional – Exam the Effects File or the Effects in the system.	
5. Press **F1 All Effects**	
6. Press **F1 Load**	The message *Are You Sure?* is displayed.
7. Press **F1 Yes**	All Effects in the file are loaded to as they appear in the file; Effect 1 as Effect 1, Effect 2 as Effect 2, etc.

Or

Keypresses	Results/Comments
1. Go to the Load menu.	
2. Press **F2 Effect Files**	Effect files in the open directory are displayed.
3. Enter the file number at the prompt.	
4. Optional – Exam the Effects File or the Effects in the system.	
5. Press **F2 Effect #**	The prompt *Effect # to Load:* is displayed.
6. Enter the start number at the prompt.	
7. Press **F2 Thru Effect #**	You are prompted for an Effect number.
8. Enter the end number at the prompt.	
9. Press **F2 To Effect #**	The prompt *Start at Effect #* is displayed.
10. Enter a number.	
11. Press **F1 Load**	You are prompted to confirm the command.
12. Press **F1 Yes**	

You can load Effects to numbers different than appear in the file.

Example: The Effect file contains Effects numbered from 1 – 20. You want to load them as Effects 21 – 40. When loading this file, you request that the load begin at Effect 21.

Keypresses	Results/Comments
1. Go to the Load menu.	
2. Press **F2 Effect Files**	Effect files in the open directory are displayed.
3. Enter the file number at the prompt.	
4. Optional - Press **F4 Exam File** or **F5 Exam Effects**	
5. Press **F1 All Effect**s	
6. Press **F2 To Effect**	The prompt *Start at Effect #* is displayed.
7. Following the example above, enter number **21**.	
8. Press **F1 Load**	You are prompted to confirm the command.
9. Press **F1 Yes**	

Deleting Effect files

Keypresses	Results/Comments
1. Go to the Delete menu.	The files in the open directory are displayed.
2. Press **F6 More** and **F2 Effect Files**	Ovation 4D/Micron 4D prompts for a file number.
3. Enter the file number.	
4. Press **F1 Delete**	You are prompted for confirmation.
5. Press **F1 Yes**	The Effect file is deleted.

The Effects Package

A predefined Effects Package is included on the Hard Disk.

An Effects archive can be downloaded from our web site and loaded to Spark 4D. The archive is named – Compulite Effect Package E###.eff.

Effects Programming - Hints & Tips

It is often useful to make a basic Effect template that contains a minimum number of spots or channels. This can them be applied to a number of spots and channels.

In general, use the Offset attribute for spot Effects, especially movement. Use Duty Cycle for channel Effects.

Example: Program basic Effect template with 2 channels and apply it to 6 channels. This Effect runs like a hard chaser.

Keypresses	**Results/Comments**
1. Select 2 channels	
2. Press **[EFFECT]**	THE Effects Editor opens.
3. Assign Step as the Primitive	The Effect starts running.
4. Press **<Att Page>**	
5. Press **<Ofst Sprd>**	
6. Press **[•]**	Channel 1 Offset is 0. Channel 2 Offset is 50.
7. Save this Effect	

You can use this Effect for a variety of chasers. Use the selection order to manipulate the Effect. Changing the Rate value controls the speed of the chaser.

Example: Apply the Effect described above to 4 channels.

Channel	1	2	3	4
Offset Spread	0	50	0	50

The Effect works as follows: Channels 1 and 3 are on; channels 2 and 4 are off. Channels 1 and 3 off; channels 2 and 4 are on.

Example: Apply the Effect described above to 4 channels, selecting channels in the following order: 1 → 2 and 4 → 3

Channel	1	2	3	4
Offset Spread	0	50	50	0

The Effect works as follows: Channels 1 and 4 are on; channels 2 and 3 are off. Channels 1 and 4 off; channels 2 and 3 are on.

➢Note

If you assign a 2:4 Duty Cycle in the example above, the channels blink twice.

Programming hard & soft chasers

Example: Program a hard chaser for channels.

Keypresses	Results/Comments
1. Select channels	
2. Press **[EFFECT]**	The Effects Editor opens.
3. Assign Step as the Primitive	The Effect starts running.
4. Press **<Att Page>**	
5. Press **<Offset Spd> [•]**	An evenly divided Offset is to the selected channels.
6. Press **<Duty Tot> [•]**	The Duty Cycle Total is the same as the number of selected channels.
7. Save this Effect	

Example: Program a Soft chase for channels.

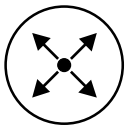
Keypresses	Results/Comments
1. Select channels	
2. Press **[EFFECT]**	The Effects Editor opens.
3. Assign Saw as the Primitive	The Effect starts running.
4.	
5. Press **<Offset Spd> [•]**	An evenly divided Offset is assigned to the channels.
6. Assign the Duty Cycle Total as half the number of channels. Example: If you have selected 8 channels the Duty Cycle is 1:4.	
7. Save this Effect.	

➢Note

When applying this Effect to more than the original number of channels the Offset Spread and Duty Cycle need adjustment repeat steps 3 and 4.

Insights to moving lights

The table below shows how to construct some simple, yet impressive Effects. These Effects are found in the Effect files available for downloading. They are described here to give you an understanding of how to construct and manipulate Effects.

Effect	Params	Base	Primitive	Delta	Size	Duty Cycle
Iris Pulse Out Hard 	Dimmer	FL	Step	↓		
	Iris	FL	Step	↓		
Iris Pulse In Hard 	Dimmer	FL	Step	↓		
	Iris	FL	Step	↑	Negative	
Iris Pulse Out Soft	Dimmer	FL	Ramp	↓		1:2
	Iris	FL	Saw	↓		1:1
Iris Pulse In Soft	Dimmer	FL	Ramp	↓		1:2
	Iris	FL	Saw	↑	Negative	1:1
Fade In while Moving	Dimmer	FL	Ramp	↓		1:2
	X*	50	Ramp	→		1:2
Dimmer On and Jump to Color or Gobo	Dimmer	Full	Step	↓		
	cw/gb	Zr	Step	↑	according to spot	

* For accurate movement, modify the Pan Base after programming the Effect

Using Primitives for Effect shapes

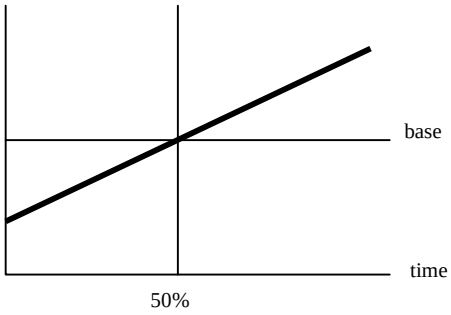
Some examples of how to use Primitives to program basic Effects:

Shape	**Primitive**	**Rate***	**Offset**	**Duty Cycle**
Circle X	Sine	R	0	1:1
Y	Cosine	R	0	1:1
Figure 8 X	Sin	R	0	1:1
Y	Cosine	R x 2	25	1:1
Triangle X	Tri	R	0	1:1
Y	Saw	R	0	2:3
Square X	Trpz	R	0	3:4
Y	Trpz	R	25	3:4

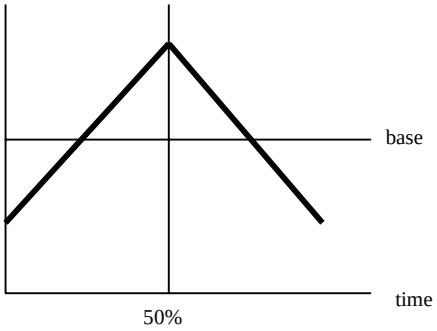
*R = any Rate value.

Types of Primitives

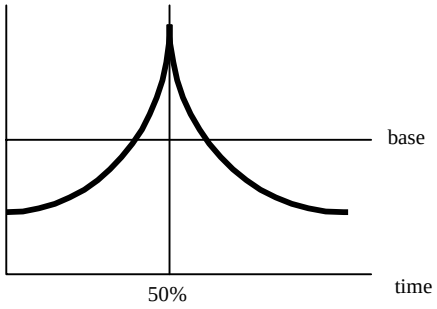
Ramp



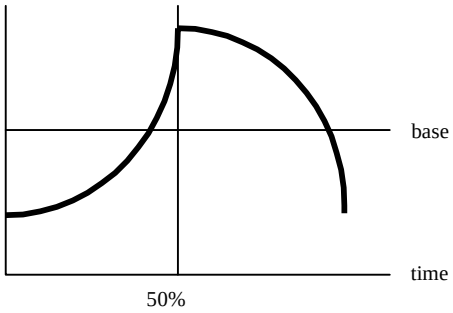
Saw



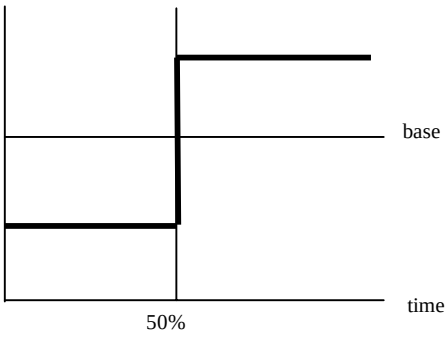
Power



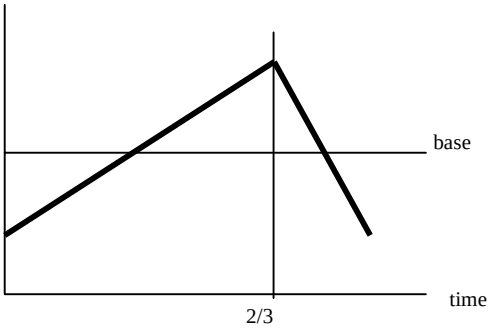
Wave



Step

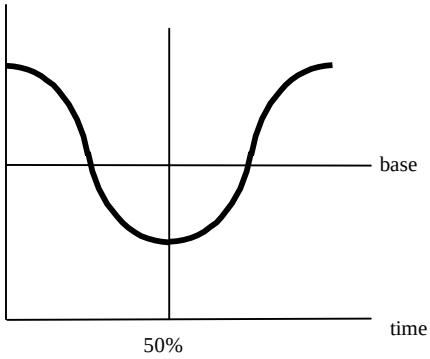


Tri

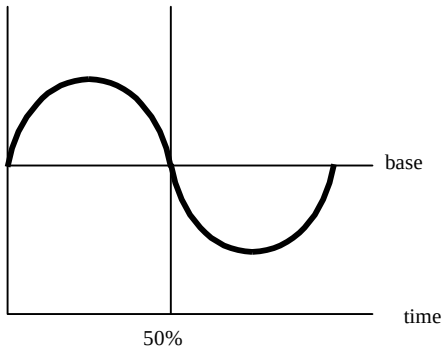


Trpz

Cosine



Sine



CHAPTER 22
AUTOCHASE

This chapter includes:

Overview

Autochases are programmed in the Autochase menu, menu 10.

Autochases, like chasers, are made up of a number of steps. Autochases are programmed in the Autochase menu, by assigning spots and channels to steps. An Autochase is assigned a Chase pattern. The default pattern is a hard chaser.

All of the channels and spots in the step are output at the same intensity assignment. The intensity is determined by the highest intensity assignment. Channels and spots that were stored with a lower intensity assignment are output during playback according to the highest level assigned in the step.

Each step has a time assignment. The time assignment determines how long the step stays on stage before the fade to the next step begins. The default time 4 seconds.

The console supports up to 99 Autochases.

Programming an Autochase

A step is programmed using the editor and/or playback device output to assign channels and spots to the step.

Step time assignments determine how long the step stays on stage before the fade to next step begins. You can assign time to a step before beginning to program the step or when modifying the step.

Using the editor output

Keypresses	Results/Comments
1. Go to the Autochase menu.	
2. Press **F1 Editing**	The console prompts for an Autochase number.
3. Enter the Autochase number.	
4. Press **F1 Create Step**	If no steps exist the default for this selection is 1. If there are some steps already programmed the default is the next step.
5. Press F5 Time	You are prompted for a number.
6. Enter the step time.	
7. Press **F3 Select Channels**	The console prompts for a channel number.
8. Select channels and assign intensity.	Channels with intensity assignment are live on stage.
9. Press **F5 Select Spots**	To select other spots use the appropriate F keys.
10. Select spots and assign intensity.	Only the dimmer parameter is operative in Autochases.
11. Press **F1 Step as Editor**	The contents of the editor are recorded as step 1. The editor is automatically reset. The console automatically prompts for the next step.
12. Repeat this procedure for as many steps as desired.	

Using the editor and playback devices

Instead of selecting channels and spots in the editor, a step may be created using the assignments on controllers and crossfader.

Keypresses	Results/Comments
1. Create a lighting state using the assignments on the playback devices.	
2. Go to the Autochase menu.	
3. Press **F1 Step As Stage**	The lighting state is recorded as a step.

Assigning a pattern

The last step in the process is assigning a pattern.

The default pattern is Step, which plays back like a hard chaser.

There are 5 patterns to choose from:

- **STEP (F1)**- is a normal chase pattern. Each step is flashed in turn.
- **SHADOW (F2)**- brings all the steps to their assigned levels. Then bumps all of the steps to zero one after the other. Example: The Autochase has 3 steps. All the steps are turned on. Then step 1 is bumped out, step 2 is bumped out, and step 3 is bumped out.
- **BUILD (F3)**- brings each step to its assigned level, one after the other, until all the steps are on. Then each step is bumped out in turn to 0%.
- **RANDOM (F4)**- flashes all the steps at random.
- **BOUNCE (F5)**- runs forwards and backwards (example: 1 - 2 - 3 - 4 - 3 - 2 - 1)

Keypresses	Results/Comments
1. After storing the last step press **F6 Restart**	
2. # **F5 Create Pattern**	
3. Select a pattern.	The selected pattern type is assigned and displayed.

Modifying Autochases

All of the functions described below are found under the main option: **F1 Editing Autochase**.

Modifying steps

Steps are modified using the same procedure for creating steps, either in the editor or with the stage outputs.

Keypresses	Results/Comments
1. Press **F1 Editing Autochase**	You are prompted for the Autochase number
2. Enter the Autochase number on the numeric keypad.	
3. Press **F2 Modify Step**	You are now prompted to enter the step number you wish to modify.
4. Enter the step number on the numeric keypad.	
5. Select spots and channels.	
6. Press **F1 Step as Edit** or Press **F3 Step as Stage**	To store the editor output only, choose this option. To store the editor and stage output, choose this option.

➢**Note**

Modifying an Autochase that is assigned to a playback device frees the Autochase from the controller or crossfader. Remember to re-assign the Autochase after modification.

Modifying step time

Keypresses	Results/Comments
1. Press **F1 Editing Autochase**	
2. Enter the Autochase number on the numeric keypad.	
3. Press **F2 Modify Step**	The console prompts for step number.
4. Enter the step number for modification.	
5. Press **F5 Time**	
6. Enter the new time for the selected step/s.	
7. Press **F1 Step as Edit**	The modified step time is displayed under the time column.

Modifying the time for a range of steps

Keypresses	Results/Comments
1. Press **F1 Editing Autochase**	
2. Enter the Autochase number on the numeric keypad.	
3. Press **F4 Modify Time**	The console prompts for step number.
4. Enter the step number.	
5. Press **F1 Thru Step #**	The console prompts for step number.
6. Enter the step number.	
7. Press **F1 Time**	
8. Enter the new time for the selected steps.	
9. Press **F1 Store**	The modified step time is displayed under the time column.

Inserting a step

Keypresses	Results/Comments
1. Press **F1 Editing Autochase**	
2. Enter the Autochase number on the numeric keypad.	
3. Press **F3 Insert Step**	The console prompts for a step number.
4. Program the step as described above.	
5. Store the step.	The steps following the newly inserted step are incremented by one whole number. Example: If a step has been inserted between steps 3 and 4, step 4 will become step 5, step 5 will become step 6, and so on.

Deleting a step

Keypresses	Results/Comments
1. Press **F1 Editing Autochase**	The console prompts for an Autochase number.
2. Enter the Autochase number.	
3. Press **F6 More** and then **F1 Delete Step**	You are prompted for the step number e.
4. Enter the step number on the numeric keypad.	
5. Press **F1 Store**	

Assigning Loops to Autochases

The default loop assignment for Autochases is an infinite loop; the Autochase runs until something is done to stop it.

A specific number of loops may be assigned to an Autochase. This limits the number of times an Autochase runs after each Go command.

Keypresses	Results/Comments
1. Press **F1 Editing Autochase**	The console prompts for an Autochase number.
2. Enter the Autochase number on the numeric keypad.	
3. Press **F6 More…**	
4. Press **F2 No. of Loops**	You are prompted for the number of loops.
5. Enter the number of loops on the numeric keypad.	
6. Press **F1 Store**	The number of loops appears in the menu header.

Re-assigning an automatic continuous loop to Autochases

Pressing **F3 Autoloop** returns the Autochase's loop assignment to automatic continuous loop, which is the default assignment. The loop assignment is displayed as < -- > under Loop, in the header.

Adding text

You can add a text label to Autochases.

Keypresses

1. Press **[AUTOCHASE]**
2. Enter the Autochase number on the numeric keypad.
3. Press **[TEXT]**
4. Type the label on the text keyboard.
5. Press **[STORE]**

Deleting an Autochase

A single Autochase or a range of Autochases may be deleted at the same time.

The Delete and Copy functions appear on the first page of the Autochase menu. If you are not on the first page of the menu, you must exit the menu and enter the menu again to see the first page.

Keypresses	**Results/Comments**
1. Press **F2 Delete Autochase**	The list of Autochases is displayed.
2. Select the Autochase for deletion.	
3. To delete are range of Autochases, press **F2 Thru Autochase** and enter the last Autochase in the range.	
4. Select the range of Autochases for deletion.	
5. Press **F1 Store**	Deletes the selected Autochases.

Autochases can also be deleted in the editor.

Keypresses	**Results/Comments**
1. Press **[AUTOCHASE]**	
2. Enter the Autochase number.	
3. Press **[ERASE]**	The selected Autochase is deleted.

Copying an Autochase

An Autochase may be copied as many times as desired. After copying an Autochase, it can then be modified.

Example: Copy Autochase 2 to Autochase 4.

Keypresses	Results/Comments
1. Press **F3 Copy Autochase**	
2. Select 2	
3. Press **F1 To Autochase #**	
4. Choose the new Autochase number on the keypad, in this example press **4**.	
5. Press **F1 Store**	You can continue editing the new Autochase.

Playing Back Autochases

Autochases are assigned and played back like chasers. They can be assigned as Hard chasers or Soft chasers.

Example: Assign Autochase 3 to controller 5 as a soft chaser.

Keypresses	Results/Comments
1. Press **[AUTO CHASE]** and enter 3 on the numeric keypad.	
2. Press **[SOFT]**	
3. Press controller 5's Soft Key.	The LED blinks red indicating an assignment that is on Hold. *EFF* is displayed on the Playback display and the chaser display.

You can program a fade in time for the Autochase. . .

Keypresses	Results/Comments
1. Press **[AUTO CHASE] [#]**	
2. Press **[SHIFT] [TIME]**	*Chase Fade* is displayed in the command line
3. Enter the fade up time on the numeric keypad.	
4. Press **[STORE]**	The Chase Fade time is displayed in the Autochase Exam.

Examining Autochases

You can view either the list of Autochases that you have recorded or individual Autochases. .

Viewing the Autochase list

Keypresses	Results/Comments
1. Press **[AUTO CHASE]**	
2. Press **[EXAM]**	A list of recorded Autochases is displayed.
3. Press **[STAGE]** to exit the display.	

Examining an Autochase

Keypresses	Results/Comments
1. Press **[AUTO CHASE]**	
2. Enter the Autochase number on the keypad.	
3. Press **[EXAM]**	The steps, pattern, and time assignments are displayed. The display is identical to what you see in the Autochase menu.
4. Press any key to exit the display.	

CHAPTER 23
EVENTS

This chapter includes:

Overview

Events are a collection of functions that can be triggered using various methods:

- SMPTE time code assignments
- Operated in the editor
- Assigned to memories and operated automatically when the memory sequences on the A/B crossfader.

Events include assignments and playback commands to A/B and controllers and Macro operation.

The Auto key must be active (Auto On LED on) to operate Events assigned to memories.

Events are programmed in the Event Menu. Events can be numbered from 0.1 to 999.9.

The Event Menu

The options in the Event menu are:

- **F2 Assign A/B**: assignments and commands to A/B – memory assignment, Go, or Hold.
- **F4 Assign Cntrlr**: assignments and commands to controllers – assigning chasers (hard chaser or soft chaser) and memories, Go, Hold.
- **F5 Macro**: only 1 macro can be assigned to each Event.

Each Event can contain all of the operation options.

Assign To	Commands	Options	What Happens when the Event is operated
A/B	Assign Mem #	Assign	The memory is assigned to the free fader.
		Go	The memory is assigned to the free fader and a crossfade is initiated from current assignment to the assignment made using Event.
	Go		A Go command is given to the A/B crossfader.
	Hold		A Hold command is given to the A/B crossfader.
Controllers	Assign Mem #	Thru Mem #	Select a range of memories for chaser assignment.
		Assign Cntrlr	Assign the selected memory to a controller.
	Assign Chaser	Hard Chase	
		Soft Chase	
	Go Chaser		Gives a Go command to the chaser on controller.
	Go contrlr		Initiate a fade of the controller assignment.
	Hold chs/cntr		Hold a running chaser or a controller fade.
	Hard Chaser		Changes the Chaser mode form Soft to Hard.
	Soft Chaser		Changes the Chaser mode form Hard to Soft.

Programming an Event

Example: Program Event 3 to operate macro 12. Assign a range of memories (memories 8 - 10) as a chaser to controller 20. The chaser starts to run on assignment.

Keypresses	Results/Comments
1. Press **[MENU] [21] [ENTER]**	You are now in the Event menu. If there are no Events the message *Event Empty* is displayed. Spark prompts for an Event number.
2. Enter 3 on the keypad.	
3. Optional – Press **F1 QList #**	If no QList is specified the memory is taken from the default QList. (See Chapter 20 Q-Lists)
4. Press **F4 Assign Cntrlr**	The console prompts for a controller number.
5. Enter 20 on the keypad.	
6. Press **F1 Mem # To Assign**	The system now prompts for the memory number.
7. Enter 8 on the numeric keypad.	
8. Press **F1 Thru mem #** or Press **[→]** and enter 10 on the keypad.	
9. Press **F3 Go Chaser**	
10. Press **F1 Hard Chaser** or **F2 Soft Chaser**	Event 3 is displayed in the Event List.

Adding to an Event

Example: Add operation of macro 12 to Event 3.

Keypresses	Results/Comments
1. Enter the Event number again, in this example, 3.	
2. Press **F5 Macro**	The system prompts for the macro number
3. Press **F6 Macro #**	
4. Enter 12 on the numeric keypad	
5. Press **F1 Store**	Macro 12 is added to Event 3.

Deleting an Event

You can delete an entire Event or selected assignments within the Event.

Example: Delete Event 3.

Keypresses	Results/Comments
1. Go to the Event menu.	The system prompts you to enter the Event number.
2. Press 3 on the keypad.	
3. Press **F1 Delete**	
4. Press **F1 All**	The Event is deleted and is no longer displayed in the Event list.

Example: Delete the controller assignment from Event 3.

Keypresses	Results/Comments
1. Go to the Event menu.	The system prompts you to enter the Event number.
2. Press 3 on the keypad.	
3. Press **F1 Delete**	
4. Press **F4 Cntrlr**	The console prompts for a controller number since there can be more than 1 controller assignment.
5. Press **F1 Store**	The controller assignment is deleted. Only the macro assignment remains.

Adding text to an Event

Text can be added to existing Events in the Event menu.

Keypresses	Results/Comments
1. Go to the Event menu.	
2. Select the Event number.	
3. Press **F6 Text**	
4. Type the text on the alphanumeric keyboard.	
5. Press **F1 Store**	The text is displayed in the text column of the Event List and, if the Event is assigned to a memory, in the Memory List.

Examining an Event

You can view the Event List while in the editor.

Keypresses	Results/Comments
1. Press **[EVENT]**	
2. Press **[EXAM**	The Event List is displayed. If there are SMPTE assignments they are also displayed.

Playing Back Events

There are three ways to operate Events:

1. You can assign Events to memories. Crossfading, on A/B, to memories with Event assignments triggers the Event. The toggle *Auto Assignment on Go*, in the System Parameters menu, influences the behavior of Events. (see Chapter 24 System Configuration).
2. You can operate Events directly through the editor.
3. Events can be assigned SMPTE time codes and operated via SMPTE. Spark 4D has a simple Teach Me function for assigning SMPTE time codes to Events (see Chapter 28 - SMPTE). SMPTE time codes can also be programmed manually.

Assigning an Event to a memory

An Event can be assigned to more than 1 memory. This is useful if you have, for instance, created an Event that gives a go command to a show curtain chaser assigned on a controller. You will probably want this Event to operate each time the show curtain closes. Therefore you could assign it to the preset, the intermission cue, and the memory that is active when the final curtain is brought in.

Example: Assign Event 3 to memory 10.

Keypresses	Results/Comments
1. Select memory 10.	
2. Select Event 3 – press **[EVENT]** and enter 3 on the keypad.	
3. Press **[STORE]**	Event 3 is assigned to memory 10 and is thus displayed on the memory list. Event 3 is operated when the Go command, that begins the crossfade to memory 10, is given.

➢Note

[AUTO] must be active (LED on) to operate Events sequencing on the A/B crossfader.

Events for A/B are ignored when operating the Event by sequencing on the A/B crossfader.

Operating an Event in the editor

Keypresses	Results/Comments
1. Press **[EVENT]**	*Event* appears in the command line.
2. Enter the Event number on the numeric keypad.	
3. Press **[ENTER]**	The selected Event is triggered.

Erasing an Event from a memory

Example: Erase Event assignment from memory 10.

Keypresses	Results/Comments
1. Select memory 10.	A range of memories can be selected
2. Press **[EVENT]**	
3. Press **[ERASE]**	The Event assignment for memory 10 is erased.

Erasing Events in the editor

Keypresses	Results/Comments
1. Select an Event	A range of Events can be selected
2. Press **[ERASE]**	

CHAPTER 24
SYSTEM CONFIGURATION

This chapter includes:

Overview

- Accessing Service Tools

Configuring in Service Tools

- Communication params
- Configuring for channels, spots, dimmers
- Special Functions
- Special Numbers

System Parameters menu

- Operator definable parameters
- Print menu screen

Overview

General basic system configuration is carried out in the Service Tools program. In Service Tools you define the number of channels, scrollers, spots, and dimmers in the Config System option. The Special Functions and Special Numbers are used for further general system configuration. The Service Tools configuration is saved in non-volatile memory. (Service Tools also provides other functions – see Appendix A Service Tools.)

Other operator definable parameters are found in the System Parameters menu. These parameters are saved with the show file.

Accessing Service Tools

Keypresses	Results/Comments
1. Turn off the power.	
2. Press and hold down **[CE]** and **[CLEAR]**	
3. Turn the power back on.	
4. After a few seconds, release the keys.	After running some self-tests, the system boots to Service Tools. The lower area of the screen shows the current F key functions.
5. Press **F3 Config System**	The different components of the system configuration are displayed.
6. Choose any of the different configuration options	Each category opens a pull down list.

Back door to Service Tools

You can also access Service Tools through the System Parameters menu.

A warning appears to save your show before exiting to Service Tools since you may use options in Service Tools that require Cold Start.

Keypresses	Results/Comments
1. Go to the System Parameters menu (menu 8).	
2. Press **F5 Exit to Service Tools**	A warning message is displayed.
3. Press **F1 Exit**	The main Service Tools menu is displayed.

Configuring in Service Tools

The items in this section of the Service Tools that appear in red are protected by a pass code. This is to ensure that unauthorized personnel do not have access to the system configuration. The system default is: pass code needed access to Special Functions and Special Numbers. The channel, dimmer, spot, scroller configuration can also be protected

when bit W – Protect All (in Special Functions) is toggled to yes. The pass code can be obtained from your Compulite distributor.

F2 Down	Moves the cursor down.
F3 Up	Moves the cursor up
F4 Enter & Next	Saves changes and goes to the next option. Example: If you are working in **F4 Special Functions**, pressing this key opens **F5 Special Numbers**.
F5 Enter & Previous	Saves the change and goes to the previous option. Example: If you are working in **F4 Special Functions**, pressing this key opens **F3 Channels**.
F6 Enter & Exit	Exit to the main screen of the Config Sys menu and requests confirmation of the store. Press **F6** again to confirm and store.

Important! After Any change in configuration you must Cold Start the system.

Communication params

Communication Parameters (**F1**) identifies different consoles that are linked in an Ethernet network configuration. Enter the IP address for the console here.

The Communication Parameters information is stored in non-volatile memory and is retained in the console until modified.

Use the arrow keys on the console or the alphanumeric keyboard to move from field to field. You can also use **F2 Next**.

Keypresses	**Results/Comments**
1. Turn off the power.	
2. Press and hold down **[CE]** and **[CLEAR]**	
3. Turn the power back on.	
4. After a few seconds, release the keys.	After some self-tests, Service Tools main menu is displayed.
5. Press **F3 Config System**	The components of the system configuration are displayed.
6. Enter the passcode.	
7. Press **F1 Communication Params**	A window opens showing the I.P. address, textual description, and console's ID number.
8. Enter the I.P. number.	
9. Enter a text label for the console.	
10. Enter the console's ID number	
11. Press **F6 Enter & Exit**	Spark 4D prompts for a confirmation of the store command.
12. Press **F6 Store**	All of the information entered under Communication parameters is stored.

Configuring for channels, spots, dimmers

The configuration limits are:

- 1536 channels (including up to 248 scrollers). Channels must be divisible by 8. Scrollers must be divisible by 4.
- 1536 dimmers – dimmers must be divisible by 8.
- "Lines" is the configuration unit for spots. 6p and 12p spots use one line each. 22p and 30p spots use 2 lines each. The maximum number of lines is 352.
- DMX Input is from 0 – 512 (The maximum is the general number of a channels see Chapter 29 - DMX Input)
- The General master maximum level can be set to 100% or 200%.

Keypresses	Results/Comments
1. Press **F3 Config System**	The configuration options are displayed.
2. Press **F3 Channels**	A pull down list is displayed.
3. Select the item that you want to modify, using **F2 Down** / **F3 Up**	
4. Enter the number of channels, scrollers, etc.	
5. Repeat steps 3 and 4 to complete the configuration.	
6. Press **F6 Enter & Exit**.	Confirmation is requested. If you have made a configuration error, the system beeps and an error message is displayed. Correct the error and store again.
7. Press **F6 Store Configuration** to confirm.	

Configuring for moving lights

Moving Lights (spots) are divided into 4 categories:

1. Spots that require up to 6 DMX channels (6p spots).
2. Spots that require up to 12 DMX channels (12p spots).
3. Spots that require up to 22 DMX channel (22p spots).
4. Spots that require up to 30 DMX channels (30p spots)

The spot configuration depends on the type of moving lights you are using.

Example: Your rig has 8 yokes, that require 6 DMX channels, and 8 Studio Color lights that require 16 DMX channels. Configure the system for 8 spots up to 6 parameters and 8 spots up to 22 parameters.

Changing the maximum general master level

The General Master Maximum Level allows you to choose the maximum level of the general master. It can be set at 100% or 200%.

When this item is highlighted, **F1 Toggle** becomes active. Toggle to select the maximum level of the general master and store the selection.

Special functions

Special Functions is selection F4. This area is used to define general parameters of the system. See below for a list of the NOVRAM toggles. Spares are reserved for future use.

Use the arrows for selection and **F1** to toggle the assignment.

Bit	Function	Toggles	Description
A	Spare		
B	Printer Time-out	0 - Long 1 - Short	It is recommended to use the *long* setting, as many printers do not respond properly when set to *short*. If your printer is not responding correctly, try toggling to *short*.
C	Master/Slave	0 -Disable 1 - Enable	The Master/Slave operation is via Ethernet.
D	Backup system	0 –No 1 – Yes	Disable the Remote Control Unit as a back up for the main console. Enable the Remote Control Unit as a back up for the main console.
E	Printer Type	0 - Alphanumeric 1 - Graphics	Use the setting that is appropriate to your printer.
F	Spots on Cold Start	0 – Assigned 1 – Unassigned	Toggle to 0 for default DMX address assignments to spots after cold start. Toggle to 1 for no DMX address assignments to spots after cold start.
G	VC compression	0- Disable 1- Enable	When working with CAD programs (that are not CompuCAD) set to 0-Disable.
H	Multi cues	0 – Disable 1 – Enable	This disallows assignment of a single memory to more than one playback source at a time. This permits assignment of a single memory to more than one playback source at a time.
I	USA system	0 – No 1 - Yes	USA system “no“ requires these type of key sequences: **[CHANNEL #] [@] [7]** **[CHANNEL #] [@] [7•5] [=] [#] [STORE]** USA system “yes” permits these key sequences: **[CHANNEL #] [@] [70]** **[CHANNEL #] [@] [75]** - no decimal point is required for the intensity assignment. **[CHAN #] [@] [85] [MEMORY #] [STORE] [=]** is dropped from the memory recording sequence.
J	999 Patch	0 – No 1 – Yes	The console ignores Patch 999. The console references Patch 999.
K	Remote Interlace	0 –Disable	When the main console has control the keys, wheels, and trackball on the RCU and UWR/UCR are not available.

Bit	Function	Toggles	Description
		1 – Enable	When the main console has control the keys, wheels, and trackball on the RCU and UWR/UCR are available.
K	Spare		
L	Old DMX Timing	0 – No 1 – Yes	Enable old DMX protocol timing or new DMX protocol timing.
M	DMX Input	0 – Disable 1 – Enable	To use DMX input this bit must be enabled and the number of DMX input must be assigned in F3 Channels config. The system cannot be configured for both SMPTE and DMX Input at the same time.
N	Spare		
O	SMPTE	0 – Disable 1 – Enable	Toggle to 0 when not using SMPTE. Toggle to 1 to enable SMPTE. The system cannot be configured for both SMPTE and DMX Input at the same time.
P	Spare		
Q	MIDI	0 – Disable 1 – Enable	Disable the MIDI function. When disabled the MIDI menu does not appear in the menu list. Enable the MIDI function.
R	Spare		
S	Spare		
T	Spare		
U	Spare		
V	Spare		
W	Protect All	0 – No 1 – Yes	Only Special Functions and Special Numbers require a pass code for access. All of the Config System options are accessed with a pass code
X	Spare		

Special numbers

Special Numbers is selection F5 and contains the following data:

Maximum #of scroller frames	0-32
Keyboard language	0 – English 1 – Swedish 2– Hungarian 3 – French 4 – German 5 – Norwegian
SMPTE frames per second	Assign between 12 – 50. The default assignment is 30.
Panel Layout version	0 (currently not used)
Type of communication	0 DMX – all connectors output DMX 1 CMX + DMX – connector 1 output is CMX. The other connectors output DMX 2 CMX + DMX – connectors 1 & 2 output CMX. The other connectors output DMX.

System Parameters menu

General system configuration options are also in the System Parameters menu, menu 8.

The upper System Parameters display shows the system configuration, which includes:

- The current show file (if any). The display includes the show file number, text, date and time of recording.
- The current software version
- Current remaining memory in %
- The diskette capacity
- The number of spots controlled as defined in the System Configuration
- Number of channels and dimmers controlled
- Number of scrollers controlled

Operator definable parameters

The lower part of the display shows parameters whose default may be operator defined. Some of the items are toggles and some require a numeric entry.

Keypresses	Results/Comments
1. Use the arrow keys to move the cursor and highlight the required item.	
2. Press **F1 Enter**	A prompt, such as Set *Parameter To:* is displayed.
3. For numeric entries you are prompted to press **F1 Store**	

The definable parameters are:

Parameter	What it does
Default memory time	The fade time(in seconds) that is assigned as default time-in to memories. This requires a numeric entry.
Default fade time	The time (in seconds) it will take dimmers to fade out after **[RESET]** has been pressed. This requires a numeric entry.
Flash rate	The rate at which the **[FLASH]** key flashes the selected channels or spots. This is a numeric assignment, ranging from 1(fast) to 40 (slow).
Sensitivity of TB	Determines the amount of trackball movement required to affect a response. 3 settings are available. Setting 1 (coarse resolution) moves the mirror a large amount in response to very little trackball movement. Setting 3 (very fine resolution) will move the spot a small distance with much trackball movement. Fine resolution is useful with yokes.
MIDI I/O channel	Determines the channel on which MIDI signals are transmitted/received. Requires a numeric entry from 1 - 16. This is displayed if the system is configured for MIDI control. Configure for MIDI control in Service Tools/Config Sys/special Functions.
MIDI sync out channel	Determines on which MIDI channel the MIDI synchronization function operates. Requires a numeric entry from 1 – 16.
G. M. Blackout	Toggle to enable or disable the G.M. blackout key.
Non dim level	Sets the intensity at which a dimmer, assigned a non-dim curve, in the Channel Patch menu, jumps to full. Requires a numeric entry.
On	Sets the level at which the **[ON]** key operates. Requires a numeric entry.
Latest Takes Precedence	Toggle to enable or disable the LTP control priority.
Time of day	Sets the system's real time clock. Requires a numeric entry.
Date	Set the date. Requires a numeric entry.
Store tracking if dimmer on	When set to yes: if the dimmer is more than 0% all of the spot parameters are recorded to memory even though some of the parameters have not been selected. When set to no: only the parameters present in the editor are recorded to memory. This is a toggle.
Scrl jump on fade	Determines the behavior of scrollers during a crossfade or a manual fade of controller assignments. They can jump or fade. This is a toggle.
Mix editing of spots	When toggled to Yes spots of different types are addressable when selecting a range of spots When toggled to No, and a range of different types of spots are selected only the last type of spot is addressed.
Automatic seq. A/B	Determines whether the **[SEQ]** key is automatically enabled after making an assignment to A/B. If toggled to No, you must enable this key manually for memory sequencing on the A/B crossfader.

Parameter	What it does
+Store increment	**[+STORE]** can be incremented to any number the operator chooses.
Wire/less Designer	Enable or disable the use of the Wire/less Remote Control.
Store Store to 1st active	Toggled to Yes, new information is stored to the first active playback fader. The system will first look at A/B, then the controllers starting from controller 1. Toggled to No, any channel intensity modifications are stored to all relevant outputs.
Auto assignment on GO	Determines when assignments to playback devices are assigned using Events. Example: the Event in memory 20 is: assign memories 5 - 8 to as a hard chaser to controller 8 and start running on assignment. Toggled to no, the assignment to the controller occurs when the crossfade to memory 19 is complete. The Go command is given when the crossfade to memory 20 begins. Toggled to Yes, the assignment and the Go command occur given when **[GO]** is pressed, initiating the crossfade to the memory 20.
Compress data on diskette	Show data up to 2Mb is automatically compressed during recording when this is toggled to Yes. The default is No.
Autosave # of generations	Enable/ disable the Autosave function. Determine the number of generations saved (1 – 8).
LookAhead fade rate	Enables and disables the LookAhead and ForceBlack features. The Fade Rate is the rate of the percent of change per second that the scroller or parameter change takes within the blackout.
Autoloop LookAhead	When is toggled to Yes, the memory immediately following a LookAhead memory is automatically assigned as a follow-on cue and receives a Delay time. When toggled to No, you must program the follow-on cue and enter the Delay time manually.
Flash spot parameters	Dimmer (F2) – Flash the dimmer parameter only. The dimmer flashes between 10% - 80%. CL1 & CL 2 (F3) – Force the parameters in CL1 and CL2 to their home values and flash the dimmer. Home (F4) - Force all parameters to their home values and flash.
Go for multifades	When toggled to *Yes*, **[GO]** operates as **[GO TO]** when pressed during a crossfade; *mult* appears on the crossfader LED display. When toggled to *No*, **[GO]** does not allow multiple presses.
Curve before Prop. Patch	When toggled to No the Proportional Patch value is calculated before Curve value. The system default is No. When toggled to Yes the both the Proportional Patch and Curve are considered. See Chapter 25- Channel and Scroller Patching.

Print menu screen

The print option (**F6**) operates as print screen. This is useful for documentation, as it contains important information such as the system configuration.

CHAPTER 25
CHANNEL AND SCROLLER PATCHING

Included in this chapter:

The Channel Patch

The Channel Patch menu, offering many options for dimmer and channel definition, is menu number 1. Spark 4D controls up to 1536 channels, which may be soft-patched.

The patch table consists of 4 lines per row:

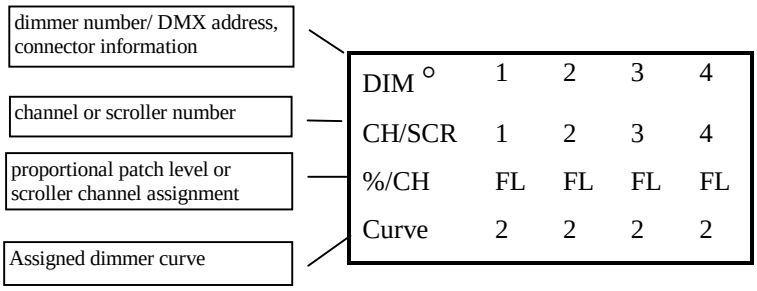


Figure 1 Channel Patch

The Default Patch is 1 to 1:
Each channel is patched to its corresponding dimmer
Curve 2
The proportional patch set to FL.

Connector information

Icons appearing at the head of the “Dim” row represent connector information:

1 circle representing connector 1

2 circles representing connector 2

3 circles representing connector 3

The default channel to dimmer patch is numbered consecutively from the first channel and dimmer to the last. In other words, the last default channel and dimmer on DMX connector 1 are channel 512 and dimmer 512. The first control channel on connector 2 is 513 and the dimmer (DMX) is also numbered 513, although the dimmer (DMX) number is actually DMX 1 on connector 2. The numbering ignores the division into connectors.

You can toggle the display to view the DMX connector rather than the Dim number.

1. Press **EXAM** on the console panel. The DMX connector 2 channel is displayed. Example: channel 513 is assigned to DMX (connector 2) 1. The DMX connector channels are displayed in light gray.

The color code key for the Channel Patch is:

Dimmer number under G.M. control	Black
Dimmer number not under G.M. control	Yellow
Default channel	Blue
Soft patch channel	Red on a white field
Scroller assignment - DMX address to scroller	▪ 1st row –yellow – GM control disabled. ▪ 2nd row – the scroller number appears in a different font in red on a white field. ▪ 3rd row – control channel number. ▪ 4th row - *scr* appears in blue, flagging this assignment as a scroller assignment.
2 Parameter control channel (dimmer and scroller)	An *s*, red on a white field, appears next to the curve number.
Curves	curve 1 S-curve: red curve 2 linear: brown (default curve) curve 3 non-dim: violet curve 4 park: white programmable curve 5: yellow programmable curve 6: green programmable curve 7: violet programmable curve 8: blue proportional patch: violet on a yellow field
Dimmers operating as external dimmers. (See Chapter 26)	A yellow capital E appears on a black field.

Patching dimmers to channels

A single dimmer or a range of dimmers can be patched to a single control channel.

Keypresses	**Results/Comments**
1. Press **F1 Assign Dimmers**	Spark 4D prompts for a dimmer number.
2. Enter dimmer number. To select a range of dimmers Press **F1 Thru Dimmer** or **[→]**. **F2 & Dimmer** is used to select non-sequential dimmers.	
3. Press **F3 To Channel**	Spark 4D prompts for a channel number.
4. Enter the channel number on the numeric keypad.	
5. Press **F1 Store**	The soft patch channel number appears in red on a white field.

Patching dimmers to scrollers

Scrollers must be assigned DMX addresses in the Channel patch menu. The assignments must be identical with the local DMX address on the scroller. The number of scrollers in the system is determined by the number of scrollers defined in the System Configuration. .

Dimmers assigned scrollers appear in yellow. This means that these DMX channels are not under General Master control. Scroller assignments are automatically removed from General Master control to avoid mishaps.

Keypresses	Results/Comments
1. Press **F1 Assign Dimmers**	Spark 4D prompts for a dimmer number.
2. Select dimmer number.	This can be a single number or the first of a range of dimmers.
3. Press **F1 Thru Dimmer**	This allows selecting a range of dimmers. **F2 & Dimmer** is used to select non-sequential dimmers.
4. Select the final dimmer number in the range.	
5. Press **F4 To Scroller**	The display jumps to the Scroller Patch menu. The dimmer/s (DMX addresses) selected must correspond to the scroller's local DMX address.
6. Enter the scroller number on the numeric keypad.	
7. Press **F1 Store**	The display jumps back to the Channel Patch menu. The DMX to scroller assignments are stored and displayed in the patch table in the Channel Patch menu and the Scroller menu.

More than one DMX address can be assigned to a scroller; thus 1 control channel can access more than 1 scroller.

Example: 4 scrollers, with local DMX addresses 201 - 204 are mounted on PAR cans. The PAR cans are patched to control channel 56. Assign DMX addresses 201 -204 to scroller 1 and then patch scroller 1 to control channel 56. Channel 56 now controls the dimmers of the 4 PAR cans and their scrollers. In this set up, the 4 scrollers are always at the same frame.

Patching channels to dimmers

You can assign a range of channels to a range of dimmers or a single channel to one or more dimmers.

Example: Soft patch a channel to a dimmer.

Keypresses	Results/Comments
1. Press **F2 Assign Channels**	Spark 4D prompts for a channel number.
2. Enter the channel number on the keypad.	
3. Press **F1 To Dimmer #**	Spark 4D prompts for a dimmer number.
4. Enter the dimmer number on the numeric keypad.	
5. Press **F1 Store**	The Channel assignment is displayed in red on a white field under the dimmer number.

Example: Soft patch channel 200 to dimmers 20, 30, and 40.

Keypresses	Results/Comments
1. Press **F2 Assign Channels**	Spark prompts for a channel number.
2. Enter **200** on the numeric keypad.	
3. Press **F1 To Dimmer #**	Spark 4D prompts for a dimmer number.
4. Enter **20** on the numeric keypad.	
5. Press **F2 Thru Dimmer #**	Spark 4D prompts for a dimmer number.
6. Enter **30** on the numeric keypad.	
7. Press **F2 Thru Dimmer #**	Spark 4D prompts for a dimmer number.
8. Enter **40** on the numeric keypad.	
9. Press **F1 Store**	Channel 200 in red on a white field appears under dimmer numbers 20, 30, and 40.

Example: Assign channels 73 - 75 to dimmers 120 - 122 respectively.

Keypresses	Results/Comments
1. Press **F2 Assign Channels**	Spark 4D prompts for a channel number.
2. Enter the channel number on the keypad.	
3. Press **F1 Thru Channel**	Spark 4D prompts for a channel number.
4. Enter the last channel in the range.	
5. Press **F1 To Dimmer #**	
6. Enter the first dimmer of the range.	
7. Press **F1 Store**	Channel 73 is assigned to dimmer 120, channel 74 to dimmer 121, channel 75 assigned to dimmer 122.

Clearing patch assignments

Channel or dimmer patch assignments can be cleared and their output disabled.

Dimmmer numbers for cleared assignments appear in gray.

Keypresses	Results/Comments
1. Press **F3 Clear Assign**	
2. Press **F1 Channels** or Press **F2 Dim**	Spark prompts for channel or dimmer numbers.
3. Enter the channel/s or dimmers numbers. There are F Key options for group and range selections.	
4. Press **F3 Store**	Now the channel/dimmer is "unpatched". The dimmers appear in yellow. Repatching the channels and dimmers restores assignments.

Restoring the default patch

The system boots up with a 1 to 1 default in the Channel Patch.

You can restore the default assignments to the entire patch table, single dimmers, or a range of dimmers.

The example below demonstrates restoration of the entire patch table.

Keypresses	Results/Comments
1. Press **F4 Default (1 to 1)**	
2. Press **F1 All Patches**	Spark asks *Are You Sure???*
3. Press **F1 Yes**	The entire patch table reverts to 1 to 1 Patch assignments.

Proportional patching

This function allows you to limit the 100% output of a specific dimmer. This is used for lamps that you do not want to operate above a certain level.

Proportional patching is handy for balancing a cyclorama wash. Adjust the proportional output of the dimmers used for the wash and you will not waste valuable plotting time fiddling the levels of units for a uniform wash. .

Keypresses	Results/Comments
1. Press **F5 Propor Patch**	The system prompts for a dimmer number.
2. Enter dimmer number.	More than 1 dimmer may be selected.
3. Use the wheel or **[@]** and the keypad to assign the maximum output level of the selected dimmer/s.	
4. Press **F1 Store**	The maximum output level appears in violet on a yellow field in the 3rd row of the patch.
5. Press **F6 Restart** to return to the main channel Patch menu.	

Exchanging dimmers

Exchanging dimmers swaps the dimmers' channel assignments. The Exchange Dimmer function is on the second page of the Channel Patch menu.

Example: Dimmer 89 is patched to channel 89 and dimmer 90 is patched to channel 56. Exchanging the dimmers assigns channel 89 to dimmer 90 and channel 56 to dimmer 89.

Keypresses	Results/Comments
1. Press **F5 Exchange Dimmers**	Spark 4D prompts: *Exchange Dimmer #:*
2. Enter the dimmer number in response to the prompt, in this example, **89**.	
3. Press **F1 With Dimmer**	
4. Enter the dimmer number in response to the prompt, in this example, **90**.	Spark 4D prompts for a dimmer number.
5. Press **F1 Store**	The result is displayed like all other soft patches.

Assigning dimmer curves

There are 4 standard dimmer curves:
1. S curve
2. Linear
3. Non-Dim - A dimmer set for non-dim jumps to full when the dimmer level reaches 50%. There is no dimmer response between 0% and 49%. This is useful for motors and strobes. The Non-Dim level can be changed in the System Parameters menu.
4. Park - is used for instruments that are always on, such as work lights or smoke machines. Park is always at 100%.

In addition to the four fixed dimmer curves, there are 4 programmable curves (curves 5 - 8). Use the programmable curves for smooth operation of mechanical dimmers, flourescent lights, and returning wayward dimmers to a linear format.

The Curve option is on the second page of the Channel Patch menu.

Assigning a standard curve

Keypresses	Results/Comments
1. Press **F2 Curve**	Spark 4D prompts *Assign curve to dimmer #*
2. Enter the dimmer number on the numeric keypad.	A range of dimmers or a group of non-sequential dimmers can be selected.
3. Press **F3 Select Curve**	The F keys display the curve options.
4. Select the desired curve.	The curve assignment appears in the 4th row of the Channel Patch table.

Programming custom curves

Curves may be programmed either by selecting steps and using the wheel to set the step's level or using fader 1 – 10 to set up the curve.

Using the faders

Keypresses	Results/Comments
1. Press **F2 Curve**	The system prompts for a dimmer number.
2. Enter the dimmer number/s for curve assignment.	
3. Press **F4 Program Curve**	The graphs for curves 5 - 8 are displayed. The system prompts for the curve number.
4. Enter the curve number on the numeric keypad (5 – 8).	
5. Press **F1 Setup From Faders**	Use the first 10 faders to manipulate the curve steps. This selection bumps you into live mode, affording the possibility of setting up the curve and simultaneously checking it by assigning the channel to faders 11 → 20 or the crossfaders.
6. Press **MENU**	Returns to the curve menu.
7. Press **F1 Store Curve**	Store the new curve parameters and concludes the operation.
8. Press **F6 Restart** to return to the main Channel Patch menu.	

Using the wheel

Keypresses	Results/Comments
1. Press **F2 Curve**	The system prompts for a dimmer number. More than one dimmer may be dealt with at a time.
2. Enter the dimmer number/s for curve assignment.	
3. Press **F4 Program Curve**	The graphs for curves 5 - 8 are displayed. The system prompts for the curve number.
4. Enter the curve number on the numeric keypad.	
5. Press **F2 Set Up Steps**	
6. Use the **{wheel}** to determine each step	
7. Press **F4** or **F5** to go to the next or previous step.	
8. Press **F1 Store**	Store the new curve parameters and concludes the operation.

Testing the curve

You can test the programmed curve before storing it. The test procedure depends on whether you have used the Set Up Steps.

Testing a curve programmed with faders

Pressing **F1 Set Up from Fader** bumped you to the editor. While still in the editor you can test the dimmer curve.

Keypresses

1. After setting up the step levels, assign the dimmer's channel to a controller in the lower bank (controllers 11 → 20).
2. Fade the assignment either manually or using a Go command.
3. Press **[MENU]** to return to the Channel patch menu.
4. If the curve is satisfactory, press **F1 Store**. If the curve is not satisfactory, reprogram and test again.

Testing a curve programmed using the wheel or editor

If you have used the wheel to program the steps, use the Start Sample option.

Keypresses	Results/Comments
1. Assign levels to the steps using the wheel and/or editor.	
2. Press **F1 Start Sample**	Spark 4D goes to the editor and executes a live fade to the dimmer's channel.
3. Press **[MENU]**	Return to the Curve menu.
4. If the curve is satisfactory, press **F1 Store Curve**. If you are not satisfied, press **F2 Setup Steps** to re-edit.	

Disabling General Master control

Dimmers can be removed from General Master control. Disable GM control for scrollers, motors, smoke machines, and other special effects. This option appears on the third page of the Channel Patch menu.

Keypresses	Results/Comments
1. Press **F1 General Master**	The system prompts you to enter the dimmer number.
2. Enter the dimmer number on the numeric keypad. A range of dimmers or a group of non-sequential dimmers can be selected.	
3. Press **F5 Disable G.M.**	Dimmer/s not under GM control are displayed in yellow.

Enabling General master control

Dimmers that were removed from General Master control can be re-instated

Keypresses	**Results/Comments**
1. Press **F1 General Master**	The system prompts you to enter the dimmer number.
2. Enter the dimmer number on the numeric keypad.	More than one dimmer can be selected.
3. Press **F4 Enable G.M.**	The selected dimmer/s are displayed in black and are fully responsive to changes in the General Master level.

Examining patch assignments

You can isolate individual channels, dimmer, and scroller patch assignments for examination.

The result of a channel exam might look like this:

DIM-	7	107	2077
CH/SCR	107	107	107
% CH	FL	FL	FL
CURVE	2	2	2

Example: examine the soft patch assignments for channel 100.

The result of a dimmer exam might look like this:

Dimmer…...…….107	Free	Status
DMX/connector… ….107	DMX1	
Proportional…….FL		
Curve……..….2	Linear	
Channel……...107		
Scroller…….…….		
G.M……...….Active		

Example: Examine the soft patch assignments for channel 100.

Keypresses	Results/Comments
1. Press **F1 Exam**	
2. Press **F1 Channel**	You are prompted for the channel number.
3. Enter the number **100** on the numeric keypad.	The dimmers patched to channel 100 are displayed.
4. Press **F1 Exam**	
5. Press **[+]** or **[F1]** and **[–]** or **[F2]** to view the next or previous channel.	

Toggling between dimmer exam and connector exam

The Channel Patch menu default patch numbers dimmers and channels sequentially across the connectors. In other words, the last default channel and dimmer on DMX connector 1 are channel 512 and dimmer 512. This first default channel and dimmer on DMX connector 2 are numbered Dim 513 and channel 513.

You can toggle the display to view the DMX connector rather than the Dim number.

Press **[EXAM]** on the console panel. The DMX connector 2 channel is displayed. Example: channel 513 is assigned to DMX (connector 2) 1. The DMX connector channels are displayed in light gray.

Viewing free dimmers

This function displays the free or unused dimmers.

Press **F1 Free Dimmers**

The color code key for this display is:

Status	Color
Cleared dimmer assignments	blue on a gray field
Dimmers assigned to scrollers and channels that are used in memories	black on a white field
Free (unused dimmers)	black on a yellow field

The Scroller Patch

The Scroller Patch menu, menu 20, provides tools for optimizing the scroller set up and quick editing selection.

Patching scrollers to channels defines the luminaire mounted with a scroller as two-parameter device; the dimmer of the fixture is one parameter and the scroller the second parameter. This allows you, during editing, to address the dimmer and the scroller using the same control channel.

The functions for scroller management are:

- Patching scrollers to control channels.
- Patch scrollers to DMX address.
- Fine adjustment of the frame position.
- Designating a frame as a "dark gel". The “dark gel” is kept in constant movement to reduce gel burn in dark filters.
- The number of frames can be customized.
- Scroller set ups can be copied from one scroller to another.
- Clear Assignments.
- Assign default DMX addresses.

The Scroller Patch Table displays all the information pertinent to the scrollers.

CHN	SCL	DMX	# F	1	2	3	4
Control number.	The scroller number	The scrollers’ DMX addresses*	The number of frames in this scroller	Frame value**	Frame value	Frame value	Frame value

* Scrollers are assigned DMX addresses in the Channel Patch menu, Assign Dimmer option. If more than one dimmer is assigned to a scroller the assignment is represented by a plus sign (+) that appears in the DMX address column of the scroller table. This option is also available in the Scroller Patch. If selected you are immediately bumped to the Channel Patch.

** The default for the number of frames is determined by the number of frames defined in Service Tools/Sys Config/Special Numbers. The number of frames can be modified per scroller in the Scroller Patch menu. The frame values default to a 0 - 100 scale based on the number of frames.
The monitor displays up to 20 frames on page 1. If the system is configured for more than 20 frames page the Scroller menu display by pressing
F5 Display →. .

Most functions in this menu require that the scroller has a channel assignment. If the scroller does not have a channel assignment the message *Unassigned Scroller* is displayed.

➢Note

If the console is not configured for scrollers, the Scroller menu does not appear.

Selecting a scroller

You must enter the number of the scroller at the prompt. The default scroller is the scroller highlighted in red in the scroller table.

Enter the scroller number on the numeric keypad. It is displayed in yellow after the prompt *Scroller #:*

Or

Press **+** or **-** to move the cursor through the Scroller Patch Table. As soon as you select a scroller, its number is displayed next to the prompt.

Patching scrollers to control channels

Patch a scroller to the channel number of its corresponding lighting unit, thus creating a two-parameter channel: dimmer and scroller.

Example: Scroller 1 is mounted on a 5 kW. lighting unit controlled by channel 100. Patching scroller 1 to control channel 100 allows you to access the dimmer of the fixture and the scroller using only one channel selection.

Keypresses	Results/Comments
1. Select scroller 1	
2. Press **F1 Assign To Chan**	The scroller number is highlighted in the patch table. The system prompts: *Assign to channel #.*
3. Enter 100 using the keypad.	
4. Press **F1 Store**	The channel number is displayed in the left column. The scroller list arranges itself in numerical order by control channels.

Patching a range of channels to a range of scrollers

Example: assign scrollers 1 – 16 to channels 101 to 116.

Keypresses	Results/Comments
1. Select scroller 1	
2. Press **F1 Assign To Chan**	The scroller number is highlighted in the patch table. The system prompts: *Assign to channel #.*
3. Enter 101 using the keypad.	
4. Press **F2 Thru Channel**	You are prompted for a channel number.
5. Enter 116 using the numeric keypad.	
6. Press **F1 Store**	The channels 101 – 116 are assigned consecutively to scrollers 1 – 16.

Patching DMX addresses to scrollers

Pressing **F2 Assign to Dimmer** bumps you to the Channel Patch menu. For instructions on assigning DMX addresses to scrollers see, page. To assign a range of addresses to a range of scrollers you must start from the Channel Patch menu. (see Patching dimmers to scrollers, page 25-4)

You can choose to assign dimmers to scrollers using the Default Dimmer option (**F4**). The default dimmers are always the last dimmers in the system.

Defining a dark gel frame

The dark gel function keeps two consecutive color frames in motion as long as the dimmer of the lighting unit is working at more than 10% intensity.

This saves on gel burn when using very dark colors, as no single area of the gel is constantly exposed to the heat of the lamp. When assembling the gel ribbon cut a double length of dark colors.

Keypresses	**Results/Comments**
1. Select the scroller	
2. Press **F4 On/Off Dark Gel**	Prompt line reads: *Set to dark gel from frame #*
3. Select the first the dark gel frame on the numeric keypad or **F4** and **F5** or press **F4** or **F5** until the cursor is on the frame.	The system automatically recognizes the next gel frame as the continuation of the dark gel.
4. Press **F1 On**	The dark gel function is now activated. A small, red 'd' appears between the two frame numbers in the frame table.

Canceling a dark gel assignment

To cancel a dark gel assignment, follow the same procedure described above, selecting **F2 Off**.

The little 'd' denoting dark gel disappears from the frame table.

Changing the number of frames

Spark 4D offers the option of changing the number of frames for individual scrollers. The default is the maximum number of frames as defined in Service Tools, system configuration, special numbers. A smaller number of frames can be defined per scroller in the Scroller menu.

➢Note

Changing the number of frames in the Scroller menu updates memories. Frames outside of the new range are updated to the last valid frame.
Example: The number of frames in scroller 1 was changed from 32 to 28. Frame 32 appears in some memories. The frame values are reassigned as frame 28.

Keypresses	Results/Comments
1. Select the scroller.	
2. Press **F1 No. of Frames**	The system prompts for the number of frames.
3. Enter the number of frames on the keypad	
4. Press **F1 Store**	The system automatically adjusts the frame increments to correspond with the number of frames.

Setting up frames

It may be necessary to fine-tune the frame increments. When this function is selected, the unit's dimmer is automatically turned on at 75%.

Keypresses	Results/Comments
1. Select the scroller	
2. Press **F1 Setup Frame**	The prompt *Setup frame #:* appears. The dimmer goes on.
3. Select the frame on the numeric keypad or press **F4** or **F5** until the cursor is on the frame.	
4. Press **F1 Enter**	The prompt *@ % (Use scrlr wheel or numeric pad)* instructs you how to adjust the frame.
5. Press **F1 Store Frame**	Spark asks for confirmation.
6. Press **F1 Store Frame**	The cursor jumps to the next frame.

Storing the frame set up with an offset

If the offset of the gel ribbon is the same for all of the frames, you can store the adjustment with an identical offset for all of the gel frames. If you have increased the frame value, storing with off set assigns the identical compensation to all the subsequent frames. If you have decreased the frame value, this selection stores the identical compensation to all previous frames.

Press **F2 Store Fr W/Offset**.

Copying the scroller setup

After setting up a scroller to your specifications, the information may be copied to another scroller or a range of scrollers.

Keypresses	**Results/Comments**
1. Select the scroller you want to copy	
2. Press **F2 Copy To Scroller**	Spark 4D prompts for the scroller number you are copying to.
3. Enter the scroller number on the numeric keypad	
4. Press **F1 store**	The number of frames, frame value modification, and dark gel assignments are copied to the selected scroller.

Testing Channels and Dimmers

You can test channels in the Test menu or in the editor.

The Test menu must be used to test dimmers independent of any patching.

Testing channels in the editor

Example: Flash through the channels starting form channel 8.

Keypresses	Results/Comments
1. Select channel 8.	
2. Press **[TEST]**	Channel 8 is selected in the editor at 80% intensity.
3. Press **[TEST]**	Channel 8's dimmer is turned off and channel 9 is now on at 80%.
4. Press **[RESET]** to exit the test function	

Testing channels in the Test menu

The Test menu is menu 11.

Keypresses	Results/Comments
1. Go to the Test menu.	
2. Press **F1 Channels**	The channel numbers are displayed. You are prompted for a channel number.
3. Enter a channel number.	You are prompted to assign intensity.
4. Assign intensity with the wheel or press **[@]** and enter a value on the keypad.	The selected channel is displayed in red.
5. Press **F1 Previous** or **F2 Next** to test the previous or next channel.	

Testing dimmers in the Test menu

The Test menu directly addresses the dimmers. Any soft patch is ignored.

Keypresses	**Results/Comments**
1. Go to the Test menu.	
2. Press **F2 Dimmers**	The dimmer numbers are displayed. You are prompted for a channel number.
3. Enter a dimmer number.	You are prompted to assign intensity.
4. Assign intensity with the wheel or press **[@]** and enter a value on the keypad.	The selected dimmer is displayed in red.
5. Press **F1 Previous** or **F2 Next** to test the previous or next dimmer.	

CHAPTER 26
SPOT MANAGEMENT AND PATCHING

This chapter includes:

Two menus are concerned with moving light management: the Mix Output menu and the Spot Patch menu.

The Mix Output menu provides all the tools for moving device definitions, patching spot numbers, and assigning output addresses.

The Spot Patch menu allows you to configure for beam movement consistent with trackball movement.

As mentioned in Chapter 24 -System Configuration, the number of spots the system controls are defined by spot size or the number of DMX channels spot types require. This configuration appears in the Mix Output menu. Use it as reference when assigning spot types to spot numbers.

The Mix Output Menu

Menu number 19.

The functions in the Mix Output menu are responsible for moving light management.

Included in this menu are:

- Spot type selection and assignment to spot control numbers.
- Setting up output addresses. Each spot is given a unique address. The local address on each spot must be identical to the address assigned in the Mix Output menu.
- Defining new devices, or editing existing definitions, including parameter wheel set up.
- Creating device libraries

Mix Output menu display

The elements in the Mix Output menu display are the Assignment Table, the Device List, the Device Definition Table, Connector Set Up, and the Parameter Library Reference.

The assignment table

The Assignment Table, on the left side of the screen, shows which types of spots (devices) are patched to control numbers and spots' output addresses. The Assignment Table consists of 3 rows:

- *Dev* stands for device. The device's two-letter label appears here.
- *Spt* is the spot number by which a particular instrument is accessed.
- *Out* is the DMX address or High End/S-Mix address output of that particular instrument.

The device list

The Device List is a list of devices that can be assigned to spot numbers. The Device List contains 13 devices.

The Device List has three columns.

- The first column is the name of the device.
- The second column is its label.
- The third column shows the number of DMX channels used by the device.

Spark 4D's default Device List is divided into three types of devices:

Device Type	
DMX	DMX devices are operator programmable. You can define devices in the Define Device (under F2 Select Device) option in this menu. DMX devices appear in the upper section of the Device List. The DMX devices in the default Device List are: Yoke Goldenscan 3E Goldenscan HP VL5 VL6 Martin XR Martin PAL Studio Color
L-MIX	Coemar NAT 2500 and NAT 1200. These moving lights work under DMX protocol. Access to the device definition is limited to Invert, Jump on x-fade, include/exclude parameters from libraries, include parameters in CL1 or CL2, define parameters' home values, and wheel set ups. L-Mix devices appear in the middle section of the Device List. The L-Mix devices in the default Device List are: Nat 2500 Nat 1200
High End S-Mix	Devices that use proprietary protocols. Access to the device definition is limited to Invert, Jump on x-fade, include/exclude from libraries, include parameters in CL1 or CL2, define parameters' home values, and wheel set ups. These devices appear in the lower section of the Device List. The High End/S-Mix devices in the default Device List are: Intelleabam Summa (S-Mix only) Cyberlight

The definition table

The device's full name and short name, output length, and ID number head the Definition Table, on the right side of the screen.The device's parameter names, parameter control channel, and other parameter configurations are displayed in the Definition Table.

The Definition Table displays information for the spot highlighted in the Device List.

Other information

Under the Assignment Table, the overall spot configuration (as defined in Service Tools/Config Sys) is displayed along with the connector definitions. The libraries' parameters reference is also displayed.

Patching spot numbers

Spot numbers are the numbers by which the editor accesses moving lights. Device types are patched to spot numbers. One spot or a range of spots may be patched at the same time.

The default assignments are Yoke for 6p spots, Intellabeam for 12p spots, Cyberlight for 22p spots, and Martin PAL for 30p spots.

Important! When patching devices to spot numbers be careful not to assign device that do not fit that spot number. Example: Your console is configured for 4 x 6p spots, 4 x 12p spots, and 4 x 22p spots. Therefore spot numbers 1 – 4 are 6p size, spot numbers 5- 8 are 12p size, and spot numbers 9 – 12 are 22p size. Do not assign Goldenscan HPE to spots numbers 1 – 4. Goldenscan HPE uses 12 DMX channels and must, according to this example, be assigned to spot numbers 5 -–8. If you assign them to spot numbers 1 – 6 there are not enough DMX channels allocated to operate all of the parameters. If you assign them to spot numbers 9 – 12, you are "wasting" DMX channels because this device does not need the amount of DMX channels allocated to 22p spots.

Keypresses	**Results/Comments**
1. Press **F2 Select Device**	
2. Use the arrow keys (**F2** and **F3**) to highlight the desired device	
3. Press **F4 Select Spot #**	The prompt line shows the type device that has been selected and prompts for the spot number for assignment.
4. Enter the spot number on the numeric keypad.	
5. Press **F2 Thru Spot #** or press **[→]** and enter the last spot number of the range.	
6. Press **F1 Store**	The device's label appears above the spot number in the assignment table.

➢Note

It is not permitted to assign more than 24 High-End spots.

Assigning output addresses

After assigning devices to spot numbers, it is necessary to set up the output addresses.

The local DMX address on each moving light must correspond to the number that appears in the OUT row in the assignment table. Plan ahead and set the local DMX addresses on the devices before they are hung in an inaccessible location!

The DMX Address function (**F1**) offers these options:

- F1 Default space
- F2 Select Spot
- F5 Auto set up - where the system accesses the definition data and sets up the DMX address accordingly.

Calculating DMX addresses

The number of DMX channels occupied by each device varies according to the type of device. The number of DMX channels (output length) used by the device appears, in the definition table and the device list. This number is used to calculate the DMX output address, which appears in the row labeled "out" in the assignment table.

Example: the selected device is *Studio Color*, which uses 16 DMX channels. This means that if the device has been assigned to spots 1→ 12, the output number appearing under spot 1 will be 1, under spot 2 the output number will be 17, and so on.

If the selected device uses only 8 channels, the output number appearing under spot 1 will be 1, under spot 2 it will be 9, and so forth.

Of course, you may be using a variety of devices that use a different number of channels, so you must set the **DMX** addresses appropriately.

Connector assignments

Connectors transmit DMX512 protocol, High-End protocol, or S-Mix.

The number of dimmers and the number of spots defined in Service Tools/Config. Sys determines distribution on the connectors. Connector 1 is the default for channels.

The connector configuration is displayed under the assignment table. The icon key for connectors is:

○ DMX 1

○○ DMX 2

* High End/S-Mix

♦ CMX 1

♦♦ CMX 2

Spot assignments	**Connector Display**
Only DMX or CMX spots	DMX/CMX 1 & 2
At least one S-Mix spot (Summa)	DMX 1 and the yellow asterisk for S-Mix
High End spots (Intellabeam and Cyberlight)	DMX 1 and the orange asterisk for High End

Using the auto set up option

Auto Set up automatically calculates the DMX offset for each spot and assigns the appropriate addresses. If you are using only DMX spots, the Auto Setup assigns all of the addresses from connector 2.

Keypresses	Results/Comments
1. Press **F1 DMX Address**	
2. Press **F5 Auto Setup**	Auto Setup automatically assigns the DMX output address according to the number of DMX channels required by each "patched" device. Display message: *All addresses will be modified, Are you sure?*
3. Press **F1 Yes**	The DMX addresses are displayed under the spot number.

Assigning DMX addresses to selected spots

You can assign addresses to selected spots. Using this option, you are prompted to specify the connector assignment for each spot.

If you are using only DMX spots, spots can be assigned to either connector. If you are using some DMX spots and High-End or S-Mix, DMX spots can only be assigned to connector 1.

If you assign spots to connectors 1, which is the channel connectors, the spots take precedence over channels.

Keypresses	Actions/Comments
1. Press **F1 DMX Address**	
2. Press **F2 Select Spot**	The system prompts for the spot number.
3. Select spots using the numeric keypad.	A range of spots can be selected using the key sequence **[# → #]**.
4. Press **F1 DMX 1** or **F2 DMX 2**	You are prompted to enter the first DMX address.
5. Enter the DMX address in response to the prompt.	
6. Press **F1 Store**	

If there are overlapping addresses an error message (Address *is overlapping spot # Do you want to store?*) is generated. The address of the overlapped spot is displayed on a in red. You must correct conflicting addresses.

Assigning a default space

You can also assign DMX output address by entering a default space. The default space assigns the selected default space to all spots per selected connector; therefore you can only use this if all of the spots output from the connector have the same DMX offset.

Keypresses	Results/Comments
1. Press **F1 DMX Address**	
2. Press **F1 Default Space**	You are prompted to enter the default output length.
3. Enter the number of channels.	
4. Select the connector assignment.	Each spot is assigned a DMX output address according to the default offset.

Or

Keypresses	Results/Comments
1. Press **F1 DMX Address**	
2. Press **F2 Select Spot**	
3. Enter the spot numbers on the keypad.	
4. Select the connector.	Spark prompts for a beginning address.
5. Enter the first DMX address that you will use for spots.	
6. Press **F1 Default Space**	You are prompted to enter the default output length.
7. Select the number of DMX channels that will be allocated to each spot.	
8. Press **F1 Store**	The DMX addresses appear under the spot numbers.

Enabling/disabling spot output

You can disable a spot's output from the console. This is useful in case a spot is malfunctioning, so you can avoid physically disconnecting the psychotic device.

The output can be reinstated by reassigning the DMX address.

Keypresses	Results/Comments
1. Press **F1 DMX Address**	
2. Press **F2 Select Spot**	A range of spots can be selected using the key sequence # → #.
3. Select the connector with the selected spots.	
4. Press **F4 Disable Output**	The output address is replaced by 3 dots..

Defining devices

The Define Device option allows you to define DMX512 devices that are not included in the Default Device List and edit existing definitions.

There is limited access to parameters of the L-Mix and S-Mix/High End devices.

A device definition includes:

- The device's full name (up to 10 characters).
- 2 characters for the device's label. This is the name that appears in the Assignment Table and the Stage Display.
- The output length is the number of DMX channels used by the device.
- An ID number. The ID number is referenced by Palettes. Different fixtures can share Palette information if the fixtures have the same ID number. Example: Two different fixtures that use CYM color mixing can share color Palettes. In the Mix Output menu/Define Device assign the same ID number to the two fixtures.
- The parameter names are represented by 2 characters.
- The parameter control channels.
- The Parameter type. Parameters can be defined as continuous, discrete step (D), or mixed step (M) parameters.
- Other options available in the device definition are: *I* invert parameter, *X* (jump or fade during crossfade) , *L* (include or exclude from Library), include in *Clear 1* or *Clear 2*, and *Home* (assign Home values).

The parameter names and their DMX control channels are found in the manufacturers' specifications.

Making room for a new device

To define a new device, you must overwrite a device that appears in the device list. Select a device that you are not using at the moment and overwrite it. To save the definition that you are overwriting, record it to a diskette or to the hard disk (see create a device library 26-17).

Defining a new device

Define the device according to the information provided in the manufacturers' specifications. After storing a new device definition, you should also record it on the hard disk or to a floppy disk. Enter all text information using the alphanumeric keyboard. Numeric entries can be typed on the alphanumeric keyboard or on the console keypad.

➢Note

To erase the name of a parameter press the Spacebar on the alphanumeric keyboard. To erase numbers press 0 on the alphanumeric keyboard or on the console keypad.

Keypresses	**Results/Comments**
1. Press **F2 Select Device**	
2. Use the arrow keys to select the device you are overwriting.	
3. Press **F5 Define Device**	The field of the definition table turns red.
4. Use the arrow keys to position the cursor.	The selection is highlighted in white.
5. Enter the parameter information.	Consult the manufacturer's specifications.
6. When the definition is completed, press **F1 STORE**	The device is added to the Device List.

➢Note

It is expedient to save the device definition on the hard disk or record it to a floppy disk, as you will need to load it after each cold start.

Defining parameters

Parameters may be assigned in any numerical order.

To take advantage of the powerful library function:

Assign gobos to parameter numbers:p5, p6, p7, p13, p15

Assign color parameters to p1, p2, p3, p4, and p14.

The parameters included in Libraries are indicated in the libraries' reference display, located below the Assignment Table.

Types of parameters

Parameters are defined as is either continuous, discrete step (D) or mixed step (M).

1. Continuous control is from 0 -- Full. Examples of continuous parameters are x, y, and dimmer parameters.
2. Discrete steps increment the parameters by one step. An example of discrete step is the gobo parameter, where each increment will move to the next gobo.
3. Mixed steps are also incremented by one step, however within each step there is continuous control. This occurs in the case of certain devices where two or more parameters share a common DMX channel. Use of mixed step insures against accidentally moving into parameter that shares the DMX control channel with another parameter, while allowing continuous control within each step.
   Example: Parameter control channel 1 from 0% - 50% controls the iris and from 50%

- 100% strobes and controls the strobe rate. Therefore, mixed step 1 provides incremental control of the iris from open to closed and step 2 provides incremental control of the strobe function.

Defining discrete and mixed step parameters

Each device may be defined for up to 16 discrete or mixed steps. Each mixed or discrete step may have up to 25 steps.

Keypresses	Results/Comments
1. Press **F2 Select Device**	
2. Place the cursor on the device being overwritten.	
3. Press **F5 Define Device**	The field of the definition table turns red, showing that it is now active.
4. Use the arrow keys to position the cursor.	The field of the selected parameter is highlighted in white.
5. Enter the parameter name and its DMX control channel.	Consult the manufacturer's specifications.
6. Use → to position the cursor on the D or M column	A window containing step definition is displayed.
7. Enter the number of steps.	Consult the manufacturer's specifications to determine how many steps to assign.
8. Press **[ENTER]**	The step definition window is now active and displayed in red.
9. Enter a value for each step in a range of 1-255 or percentage.	Step values may be entered in bits or percentage. Use the spacebar on the alphanumeric keyboard or **[•]** on the console to toggle between absolute and percentage definition. Use the arrow keys to select steps.
10. Press **[ENTER]** to exit the Step window.	
11. When the definition is complete Press **F1 Store**	

This procedure may be modified at every level without repeating the entire procedure. Simply place the cursor at the required step and modify the step value.

To convert a discrete or mixed step to continuous type 0 (zero) in the D or M column.

Defining other parameter attributes

Additional parameter attributes are:

Attribute	What it does
Home	The home definition determines the parameter values, to which all spot parameters return When **[HOME]**, is pressed. **[CLR1]**, **[CLR2]**, and the Spot Patch menu also access the home definition.
I (invert)	Invert a parameter. Example: When the parameter value for the iris is at 0% the iris is fully open. When the parameter value is FL the iris is closed. Defining the parameter as inverted results in the iris being open when the parameter value is FL and closed when the parameter value is 0.
X (crossfade)	Choose between the parameter jumping in the crossfade or fading in the crossfade.
Clear) *1*	(Color parameters are usually assigned to **[CLR1]**. **[CLR1]** references parameters' home values.
(Clear) *2*	Gobo parameters are usually assigned to **[CLR2]**. **[CLR2]**references parameters' home values.
L (Library)	Parameters that are normally included (see the Library reference display) in libraries may be excluded.

Keypresses	Results/Comments
1. When the cursor is positioned on a parameter, use the → key to move to one of the columns described above. 2. Use the **+** or **—** keys according to instructions.	A window opens with instructions for determining the attribute setting.

Ignition

Many moving lights have a control channel to strike the lamp, extinguish the lamp, reset the device, and control the fans. This control channel is the channel referenced when selecting the ignite function.

The ignite parameter is definable for DMX 512 controlled spots only. The ignite for L-Mix devices and High End are factory programmed and may not be changed.

As with all device definitions, consult the manufacturers' specifications.

See Chapter 6 Selecting and Editing Spots for instructions on igniting spots.

Continuous ignition definitions for DMX spots

Ignition channel definitions consist of a DMX channel, Time, and a Value. The default value or a selected value can be transmitted.

There are 3 possibilities for ignite channel definition.

1. DMX is set at 99 – The value is sent to all parameters for the duration of the time entry.
2. DMX is assigned according to the manufacturer’s specifications and time is set to 99. The default or selected value is sent until a new ignition command is transmitted.
3. DMX is set to control channel according to specifications and time is set to any value except 99. The default or selected value is transmitted; the duration of the transmission is determined by the time value.

It is illegal to assign 99 to both DMX and time.

Example 1: DMX set at 99. Most Clay Paky devices use this definition to reset the lights.

Contr	DMX	Time	Value
Ignite	99	6	0

Example 2: DMX is set according to manufacturer's specifications and the time is set to 99. In this case the default value or a selected value is sent indefinitely until a new ignition command is transmitted.

Contr	DMX	Time	Value
Ignite	12	99	0

Example 3: DMX is set according to manufacturer's specifications and time is set from 1 up to and including 14. Setting the time to more than 14 results in an *illegal number* message. The default or selected value is transmitted; the duration of the transmission is determined by the time value. This definition is used for the NATs and Summa. When sending the ignition, enter 0 for lamp off, 1 for lamp on, 2 for reset.

Contr	DMX	Time	Value
Ignite	12	6	0

Ignition with discrete steps

The ignite parameter may also be defined as having discrete steps. Consult the manufacture’s specifications for the details step divisions. An example of a moving light having discrete step ignition is MAC 1200.

Each step is given a unique time. A step whose time is 99 continues transmitting until a new Ignite command is entered.

Editing parameter wheels assignments

This function permits you to assign parameters to the wheels in any order desired. The display for the **Param To Wheels** function (**F1**) consists of the wheels window showing 3 wheels, Wheel 1 being the bottom wheel. Each wheel has 9 banks. The parameter window displays the parameter names of the selected spot. Parameters may be assigned to 1 or more wheel bank. A color code shows the assignment status of each parameter:

Color	Wheel assignment status
White	selected
Gray	no wheel assignment for parameter
Blue	parameter assigned to one wheel bank
Brown	parameter assigned to more than one wheel bank

Keypresses	Results/Comments
1. Press **F2 Select Device**	
2. Use the arrows (**F2** and **F3**) to select the device	
3. Press **F1 ParamsTo Wheels**	The wheel set up is displayed.
4. Select the wheel you want to start with by pressing **F4 Select Wheel**.	Each press moves the cursor to another wheel.
5. Use the arrows (**F2** and **F3**) to select a wheel bank.	
6. Press **F1 Select Param**	The parameters window is now active (framed in red).
7. Use the arrows to select the parameter.	
8. Press **F5 Enter & Next**	The cursor moves to the next wheel in the wheel bank and selects the next parameter in the parameter window. The parameter window is still the active window.
9. Repeat steps 6 and 7 until all of the parameters are assigned.	
10. Press **F1 Enter**	Returns control to the wheels display.
11. Press **F6 Store & Exit**	Store the wheel set up and return to the top of the command chain.

Releasing home values

All parameters are assigned a default value for Home, the Home value can be released. The home values are accessed by the operations:
SPOT # HOME
SPOT # CL1
SPOT # CL2
and the Spot Patch menu.

When a parameter has no Home value, its assignment does not change when using **[HOME]**, **[CL1]**, and **[CL2].**

Keypresses	Results/Comments
1. Press **F2 Select Device**	
2. Place the cursor on the device.	
3. Press **F5 Define Device**	The Device Table is displayed in red.
4. Place the cursor in the Home (Hm) column for the parameter being redefined.	
5. Press **RELEASE** (on the console panel)	The assigned value is released and no longer displayed.
6. Press **F1 Store**	

➢Tip

Record this new device definition, as it reverts to the original definition after Cold Start. You can load your definition from the file you have recorded.

Defining an external dimmer

The definition function contains another useful item: the external dimmer assignment.

The purpose of this function is to allow the dimmer of a lamp controlled through a conventional dimmer frame, but fitted with moving accessories, to become one of the moving light parameters.

Some examples of these types of devices are VL5, VL5E, and conventional projectors mounted on yokes. The default definitions of Varilite 5 and 5E include external dimmers.

There are 4 steps when defining an external dimmer:

1. Define the device as having an external dimmer.
2. Patch the device to a spot number.
3. Assign the Out address.
4. Patch the spot number to the dimmer, in the Channel Patch menu.

The steps below define yokes with external dimmers and assign yokes the yokes to spot numbers. In the example the external dimmers are dimmers 100 and 101 and the yokes are assigned to spot numbers 5 and 6.

Example: A Profile Zoom is mounted on a yoke. A conventional dimmer controls the lamp, while the yoke is associated with the X/Y and focus parameters of a moving light.

Yoke #	DMX address	Dimmer	Control Channel
5	1	100	100
6	7	101	101

Step 1 (if necessary)**- defining a yoke**

Keypresses	Results/Comments
1. Press **F2 Select Device**	Access the device list.
2. Place the cursor on the space you have reserved for the yoke definition.	
3. Press **F5 Define Device**	Select the **Define Device** option.
4. Type: Yoke, Yo,	Identify yoke as a new device.
5. Use the procedure described above to define the x and y parameters.	
6. Move the cursor to parameter *DM*.	
7. Type 99	Identifies this parameter as an *external dimmer.*
8. Define the rest of the parameters	Values for "home" and clear functions may also be entered at this time.
9. Press **F1 Store**	

Step 2 -Assigning spot numbers

The next step is to patch the unit to a spot number.

Keypresses	Results/Comments
1. Press **F2 Select Device**	Access the device list for selection.
2. Use the arrow keys (**F2** and **F3**) to place the cursor on your selection.	Select “yoke”.
3. Press **F4 Select Spot #**	
4. Press 5 on the keypad.	
5. Press **F2 Thru Spot #** or **[→]** on the console.	
6. Using example, press 6.	
7. Press **F1 Store**	Spot numbers 5 and 6 control yokes.

Step 3 - setting up the output address

To complete this operation it is now necessary to assign the DMX address.

Assuming that the yoke has parameters: x and y with high-resolution movement, focus, and zoom it requires 6 DMX channels. Since the local DMX address, for the first yoke (spot 5), has been set at 1, the output address under spot 5 must be 1. The DMX address of the second yoke (spot 6) is 7. The output address under spot 6 must be 7. (see page **Error! Bookmark not defined.**.)

Step 4 -Soft patching in the Channel Patch

The last phase of patching when using external dimmer is done in the Channel Patch menu. Patch the spot number associated with the unit to its hard patch dimmer number. In this case, dimmers 100 and 101.

Keypresses	Results/Comments
1. Press **[MENU] [1] [ENTER]**	You are now in the Channel Patch menu.
2. Press **F1 Assign Dimmers**	
3. Select **100**	Select the dimmer controlling the lamp of the unit mounted on the yoke.
4. Press **F3 To Channel**	Select the spot number of the first yoke.
5. Select **5**	
6. Press **F2 Thru Channel**	
7. Select **6**	Select the last yoke in the range.
8. Press **F1 Store**	Dimmers 100 and 101 are assigned channels 5 and 6 respectively. The channels are marked with an **E**, signifying that they are actually spot numbers associated with an external dimmer.

IMPORTANT! In the Channel Patch menu, channel numbers that are identical with the spot numbers assigned external dimmers are no longer available as conventional channel numbers because they now represent spot numbers. You must clear their assignments from the channel patch table. If the dimmers associated with those channel numbers are to be used, they must be assigned alternate channel numbers.

Example (using the set up described above):
Patch dimmer 100 to channel 5. An E appears alongside 5 in the channel row, identifying this as an external dimmer associated with moving lights. After having done this, channel 5 still is associated with dimmer 5 unless the 1 to 1 default patch assignments has been cleared. Since channel 5 has become part of the moving spots, its original default assignment must be cleared. In order to use dimmer 5, simply assign a channel number other than 5.

If a range of channels is selected in the editor, the channels that are identified as external dimmers are ignored.

Example:
Select channels 1→ 20 and Spark skips over channels 5 and 6 since they are now considered part of moving lights and are accessed through spot numbers. If you select channels 5 and 6 only the message *Which Number is displayed.*

Creating a device library

You can create a device library by recording device definitions to a floppy disk or to the hard disk. New device definitions that you have programmed can be recorded, as well as the default definitions in Spark 4D.

The hard disk contains a directory called ‘dev’ that is accessed when you select the Load or Record device functions.

Recording device definitions

As explained above, any DMX512 device that appears in the device list can be *replaced* by newly defined DMX devices. What do you do if you want to define a new device, but don't want to lose the definition of the device you are overwriting? You save the device definition that you are overwriting to the hard disk in the Dev directory or save it on a floppy disk.

Example: Assume that at the present you do not need VL5 in the device list. You want that space for a new device that you have just acquired or you want to redefine an existing device. You do, however, want to save the VL5 definition for future use.

Keypresses	**Results/Comments**
1. Press **F5 Record Device**	The files in the Dev directory are displayed. If you want to save the device definition to a floppy disk, put a diskette in the disk drive and change the drive.
2. Use the arrow keys to select the device.	
3. Press **F1 Record**	One file, identified by device name, is recorded onto the disk. The file includes a date and time stamp.

Loading device definitions

You can load any of the stored definitions to the device list.

Keypresses	**Results/Comments**
1. Insert a diskette to the disk drive.	
2. Press **F5 Record Device**	
3. Use the arrow keys to select the device you are overwriting.	
4. Enter the file number for the device you are loading.	
5. Press **F1 Record**	One file, identified by device name, is recorded onto the disk. The file includes a date and time stamp. If the device name already exists on the diskette a warning message is issued. Press F1 again to overwrite the existing file.

The Spot Patch

This is menu number 13. The Spot Patch menu configures for consistent beam movement vis a vis the trackball, regardless of the physical orientation of the spots.

Example: You have a number of spots in different positions- one with its head pointed stage right, on facing stage left, another lying upstage on its back. If you move the trackball left, you want all spots to move to your left; if you push the trackball up, you want all spots to move upstage.

There are 8 different positions. Positions 1 - 4 simply invert one or both of the axes. Positions 5 - 8 swap the x and y axes. Position 1 is the default assignment.

Assigning patch position

If you have selected a range of spots, Spark 4D turns on one lamp at a time. So, if the range of spots is spots 1 - 6, first spot 1 is turned on. After you have stored the new potion for spot 1 press **F3 Advance**. The dimmer of spot number 2 goes on and the spot is displayed in the x/y co-ordinates window.

Keypresses	Results/Comments
1. Press **F1 Patch Position**	The prompt: *Patch position x/y of spot #:* and graphic displays of the 8 positions are displayed.
2. Select a spot using the numeric keypad.	Enter the spot number on the numeric keypad. A range or a group of spots can be selected.
3. Press **F1 Convert To**	The dimmer is turned on, so you are working live. All parameters, except X and Y, are Home values. Note that a small window showing the x/y co-ordinates of the spot appears in the lower left corner of the display.
4. Select one position by entering the position number on the numeric keypad.	
5. Use the trackball to move the spot, determining whether you have chosen the proper position.	If you want to try another position, just enter a new position number through the keypad.
6. Press **F1 Store Convert**	When you are satisfied with your choice of patch position, store the new information.

Returning to the default position

Restore all the assigned patch positions to their default position (position 1):

Keypresses	Results/Comments
1. Press **F3 DEFAULT POSITION**	The prompt asks ***are you sure???***
2. Press **F1 STORE**	Confirm the store command. All of the spots are assigned position 1.

CHAPTER 27
MIDI IN/OUT

This chapter includes:

Configuring the System for MIDI

To configure Spark 4D for MIDI communication, you must enable bit Q Sys in Service Tools/ Config Sys /Special Functions. You must also define the MIDI communication channel in the System Parameters menu.

Configuring for MIDI in Service Tools

Keypresses	Results/Comments
1. Go to Service Tools.	
2. Press **F3 Config Sys**.	
3. Enter the password.	
4. Press **F4 Special Functions**	
5. Press the arrow keys until the cursor is on Bit Q MIDI	
6. Press **F1 Toggle**	Bit Q is now toggled to *Enable*
7. Press **F6 Enter & Exit**	The main Config Sys menu is displayed. A confirmation request is displayed.
8. Press **F6 Store Configuration**	
9. Turn off Spark 4D and switch it back on.	Spark 4D now boots up. After major changes in the system configuration it is necessary to power down and power up again.
10. Press **F1 Cold Start**	The system exits Service Tools and comes up in editor mode.

Defining the MIDI channel in System Parameters

Keypresses	Results/Comments
1. Press **MENU**	The menu list is displayed.
2. Press **8 ENTER**	The System Parameters menu is on view.
3. Use the arrow keys to move the cursor, highlighting **MIDI i/o channel**.	
4. Press **F1 Enter**	
5. Enter the MIDI communication channel (1 - 16) on the numeric keypad.	
6. Press **F1 Store**	

Enabling/Disabling MIDI

The console transmits or receives MIDI commands, when MIDI is enabled. When MIDI is disabled, the console ignores all MIDI communication.

A flag at the top center of the display shows the MIDI status.

Turning MIDI on

Keypresses	**Results/Comments**
1. Go to the MIDI menu.	
2. Press **F6 More** and **F3 MIDI on**	
3. Exit the menu.	The MIDI flag, appearing at the top of the display reads: *I/O On*.

Turning MIDI off

Keypresses	**Results/Comments**
1. Go to the MIDI menu.	
2. Press **F6 More** and **F4 MIDI off**	
3. Exit the menu.	The MIDI flag, appearing at the top of the display reads: *I/O On*.

The MIDI Menu

When receiving MIDI commands, an exterior instrument sending MIDI signals initiates console operations. The exterior instrument can be a synthesizer or a PC with a music program or any other device that communicates via MIDI.

MIDI transmission is often used to control other lighting consoles.

The MIDI In/Out menu, menu 23, offers the options of enabling or disabling all or part of the input keys, output keys, input controllers, and output controllers. All the keys and controllers are defined as note off, note on, or control change responsive. The default MIDI codes can be edited.

➢Note

If the MIDI function has not been Enabled in Service Tools (see Configuring the System for MIDI, page 27-2), the MIDI menu does not appear in the menu list.

Enabling and disabling keys and controllers

A red asterisk next to a key denotes that it is enabled and responsive to MIDI commands.

It is recommended to enable only those keys that you will actually use.

Keypresses	Results/Comments
1. Press **F1 Input Keys/ F2 Output Keys** or **F3 Input Cntrlrs/F4 Output Cntrlrs**	Select input keys. A list of all of the keys in the system and their MIDI command codes is displayed. There are 2 pages of MIDI codes. Select input controllers. A list of playback devices and their MIDI command codes are displayed.
2. Use the arrow keys on the console to highlight the key or playback device.	
3. Press **F1 Enter**	The key name is highlighted in red.
4. Press **F2** ↑	An asterisk (*) is inserted in front of the key name, denoting that this key is enabled and responds when the appropriate MIDI command is received.
5. Press **F1 Store**	

To disable keys follow the same procedure. When disabled there is no asterisk in front of the key name.

The keys that are enabled as default are:

GO A/B	**HOLD A/B**
BACKFADE A/B	**GO TO A/B**
SEQ A/B	**AUTO ON**

You can also enable or disable all of the keys.

Keypresses	Results/Comments
1. Go to the MIDI menu.	
2. Press **F6 More** and **F1 Enable all** or **F2 Disable all**	
3. Select Input keys, Output keys, Input controllers, or Output controllers.	A red asterisk appears next to all of the keys in the MIDI list.

Editing MIDI data for keys and controllers

You can edit the message and data assignments.

The input and output key display has 3 columns:
1. Key
2. Message - the message information can be assigned as *note on*, *note off*, or *control change*.
3. Data - the MIDI code in the data column can be changed.

The input and output controllers' display has 2 columns:
1. Sys - indicating the playback device.
2. MIDI - the MIDI code assigned to the playback device.

The message for input/output controllers is **always** control change.

If control change is assigned to the input/output keys, care must be taken to assure that there is no duplication of the MIDI code. Example: if input/output controller A/B is programmed as MIDI 20, do not program input/output key Hold A/B as control change, data 20.

The instructions for editing MIDI information in the MIDI menu uses input keys. The procedure is the same for output keys, input controllers, and output controllers.

Keypresses	Results/Comments
1. Press **F1 Input Keys**	Select the input keys.
2. On the console panel, press the key that you want to edit. The cursor automatically jumps to that key in the MIDI table.	
3. Press **F1 Enter**	You now have access to the selected entry.
4. Press **F5** → to select the Message or Data column.	
5. Press **F2** ↑ to change the Message assignment. Enter a number on the numeric keypad for the Data assignment.	Use this key to toggle to the required selection: *note on*, *note off*, *control change*.
6. Press **F1 Store**	

MIDI Macro

The MIDI Macro function allows you to program a macro using MIDI transmission input. The macro collects the MIDI codes received from a MIDI transmitting source.

Keypresses	Results/Comments
1. Go to the MIDI menu.	
2. Press **F5 MIDI Macro**	This selection transports you to the Macro menu.
3. Press **F1 Create Macro**	The system prompts for a macro number.
4. Transmit MIDI commands to console	This transmission should contain no more than 16 commands.
5. Press **F1 Store**	Store the macro. The macro appears in blue and is a collection of MIDI codes.

MIDI Sync

MIDI sync is an additional MIDI function that serves to synchronize 2 consoles, one console being the master and the other the slave.

The synchronization works via Go commands to the A/B crossfader.

The synchronization is carried out by a MIDI transmission, to the slave console, of the keys **[MEMORY] [#] [TIME] [GOTO]** whenever a Go command occurs on the A/B crossfader, The # is the number of the incoming memory.

The Go commands include:
- Pressing **[GO]**
- Pressing **[GO TO]**
- Manually moving the fader.

To use the MIDI sync function, you must:
- Connect the consoles as Master/Slave via MIDI.
- Assign the MIDI Sync channel in the System Parameters menu in the master and the identical channel as the MIDI I/O channel in the slave console.
- Enable the MIDI Sync function in the MIDI menu on both consoles.

Setting up MIDI Sync in the master console

Since the MIDI sync function and the regular MIDI transmission can operate simultaneously, a unique channel must be set for MIDI I/O.

The default assignment for the MIDI Sync channel is 2. The default assignment for MIDI I/O is 1.

Keypresses

1. Configure the system for MIDI as described above.
2. Go to the System Parameters menu.
3. Set a channel for *MIDI sync out*.
4. Optional - Set a different channel for *MIDI I/O*.

Setting up MIDI sync in the slave console

If the receiving console is not a Compulite console, the following keys on the receiving console must be programmed with the identical MIDI codes as in the MIDI menu of Spark 4D :

- **MEMORY**
- digits 0 - 9
- decimal point (for numbers like 2.8, etc.)
- **TIME**
- **GO** (A/B)
- **GOTO** (A/B).

Keypresses	Results/Comments
1. In the MIDI menu, enable all of the Input Keys.	
2. Go to the System Parameters menu.	
3. Set a channel for *MIDI I/O*.	The MIDI I/O channel, of the slave console, must be set to the same channel as the MIDI Sync channel in the master console.

Enabling/disabling MIDI Sync

The MIDI Sync function can be enabled or disabled at anytime. This is done in the MIDI menu. MIDI Sync is found on the 3rd page in the MIDI menu.

Press **F1 MIDI SYNC ON** to enable MIDI sync.

Press **F2 MIDI SYNC OFF** to disable MIDI sync.

The MIDI Sync status is displayed in the center at the top of the monitor.

Standard MIDI codes

MIDI code chart for decimal to hexadecimal equivalents

Decimal	*Hex*	*Decimal*	*Hex*	*Decimal*	*Hex*	*Decimal*	*Hex*
0	00	32	20	64	40	96	60
1	01	33	21	65	41	97	61
2	02	34	22	66	42	98	62
3	03	35	23	67	43	99	63
4	04	36	24	68	44	100	64
5	05	37	25	69	45	101	65
6	06	38	26	70	46	102	66
7	07	39	27	71	47	103	67
8	08	40	28	72	48	104	68
9	09	41	29	73	49	105	69
10	0A	42	2A	74	4A	106	6A
11	0B	43	2B	75	4B	107	6B
12	0C	44	2C	76	4C	108	6C
13	0D	45	2D	77	4D	109	6D
14	0E	46	2E	78	4E	110	6E
15	0F	47	2F	79	4F	111	6F
16	10	48	30	80	50	112	70
17	11	49	31	81	51	113	71
18	12	50	32	82	52	114	72
19	13	51	33	83	53	115	73
20	14	52	34	84	54	116	74
21	15	53	35	85	55	117	75
22	16	54	36	86	56	118	76
23	17	55	37	87	57	119	77
24	18	56	38	88	58	120	78
25	19	57	39	89	59	121	79
26	1A	58	3A	90	5A	122	7A
27	1B	59	3B	91	5B	123	7B
28	1C	60	3C	92	5C	124	7C
29	1D	61	3D	93	5D	125	7D
30	1E	62	3E	94	5E	126	7E
31	1F	63	3F	95	5F	127	7F

MIDI codes are also organized according to the 12 octaves on the piano.

Note	**Name**	**Note**	**Name**	**Note**	**Name**	**Note**	**Name**
C-2	:00	C-1	:36	C-4	:72	C-7	:108
Db-2	:01	Db-1	:37	Db-4	:73	Db-7	:109
D-2	:02	D-1	:38	D-4	:74	D-7	:110
Eb-2	:03	Eb-1	:39	Eb-4	:75	Eb-7	:111
E-2	:04	E-1	:40	E-4	:76	E-7	:112
F-2	:05	F-1	:41	F-4	:77	F-7	:113
Gb-2	:06	Gb-1	:42	Gb-4	:78	Gb-7	:114
G-2	:07	G-1	:43	G-4	:79	G-7	:115
Ab-2	:08	Ab-1	:44	Ab-4	:80	Ab-7	:116
A-2	:09	A-1	:45	A-4	:81	A-7	:117
Bb-2	:10	Bb-1	:46	Bb-4	:82	Bb-7	:118
B-2	:11	B-1	:47	B-4	:83	B-7	:119
C-1	:12	C-2	:48	C-5	:84	C-8	:120
Db-1	:13	Db-2	:49	Db-5	:85	Db-8	:121
D-1	:14	D-2	:50	D-5	:86	D-8	:122
Eb-1	:15	Eb-2	:51	Eb-5	:87	Eb-8	:123
E-1	:16	E-2	:52	E-5	:88	E-8	:124
F-1	:17	F-2	:53	F-5	:89	F-8	:125
Gb-1	:18	Gb-2	:54	Gb-5	:80	Gb-8	:126
G-1	:19	G-2	:55	G-5	:91	G-8	:127
Ab-1	:20	Ab-2	:56	Ab-5	:92		
A-1	:21	A-2	:57	A-5	:93		
Bb-1	:22	Bb-2	:58	Bb-5	:94		
B-1	:23	B-2	:59	B-5	:95		
C-0	:24	C-3	:60	C-6	:96		
Db-0	:25	Db-3	:61	Db-6	:97		
D-0	:26	D-3	:62	D-6	:98		
Eb-0	:27	Eb-3	:63	Eb-6	:99		
E-0	:28	E-3	:64	E-6	:100		
F-0	:29	F-3	:65	F-6	:101		
Gb-0	:30	Gb-3	:66	Gb-6	:102		
G-0	:31	G-3	:67	G-6	:103		
Ab-0	:32	Ab-3	:68	Ab-6	:104		
A-0	:33	A-3	:69	A-6	:105		
Bb-0	:34	Bb-3	:70	Bb-6	:106		
B-0	:35	B-3	:71	B-6	:107		

CHAPTER 28
SMPTE

This chapter includes:

Overview

SMPTE time codes can be assigned to memories and Events. Time codes can be entered manually in the editor or using the Teach Me function. There is an array of sequences to modify time codes uniquely or globally.

Events with SMPTE assignments operate in response to the time code trigger. The trigger originates from an external SMPTE generator or the internal SMPTE clock.

Memories with SMPTE assignments operate when they are assigned to a playback device (A/B or controllers). The trigger originates from an external SMPTE generator or the internal SMPTE clock.

When SMPTE is active the clock is displayed above the command line. The SMPTE clock digits are displayed in different colors and different colored fields according to the clock's status; the clock can be running, the clock can be accessed for resetting, the clock can be stopped.

There are three basic SMPTE functions.

SMPTE on - Playback (the console 'listens' to SMPTE)

SMPTE off

Teach SMPTE – a convenient method for assigning time codes to Events and memories.

➢Note
Keyboard EPROM PHOTOA09 is installed in all systems delivered after February 1, 1999. Systems delivered before February 1, 1999 must use the SMPTE converter.

Configuring for SMPTE operation

The internal SMPTE clock is always available.

NOVRAM Bit O- External SMPTE defines the DMX Input/SMPTE connector.

When toggled to 0 – Disable, the DMX Input/SMPTE connector is defined for DMX Input. (To use DMX Input, Bit M must be Enabled.)

When toggled to 1 – Enable, the DMX Input/SMPTE connector is defined for SMPTE input; the console recognizes an outboard SMPTE generator. In this case, DMX Input cannot be used.

If bit 0 is toggled to 1 – Enable, you must disable DMX Input (bit M).

Configuring for the number of frames

It is recommended to configure for the number of SMPTE frames per second. If you do not configure the system for the number of frames, the console defaults to 30 frames per second.

Keypresses	**Results/Comments**
1. Go to Service Tools.	
2. Press **F3 Config Sys**.	
3. Enter the password.	
4. Press **F5 Special Numbers**.	The Special Numbers are displayed.
5. Move the cursor to *SMPTE frames per sec*.	
6. Enter the number of the frames.	
7. Press **F6 Enter & Exit**	The main Config Sys menu is displayed.
8. Press **F6 Store Configuration**	The message *Press F6 to Store Changes* is displayed.
9. Press **F6 OK**	
10. Press **[MENU]**	
11. Press **F1 Cold Start**	The system exits Service Tools and comes up in editor mode.

Using the Internal SMPTE Clock

The internal SMPTE clock is used in conjunction with the Teach function to assign SMPTE time codes and for playback.

When SMPTE is turned on, the clock is displayed at the left above the command line.

To use the internal SMPTE clock to teach memories and Events time codes and for playback the SMPTE function must be turned on. If it is not turned on the system ignores the SMPTE time clock even though it is running.

When you turn on SMPTE and there are no upcoming SMPTE assignments the message *SMPTE Over* is displayed.

➢Tip

For operational ease make Macros for turning on SMPTE, turning off SMPTE, starting the clock, stopping the clock, and resetting the clock.

Units of time format

Format	Unit of Time
••#	Frames
• #	Seconds
#	Minutes
#••	Hours
•#•#	Seconds•Frames
#•#•	Hours•Minutes
#•#•#	Hours•Minutes •Seconds
#•#•#•#	Hours•Minutes •Seconds•Frames

Color key for the SMPTE clock

Color	What it means
Red on a yellow field	Clock running
Yellow on a red field	The clock is accessible and can be reset.
Gray on a yellow field	Clock is stopped

Turning on the SMPTE function

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[FULL]**	The system is now listening to the SMPTE generator. The message *SMPTE Over* is displayed.

Turning off the SMPTE function

When the SMPTE function is turned off the system ignores any SMPTE assignments even though the internal SMPTE clock is running.

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[ZERO]**	The system ignores SMPTE.

Starting the SMPTE clock

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[TIME]**	The clock is displayed at its last setting.
3. Press **[ENTER]**	The SMPTE clock is displayed in red on a yellow field. The clock starts running.

Stopping the clock

Keypresses	Results/Comments
1. Press **[SMPTE]**	The clock is displayed in yellow on a red field.
2. Press **[WAIT]**	The clock stops. The clock is displayed in gray on a yellow field.

Resetting the clock to 0

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[TIME]**	If the clock is running. It appears on a red field.
3. Press **[0]**	
4. Press **[WAIT]**	The clock stops and is reset to 00:00:00:00.

Resetting and starting the clock

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[TIME]**	The clock is displayed in the command line.
3. Press **[0]**	
4. Press **[ENTER]**	The clock starts running from 00:00:00:00. The clock is displayed in red.

Setting the clock to a selected time

There are 3 methods to set the SMPTE clock for a time other than 0.

➢**Note**
Time assignments greater than 59 are not accepted.

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[TIME]**	The SMPTE clock is displayed in the command line.
3. Enter the time on the keypad.	Enter the time in the following format, using 2 digits for each unit: **hour.minutes.seconds.frames**.
4. Press **[WAIT]**	The clock shows the selected time.

Setting the clock to a selected time and starting

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[TIME]**	The SMPTE clock is displayed in the command line.
3. Enter the time on the keypad.	Enter the time in the following format, using 2 digits for each unit: **hour.minutes.seconds.frames**
4. Press **[ENTER]**	The clock starts running from the selected time. The time is displayed in red.

Setting the clock using the A/B Rate wheel

You can use the A/B rate wheel to change the clock's setting.

The clock must be running to use the rate wheel.

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Use the A/B Rate wheel to assign time.	The SMPTE clock is displayed in red. The wheel sensitivity is fine.
3. Press **[WAIT]** to stop the clock. Press **[RESET]** or **[CLEAR]** to continue running from new time setting.	

Or

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press and hold **[SHIFT]** and move the A/B Rate wheel.	The SMPTE clock is displayed in red. The wheel movement is coarse; very little wheel movement is needed to increment or decrement the time.
3. Press **[WAIT]** to stop the clock. Press **[RESET]** or **[CLEAR]** to continue running from new time setting.	

Assigning Time Codes Using Teach

The Teach function can be used to assign SMPTE time codes to memories and Events. The Teach function uses the console's internal SMPTE clock.

Each time the time code is stored to an Event or a memory the result is live on stage.

The Teach option is used only when the memory or Event has no previous SMPTE assignment. It is not allowed to overwrite a time assignment using Teach. To modify assignments use the manual assignment.

Assigning time codes to Events

When assigning time codes to Events *Teach E# N_ _* is displayed in the upper right of the monitor.

E# is the upcoming Event. When displayed in green the upcoming Event does not have a SMPTE assignment. The keypresses described below assign a time code to the Event. The Event number displayed in red means that the Event has a time assignment larger than the present time on the SMPTE clock.

N stands for Next, showing the next Event with a SMPTE assignment. The countdown to the SMPTE assignment that triggers the Next Event is displayed.

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[TEACH MACRO]**	
3. Press **[SMPTE]**	
4. Set the time on the clock and press **[ENTER]**	The SMPTE clock begins running. The clock is displayed on a yellow field. The upcoming Event number is displayed at the top of the screen.
5. Press **[EVENT]** to store the time code to an Event.	The message *Event # Stored* is displayed. When the time code is stored to an Event, the system automatically advances to the next Event number.

Assigning time codes to memories

Keypresses	Results/Comments
1. Assign memories or Q-Lists to the crossfaders.	
2. Press **[SMPTE]**	
3. Press **[TEACH MACRO]**	
4. Press **[SMPTE]**.	
5. If necessary set the time on the clock.	
6. Press **[ENTER]**	The SMPTE clock begins running. The clock is displayed on a yellow field above the system clock. The next memory number is displayed at the top of the screen.
Press **[GO]** or **[GO TO]** for A/B	The time code is stored to incoming memory. *Memory # Stored* is displayed.

Exiting the Teach function

Keypresses	Results/Comments
1. Press **[SMPTE]**	
2. Press **[TEACH MACRO]**	The Teach display at the top of the screen disappears.

Manually Assigning SMPTE Time

You can manually enter SMPTE time codes for memories and Events. A combination of numerical selections and **[•]** are used for time codes.

Time assignments greater than 59 are not accepted.

Assigning SMPTE code to memories

You can assign time codes to single memories or a range of memories. In the examples below the time assignment is an absolute value.

When assigning a value to a range of memories the console takes into consideration memory fade times when calculating the SMPTE assignments.

The procedures for assigning SMPTE time to Events are identical to that of memories. Use the sequences described below, substituting **[EVENT]** for **[MEMORY]**.

Example 1: Assign an absolute value of 1 minute and 55 seconds to memory 10.

Keypresses	**Results/Comments**
1. Select memory 10.	
2. Press **[SMPTE]**	The current time assignment is displayed in the command line.
3. Press **[1] [•] [55]**	
4. Press **[STORE]**	The time code assignment is displayed under the memory number in the Memory List.

Example: Assign an absolute value of 4 seconds to memories 1 → 5. All the time-in assignments for memories in the selected range are 4 seconds. ALL memories in the range are assigned time codes.

When an absolute value is entered the first memory is assigned the time entered.

All subsequent memories are assigned times calculated from the first assignment plus the difference between each memory and the first memory.

Keypresses	**Results/Comments**
1. Select memories 1→ 5.	
2. Press **[SMPTE]**	The current time assignment is displayed in the command line.
3. Press **[•] [4]**	
4. Press **[STORE]**	Memory 1 is executed at 4 seconds. Memory 2 at 8 seconds. Memory 3 at 12 seconds. Memory 4 at 16 seconds. Memory 5 at 20 seconds.

Delay assignments are also taken into consideration. The table below shows an example of SMPTE code assignments when some of the memories have delay or wait times. 4 is assigned as an absolute value to the memory range.

Memory	**Time In**	Delay	Wait In	SMPTE assignment
1	4	---	---	00:00:04:00
2	4	10	---	00:00:18:00
3	4	---	---	00:00:22:00
4	4	---	16	00:00:26:00
5	4	---	---	00:00:46:00

Modifying assignments for memo ries

You have the option of modifying the SMPTE assignments with absolute or relative values.

The tables below show the keypresses and the results.

In all of the operations described below, only memories that already have SMPTE assignments are modified. SMPTE codes are not assigned to memories within the selected range that do not already have SMPTE assignments.

The procedures for assigning SMPTE time to Events are identical to that of memories. Use the sequences described below, substituting **[EVENT]** for **[MEMORY]**.

➢Tip

When modifying the SMPTE time assignments for memories it is convenient to have the Memory List displayed.

Relative modification

Example 1: Modify the time codes for memories 1 – 5 by adding 40 seconds to the time assignments.

Keypresses	**Results/Comments**
1. Select the memory range - **[MEMORY 1 → 5]**	
2. Press **[SMPTE]**	The time assignment for the first memory in the range is displayed in the command line.
3. Press **[+]**	
4. Press **[•] [40]**	
5. Press **[STORE]**	

Example 2: Modify the time codes for memories 1 – 5 by adding 1 hour to the time codes for each memory.

Keypresses	**Results/Comments**
1. Select the memory range - **[MEMORY 1 → 5]**	
2. Press **[SMPTE]**	The time assignment for the first memory in the range is displayed in the command line.
3. Press **[+]**	
4. Press **[1] [•] [•]**	*1::* is displayed in the command line.
5. Press **[STORE]**	The SMPTE assignments are updated relatively.

The results of the examples above are illustrated in the following table.

Memory	**Time In**	**Original SMPTE assignment**	**Modified SMPTE assignment**	
			Example 1	Example 2
1	4	01:00:04.00	01:00:44.00	02:00:04.00
2	4	01:00:08.00	01:00:48.00	02:00:08.00
3	4	01:00:12.00	01:00:52.00	02:00:12.00
4	4	01:00:16.00	01:00:56.00	02:00:16.00
5	4	01:00:20.00	01:01:00.00	02:00:20.00

Example: Modify the time codes for memories 1 – 5 with a relative value of -4 seconds.

Keypresses	Results/Comments
1. Select the memory range - **[MEMORY 1 → 5]**	
2. Press **[SMPTE]**	The time assignment for the first memory in the range is displayed in the command line.
3. Press **[-]**	
4. Press **[•] [40]**	
5. Press **[STORE]**	The SMPTE assignments are updated relatively.

The result of the example above is illustrated in the following table.

Memory	Time In	Previous SMPTE assignment	Modified SMPTE assignment
1	4	01:00:04.00	00:59:24.00
2	4	01:00:08.00	00:59:28.00
3	4	01:00:12.00	00:59:32.00
4	4	01:00:16.00	00:59:36.00
5	4	01:00:20.00	00:59:40.00

Absolute modification

The first memory in the selection must have a time code assignment before using this function.

The selected time is assigned to the first memory in the range. All of the memories in the selected range that have SMPTE assignments are updated, calculated according to the assignment to the first memory.

Example: Change the absolute assignment to the first memory to 30 seconds. Memories with time code assignments are updated automatically. Memories without previous assignments are ignored.

Keypresses	Results/Comments
1. Select the memory range - **[MEMORY 1 → 5]**	
2. Press **[SMPTE]**	The time assignment for the first memory in the range is displayed in the command line.
3. Press **[@]**	
4. Press **[•] [30]**	
5. Press **[STORE]**	The SMPTE assignments for memories that already have SMPTE assignments are updated.

The result of the example above is illustrated in the following table.

Memory	Time In	Previous SMPTE assignment	Modified SMPTE assignment
1	4	00:00:04.00	00:00:30.00
2	4	00:00:08.00	00:00:34.00
3	4	none	none
4	4	none	none
5	4	00:00:20.00	00:00:46.00

➢Note

In the preceding example, not all of the memories in the range have a SMPTE assignment. Note that only memories with a SMPTE assignment are modified.

Using an increasing delta

Example: Apply an increasing delta of 4 seconds.

Keypresses	Results/Comments
1. Select the memory range - **[MEMORY 1 → 5]**	
2. Press **[SMPTE]**	The time assignment for the first memory in the range is displayed in the command line.
3. Press **[+] [+]**	
4. Press **[•] [4]**	
5. Press **[STORE]**	The SMPTE assignments are updated.

The result of the example above is illustrated in the following table.

Memory	Time In	Original SMPTE assignment	Modified SMPTE assignment	Modified by
1	4	00:00:04.00	00:00:04.00	+0
2	4	00:00:08.00	00:00:12.00	+4
3	4	00:00:12.00	00:00:20.00	+8
4	4	00:00:16.00	00:00:28.00	+12
5	4	00:00:20.00	00:00:36.00	+16

Using a decreasing delta

Example: Apply a decreasing delta of 2 seconds.

Keypresses	**Results/Comments**
1. Select the memory range - **[MEMORY 1 → 5]**	
2. Press **[SMPTE]**	The time assignment for the first memory in the range is displayed in the command line.
3. Press **[-] [-]**	
4. Press **[•] [2]**	
5. Press **[STORE]**	The SMPTE assignments are updated.

The result of the example above is illustrated in the following table.

Memory	**Time In**	**Original SMPTE assignment**	**Modified SMPTE assignment**	**Modified by**
1	4	00:00:04.00	00:00:04.00	-0
2	4	00:00:08.00	00:00:06.00	-2
3	4	00:00:12.00	00:00:08.00	-4
4	4	00:00:16.00	00:00:10.00	-6
5	4	00:00:20.00	00:00:12.00	-8

SMPTE Quick Reference

Assign or Modify SMPTE code	Keypresses
For 1 memory or Event	**[MEMORY #] [SMPTE] [time value] [STORE]** [EVENT #] [SMPTE] [time value] [STORE]
Range assignment or modification	**[MEMORY] [# → #] [SMPTE] [time value] [STORE]** **[EVENT] [# →#] [SMPTE] [time value] [STORE]**
Relative modification	**[MEMORY] [# → #] [SMPTE] [+] [time value] [STORE]** **[MEMORY] [# → #] [SMPTE] [-] [time value] [STORE]** **[EVENT] [# →#] [SMPTE] [+] [time value] [STORE]** **[EVENT] [# →#] [SMPTE] [-] [time value] [STORE]**
Absolute modification	**[MEMORY] [# → #] [SMPTE] [@] [time value] [STORE]** **[EVENT] [# →#] [SMPTE] [@] [time value] [STORE]**
Modify with increasing delta	**[MEMORY] [# → #] [SMPTE] [+][+] [time value] [STORE]** **[EVENT] [# →#] [SMPTE] [+] [+] [time value] [STORE]**
Modify with decreasing delta	**[MEMORY] [# → #] [SMPTE] [-][-] [time value] [STORE]** **[EVENT] [# →#] [SMPTE] [-] [-] [time value] [STORE]**

Erasing SMPTE assignments

Keypresses	Results/Comments
1. Select memories or Events.	One or a range of memories and Events can be selected.
2. Press **[SMPTE]**	
3. Press **[ERASE]**	The time code assignments are erased.

Playing back Events and m e mories

The playback begins from the first Event or memory with a time code assignment greater than the SMPTE clock time.

When you enable the SMPTE function and start the clock at 00:00:00:00, the first Event or memory with a time assignment is triggered at the appropriate time.

If you enable the SMPTE function and start the clock from, for example, 02:30:00:00 Events and memories with assignments prior to 2 and a half-hours are ignored.

The upcoming SMPTE event is displayed in yellow.

The countdown clock shows how much time will elapse until the upcoming Event is triggered.

Enabling the console for playbac k

Keypresses	**Results/Comments**
1. Press **[SMPTE]**	
2. Press **[FULL]**	The system is now listening to the SMPTE generator. The message *SMPTE Over* is displayed.
3. Press **[SMPTE]**	
4. Press **[TIME]**	The SMPTE clock is displayed. The clock is at its last setting.
5. If necessary reset the clock.	
6. Press **[ENTER]**	The SMPTE clock is displayed in red on a yellow field. The clock starts running.

➢Note

If you are using an external SMPTE generator execute steps 1 and 2 only. The SMPTE counter (clock) is displayed as soon you complete step 2, if the SMPTE generator is already running. If the SMPTE generator is not active, turn it on after step 2.

CHAPTER 29
DMX INPUT

This chapter includes:

A DMX source, such as a second lighting computer or a manual desk can be connected to the Spark 4D. DMX input controls conventional channels, spots, and operates macros. DMX input is displayed in black numerals on a gray field.

DMX input for channels and spots can be merged with the main console output. Use the Call function to integrate DMX input when programming memories (see Chapter 7 Programming Memories).

Configuring Spark 4D for DMX Input

Spark 4D must be configured for the number DMX input channels in use and must also be enabled for DMX input. Configure the number of input channels in Service Tools/Config Sys/Control Capacity . Enable DMX Input in Service Tools/Config Sys/Special Functions. To access the Special Functions and Special Numbers a password is required. (If you do not have your password, contact your Compulite distributor.)

Keypresses	Results/Comments
1. Go to Service Tools.	
2. Press **F3 Config Sys**.	
3. Enter the password.	
4. Press **F4 Special Functions**	The Special Functions - NOVRAM bit toggles are displayed.
5. Move the cursor to M - DMX Input.	
6. Toggle to Enable.	If bit O-SMPTE is enabled, toggle to disable. SMPTE and DMX input cannot both be enabled simultaneously.
7. Press **F5 Enter & Previous**	
8. Place the cursor on **Input DMX**	
9. Enter the number of DMX input channels.	0 (zero) for spots. For conventional channels the number of DMX Input channels is less than or equal to the number of channels in the general System Configuration.
10. Press **F6 Enter & Exit**	Service Tools main menu is now displayed and you are prompted to confirm the new configuration
11. Press **F6 Store Config.**	
12. Turn off Spark 4D and switch back on.	Spark 4D now boots up. After changes in the system configuration it is recommended to power down and power up again.
13. Press **F1 Cold Start**	The system exits Service Tools and comes up in editor mode.

The DMX Input patch

The Input Patch Table is located in the Channel Patch menu. The extent of the patch table depends on the DMX input configuration.

Access the Input Patch Table by pressing **F3 Input Patch**, on the second page of the Channel patch menu.

Each row of the Input Patch Table contains 4 lines.

- CHAN – the console's DMX channels.
- INPUT - the input channel controlling the DMX channel.
- MACRO - the macro number appears, if there are macros assigned to the DMX input channels.
- % - the execution threshold for Macro operation.

Color key for input assignments:

- DMX input channel patch assignments - red on a white field.
- Macro assignments - yellow.

Patching Input channels

DMX Input channels can be assigned to control channels in the Spark 4D.

Example 1: DMX input channel 10 is patched to control channels 1 through 10, and 15.

Keypresses	Results/Comments
1. Go to the Channel Patch menu.	
2. Press **F6 More** and **F3 Input Patch**	The Input Patch Table is displayed.
3. Press **F1 Assign Input**	Spark 4D prompts for an input channel number
4. Enter 10 on the numeric keypad.	
5. Press **F2 To Channel**	The prompt *To channel #:* appears.
6. Enter 1 on the keypad.	
7. Press **F1 Thru Channel**	Spark 4D prompts for a channel number.
8. Enter 10 on the keypad.	
9. Press **F2 & Channel**	
10. Enter 15 on the keypad	
11. Press **F3 Store**	The input assignment appears in red on a white field below the channel number.

Example 2: Patch channel 55 to DMX Input channel 10, channel 56 to DMX Input channel 11, channel 57 to DMX Input channel 12, channel 58 to DMX Input channel 13.

Keypresses	Results/Comments
1. Go to the Channel Patch menu.	
2. Press **F6 More** and **F3 Input Patch**	The Input Patch Table is displayed.
3. Press **F1 Assign Input**	Spark 4D prompts for an input channel number
4. Enter 10 on the numeric keypad.	
5. Press **F1 Thru Input**	Spark 4D prompts for an input channel number
6. Enter 13 on the keypad.	
7. Press **F2 To Channel**	Spark 4D prompts for a channel number.
8. Enter 55 on the keypad.	
9. Press **F1 Store**	The input assignments appear in red on a white field below the channel number.

Clearing Input patch assignments

You have the option of clearing the Inputs or the system Channels. The example below shows how to clear Input assignments.

Keypresses	Results/Comments
1. Press **F2 Clear Input**	
2. Press **F1 Inputs**	
3. Enter a number in answer to the prompt.	More than 1 input channel may be selected at this time.
4. Press **F1 Store**	The assignment is cleared.

Returning to the default patch

You can return the entire Patch Table or selected patches to the 1-to-1 default DMX Input Patch

Example: Reset the entire patch.

Keypresses	Results/Comments
1. Press **F3 Default (1 to 1)**	
2. Press **F1 All Patches**	Spark 4D asks *Are you Sure??*.
3. Press **F1 Yes**	All assignments are returned to default.

Example: Return channels .55 → 57 to the default.

Keypresses	Results/Comments
1. Press **F3 Default (1 to 1)**	
2. Press **F2 Channels**	Spark 4D prompts for a channel number.
3. Enter 55 on the numeric keypad.	
4. Press **F1 Thru Channel** and enter 57 on the keypad or Press **[→]** and enter 57 on the keypad.	
5. Press **F3 Store**	The selected channels return to their default assignments.

Examining DMX input assignments

Isolate selected input channels for examination.

Keypresses	Results/Comments
1. Press **F5 Exam**	Spark 4D prompts: *Exam assignment of input #:*
2. Enter the input number on the numeric keypad.	
3. Press **F1 Enter**	The patch assignments for the selected input channel are displayed.
4. Press or **F1 Previous** or **F2 Next** or **[-] [+]** to continuing.	

Assigning Macros to DMX input

One Macro can be assigned to an input channel. When a Macro is assigned, raising the intensity level of the input channel operates the Macro. The default execution threshold is 50%. The execution threshold can be changed in the Assign Input option in the Macro menu.

Keypresses	Results/Comments
1. Go to the Macro menu.	
2. Press **F5 Assign Input**	The input patch table is displayed.
3. Enter a macro number.	Spark 4D prompts for an Input channel number.
4. Enter an input channel.	
5. Optional - Press **F2 Start From** and enter a level.	The default level assignment is 50%.
6. Press **F1 Store**	

Canceling a Macro assignment

Keypresses	Results/Comments
1. Go to the Macro menu.	
2. Press **F5 Assign Input**	The input patch table is displayed.
3. Enter a macro number.	
4. Press **F3 Delete**	The Input channel is returned to its default assignment.

CHAPTER 30
ETHERNET

This chapter includes:

Overview

Spark 4D is equipped with standard on-board Ethernet interfaces

Both consoles generate up to 4 DMX strings and are capable of transmitting the data on standard DMX, as well as on Ethernet. The consoles accept up to 2 DMX input strings in standard DMX or 4 DMX input strings from the Ethernet.

Both consoles fully support all Compulite Ethernet related peripheral equipment, as well as remote file server access.

The Ethernet nodes include:

VideoLINK	The VideoLINK is a workstation with a remote VGA display and text keyboard. You can view Exams independent of the main console, attach text labels, or master the main console using the local text keyboard. Up to 4 VideoLINK peripherals can be logged on.
CompuLINK	The CompuLINK workstation supports all the VideoLINK functions. In addition, CompuLINK has connectors for DMX input and output, MIDI, SMPTE, Remote bus, Panel bus, and a floppy disk drive. Up to 4 CompuLINK nodes can be logged on. A Remote Control Unit, Macro Extension Keyboard, or Submaster Wing can be remotely connected to the console via CompuLINK. When CompuLINK is logged on to the console, the remote bus peripherals behave as if they are connected directly to the console.
E-Mix	The E-Mix node is an Ethernet/DMX (CMX) router.

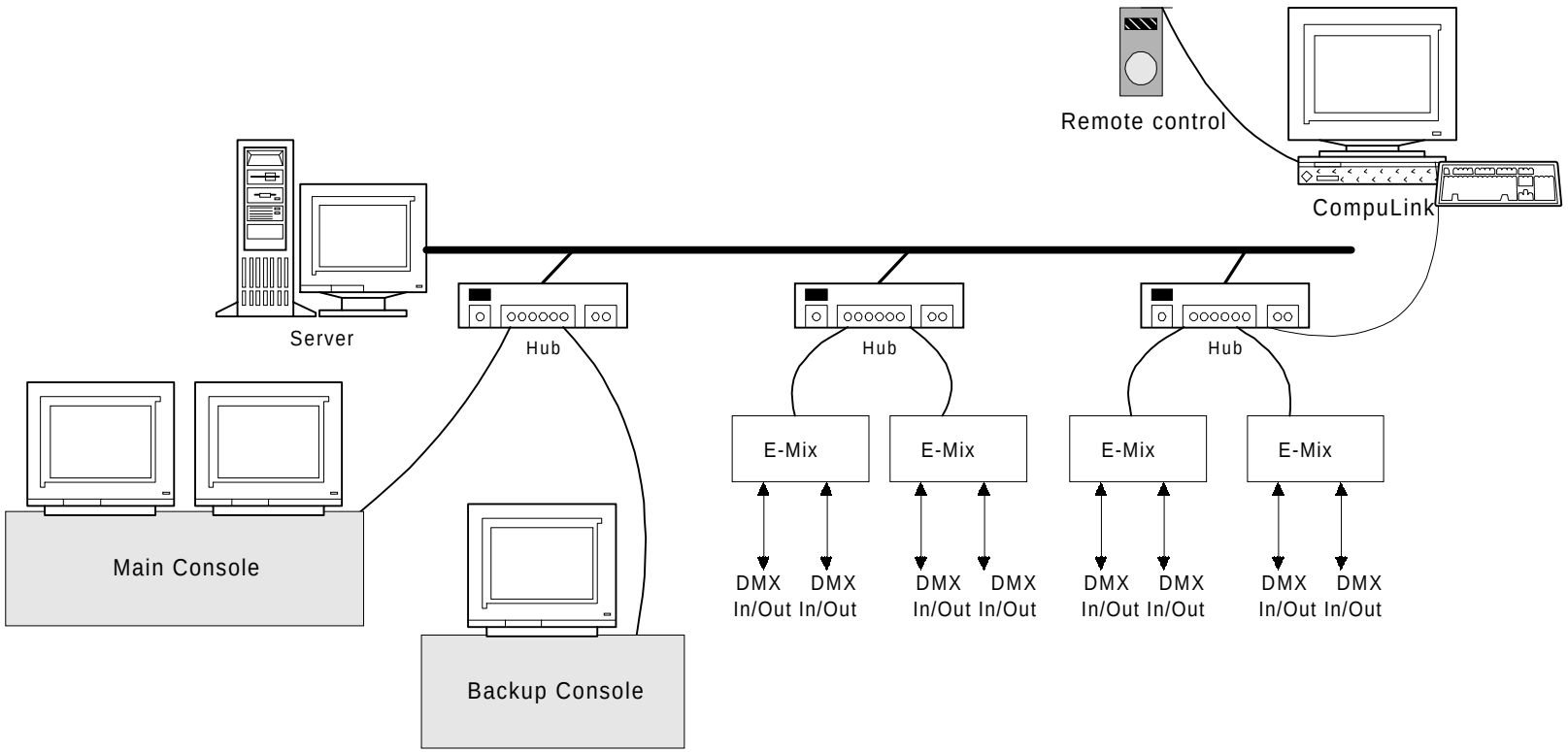


Figure 0 Typical Ethernet configuration

Network Settings

Menu 26 Network Settings is used to:

- View the console's name and IP address.
- Assign the Preferred Master's IP addresses when 2 lighting boards are working as Master/Slave. IP addresses are in X.X.X.X format, where X is from 0 – 255.
- Assign ID numbers when the console is connected to an Ethernet Network.
- Map network drives to a Server.
- Disable output from the console.
- Edit the VC (Virtual Connectors) Table.
- Send or request a VC Table over the network.

Use the arrow keys to move from field to field.

➢Note

If you use the alphanumeric text keyboard when working in the Network Settings menu, don't forget to enable the keyboard by pressing **Alt A.**

Assigning IP address for Master/Slave configuration

The *Preferred Master's IP Address* notifies the Slave console where to attempt connection.

When using 2 consoles only, it is most convenient to enter 0.0.0.0 as the *Preferred Master Address* in both consoles

Keypresses	Results/Comments
1. Go to menu 26.	The cursor should be on *Preferred Master Address*
2. Press **F1 Enter**	The console prompts for a number.
3. Enter the IP address of the Master console. The IP address format is X.X.X.X	
4. Press **F1 OK**	

Assigning an ID number

The ID number is referenced by the console and serves as the index number in the system wide Connector Patch Table.

When the ID number is changed in the Network Settings menu, the new number is burned to the system's Flash Memory. It is remembered until changed manually or a new software version is installed. When a new software version is installed the ID number is reset to 0 and the VC Table is reset.

The ID number may also be changed in Service Tools/Config System/Communication Params.

Keypresses	Results/Comments
1. Go to menu 26.	
2. Use the arrow keys to place the cursor on *System's ID Number*	
3. Press **F1 Enter**	The console prompts for a number.
4. The ID number format is XXX	
5. Press **F1 OK**	The message *Burning new system ID* is displayed. When complete the new VC Table is displayed at the bottom of the monitor.

Mapping the Network Drives

The lighting console can be part of a network containing one or more WIN95/NT File Servers.

Example: The console can request show files stored on the File Server loaded to the console. Also, show files from the console can be stored on the File Server. The console can be mapped to any or all of the PCs that serve the network.

After mapping, you can change the default drive to one of the mapped drives. You can then load and record show files or device files to that drive. This configuration can be used for file sharing among several consoles.

➢Note

The Server Application program must be open (on the Server) to map successfully. If the application is not open the message *Connection Failed* is displayed. This message is also displayed if the server's IP address is incorrect.

Keypresses	Results/Comments
1. Go to menu 26.	
2. Use the arrow keys to place the cursor on the drive.	
3. Press **F1 Map Drive**	The console prompts for the Server IP address.
4. Enter the server's IP. The IP address format is X.X.X.X	
5. Press **F1 Map It**	The message *Trying to Establish Connection* is displayed. When the connection is successful the Server name is displayed.

Virtual Connector Editing

The Virtual Connector Table can be defined for the console's use only or broadcast to the other consoles and Ethernet nodes in the network. The console's internal Ethernet nodes allow you to broadcast the Virtual connector Table to the Network.

Edit VC Tables by assigning Virtual Connectors to Output/Input Connectors and Slots. Connectors are the console's physical connectors. Slots are the Internal node connectors.

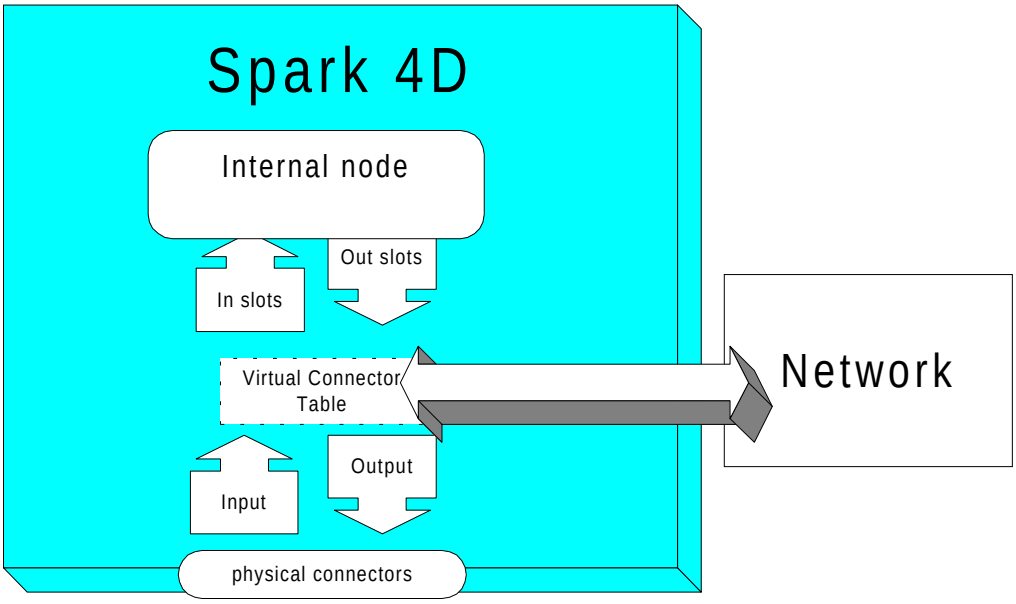


Figure 1 Internal Ethernet node

Slots ⇒ VC – Define the Virtual Connector numbers which the console will transmit its output on the Ethernet.

VC ⇒ Slots – Define the Virtual Connector numbers received as DMX input from the Ethernet.

The VC Table has 255 rows. Use Page Up, Page Down, Home, and End to page through the VC Table.

Keypresses	Results/Comments
1. Go to menu 26.	
2. Press **F5 Edit VC Table**	The entire VC Table, containing 255 rows, opens.
3. Use the arrows to place the cursor in the cell for editing.	
4. Enter the appropriate number.	
5. Select the output type.	D – for DMX, C- for CMX, H – for High End is entered in the cell.
6. Press **F1 Store**	

Connectors and slots can be configured to broadcast or receive DMX, CMX, and High End protocol. Here is an example of a Virtual Connector Table:

ID	Type	Output						Input					
		1	2	3	4	5	6	1	2	3	4	5	6
001	Connectors		2D					5D	3D				
	Slots	1D	2D		4D				3D				

The console's Output and Input according to the configuration is:
Slot 1 and 2 are broadcast on as VC 1 and VC 2.
VC 2 is transmitted through physical connector 2.

The information received on Input connector 1 is broadcast on the net as VC 5.

The information received on Input connector 2 is broadcast on the net as VC 3 and input to slot 2.

All Input and Output are defined as DMX.

The Local VC defines the connection between the console's physical connectors and the slots of the Internal node. This connection is not broadcast on the network.

When the System ID number is 0, Local VC numbers are displayed on a blue field in the VC Table

After Cold Start, if there is no VC Table stored in the EPROM Flash, the VC Table is reset with the Local VC values.

Example: If slot 4 is configured as High End, the local VC is 4H.

The Local VCs use 12 VC channels.

➢**Note**
The number of regular VCs is limited to 243.

Resetting Local VCs

In the Network Settings menu resets the VC Table with Local VCs, as described above.

Keypresses	**Results/Comments**
1. Go to menu 26.	
2. Press **F4 Reset VC Table**	The default VC Table is displayed.

Broadcasting & Requesting VC Table

Keypresses	**Results/Comments**
1. Go to menu 26.	
2. Press **F1 Send VC Table**	The VC Table displayed in the console's network settings menu is transmitted over the network. All active Ethernet units accept the new table..

You can request a new VC Table from another console, CompuLINK, or E-Mix

Keypresses	Results/Comments
1. Go to menu 26.	
2. Press **F2 Request VC Table**	The received VC table is displayed ian the network Settings menu.

Disabling/Enabling output

You can disable and reinstate the output from the console.

Keypresses	Results/Comments
1. Go to menu 26.	
2. Press **F4 Disable Output**	*No* is displayed for item *Local Outputs Enabled.*
3. To reinstate the output from the console, Press **F4 Enable Output**	*Yes* is displayed for item *Local Outputs Enabled.*

CompuCAD Net Interface

Dual editing allows you to build lighting states simultaneously on CompuCAD and a 4D console. Channels selected and assigned intensity on the console are registered on CompuCAD; channels selected and assigned intensity on CompuCAD are registered on the console. Memories stored on either the console or CompuCAD are shared by both applications.

➢Note
The TCP/IP addresses for the console and the CompuCAD must be as follows:
The first 3 digits (the net ID) must be identical. The last 3 digits (the host ID) must be unique.

Connecting CompuCAD and the lighting console

Keypresses	Results/Comments
1. Start CompuCAD and open your show	
2. Optional - check your Ethernet connection: 1. Click on the Start icon and select Run. 2.Type in `ping` and the console address.	
3. Go to the Cue Editor	
4. Press Connect	A window labeled Open Connection to console is displayed. The window shows the console's address and heartbeat.
5. Click on OK	When the connection is made, memories from the console are automatically transferred to CompuCAD.

Copying the Channel Patch

The Channel Patch table is automatically transferred from the console to CompuCAD on connection.

You can also copy the Patch table from CompuCAD to the console.

To transfer the Patch table to the console:

Keypresses	Results/Comments
1. In the Cue Editor, open the Command menu.	
2. Click on Impose Patch	The Patch tables are copied from the show in CompuCAD to the console.

APPENDIX A
SERVICE TOOLS

This chapter includes:

Service Tools is where you configure Spark 4D, format disks, carry out hardware tests, and upgrade Spark 4D's software.

The System Configuration functions appear in Chapter 26 - System Configuration.

Accessing Service Tools

1. Turn off the power.
2. Press and hold down **CE CLEAR**
3. Turn the power back on.
4. After a few seconds, release the keys. After running some self-tests, the Service Tools main menu is displayed. The information on the upper part of the screen shows the different sections of the program and EPROM. The lower area of the screen shows the current F key functions.

Main Menu

In the main menu, the Function keys offer the following options:

F1 Cold Start	Clears the system of all show memory data. The system should be 'cold started' occasionally.
F2 Warm Start	Retains all the current memories.
F3 Config. System	Access the different system definition options. See Chapter 26 - System Configuration
F4 Diagnostic	Access various diagnostic functions that aid in isolating hardware and keyboard malfunctions.
F5 Software Upgrade	Used to replace software versions.
F6 Disk Operations	Tools for diskette formatting and software upgrades. Record and Load system configuration. Boot floppy, boots the system to DOS.
0 Print Configuration	Print the entire system configuration, including current software version, current hardware configuration, system configuration (number of spots, channels, etc.), NOVRAM set up, etc. If this print is included in the file you keep on the show, there will be no guessing as to which system configuration was used.
MENU More…	Access Patch 999 – see Appendix C Dimmer Status and Patch 999.

Diagnostics

The diagnostic function (**F4**) provides 3 tests for hardware, each for a separate part of the system.

1. **F3 CRT's & PANEL** - This tests the panel by flashing all the LEDs on keys, checks the LED displays, and shows a color chart on CRT.
   Press **[RESET]** to return to the main Diagnostic menu.
2. **F4 KEYBOARD TEST -** Displays a map of all the wheels, controllers, the trackball, the A/B crossfaders, and the General Master, which are tested by moving them. The lower right corner of the display has a small window for checking the keystrokes of the main console keys, Submaster Wing, Macro Extension Keyboard, Remote Control, and the alphanumeric keyboard. Numbers run on the LED displays.
   Press **[RESET]** to return to the main Diagnostic menu.
3. **F5 MEMORY TEST -** Provides two different memory tests. Pattern (**F1**), which will check the memory while retaining all the current show data and Warm (**F2**), which loses all the current show data.

Upgrading Software

Please read this thoroughly before attempting to upgrade the software.

There are two software Upgrade functions. **F5 Software Upgrade** is used when upgrading the Image files (imf) and Text files (tim). Service Tool software upgrades are carried out in the Disk Operations (**F6**) option.

Using the Software Upgrade

This is option **F5 Software Upgrade**.

DO NOT attempt to upgrade the OSi software here. **Upgrades for OSi are executed under F6 Disk Operations only.**

Prepare an empty formatted diskette.

You can abort the upgrade at any point by selecting **[MENU]**.

Keypresses	Results/Comments
1. Press **F5 Software Upgrade**	Select the software upgrade function. The system loads the present software version from the flash EPROM. The system generates the message: *Old software has been loaded from flash. Please insert EMPTY formatted disk*.
2. Insert empty formatted disk.	
3. Press **F1 Continue**	The old software will be written to the disk you have just inserted. When the old software has finished copying to disk, the system prompts: *Please insert the NEW software disk*.
4. Insert the diskette containing the new software	
5. Press **F1 Continue**	The new software is loaded. When the load is complete, the system will prompt: *Do you really want to program the flash?*
6. Press **F1 Continue**	Now the old software is erased from the flash. The new s/w is flashed and the system verifies that the procedure was successful. When the writing of the new software to the flash is complete, the system generates the message: *Press any key*, which returns you to the main Service Tools menu.
7. Press any key.	The first page of Service Tools is now displayed.
8. Press **F1 Cold Start**	**It is imperative to cold start the system after flashing new software.**

Upgrading software under Disk Operations

Upgrade OSi software here.

You can also upgrade the image and time files here, however it is not recommended as the current files are not recorded to diskette leaving you without a backup if anything goes wrong. Use the Software Upgrade option available on the first page of Service Tools for upgrading image and text files.

Important!!! After burning a new OSi file you must turn of the power and then turn it back on.

Keypresses	Results/Comments
1. Press **F6 Disk Operations**	Select the Disk Operations functions.
2. Insert the disk containing the new software	
3. Press **F2 Load Image**	The system reads the diskette and displays the name of the image file and text file on the disk. Enter a number on the numeric keypad to select/deselect files.
4. Press **F1 Load Files**	The files from the new software diskette will be loaded.
5. Press **F6 Program Flash**	The old software is erased from the flash and the new software is written to the flash. When the writing of the new software to the flash is complete, the system generates the message: *Press Any Key*.
6. Press any key	Returns you to the main Service Tools menu.
7. Press **F1 Cold Start**	**It is imperative to cold start after flashing new software.**

Disk Operations

Formatting disks

Keypresses	Results/Comments
1. Press **F6 Disk Operations**	
2. Press **F1 Format Disk**	Reads and displays the files recorded on the disk.
3. Press **F1 Format 1.44 Mb.** or **F2 Quick Format**	Use this option is formatting a new 1.44 m. diskette. Use this option to format a diskette that has already been formatted. Reformatting a diskette will erase all the information previously recorded.
4. Press **F6** to confirm format command or press any key to cancel.	

Recording the system configuration

This function records the system configuration which includes the number of channels, scrollers, dimmers, amount and type of moving devices, as well as the special function and special number data.

It is important to record the system configuration to eliminate guesswork when reconstructing a show. Each configuration recording is given a file name and text. Load the configuration for your show if the current system configuration differs from the system configuration on which the show data was recorded.

Configuration files are accessible only in Service Tools and do not appear when examining the diskette in the Load menu.

Keypresses	Results/Comments
1. Press **F6 Disk Operations**	
2. Press **F4 Record Config**	The system prompts you to enter a file name. Enter a file name (number) on the numeric keypad
3. Press **F4 Record S.T. File**	A text window opens. You may enter a textual description for the configuration file on the alphanumeric keyboard.
4. Press **F1 Enter**	When completed the message *Recording Done* is displayed.

Loading the system configuration

It is recommended to load the configuration before loading a show file to avoid loading the show file under Warning Difference (see Chapter 10 – Data Storing and Retrieval).

Keypresses	Results/Comments
1. Press **F6 Disk Operations**	
2. Insert the diskette with the Configuration files.	
3. Press **F5 Load Config**	The Config files are displayed.
4. Enter the file number on the numeric keypad or use **F2** and **F3** to select the file.	
5. Press **F5 Load S.T. Config**	Load the selected file. The display returns to the system configuration. The prompt, *Press F6 To Store Changes!!!!* Is displayed.
6. Press **F6 Store Configuration**	Store the configuration that you have just loaded. This is not always necessary and the system will prompt you to store configuration if it is needed.

Filer

Filer, in Disk Operations, provides access to the Hard Disk.

Filer allows you to:
1. Load and Record image files from and to the Hard Disk.
2. Move image files between the Floppy disk and the Hard Disk.
3. Load and Record configuration files (*.cfg and *.nov) from and to the Hard Disk.
4. Upgrade software using the hard Disk.

Filer displays all *.imf, *.tim, *.cfg, and *.nov files and subdirectories in the current directory. The working directory path is displayed in the upper left corner. The system defaults to drive C.

Navigating in the Filer

Use the arrow keys on the console panel or the alphanumeric keyboard to navigate the Filer display.

↑ and ↓ moves among files and directories.

→ or Page **Up** goes to the next page.

← or Page **Down** goes to the previous page.

[SHIFT] F6 Change Drv toggles between the Floppy Drive and the hard Drive.

F2 Sel/Desel selects or deselects the files subdirectories, and directories.

➢Note

Before entering Filer you should, if necessary, change drives.

Recording the system configuration

This function records the system configuration which includes the number of channels, scrollers, dimmers, amount and type of moving devices, as well as the special function and special number data.

It is important to record the system configuration to eliminate guesswork when reconstructing a show. Each configuration recording is given a file name and text.

Configuration files are accessible only in Service Tools and do not appear when examine the diskette in the Load menu.

Recording to a floppy diskette

Keypresses	Results/Comments
1. Press **F4 Record Config**	The system prompts you to enter a file name. Enter a file name (number) on the numeric keypad
2. Press **F4 Record S.T. File**	A text window opens. You may enter a textual description for the configuration file on the alphanumeric keyboard.
3. Press **F1 Enter**	Records file to the diskette.

Recording to the hard disk

To record a Config to the main directory on drive C, use the usual procedure: Service Tools/Disk Oper/Load or Record Config.

Configuration files that are automatically saved in the show file have the extension *.nov.

Configuration files saved in Service Tools in the Disk Operations menu have the extension *.cfg.

Keypresses	Results/Comments
1. Go to Service Tools.	
2. Press **F6 Disk Operations**	
3. Press **F6 Filer**	
4. Select a directory and press **F2 Enter Dir**.	The files in the directory are displayed.
5. Press **[RESET] – Exit**	
6. Press **F6 Disk Operations**	
7. Press **F4 Record Config**	
8. Enter the file name (3 digits) at the prompt.	
9. Press **F4 Record S.T. Config**	The system prompts for a text label.
10. Optional - Enter text	
11. Press **F1 Enter**	The new Config file is displayed in the file lost of the current directory.

Loading the system configuration

Config files are labeled *S.T*

It is a good habit to load the configuration whenever you load a show unless you are certain that the current configuration is identical to the configuration of the show you are loading.

Loading config files from the floppy

Keypresses	Results/Comments
1. Press **F5 Load Config**	
2. Enter the file number on the numeric keypad or use **F2** and **F3** to select the file or select file with the cursor	
3. Press **F5 Load S.T. Config**	When the load is complete the display returns to the system configuration screen and beeps if the configuration has been changed. The prompt, *Press F6 To Store Changes !!!!* is displayed.
4. Press **F6 Store Configuration**	Store the configuration that you have just loaded. This is not always necessary. The system prompts you to store configuration if it is needed.

Loading config files from the hard disk

Keypresses	Results/Comments
1. Go to Service Tools.	
2. Press **F6 Disk Operations**	
3. Press **F6 Filer**	
4. Select a directory and press **F2 Enter Dir**.	
5. Press **[RESET] – Exit**	The main Disk Operations menu is displayed.
6. Press **F5 Load Config**	The files in the selected directory are displayed.
7. Enter the file name (3 digits) at the prompt.	
8. Press **F5 Load File**	

Recording image files to the Hard Disk

Keypresses	Results/Comments
1. Insert the floppy disk with the image file to the disk drive.	
2. Go to Service Tools.	
3. Press **F6 Disk Operations**	The system reads the files on drive A.
4. If necessary, change drives.	
5. Press **F2 Load Imf**	
6. Press **F1 Load Files**	
7. Press **F1 Filer**	
8. Change to drive C:\	The directories on C are displayed.
9. Select a directory and press **F2 Enter Dir**	
10. Press **[RESET] – Exit**	
11. Press **F4 Write New Imf**	When complete the file is displayed in the selected directory.

Loading image files from the Hard Disk

Keypresses	Results/Comments
1. Go to Service Tools.	
2. Press **F6 Disk Operations**	
3. If necessary change drives to drive C:\	
4. Press **F2 Load Imf**	The Hard Disk files are displayed.
5. Select a directory and press **F2 Select**.	
6. Press **F1 Load Files**	
7. Press **F6 Program Flash**	

APPENDIX B
MASTER/SLAVE

This appendix includes:

Configuring for Master/Slave operation

Assigning IP address for Master/Slave configuration

The Master/Slave menu

- Setting up the Master console
- Setting up the Slave console

What happens when the master stops functioning?

- Taking control on the Slave console
- Getting the Master console back online

Going to Stand Alone mode

- Going to stand alone from hardware tracking on the slave console
- Going to stand alone from playback tracking mode on the slave console
- Going to stand alone mode from hardware or playback on the master console

Master/Slave

Master and Slave configurations are connected on Ethernet via the RG 45 connector using a Hub.

This function permits connecting 2 lighting consoles in a Master/Slave configuration. For example, connect Spark 4D with another Spark 4D. The system designated as Slave tracks the Master console.

Master/ Slave operates in Hardware tracking mode; the slave echoes any keypress, fader movement, or wheel movement carried out on the master console. Note that when working in Hardware Tracking mode the Dimmer wheel works in a higher resolution than usual.

Flags for the Master/Slave status are displayed at the top of the monitor. The Master/Slave flags are:

HW MS - Hardware Tracking Master

HW SL - Hardware Tracking Slave

Configuring for Master/Slave operation

Both consoles participating in the Master/Slave operation must be configured in Service Tools.

Keypresses

1. Enter Service Tools
2. Press **F3 Config Sys**
3. Enter the password to gain access to **F4 Special Functions**
4. Move the cursor to bit C Master/Slave
5. Press **F1** to toggle to 1 – Enable
6. Press **F6 Enter & Exit**
7. Press **F6 Store Changes**
8. Cold Start the console.

➢Note

The console must also know the IP address of its peer. (See below)

Assigning IP address for Master/Slave configuration

When 2 lighting boards are run as Master/Slave, they must be informed of the second console's IP address to allow communication between them.

The Slave's IP address is entered to the Master console. The Master's IP address is entered to the Slave console.

Keypresses	**Results/Comments**
1. Go to menu 26.	
2. Place the cursor on *M/S Peer's IP Address*	
3. Press **F1 Enter**	The console prompts for a number.
4. Enter the Slave console's IP address if you are working on the Master console. Enter the Master console's IP address if you are working on the Slave console. IP address format is X.X.X.X	
5. Press **F1 OK**	

The Master/Slave menu

After enabling both consoles for Master/Slave operation, you must set up the type of operation in the Master/Slave menu, menu 22. If Master/Slave is not enabled in the System Configuration Menu 22 Master/Slave does not appear in the menu list.

Setting up the Master console

Keypresses
1. Go to menu 22
2. Select **F2 Hardware Tracking**
3. Press **F1 Master**

Setting up the Slave console

This must be done within 8 – 10 seconds after setting up the Master.

Keypresses	**Results/Comments**
1. Go to menu 22	
2. Select the same tracking mode as the Master console.	
3. Press **F2 Slave**	When communication is established, a designation flag appears at the top of the respective CRTs.

What happens when the master stops functioning?

If the master console goes down and communication is lost between the two consoles, the Slave console automatically takes control, going to Stand Alone mode.

A "snapshot" of the current output from the Master console is captured on the Slave console. The outputs are temporarily frozen, chasers running or fades in progress stop, captured in the editor on the Slave console. The message *Communication Problem. No Commands from Peer* is displayed on the Slave's monitor.

Taking control on the Slave console

Keypresses	Results/Comments
1. Press **[CLEAR]**	The message is cleared from the screen.
2. Match controller levels with the levels on the Master console.	This must be done to avoid a lighting jump on stage.
3. Press **[RESET]** (see below)	

Important! If the consoles are working in LTP mode, the LTP order is preserved when the "snapshot" of output occurs. However, when you move faders and controllers to match the situation on the Master console the original LTP order is lost.

Getting the Master console back online

Keypresses	Results/Comments
1. Correct the problem in the Master console.	
2. Power Up the Master console.	Now both the Master and Slave consoles are outputting to the dimmers or other end equipment.
3. Go to the Master/Slave menu and renew the Master/Slave connection.	

Going to Stand Alone mode

Stand Alone mode means that the console has been freed from the Master/Slave configuration and is working independently. When communication is lost between the Master console and the Slave console, the Slave console automatically goes to Stand Alone mode.

You can initiate going to Stand Alone mode, freeing the consoles from the Master/Slave connection.

On the slave console

Keypresses	Results/Comments
1. Press **[CLEAR]** on the slave console	The message *Stand Alone??* Is displayed
2. Press **[CLEAR]** again	The slave console is now independent

On the master console

Keypresses	Results/Comments
1. Go to menu 22	
2. Press **F1 Stand Alone**	The console is now independent

APPENDIX C
DIMMER STATUS & PATCH 999

This appendix includes:

Dimmer Status

When connected to Compulite CMX protocol dimmers and the system is configured for CMX communications (see Chapter 22 System Configuration) , there is 2-way communication between the console and the dimmers. .

You can view 5 Dimmer Status reports on your monitor.

Display	Information
FRAMES	The current power consumption in amperage and the temperature of the dimmer frame.
DMX	The DMX line and their CMX dimmers with output information per dimmer. The DMX lines appear in numeric sequence. This is for two tiered patch (Patch 999) only systems. If the system is not using Patch 999 this display does not appear.
CMX	All CMX dimmers appear in numerical sequence with output information per dimmer.
ERROR	Only dimmers showing errors are displayed. The error information includes: • Tmp The dimmer temperature is above the allowed limit. • Nld – No Load. This message can be the result of a bad cable from lamp to dimmer, a burnt out lamp, nothing connected to the dimmer. • Ovc - overload for dimmer. • Flt - bad dimmer. Dimmer is always on. • Cbr - circuit breaker off. • Com - communication break with the dimmer frame. All errors accumulate until the errors are erased or stored: **[STATUS] [ERASE]** or **[STATUS] [STORE]** If stored error information is displayed in the Reference display screen. Errors that have not been stored for reference are displayed in red. Errors that have been stored are displayed in blue.
REFERENCE	This display shows all dimmers and stored error information. Clear stored reference information by pressing **[STATUS] [ERASE]**, while viewing this screen to store new error information. Use **Print Screen** on the alphanumeric keyboard to print the reference display if hard copy is desired.

Accessing the Dimmer Status displays

There is no dedicated key for requesting dimmer status reports, This key is available as a Macro. You must program this Macro.

Keypresses

1. Go to the Macro menu.
2. Press **F1 Create**.
3. Enter a Macro number in answer to the prompt.
4. Press **F2** ← to place the cursor on the SK mode, which was automatically entered to the Macro, and press **[CE]**. Repeat to erase the SK mode completely.
5. Press **F6 More F6 More** and **F5 Status**
6. Press **F1 Store Macro**.

To view the Dimmer Status reports:

Keypresses

1. Operate the Macro for Dimmer Status
2. Press **[PAGE UP]** or **[PAGE DN]** to view the different Dimmer Status displays.

Each press on **STATUS** Macro shows a new display.

Re-entering the Dimmer Status display shows the last screen you viewed.

All displays, except the Reference display, shows current information in real time.

When errors occur, a red 'E' blinks on the command line. The blinking continues until you erase or store the accumulated errors.

Patch 999

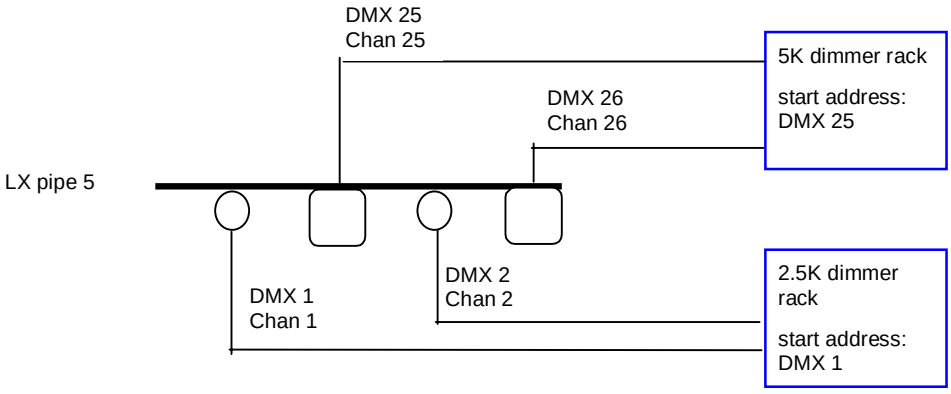
Patch 999 allows an additional layer of patching at the channel level. In Patch 999, logical channels range from 1 to 999. The Patch 999 maps the logical channels to DMX addresses. The logical number of channels mapped cannot exceed the number of actual channels in the system. .

The regular soft patching in the Channel Patch menu can also be applied after programming Patch 999. It will patch **logical channels** to dimmers.

Patch 999 is accessed in Service Tools. Patch 999 is saved on the flash RAM in conjunction with the system text (*.tim) file. Since Patch 999 is saved in the flash RAM it is not lost after Cold Starting the system. When you burn a new *.tim file a backup file of Patch 999 is automatically generated and Patch 999 reverts to default 1-to-1. The backup file is called Rescue. 999. The system displays a message while recording the Rescue file.

Example 1: The system is configured for 200 actual channels. The 999 patch can be used to define these 200 channels as logical channels. They can be defined in many combinations, for instance, 100 - 199 and 400 -499.

Example 2: Assume that your rig is set up like this:



On LX pipe 5 there are 2 PAR cans circuited to 2.5K dimmers. The DMX start address for the rack is 1. The default channel patch is 1 to 1, so the instrument connected at DMX 1 is controlled by control channel 1 and the instrument connected at DMX 2 is controlled by channel 2. On the same pipe there are 2 x 5K lamps circuited to a dimmer rack whose start address is 25. Again, since the default channel patch is 1 to 1 the lamps circuited to DMX 25 and 26 are controlled by channels 25 and 26 respectively.

This is a very simple example, but it is obvious how a confusing array of control channels can be found on one LX hanging position. Patch 999 can be used to create a default patch that appears in the Channel Patch menu as 1 to 1.

Configuring for Patch 999

Keypresses	Results/Comments
1. Go to Service Tools	
2. Press **F3 Config System**	
3. Enter the passcode	
4. Press **F4 Special Functions**	
5. Toggle bit J to Yes.	If toggled to No, the system ignores Patch 999.

Programming and burning Patch 999

Keypresses	Results/Comments
1. Enter Service Tools	
2. Press **[MENU] More functions**	The second page of options is displayed.
3. Press **F3 999 OPER**	Access patch 999. The patch display consists of 8 columns. Each column is further divided into 2 labeled *chan* and *DMX*. The chan/DMX numbers go from 1 to 999 in ascending order. Numbers that are higher than the number of dimmers in the system configuration appear in dark gray and DMX 0 is assigned as a default.
4. Insert formatted diskette to disk drive	Editing this patch table is done on a PC, therefore the file must first be copied onto a diskette.
5. Press **F2 RECORD 999**	Patch 999 is copied to the diskette. The file name is recorded as the image file name and the suffix 999. Example: the image file is SPD03R01. The name of the recorded Patch 999 file will be SPD03R01.999.
6. Edit the file using the text editor on your PC.	(see instructions table below)
7. Insert the disk into the disk drive on the lighting console.	Now the edited Patch 999 can be written to the Flash RAM.
8. Go to Disk Operation	
9. Press **F2 LOAD IMAGE**	If more than one file exists on the disk, select the one you want to load.
10. Press **F1 LOAD FILES**	The system automatically records the old Patch 999, as a rescue file.
11. Press **F6 PROGRAM FLASH**	The new Patch 999 is written to the Flash RAM. When completed, return to the main of Service Tools and press F1 to **Cold Start** the system.

Editing the file on a PC

Keypresses	Results/Comments
1. Boot up to DOS	
2. Insert the disk containing the Patch 999 copied from the console.	
3. Change directory to your floppy drive.	
4. Type `Edit` and the file name.	
5. Edit the file.	**DO NOT** change the numbers in the channel column. Only the DMX # column should be edited. **A DMX NUMBER CANNOT APPEAR TWICE. DELETE IT WHERE NECESSARY.**
6. Save the edited file to the floppy disk.	When saving the new data, the file name can be changed
7. Copy the edited file to the console (see steps 7 – 10 above).	

➢Note

Comments can be added by starting a new line. This line must begin with the character #, which signals that this is a comment line and not to be considered part of the patch.

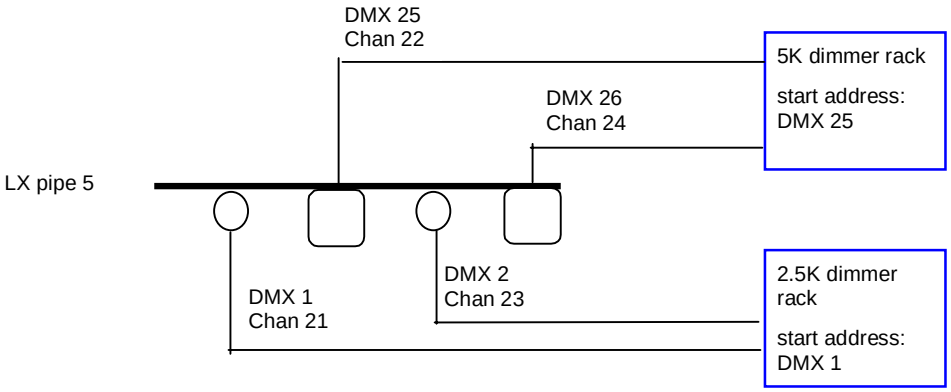
Now that we've seen how to download, edit, and flash in Patch 999, let's look at how it applies to the example above. As it stands the control channels for the instruments (when left at default 1 to 1) hung on lx pipe 5 are DMX 1, 25, 2, 26. If you want them to run consecutively starting from channel 21, edit Patch 999 like this:

chan	DMX	chan	DMX	chan	DMX
1	0	2	0	3	3
4	4	5	5	6	6
7	7	8	8	9	9
10	10	11	11	12	12
13	13	14	14	15	15
16	16	17	17	18	18
19	19	20	20	**21**	**1**
22	**25**	**23**	**2**	**24**	**26**
25	0	26	0	27	27

Note that the default DMX assignment for channels 1, 2, 25, and 26 have been cleared.

A DMX ASSIGNMENT CANNOT BE ASSIGNED TO MORE THAN ONE CHANNEL. DO NOT change the numbers in the channel column.

The result of the patching described above looks like this:



Color key for Patch 999

Item	Color
Cleared assignments	Dark Gray
Channels with DMX assignments different from their default.	Blue
DMX assignments to channels different from their default.	White

Examining Patch 999

Patch 999 information appears in the dimmer exam window when examining selected dimmers.

Keypresses	Results/Comments
1. Go to the Channel Patch menu.	You will notice that the Channel Patch now reflects Patch 999.
2. Press **F6 More F1 Exam**	
3. Press **F2 Dimmer**	The system prompts for a dimmer number.
4. Enter a dimmer number in response to the prompt.	A window showing all the patch information is displayed.

You can also see the result in the Channel Patch Table. Using the example above:

The default Channel Patch will be 1-to-1. However, since we cleared DMX 1, 2, 25, and 26 these dimmers and channels do not appear in the Channel Patch Table.

➢Note

There are no connector icons displayed because the connector Dim numbers in the Channel Patch do not necessarily run consecutively when using Patch 999.

APPENDIX D
PANEL LAYOUT

The appendix is arranged alphabetically.

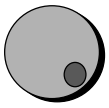
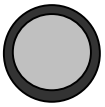
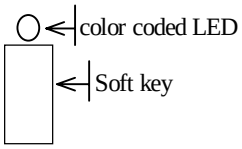
Key	What it does
→	"Through" key for selecting ranges of channels, spots, or memories. This key is also used to free or call a range of controllers.
—	Decrement selected channel, spot, library, snap, or memory by one.
+	Increments selected channel, spot, library, snap, or memory by one.
• (decimal point)	Use for sub-decimal memories, intensity assignment, or fade time assignments that are less a whole number. If the system is defined as 'USA' it is unnecessary to use this key for intensity assignments. When editor is in idle, pressing this key displays the System Status, including any remote devices and the battery.
+STORE	Store the group in the editor as a memory, incrementing the previously stored memory number by a predetermined increment. The increment is adjustable in the system parameters menu.
@	Used when assigning dimmer intensity on the numeric keypad.
=	Put the system in memory recording mode. Use when storing or renaming memories.
0 thru 9	Used for all numeric selections.
A	Access crossfader A for assignment or call.
ALL	Select all spot parameters.
Arrow keys	On numeric keys , 4, 6, 8. Move the cursor in Service Tools and Network Settings menu.
ASSIGN	Assign memories, groups of channels/spots, chasers to the controllers. A double hit changes the Soft Key mode to Assign mode.
AUTOCHS	Select Autochase sequences for assignment or deletion. Autochases must be pre-programmed in the Autochase menu. Access with **[SHIFT]**.
AUTO	When activated (LED is on) the system executes Event assignments in conjunction with memories sequencing on the A/B crossfader. When disabled (LED is off) any Event assignments are ignored. It is automatically activated when an assignment is made to A or B. Access with **[SHIFT]**.
B	Access crossfader B for assignment or call.

Key	What it does
BACK	Returns to the previous memory in a fade time of 1 second.
BIG	Toggle the parameter display for big spots (moving devices having more than 22 parameters have 2 pages of parameters). Access with **[SHIFT]**.
BLIND	Blind mode allows memory programming without disturbing the output on stage. Press a second time to exit Blind mode.
BO	Blacks out the entire output of the control board. The black out key for the General Master may be disabled in the System Parameters menu.
CALL	Enter entire console output or selected output from playback sites or controllers to the editor. Call output to editor, calculating the G.M. level if the G.M. is not at 100%. Access with **[SHIFT]**.
CE	Clear entry - clear the last numeric entry in the command line.
CHANNEL	Set the keypad for channel selection. This key also acts as an "and" key when used between channel selections. Press twice in order to set the keypad to default to channel selection for first number selection. *Channel* appears in the command line on a gray field. The system recognizes the first number selection as a channel without needing to press this key.
CL1	Home the spot parameters assigned to CL1. Access with **[SHIFT]**.
CL2	Home the spot parameters assigned to CL2. Access with **[SHIFT]**.
CLEAR	A regressive clear function, clearing the command line of the last entry displayed and finally clearing the editor and putting it in idle.
COLOR	Access Color libraries for storing, modification, or selection. Access with **[SHIFT]**.
COPY	Copy parameter values from one spot to another using values deriving from the editor, memories, or libraries. Copy scroller frame assignments. Copy channel intensity assignments. Access with **[SHIFT]**.
DELTA	A memory modification tracking function. Examine and apply Delta. Access with **[SHIFT]**.
EDITOR	Toggle between editor 1 and editor 2.
EFFECT	Go to the Effects Editor.
ENTER	Convert a selected memory to a group of channels and/or spots in the editor, preserving the channels' associated levels and the spot parameters of the original memory. End the Copy parameter sequence.
ERASE	Erase (delete) memories, Loops, Links, Delta, Libraries, Groups, Snaps, Palettes, Events, Effects, and text assignments.

Key	What it does
EVENT	Select Events number for operation, examination, or SMPTE time code editing.
EXAM	Used in conjunction with appropriate commands, examines channel assignments, libraries, contents of memories, the memory sheet, controller assignments, and more.
F1 thru F6	Soft keys. In menu mode these six keys change their function in accordance with the current menu. Direct access to Macros 1 - 5.
F6	Press to view the Macro list.
FLASH	Flash the dimmer of the selected channels and spots. The Flash rate is adjustable in the System Parameters menu. Access with **[SHIFT]**.
FRAME	Access the scroller frame to assign a frame value using the numeric keypad. Access with **[SHIFT]**.
FREE	Release the assignments from playback faders and controllers.
FULL	Assign 100% (FL) intensity to selected channels and spots.
General Master	The General Master controls the entire output of the desk. The potentiometer level may be altered via the Diagnostics function. The top level of the General Master may be set at either 100% or 200%. The General Master may also be used to control the output of crossfaders and controllers to create new memories. Channels can be removed from GM control in the Channel Patch menu.
GO	Initiate a crossfade on the A/B crossfaders. Interrupt a crossfade in progress and immediately initiate a fade to the next memory in the sequence.
GO TO	Interrupt a crossfade in progress and immediately initiate a fade to the next memory in the sequence. Exit a loop. Fade to a selected memory either in editor time or recorded memory time.
GOBO	Access Gobo libraries for storing , modification, or selection. Access with **[SHIFT]**.
GROUP	Program and select Groups of spots and channels for quick editing selection.
HARD	Assign chasers in hard run mode. Hard chasers bump from step to step.
HELP	On line help. Select any key; the help window displays information pertaining to the selected function. Access with **[SHIFT]**.
HOLD	Halt a crossfade in progress.

Key	What it does
HOME	Return spot parameters to Home values. This is SK 20 in Param mode.
IGNITE EXAM	View the Ignite Exam display. This table shows which spots have been ignited, differentiating between DMX and proprietary protocol spots.
IGN OFF	Extinguish the lamp for Cyberlight and Intellabeam. Access with **[SHIFT]**.
IGN ON	Ignite moving lights. Access with **[SHIFT]**.
IN LIB	Signal library storage.
LATCH	Change the bump buttons to on/off keys.
LINK	Link nonsequential memories. Access with **[SHIFT]**.
LookAhd	Program memories to move scrollers and parameter values during dimmer blackout. Access with **[SHIFT]**.
LOOP	Connect a range of memories in a Loop. The types of loops are: automatic (infinite) loops, continuous manual loops, manual loops, follow on cues, finite loops, and auto follow loops.
MACRO	Change the Soft Key mode to Macro.
MEMORY	Set the numeric keypad to memory mode. Press twice in order to set the keypad to default to memory selection for first number selection. *Memory* appears in the command line on a gray field when the number selection default is memory.
MENU	Select menu mode, the main menu list is displayed. Press a second time to exit menu mode and return editor mode.
ON	Assign an intensity of 50% (default value) to selected channels. The value of this key may be changed in the System Parameters menu. Access with **[SHIFT]**.
PALETTE	Access Palettes for storing or selection. Access with **[SHIFT]**.
PAGE DN	Go to the next display page. Access with **[SHIFT]**.
PAGE UP	Page the previous display. Access with **[SHIFT]**.
PAGE UP	Page the spot display.
PARAM	Switch to the Soft Key mode to Parameter display .
PART	Divide memories into up to 9 parts, each having its own fade and wait times.
POS	Access Position libraries for storing, modification, or selection.
Q-LIST	Access Q-Lists for storing or selection. Access with **[SHIFT]**.

Key	What it does
RATE A/B	The Rate wheel takes control of the rate of the crossfade running on the A/B crossfaders.
RATE CHASE	The Rate wheel takes control over the rate of a chaser running on the controllers.
RELEASE	Release spots and parameters from memories, the editor, libraries, and controller assignments. Access with **[SHIFT]**.
RESET	Clear the editor. One press fades the active channels and spots, two quick presses bumps them out. Exit menu mode, or exit a specific menu function, returning to the menu list.
S/L OFF	Disable the Sound-to-Light function. Access with **[SHIFT]**.
S/L ON	Enable the Sound-to-Light function.
SEQ	When activated, this key automatically assigns the next memory, in the numerical sequence, to the fader that is at its zero limit. It is automatically activated when an assignment is made to A or B.
SHIFT	Use to access the secondary function of double function keys. The secondary function appears in the upper half of the key.
SMPTE	Access the functions for SMPTE programming and playback. Access with **[SHIFT]**.
SNAP	Take a 'snapshot' of all the fader and controller assignments on the console. These assignments are recorded and available for instantaneous recall. Upon retrieval all the recorded assignments snap into their proper places.
SOFT	Assign chasers in soft run mode. Soft chasers fade from step to step. Access with **[SHIFT]**.
SOLO	Change SK operation. All controller output, except the SK pressed, is blacked out.
- SOLO	Invert Solo. The output of the selected controller only is blacked out. Access with **[SHIFT]**.
SPOT	Signals spot selection. This key also acts as an "and" key when used between spot selections. Press twice to set the keypad to default to spot selection for first number selection. *Spot* appears in the command line on a gray field. The system recognizes the first number selection as spot selection, making it unnecessary to press this key before the number selection.
STAGE	Access the display format options. This key also returns you to the stage display from most exam displays.
STEP DN	Decrement parameter step value by 1.

Key	What it does
STEP UP	Increment parameter step value by 1.
STORE	Store memories from the editor, time assignments, Snaps, Libraries, Palettes, Groups, Effects, Snaps, and text labels.
SUBM	Assign selected controllers as inhibit submasters.
TEACH MACRO	Program mMacros live.Also provides a way to construct macros for menu functions (not including Macro menu). Access with **[SHIFT]**.
TEST	Test channels and the dimmer for spots. Access with **[SHIFT]**.
TEXT	Access the alphanumeric keyboard while displaying a blue field for any notes or other textual uses. Used in conjunction with the memory key attaching text to an individual memory. Text may also be attached to show files, Snaps, Effects, Events, Palettes, Groups, and Macros.
TIME	Assign fade up time to the selected memory. Press twice to access time out.
U/L/X	Assign a controller to submaster the Upper bank of controllers, the Lower bank of controllers, the crossfaders, or DMX Input. Access with **[SHIFT]**.
VISIBLE	Select spots and channels with participating in the current lighting state. Access with **[SHIFT]**.
WAIT	Assign of wait in times and wait out times to the selected memory. Press twice to access wait-out
WHEEL +	Go to the next wheel bank.
WHEEL -	Go the previous wheel bank. Access with **[SHIFT]**.
X	Select pan (x). Access with **[SHIFT]**.
Y	Select tilt (y). Access with **[SHIFT]**.
ZERO	Forces selected channel to zero.
	Wheels are used for parameter value assignments and for rate control.
	The trackball controls the pand and tilt for moving lights. Trackball sensitivity is adjustable in the System Parameters menu.
	Each controller/chaser has a Soft Key. In Assign mode the Soft Key flashes the contents of the associated controller from its current output level to full. In Macro and Snap modes pressing the SK operates the Macro or Snap. In Effect mode the SKs operate the Effects editor. In Group and Palette modes use for selection. In Free mode press to free the assignment.

Index

D

E

F

G

H

I

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z