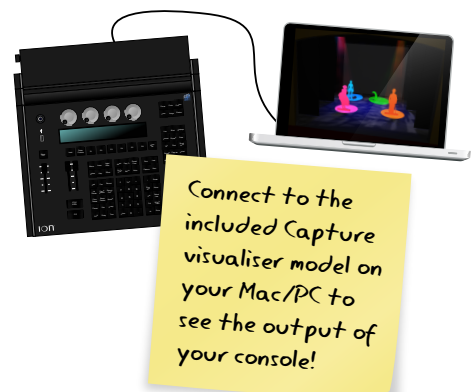
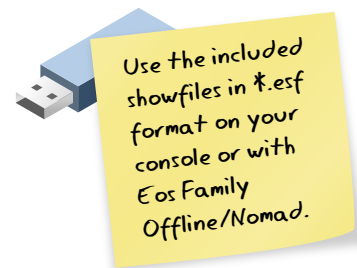




# TEA BREAK TUTORIALS

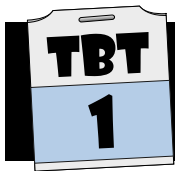
For Eos-Family Software Version 2.2

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eos  
family





# Power-on and Navigation



## Power-on

### Primary

Press the power button on the front panel - the console will begin its boot sequence. Depending on how the console has been configured, you may have to press or click the "Primary" button to begin. This area above the main keypad (or on an external monitor on Ion) is referred to as the Central Information Area, or CIA.

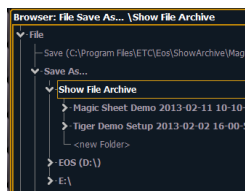
## Save



Activate the Browser, which allows you to "get to" many areas of the desk that don't have dedicated buttons. Use the arrow keys and **[Select]** to navigate.

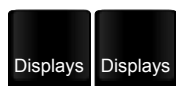


Use the star icon to identify the Browser as your "Favourite" - the default display in the CIA.



- Use the level wheel and/or the **[Page Up]** / **[Page Down]** keys to navigate to **File**
- Use the **[Page Right]** key to open submenus to get to **Save As | Show File Archive**. Use **[Select]** to save the current show, calling it "Tutorial Backup". This show is now saved on the internal hard drive.
- Re-select the Browser. Use the **[Page Left]** key to navigate back to **File | New**. Use the **[OK]** button to start a new show.

## Open Base Showfile



Activate the Browser again and navigate to **File | Open | (your USB memory stick)**, and open the **Eos Family TBT 01 Power-on and Navigation.esf** (Eos-Family Show File) for this tutorial. This will be indicated in future tutorials with the icon to the right showing the file to load before starting.



## Tab Navigation



You are now in **Live** mode - this is the normal mode for controlling lights. Note the **Live Tab** is now active on an external monitor - you can see the gold tab title and border. Tabs in the Eos Family work much like those on a web browser or mobile phone - the active tab receives any commands you type.

1 Live Channel 2 P



Press **[Format]**. Many displays have multiple formats. In Live, you can choose Live Channel or Live Table. Ensure that the Live Channel (aka summary or tombstone) format is active.



Press **[Tab]**. The Playback Status tab is now active (it has a gold border). There are 3 different formats on this display. *Note that throughout this tutorial series, the Eos Ti's button style will be shown - this may differ on your console.*



Pressing **[Live]** puts you back in Live mode.



In channel displays, using **[Page Up]** and **[Page Down]** will move onto the next page.



Toggling **[Scroll Lock]** on will cause the same paging keys to now only move by one row.



Press **[Sub]** twice in rapid succession. Pressing a record target (anything we can record to) button twice in this manner brings up a list of that record target type - in this case, submasters - in a new tab, numbered **15**.



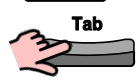
You now have a list of all Groups, again in a new tab numbered **17**.



Pressing **[Live]** puts you back in Live mode (tab **1**).



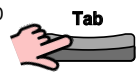
The Patch display is opened in a new tab **12**.



Holding **[Tab]** and typing a number will take you directly to that tab - in this case, Live.



The submaster list is now active again. Note that as this tab was already open (but not active), a new tab was not created - the focus was merely changed to the submaster list.



Holding **[Tab]** and navigation arrows will move tabs between displays.



You now have a list of all Focus Palettes.



You now have a list of all Color Palettes.



The Color Palette list tab (tab **24**) is now closed. You can close any tab by focussing on it (using any of the methods above) and pressing **[Escape]**. Note that Live/Blind and Playback Status (tabs **1** and **2**) cannot be closed.



As each tab type has a dedicated number, holding **[Tab]** and typing that number will also open that tab.



Holding **[Format]** and using the wheel will zoom your active display.



Holding **[Help]** and selecting another key will put a short description of the key onscreen in the CIA.

# Advanced Tab Navigation

1 Live Channel

2 Playback Status

Touch or click on a tab to activate it.

2 Playback Status

✕

✕

↺

✕

Double-tap/click (or right-click) on a tab to give additional tab option such as **Close Tab**, **Replace Tab**, **Close All Tabs But This**, and **Close All Tabs**.

us

+

☰

▶

⌘

Click on the "+" tab to open a new tab. Various **Displays** and **Controls** are offered.

## Workspaces and Frames

1

2

3

At the top of each internal/external monitor, there are a series of icons which allow you to select a virtual Workspace. A workspace is simply a collection of tabs.

2

Select Workspace 2. Again various **Displays** and **Controls** are offered, as well as **Layout** options.

☰

☰

▶

⌘

Select a Layout with multiple **Frames**. Each Frame offers the various Displays and Controls.

☰

☰

▶

⌘

At the top of each internal/external monitor, there is an icon which allows you to manage or change the Workspaces' Layout and other options.

⬆

⬆

⬆

⬆

Select the "Resize Frames" icon.

⬆

⬆

Split controls now appear, allowing you to resize frames. Touch/click anywhere else to return to normal control.

✓

Set up Workspace 3 with various Display tabs as shown:

Live Channel Tab

Playback Status Tab

Groups List Tab

(Empty frame)

Live Channel Tab

✓ = Your turn!

These exercises help ensure that you understand the concepts – this isn't just data entry!

⚙

1 L

In the gear menu (⚙) in the lower right frame, select the option "Open New Tabs In This Frame".

⚙

1 L

Note that the gear turns amber to brag about this exciting new role!

Sub

Sub

A submaster list is opened in the lower right frame.

Tab

&

Page ▶

◀ Page

Note that **[Tab]** and the left/right paging keys now moves the selected Tab through the various frames, not just different monitors.

Tab


&

Page ▲

Page ▼

Holding **[Tab]** and using the **[Page Up]** and **[Page Down]** keys will change the active workspace on **All Monitors**. Return to Workspace 3.

✓

Using the gear menu again, set a frame to be locked. You should see the  icon replacing the gear. Again move the Submaster list tab through the frames to see the result.

✓

Select a tab in a frame with multiple display tabs. Use **[Shift]&[Tab]** to close all tabs in unlocked frames. Note that you can use **[Shift]&[Tab][Tab]** to close all tabs, including those in locked frames (except tabs 1&2).

## Control Tabs

25

In the empty frame in the workspace 3 you created earlier, open a Direct Select (x25) as a new tab.

☰

☰

In the same frame, also add a Virtual Faders tab.

1 Live Channel

2 Playback Status

In the top frame, activate Tab 2 (Playback Status) again.

4 Direct Selects

28 Virtual Faders

In the frame with the controls, touch or click on the tabs. Note that the tab is selected but not highlighted - this is to ensure that Control tabs do not "steal" focus from display tabs during programming. Note that you can double-press or click on Control tabs to also highlight them. These tabs have purple text to differentiate them.

4 Direct Selects

28 Virtual Faders

## Introduction

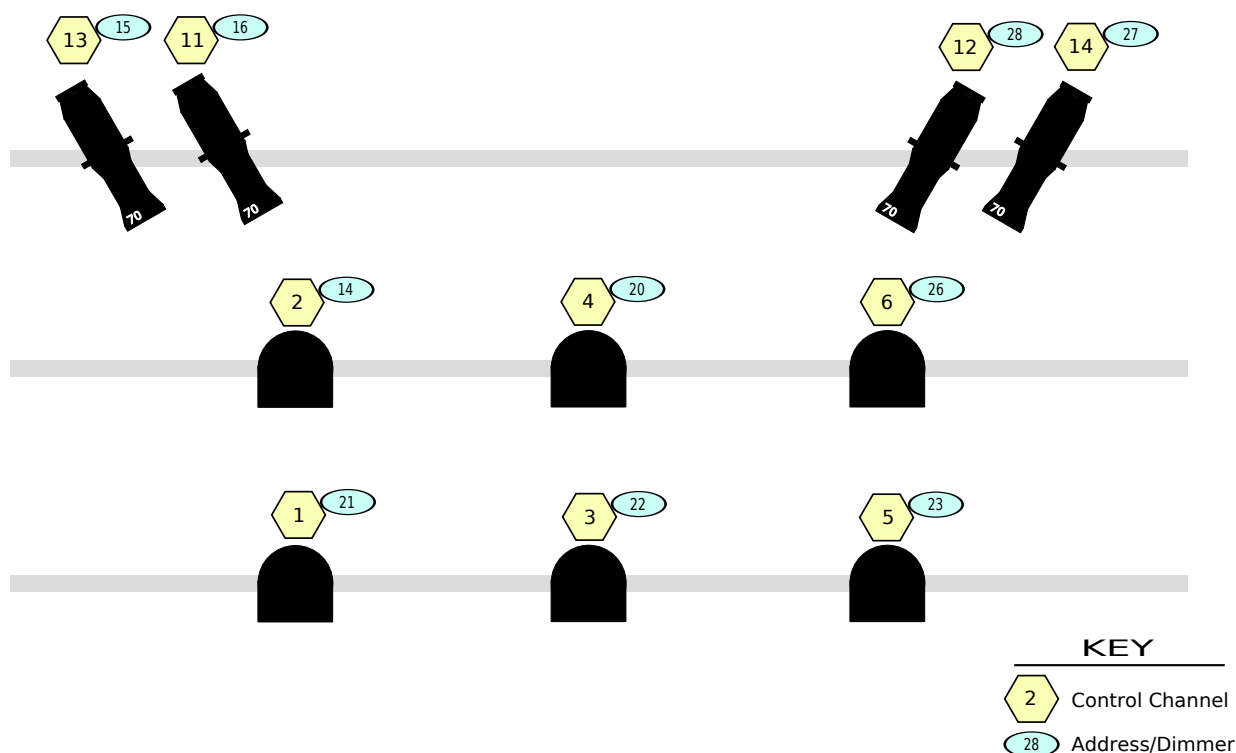
Patching is the process of assigning which channel/fader controls which dimmer or dimmers. Although you can work with a 1-to-1 patch (where the channel and dimmer number are the same), it is often useful to group certain channels together in an easier-to-remember fashion. You might group toplights, crosslight, LX1 warms, LX4 backs, etcetera.

Don't forget to load this show file first!

In the Patch display, you can choose between two different formats: by-channel or by-address (dimmer). This allows you to quickly find the information you want as well as allowing you to patch "whichever direction" your information is organised.

A channel can contain multiple dimmers - each of these will be allocated to a new "part" in Patch. A given dimmer, however, can only be assigned to one control channel. All dimmers in a channel will be driven to the same level in Live.

Take, as an example, this small lighting plot. It contains 6x Source Four PARs as toplight and 4x Source Four 70° profiles with a breakup pattern.



You can see that although the dimmers are assigned seemingly randomly (due to which plug socket was closest), control channels 1-6 are the downlights and 11-14 are the breakup pattern.

Unpatched channels (channels without a dimmer assigned) can still be set and recorded in Live. Deleted channels, on the other hand, cannot. Some users might prefer to delete all channels first, then only patch those that exist in the rig.

Note: The above assumes that the installation is dimmer-per-circuit. This simply means that there is no hard-patch bay, but that there is a physical dimmer for each and every individual circuit. With a patch bay, the console patching operation is identical - you will just have to also create a circuit-to-dimmer schedule for your hard patch.



# Patching Conventionals



Use the **{Patch}** softkey after hitting **[Displays]**. This will take you to a mode where you define your softpatch: what dimmers are controlled by each channel. If available, you can also double-hit the **[Address]** key.



Press the **[Format]** button. Most displays have multiple formats - different ways to see the data. In Patch, you can toggle whether your list is sorted by Address (dimmer) or Channel. Leave the display sorted by channel.



Channel 2 is patched to DMX address 14. It is automatically given a type of "dimmer".



Channel 4 is patched to address 20.



Channel 6 is patched to address 26.



Channels 22-24 are patched to 3 contiguous dimmers: 17, 18, and 19.



As above, channels are patched, but the **[Offset]** of 2 selects every other channel in the range. This is a quick method to patch multiple channels.



The display changes to show Address in the first column, channel in the second. More importantly, the patching syntax changes so that the first number you enter is the address, and that is applied to the channel that you now type.



Address 1 is patched to channel 11 - this is the opposite logic to above.



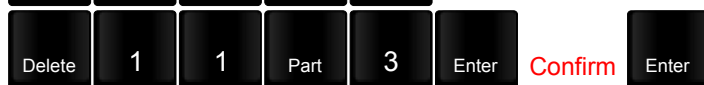
Address 2 is also patched to channel 11. Two parts now appear in channel 11 - one to hold each address (dimmer).



The display and patch syntax reverts to channel first, then address.



Address 3 is also patched to channel 11. Three parts now appear in channel 11 - one to hold each address (dimmer). Note that existing addresses are not removed.



Address 3 is removed from channel 11, and again there are only two parts. Note that deletion normally requires a confirmation.



Address 2 is removed from channel 11. There is again only one part.



Channel 11 is now patched to address 16 instead of 3. In this syntax, **{Replace}** takes the place of **[At]**.



Channel 71 is patched to address 204 on DMX/SACN universe 3 (an external Gateway would be required).



Channel 72 is patched to address 1232 (address 208 on universe 3).



Use **[PgUp]** and **[PgDown]** to see Channels 71 and 72 together.



You may need to toggle **[Scroll Lock]** - this toggles whether the arrow keys move by row or page.



Pressing **[Data]** once shows addresses in long address format (see blue text at the top left of the tab)



Press again to show addresses by universe (Port/Offset)



Press again to show addresses in the format in which they were typed.



The command **[At][Enter]** signifies "remove data". As such, channels 71 and 72 are now unpatched, but the type is not changed.



Channels 7 through 10 are deleted. Note that this, unlike simply unpatching, will remove any and all show data for this channel and also make it unavailable for selection in Live/Blind.



Use the **{Swap}** softkey to quickly change the patch information between two channels, using the syntax: **[X]{Swap}[Y][Enter]**. Also use the **{Unpatch}** softkey to see how it differs from **[At][Enter]**.

## Command Structure

Eos family consoles are command-line driven desks. As a general rule, the command structure is:

What Channels	What Parameters	Do What	To/From Where	Enter
---------------	-----------------	---------	---------------	-------

In many cases, not all of the command components are required. For example:

1 Thru 5		At	50	Enter
11 Thru 14		Record	Sub 33	Enter
		Record	Cue 7	Enter
22 Thru 25	Color	Recall From	21	Enter
Group 4		Level		
(Existing Selection)		Flash		

You will find that most if not all commands are variations on this structure.


## Selective vs. Full Recording

Two primary methods of recording are supported - **Selective** and **Full**.

Selective recording simply means that a channel selection is provided before the **[Record]** command. This is often used when recording submasters, palettes, or other non-cue information. With this method, only selected channels are placed into the target (Cue, Group, Sub, Palette, etcetera). Existing information for those channels will be overwritten, but other channels that already have data will not be affected.

Full recording means that no channel selection is provided before the **[Record]** command. A simple ruleset exists for which channels will then be included in the target:

- Channels above zero
- Channels that have moved to zero
- Channels tracking at zero
- Channels with manual information

As a general rule, this means that you record what you see - this is very commonly used when recording cues. With a terminated command line (look for the  symbol), **[Record]** will clear your existing channel selection.

## Auto Playback on Record

Eos-family consoles default to "Auto Playback on Record". This simply means that when you record a cue, that cue is now active in your playback - there is no need to "release" manual control channels.



Note that this behaviour happens only with a Full record - you will still have manual levels onstage when using selective recording.

# Manual Control

**Live** Go to Live mode to control lights. **1** **At** **Full** **Enter** Channel 1 goes to Full (note that **[Full]** is not self-terminating).

**2** **+** **3** **At** **3** **Enter** 2 and 3 go to 30%.

**At** **3** **3** **Enter** 2 and 3 (your last selection, still on the command line) goes to 33%

 **Shift** **&** **+**  **Shift** **&** **+** 2 and 3 go to 43%, then 53% (the level to increment can be modified in the Setup menu).

**4** **At** **At** 4 goes to Full. Note that Enter is not required, as **[At][At]** acts as a termination. This brings you to a definable "level", which can be changed in the Setup menu.

**5** **Thru** **6** **At** **5** **Enter** 5 through 6 go to 50%.

**1** **1** **Thru** **1** **4** **-** **1** **3** **At** **0** **5** **Enter** 11 through 12 and 14 go to 5%.

**6** **Out** 6 goes to 0%.

**EOS GIO** **+** **%** **+** **%**

**EOS GIO** **Level**

## Recording

**1** **Thru** **2** **Record** **Group** **1** **Enter** 1 through 2 are recorded as Group 1. This is a "selective record", as we provided a channel list before the **[Record]** command.

**Record** **Cue** **1** **Enter** Cue 1 is recorded with a time of 5 seconds. This is a "full record" - any terminated channel selection is automatically cleared with **[Record]**. Cue 1 is now active in the master playback.

**Cue** **1** **Time** **3** **Enter** Cue 1's time is changed from 5 (the default) to 3 seconds. Note that **[Cue][1]** is optional, as 1 is the current cue and therefore assumed.


**5** **Thru** **6** **At** **1** **Enter** 5 through 6 go to 10%.

**2** **+** **3** **Recall From** **1** **Enter** 2 and 3 go to Full, the level of channel 1. Note that you could also recall from another cue as well: **[Recall From] [Cue] [x]**. Double-hitting **[Recall From]** will post **[Recall From] [Cue]** to the command line as well.


**Record** **2** **Time** **3** **Enter** Cue 2 is recorded with a time of 3 seconds. It is now the active cue in the playback.

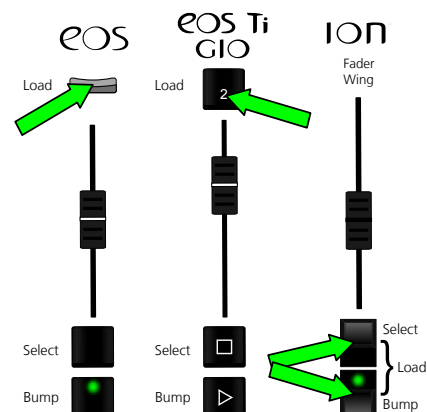
**Time** **4** **Time** **8** **Enter** Cue 2's time is changed from 3 (the previous command) to have a 4 second upfade and an 8 second downfade. **[Time] [4] [/] [8] [Enter]** will also work.

**Record** **Sub** **2** **Enter** Submaster 2 is recorded. This must now be loaded to a fader - load this to fader 2. (See figure to the right)

 (2) Bring Sub 2 to full, then back to 0. As submasters are HTP with cues, you will not see any changes onstage - Sub 2 is not taking levels any higher than those provided by Cue 2.

**Go To Cue** **0** **Enter** The main playback is reset to the beginning, and intensities are faded out.

 (2) Again bring Sub 2 up and down - this time you should see changes, as there are no cues active.



Clear the command line and practice loading Submaster 2 to different faders. **[Shift]&[Load]** will unload. Also record a few more subs, noting the difference between full- and selective-recording.

## Go To Cue

---

You can have up to 999 cue lists containing up to 9999 cues. These cues can be numbered between 0.01 and 999.99. Each time the **[Go]** button is pressed, the next cue in the "stack" is executed. Broadly speaking, in most theatre applications only one cue list is used for the main programming of the show.

It is useful to know about the concept of Cue 0 (zero). Cue 0 is the beginning of the cue list. The command **[Go To Cue] [0] [Enter]** will return you to this point, making the first cue in the stack the pending cue. Assuming there are no submasters or Park levels outputting, you will also have a blackout - Cue 0 contains no levels. Just as you can go to Cue 0 with the above command, you can just as easily jump to any other cue in the list - foreexample, **[Go To Cue] [3] [Enter]**. Note that the time to fade to this cue is dictated by the "Go To Cue Time" in the Setup menu, not the time of the cue. If you do want to use the cue's stored timing, you can append the **[Time]** command - **[Go To Cue] [2] [Time] [Enter]**. If you want to temporarily over-ride the Go To Cue time, you can append a time into the command - **[Go To Cue] [2] [Time] [1] [Enter]**.

## Stop/Back

---

You will notice that there is only one button for both Stop and Back. If there is an active fade/transition happening onstage, the first press of this button will Stop (pause) the fade, and the second will go back to the previous cue.

If there is no active fade, the first press will go back to the previous cue.

## Editing

---

One of the more common activities in lighting programming is making edits to existing cues.

It is important to know that changes that you make in Live mode will result in manual levels. If you want to keep these changes, you must remember to use the Update feature - this will automatically apply the changes to the active cue and also include any tracking. You can use the **[Update] [Cue Only] [Enter]** command to ensure that no changes track forward, if this is desired. Tracking is discussed in much greater detail in Tutorial 13.

Changes made in Blind will be applied immediately. There is no need to update - once a change is made, it is done, including any tracking. If you do not want to track changes forward, or if you are not sure, you can again use the **[Cue Only]** key. For example - **[1] [At] [2] [5] [Cue Only] [Enter]**.

## Blind Spreadsheet Format

---

In Blind mode, there is a third format called "Spreadsheet". This format allows you to see the levels and tracking across multiple cues. This is often a useful tool to determine when a channel comes in or changes.

## Go, Stop/Back, and Go To Cue in Blind

---

It is important to remember that there are a few commands that will still happen "Live" even if you are in Blind mode.

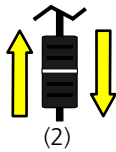
- **Go**
- **Stop/Back**
- **Go To Cue**

A common mistake is to use **[Go To Cue]** in Blind in an effort to see that cue. Instead, the command **[Cue] [x] [Enter]** or **[Next] / [Last]** should be used.

# Playback



The main playback is reset to the beginning, intensities are faded out.



Bring submaster 2's fader up and down. Notice the levels fading in and out in **yellow**.

**Red levels** indicate manual instructions - Live commands not yet recorded

**Blue levels** indicate that levels are higher than the previous cue

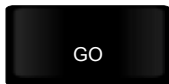
**Green levels** indicate that levels are lower than the previous cue

**Magenta levels** indicate that levels are the same as the previous cue (tracking levels)

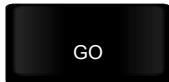
**White levels** indicate that levels are the same as the previous cue (blocked levels)

## Some Mnemonics

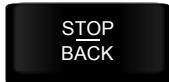
<b>Yellow</b>	<b>sub</b> marine
<b>Blue</b>	like the sky
<b>Green</b>	like the grass
<b>Magenta</b>	<b>Purple</b> Rain is a <b>track</b> by Prince *
<b>Red</b>	Have you <b>read</b> the <b>manual</b> ?



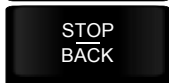
Cue 1 is faded in over 3 seconds.



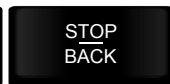
Cue 2 is faded in with channels moving up over 4 second and down over 8 seconds



Cue 1 is faded in over 1 second, the default Back Time in Setup



Cue 0 (the beginning of the stack) is faded in over 1 second, the default Back Time in Setup



Cue 1 begins to fade in, then pauses



Cue 1 continues to fade in, and Cue 2 fades on top of it.

# Live Editing



Go to Live.



Channel 1 goes to 10%.



2 and 3 go to 53%. **[At][Enter]** means "remove information", which will cause these channels to track (inherit levels) from the previous cue.



Channels 1, 2 and 3 are updated into cue 2.

# Blind Editing



Go to Blind. Note that the display background has changed as a reminder that you are in Blind, where the live output of the desk is not affected, and edits happen immediately (recording/updating not required or possible).



Cue 1 is now the cue being edited



Cue 2 is now the cue being edited



4 is now at 50% in cue 2 - remember, no record or update is needed (or even possible).



Cue 1 is now the cue being edited.



2 is now at Full in both cues 1 and 2. This is because the Eos Family are tracking consoles - if a channel is at the same level in 2 cues in a row, and you change the level in the first one, it will track through to the second (and on until a level change or a block is encountered).



3 is at Full in cue 1, but has not tracked through to cue 2, because of the **[Cue Only]** command - 3 is still at 53% in cue 2 (and is shown in green as it is move instruction to a lower level).



Go back to Live and make some more edits to cues, practicing using different command-line structures and shortcuts. Remember to update these changes.

Also make some changes in Blind, remembering to use **[Next]**, **[Last]**, and **[Cue] [x]** to navigate.

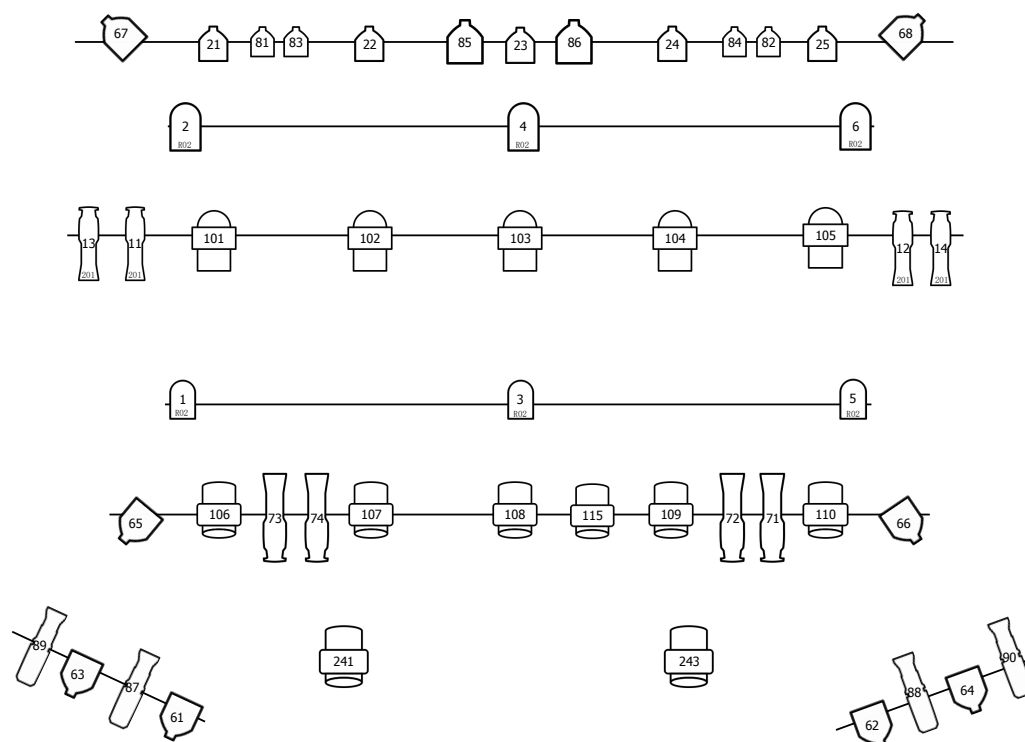


## What is a Magic Sheet?

In the old days, it was common for stage lighting designers to keep a "Magic Sheet" (or Ye Magicke Sheete, in the really old days) which acted as a "cheat sheet" for the lights that they put in their plot. Its goal was simple: to speed up the act of recalling specific channels for a given purpose, or for selecting a gel colour in a scroller, or for various other tasks where simply remembering the numbers can be difficult.

Concurrently, the poor person sitting behind the lighting desk probably had a few sheets of their own with random bits of information on them - perhaps the channels which make up the cyclorama, or the gobos in each fixture, etcetera.

The Eos family Magic Sheets are a modern solution to the same problem: sometimes you just need a place where you can put information/drawings/sketches/jokes that make sense to you. A classic example of an Eos Magic Sheet is a lighting plot:

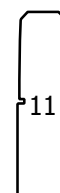


## The Concept

The principle of Eos Magic Sheets is very simple: you place objects on a canvas, and assign those objects to an Eos target (Channel, Dimmer, Group, Palette, etcetera). There are also many tools which speed up adding multiple objects (copy/paste, array, align tools). If you've worked before with any standard drawing or layout tools, you should find the Eos Magic Sheet interface very easy to learn!

Each object can have multiple dynamic fields associated with it. For example, a fixture symbol might have its channel number, current level, patch label, and database field 1 associated. When any of those fields change (level fading in a cue, for example), the Magic Sheet display is updated dynamically.

The best way to explain Magic Sheets, however, is to play with them!



# Creating a Magic Sheet



Open a new Magic Sheet Display in a full-monitor workspace.



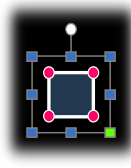
Use the "New Magic Sheet" icon in the banner that appears.



You are automatically in editing mode. The editing "drawer" is opened and closed using the arrow handle.



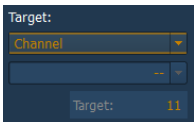
Insert a simple square shape from the list by clicking first on the shape, then clicking anywhere in the canvas.



Note that the object is now in editing mode, identified by the happy pink "shape" handles on the object, the blue (and one green) "resize" handles, and the white "rotate" handle.



Experiment with the various handles, and see how you can also change size/angle in the properties editor in the editing drawer. Also change the outline width and outline/fill colours.



Select the object, and use the property editor assign it to channel 11.



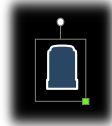
Close the Magic Sheet editing drawer.



Touch or click on the object. Note that channel 11 is selected in Live!



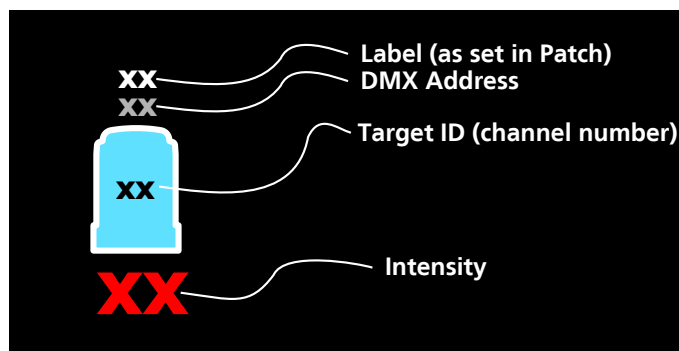
Open the editor again.



Use the fixture icon to show the list of fixture symbols. Insert the fresnel fixture. Note that these special objects have only the green (relative) resize and rotate handle. Also note that the target is automatically set to "Channel" and a channel is assigned.



Change the fixture's fields to show the following info:



Use the external keyboard Ctrl-C (Copy) and Ctrl-V (Paste) command to make some copies of the fixture symbol. Note that the next channel number is automatically assigned.



Experiment with the editing modes:

Normal Mode

Quick Layout Mode

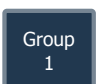
Quick Number Mode



Experiment with the Live vs Blind background colours. Set the Live background colour to be a dark amber colour, and set the Blind background to be a dark blue colour.



Insert a special "Group" box from the list of objects. Note that these special objects (C, G, P, etcetera) automatically populate with Channel/Group/Preset fields, similar to the fixture icons.



Create a few new Magic Sheets, and use multiple Workspace frames to show multiple Magic Sheets at the same time. Pretend that you are monitoring a space mission rather than controlling lights. Awesome.





## Groups

Groups on the Eos Family, unlike some other lighting desks, only contain a list of channels - they do not store levels. Groups can largely be considered a selection tool - they are not a tool for referencing.

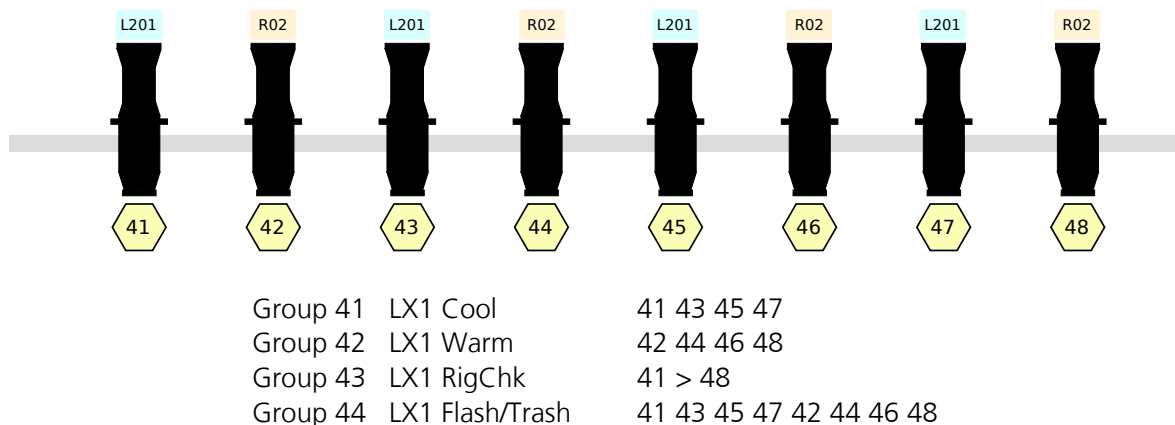
For example, here are some Groups:

Group 1	Downlights	1 > 6
Group 2	Breakup	11 > 14
Group 3	Backlight Scrollers	21 > 35
Group 4	Specials	71 > 74
Group 5	Cyclorama	31 > 46

As you can see, there are no levels, just channel numbers.

It is also important to know that Groups are used at selection-time only. If you later make changes to a Group, it will not affect existing Cues/Subs/other references.

Groups also store the order in which they are created. This can be useful, for example, when using Groups in an Effect or rig check. For example, you might have cool and warm FOH washes from LX1. You might want a few different Groups to select them, based on what you are trying to do:



## Target Groups

Although you can create pre-planned Groups as above, sometimes it is useful to utilise "Target Groups". This simply means that you can use an existing record target (Cues, Subs, Palettes, Effects) as a temporary group.

For example, you might have a Submaster which contains sidelight, but only shins and mids. Rather than typing in all the channel numbers or going through and creating a new group to contain these channels, you could use:

**[Group] [Sub] [3][6] [Enter]**

This will give you all the channels in Submaster 36 as a selection for manual control.

You could also use ranges:

**[Group] [Cue] [1][1] [Thru] [1][5] [Enter]**

This will select all channels used (above zero) in this range of cues. Again, this will be a selection - channels are not driven to levels.

# Creating Groups

Live

Enter Live mode.

3

Thru

6

Record

Group

2

Enter

Group 2 is recorded with channels 3 through 6. Groups do not have associated levels; they are simply channel selectors.

Group

Group

Open a group list. Group 2 is probably highlighted.

Last

Next

Moves to the previous and next item in the list. Group 2 is now highlighted

-

6

Enter

Channel 6 is removed from Group 2.

+

6

Enter

Channel 6 is added to Group 2.

Group

2

5

Enter

Group 25 is created, but empty.

1

1

Thru

1

4

Enter

Channels 11 through 14 are added to group 25.

Label Note

Breakup

Enter

Group 25 is given a label of "Breakup". You can use either the on-screen or an external USB keyboard.

Group

2

6

Enter

Group 26 is created, but empty.

1

+

3

+

5

+

2

+

4

+

6

Enter

You now have a group with 1-6, but in the order as typed.

Select a range of channels, then press the **{Offset}** softkey. Experiment with the different options to create different ordering and grouping. Store some new groups with these included. Note that you can also use **[Shift]&[/]** to post "(" and ")" to manually insert subgrouping within a selection.

# Using Groups with Direct Selects

Place a Direct Select (DS-x25) control onscreen. Use the **[+25]** and **[-25]** buttons to add and remove banks of buttons.

Select

+25

Note that buttons shown like this are within the Direct Select, not on the keypad.

Select

Groups

Groups are now displayed on your Direct Select buttons.

Page 1

Page 2

Use the paging keys to select different banks of Groups. Note the tiny numbers on the tiles which show you where you are, as well as the Page indicator under the word Groups.

Flexi

Flexi mode (we'll cover Flexi more in Tutorial 9) condenses the tiles to show only those with content, while leaving space to record the next target of each contiguous set (Group 3 in this case).

Live

Group 1

Group 1 button is highlighted. Channels 1 through 2 are selected in Live.

Group 2

Group 2 button is highlighted. Channels 1 through 6 (Groups 1 and 2) are selected in Live.

Group 1

Group 1

Group 1 button is highlighted, Group 2 button is not. Only channels 1 and 2 (Group 1) are selected.

At

6

5

Enter

Channels 1 through 2 are set to 65%. Note that these are manual levels.

Group 2

At

5

Enter

Channels 3 through 6 are set to 50%.

Clear

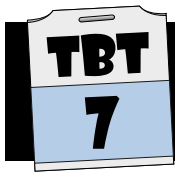
Sneak

Enter

All manual changes are faded back to cue or background state.

Load channels to the direct selects to see how they behave. Try to select channels 1,3, and 5 and record them into a new group using only the Direct Select control. (Hint! Look for the **[Record]** key on the side.)

Create a Magic Sheet with some objects assigned as Groups. Note how they interact with each other and the Direct Selects.



# Follow and Hang, Link and Loop



## Follow

Adding a follow to a cue tells the console to automatically run the next cue in the sequence after a set amount of time. This is frequently used for:

- Complex cue structures which would be difficult to call/run accurately
- There is a desire for uncalled cues to run to preset moving lights
- A series of snap cues that should run evenly and/or predictably
- To reduce the number of unnecessarily called cues

The Follow command is applied to the cue which is the trigger. In other words, if you want Cue 6 to follow on from Cue 5, you should put the Follow flag on Cue 5:

**[Cue] [5] [Follow] [5] [Enter]**

This will cause Cue 6 to automatically run 5 seconds after Cue 5 is triggered. It is important to remember, in the case of "auto-follows" (run the next cue when this cue completes) that if you change the time of the cue, you must also change the follow time:

**[Cue] [5] [Time] [3] [Enter]    [Follow] [3] [Enter]**

## Hang

Hang is similar to Follow, except that the countdown begins from the completion of the flagged cue. For example:

**[Cue] [5] [Hang] [2] [Enter]**

will cause Cue 6 to run 2 seconds after Cue 5 has completed its fade.

**[Hang] [0]** is frequently used when an "auto-follow" is desired - no maths is required and if times are changed the autofollow is still respected. Note that negative hangs are also possible:

**[Hang] [-] [1] [Enter]** will run the next Cue one second before the flagged Cue has completed.

## Link

Under normal circumstances, a cue list will run its cues in order. Link is used if you wish to change this order - for example to "link out" a section of the show. For example, during rehearsals, Peter Pan entered via a zipline over the audience. Now, on opening night, the HSE has determined that it would be better for him to walk in from DSR. You now want to jump directly from Cue 33 to Cue 38, ignoring the intermediate cues:

**[Cue] [33] [3] {Link/Loop} [3] [8] [Enter]**

Now, after Cue 33 is run, Cue 38 is pending - 34 through 37 are skipped.

## Loop

Loop allows you to set a number of times to perform a link. For example, you may have a sequence of cues for a dance piece that repeats - Cues 6-9 repeat themselves 3 times, then it should go on to Cue 10. You would put a link from Cue 9 to 6 with a Loop of 2 (loop twice):

**[Cue] [9] {Link/Loop} [6] {Link/Loop} {Link/Loop} [2] [Enter]**



Cue 10 is now the "recovery cue" - the cue that plays when the link/loop sequence is complete. Note: If you do not want levels to track from Cue 9 into Cue 6, put an Assert flag on Cue 6.


## Follow and Hang

<b>Live</b>	Pressing <b>[Live]</b> puts you back in Live mode.				<b>Go To Cue</b>	<b>2</b>	<b>Enter</b>	Cue 2 is faded in over 5 seconds (unless it is already the active cue).				
<b>Group</b>	<b>2</b>	<b>5</b>	<b>At</b>	<b>7</b>	<b>Rem Dim</b>	<b>Enter</b>	Our breakup pattern is brought to 70%, and all other levels are set to 0.					
<b>Record</b>	<b>3</b>	<b>Time</b>	<b>2</b>	<b>Enter</b>	A new cue, 3, is recorded with a time of 2 seconds.							
<b>1</b>	<b>Thru</b>	<b>2</b>	<b>Full</b>	<b>Full</b>	1 and 2 are taken to full.		<b>Record</b>	<b>4</b>	<b>Time</b>	<b>2</b>	<b>Enter</b>	A new cue, 4, is recorded with a time of 2 seconds.
<b>3</b>	<b>Thru</b>	<b>4</b>	<b>Full</b>	<b>Full</b>	3 and 4 are taken to full.		<b>Record</b>	<b>Next</b>	<b>Time</b>	<b>2</b>	<b>Enter</b>	A new cue, 5, is recorded with a time of 2 seconds.
<b>5</b>	<b>Thru</b>	<b>6</b>	<b>Full</b>	<b>Full</b>	5 and 6 are taken to full.		<b>Record</b>	<b>Next</b>	<b>Time</b>	<b>2</b>	<b>Enter</b>	A new cue, 6, is recorded with a time of 2 seconds.
<b>Cue</b>	<b>3</b>	<b>S 2 Fw/Hg</b>	<b>2</b>	<b>Enter</b>	Cue 3 is given a Follow time of 2 seconds. This means that upon execution of Cue 3, a countdown of 2 seconds will begin and then the next Cue (4) will be automatically started.							
<b>Go To Cue</b>	<b>2</b>	<b>Enter</b>	Cue 2 is faded in over 5 seconds.		<b>GO</b>	Cue 3 is faded in over 2 seconds, and a Follow countdown appears on the playback status display. After 2 seconds, Cue 4 is automatically started.						
<b>Cue</b>	<b>3</b>	<b>S 2 Fw/Hg</b>	<b>S 2 Fw/Hg</b>	<b>0</b>	<b>Enter</b>	Cue 3 is given a Hang time of 0. This means that upon completion of Cue 3, the next Cue (4) will be triggered immediately.						
<b>Go To Cue</b>	<b>2</b>	<b>Enter</b>	Cue 2 is faded in over 5 seconds.		<b>GO</b>	Cue 3 is faded in over 2 seconds, and a Hang countdown appears on the playback status display. After 2 seconds, Cue 4 is automatically started.						
<b>Cue</b>	<b>3</b>	<b>S 2 Fw/Hg</b>	<b>Enter</b>	Cue 3 no longer has a follow or hang time onto cue 4. Note that you can also use <b>[Shift]&amp;[Delay]</b> to insert a Follow.								

## Link and Loop

<b>Cue</b>	<b>6</b>	<b>S 4 Link/Loop</b>	<b>4</b>	<b>Enter</b>	Cue 6 is linked to Cue 4. This means that after Cue 6 is run, Cue 4 will be the pending Cue.			
<b>GO</b>	<b>GO</b>	<b>GO</b>	Cues 4 through 6 are played back. In this situation, Cue 6 will link back to Cue 4 indefinitely.					
<b>Go To Cue</b>	<b>6</b>	<b>Enter</b>	Cue 6 is played back.					
<b>Clear</b>	<b>Select Active</b>	<b>Out</b>	All channels go to 0.					
<b>Record</b>	<b>7</b>	<b>Time</b>	<b>2</b>	<b>Enter</b>	Cue 7, a blackout, is recorded with a time of 2 seconds.			
<b>Cue</b>	<b>6</b>	<b>S 4 Link/Loop</b>	<b>S 4 Link/Loop</b>	<b>2</b>	<b>Enter</b>	Cue 6 is set to loop back to Cue 4 twice. Note that this will result in the entire Cue 4-6 sequence playing back three times before moving onto the next Cue, 7.		
<b>Go To Cue</b>	<b>3</b>	<b>Enter</b>	Cue 3 is played back.		<b>GO</b>	Press <b>[Go]</b> until the loop are completed. Note that the number of remaining loops is displayed in brackets. Note, however, that levels from Cue 6 are tracking into Cue 4.		
<b>Cue</b>	<b>4</b>	<b>Assert</b>	<b>Enter</b>	Cue 4 is given an Assert flag. This will cause levels from Cue 6 to no longer track when the loop is executed.				
<b>Go To Cue</b>	<b>3</b>	<b>Enter</b>	Cue 3 is played back.		<b>GO</b>	Press <b>[Go]</b> until the loops are completed. Note that because Cue 4 is now asserted, Cue 6's levels no longer track into Cue 4 whilst looping.		


  

**Shift** & **Select Last** **S1** **Select Active**


  
**More SK** **S4** **Assert**



## Select Last, Select Manual, and Select Active



### Select Last

---

As you saw earlier, Record operations will clear your channel selection. This is because **[Record]** as a command uses a simple ruleset for which channels will be included in the Record Target:

- Channels above zero
- Channels that have moved to zero
- Channels tracking at zero
- Channels with manual information

As a result, it is very common to have to reselect the group of channels you were just working with. This is where the **[Select Last]** key comes in very useful - it simply re-selects the same channels that you previously selected.

### Select Manual

---

It is often useful to grab all of the channels to which you have made a change (channels in red or manual channels) and modify them. You might wish to select all of the channels with manual changes within a given range and put them at half of their current values:

**[1] [Thru] [2][0] [Select Manual] [At] [/] [5][0] [Enter].**

### Select Active

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Similarly, selecting only channels that have a level is very common. To create a blackout on stage:

**[Select Active] [Out]**

is a simple command to remember. This can also be used within a range. For example if you want all of the FOH channels out,

**[1] [Thru] [4][0] [Select Active] [Out]**

will be a useful command.

**[Select Active] [Select Active] [Out]**

will select non-sub active channels - those channels which are on from a source other than a submaster. This is useful to not select working lights, house lights, hazers, etcetera.

# Select Last, Select Manual, and Select Active

**Live** Pressing [Live] puts you back in Live mode.

**Go To Cue** **1** **Enter** Cue 1 is faded in over 5 seconds.

**1** **At** **1** **Enter** Channel 1 goes to 10%

**2** **At** **5** **Enter** Channel 2 goes to 50%

**Update** **Enter** The levels (and any tracking) are updated into cue 1.

**Select Last** **At** **Full** **Enter** Channel 2 is selected and brought to full - this was the last channel (or range of channels) selected before updating.

**Record** **1** **■** **5** **Enter** Cue 1.5 is inserted between 1 and 2. Note that as we have modified channel 2 from 50% to full, this new level of full will affect tracking, and it is therefore full in cue 2 as well.

**3** **+** **Next** **At** **8** **Enter** Channels 3 and 4 are now at 80%.

**1** **At** **5** **Enter** Channel 1 goes to 50%

**Select Manual** Channels 1, 3 and 4 are selected, as they have manual (red) levels. This is an easy way to select all channels that have been changed or added.

**At** **6** **Enter** Channels 1, 3 and 4 go to 60%

**Update** **Q Only Track** **Enter** Cue 1.5 is updated, but no changes are tracked forward.

**Select Active** All channels currently above zero (all active channels) are selected.

**Out** All channels currently above zero (all active channels) go to zero. This is the fastest and best way to achieve a blackout.

**Record** **1** **■** **7** **Q Only Track** **Enter** Cue 1.7 is inserted between 1.5 and 2. To ensure that no channels track as a blackout, we used the Q Only command.

**Block** **Enter** A Block flag is placed on cue 1.7. This will insure that any channels we add to cues upstream of cue 1.7 will not track into the blackout. Putting a Block on blackout cues is normal practice on a tracking console.

**GO** **GO** Cue 2 and then Cue 3 are executed.

**Group** **Sub** **2** **At** **8** **Enter** Submaster 2's channels are used as a Group, and brought to 80%. Any record target (Subs, Cues, Presets, Palettes) can be used as a group for selection.

**Select Last** **Rem Dim** **Enter** Any channels not active in Sub 2 (in this case, channel 13) are brought to zero.

**Clear** **Sneak** **Enter** All channels are returned to their recorded cue 3 state.



Use **[Select Active]** and **[Select Manual]** with a leading channel selection to select only certain lights within a range.



## Live and Blind Flexi Modes

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You will remember from earlier lessons that **[Format]** allows you to change how you see the data. In Live, for example, **[Format]** will toggle between Summary and Table formats. You still, however, see and have access to all of the channels.

Flexi (aka Flexichannel) allows you to dictate which channels you see onscreen. Simply pressing **[Flexi]** takes you to the next Flexi state - holding **[Flexi]** will repaint the softkeys to show your various Flexi options.

There are six built-in Flexi states and one user-definable state:

<b>All Channels</b>	All channels appear onscreen.
<b>Patched Channels</b>	Channels with an address associated in Patch. This can be a useful view to quickly remove channels that you are not using in a show.
<b>Manual Channels</b>	Channels with manual changes. This is a very useful "programmer" display - the channels that will be affected by Update.
<b>Show Channels</b>	Channels stored in Cues and/or Submasters in the show. This can be a useful view for lighting designers, as it will not show channels that they are not using in a rep.
<b>Active Channels</b>	Channels above zero in the current Cue, also including channels that just moved to zero. This is another useful view for designers, as they are often not interested in lights that are tracking at 0.
<b>Selected Channels</b>	Channels that are currently selected. This is useful to compare channels side-by-side, even if they would normally appear on different screens.
<b>View Channels</b>	A user-definable view to show desired channels only. For example, you may want to only show channels used in Act 1, or only MLs and scrollers, or only FOH channels.

Note that your Flexi state can impact which channels are selected with a **[Thru]** command. Use **[Thru] [Thru]** to force all channels in a range to be selected, regardless of the flexi state.



# Flexi Modes



Pressing **[Live]** puts you back in Live mode.



2

Enter

Cue 2 is faded in.

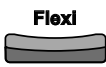


At

9

Enter

Channel 1 moves to 90%.



Flexi

You should now see text in the upper right corner of the Live display showing that you are in Patched Channels flexi mode. You only see channels with an address in Patch. There are vertical bars to indicate a missing range - for example, between channels 6 and 11.

Patched Channels	
71	72
42	92



Flexi

You are now in Manual Channels Flexi mode. This mode will only show channels that are manual (red levels). If you were to use the Update function, these are the channels that would be affected.



Flexi

You are now in Show Channels Flexi mode. This mode will only show channels that are used in either a cue or submaster in the current show.



Flexi

Active Channels will show only those channels above 0 or those that have just moved to 0. Note that in Blind Palette/ Preset views, Active Channels will reveal only channels that have data for that target.



Flexi

You are now in Selected Channels Flexi. This will only show channels that are currently selected - this is often useful to compare channels that normally do not appear on the same page.



+

4

+

6

Enter

You now see channels 2, 4, and 6.



Flexi

You are now back in All Channels Flexi - no label appears for this mode.



+

4

+

6



&



Create an unterminated selection of channels 2,4, and 6, then hold Flexi whilst pressing View Chans. This creates a temporary Flexi mode.



&



Pressing **[Flexi]** and selecting another Flexi mode will take you to that mode without having to pass all of the other modes first.

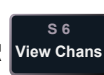


Clear

Your channel selection is cleared.



&



You are now back in View Channels Flexi, and see channels 2, 4, and 6 onscreen.



Cue

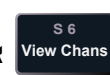
3

Thru

5



&



Active channels in cues 3 through 5 are selected, and a View Channels flexi is created. Only channels 1-4 and 11-14 are now onscreen. This can be useful to see only channels used in various parts of a show.



+

6

Enter

Even though channels 5 and 6 are not in the current Flexi mode, you will still see them if they are selected.



Thru

6

Enter

As Channel 1 is in your current Flexi mode, but 6 is not, only Channels 1-4 are selected.



Thru

Thru

6

Enter

The command **[Thru] [Thru]** will force all non-Flexi channels to be selected.



Blind

Go to Blind. Note that Live and Blind have discrete Flexi modes. For example, you can maintain Blind Flexi in Selected Channels whilst leaving Live Flexi as Show Channels. Use the **[Flexi]** key to change modes, just as in Live.



In Live, create a new View Channels Flexi mode with channels 1-6 and 21-25.

Return to Patched Channels Flexi for the remaining tutorials.

## Channel Check

Channel Check is a mode of the desk which allows you to quickly set a level on a channel and then move onto the next patched channel. This is normally used for a rig check or "flash-around" to verify that channels are working prior to a performance.

**[1] [At] [8] {Chan Check} [Enter]** will bring Channel 1 to 80%. **[Next]** will bring 2 to 80% and return Channel 1 to its background (cue/sub) level. Only channels with an address assigned in Patch will be selected in Channel Check mode. Pressing any key other than **[Next]** or **[Last]** will terminate Channel Check mode.

## Park

Often, you wish to bring a Channel or Address to a level, but not have this level recorded into any record targets or have live control of it. Some examples of when you might Park a channel rather than bring it up live:

- Setting the Houselights to 20% during technical rehearsals
- Setting a channel to zero whilst a problem with the lantern is being resolved
- Performing a dimmer check from a client/remote onstage during a notes/programming session
- Setting moving light power relays on for a performance
- Parking a faulty colour scroller to a non-obtrusive colour during a performance
- Parking a moving light out and at home until it can be reset during the interval

Channels and/or dimmers can be parked from Live directly, or from the Park display. Channel Check mode is the default behaviour whilst in the Park display. A proportional Park is also possible. Setting **[6] [At] [/] [9] [Enter]** whilst in the Park display will cause channel 6 to play back at 90% of its stored values in all cues and/or submasters. Note that the Park status is not loaded as part of a show by default.

## Channel Check in Live

Live

Pressing **[Live]** puts you back in Live mode.

Go To Cue

0

Enter

Channels are faded out and the cuelist is reset to the beginning.

1

At

Full

Enter

Channel 1 goes to Full.

Next

Channel 2 is selected, Channel 1 remains at Full.

Clear

Sneak

Enter

All manual channels are sneaked back to their background level. Without a selection, **[Sneak]** assumes all channels with manual values.

1

At

Full

More SK

S 5 Chan Check

Enter

Channel 1 goes to full. We are now in Channel Check mode, which is cancelled by any key other than **[Next]** or **[Last]**.

Next

Channel 2 goes to full, channel 1 returns to 0.

Next

Channel 3 goes to full, channel 2 returns to 0.

Last

Channel 2 goes to full, channel 3 returns to 0.

Clear

All channels are returned to 0 - Channel Check mode is cancelled..

# Park

1

At

Full

Park

Enter

Channel 1 is now parked at full. You will not see the FL in red, but instead a small P symbol in the tombstone. In addition, you will see Parked Channels at the top of the screen, and the **[Park]** button LED will be lit in green.

Park

Park

A new tab showing Parked channels and addresses is opened. You can see that Channel 1 is parked at Full.

2

At

5

Enter

Channel 2 is now parked at 50%. This level is what will be output.

Live

2

At

7

Enter

Channel 2 is shown at 70%. This level is what would be recorded or updated, but the light is still parked and output at 50%.

2

Recall From

Park

Enter

Channel 2 is now set to the same value (50%) at which it is parked. Note that this does not unpark the channel.

Park

Park

The Park display is now active again.

1

At

Enter

Channel 1 is unparked (remember that **[At] [Enter]** means "remove information").

S 1  
Address

2

6

At

Full

Enter

Address (dimmer) 26 is parked at Full. As this dimmer is patched to Channel 6, we see that information as well. Note that [Address] is also an Eos/Gio hard-key.

Park

Enter

Enter

All channels are unparked. Note that any parked addresses remain parked.

S 1  
Address

Park

Enter

Enter

All addresses are also now unparked.

## Sneak

Sneak allows you to restore a channel to its recorded/background state or define a new state, typically with non-zero timing.

With one or more channels selected, **[Sneak] [Enter]** will return those channels to the current cue or sub level using the Sneak Time (default of 5 seconds). **[Sneak] [2] [Enter]** would do the same, but over 2 seconds rather than 5. **[At] [5] [Sneak] [Enter]** would set the channel(s) to 50% over 5 seconds.

With a clear command line (no channels selected), **[Sneak] [Enter]** will restore all channels to their background level.

Some examples of when you might use **[Sneak] [Enter]** rather than setting a level directly:

- You were asked to bring a channel to a level during programming, but the designer says "No, never mind." Sneaking the channel rather than setting a hard zero ensures that tracking is maintained and that no changes are stored for that channel.
- You have changed the colour and level on a scroller. It is decided to leave the colour as it was, but at a lower level. **{Color} [Sneak] [Enter]** will return to the original colour, but maintain the level change.
- You are in a dress rehearsal, making last-minute changes. In order to not distract the actors or draw attention to the changes, change the Sneak Time to 10 in Setup, and append **[Sneak]** to all changes - for example, **[Group] [2] [At] [Full] [Sneak] [Enter]**.

Submasters can also be Sneaked. For example, perhaps you wish to bring the Houselight submaster to Full over 30 seconds at the end of a performance. Rather than doing this manually, **[Sub] [9] [At] [Full] [Sneak] [3] [0] [Enter]** will fade the sub for you.

**[Shift] & [Sneak]** after a channel selection will remove the red manual colour from the channels so that they will not be included in an Update, Record Only or Sneak operation.



# Sneak

Live	Pressing <b>[Live]</b> puts you back in Live mode.							
Go To Cue	6	Enter	Cue 6 is faded in.					
1	Thru	6	At	5	Enter	Channels 1 through 6 are lowered to 50%. As always, red indicates that these are manual values.		
Group	2	5	At	Full	Enter	Channels 11 through 14 are raised to full.		
Sneak	Enter	Channels 11 through 14 (the currently selected channels) are sneaked back to their cue level of 70%. This happens over 5 seconds, the default sneak time.						
Group	2	5	At	8	Enter	Channels 11 through 14 are raised to 80%.		
Clear	Sneak	Enter	All manual channels are sneaked back to their cue level. Without a selection, <b>[Sneak]</b> assumes all channels with manual values.					
1	Thru	4	At	2	Enter	Channels 1 through 4 are lowered to 20%.		
3	Thru	4	Sneak	Enter	Only channels 3 and 4 are sneaked. All other manual values remain at their current values.			
2	Sneak	1	0	Enter	Channels 2 is sneaked over 10 seconds. Note that you could use <b>[Time]</b> after Sneak - but it is assumed.			
1	Thru	4	At	9	Sneak	2	Enter	Channels 1 through 4 are sneaked to 90% over 2 seconds.
Clear	-	3	Sneak	Enter	All channels in the show except 3 are sneaked.			
At	4	An error appears on the command line - you cannot set levels using a negative selection. This is to protect you from accidentally driving nearly all channels to a level.						
Undo	With an unterminated command line (such as ours which has an error), <b>[Undo]</b> clears the entire command line but does not bring up the undo history.							
Go To Cue	0	Enter	Channels are faded out and the cuelist is reset to the beginning.					
Sub	2	At	5	Enter	Submaster 2 is set to 50%. On Eos/Gio, you will see the motorised fader move, assuming you have a fader page with Sub 2 active. On a fader wing, the LED flashes to indicate a mismatch.			
Sub	2	At	8	Sneak	5	Enter	Submaster 2 is sneaked to 80% - this will behave as if the sub's fader has been moved to 80% over 3 seconds. On Eos/Gio, the fader handle will still move to its end state in 0 time.	
Sub	2	Home	Sneak	1	Enter	Submaster 2 is homed (0% for additive subs) with a 1 second sneak.		
Recall From	Cue	2	Sneak	Enter	The active channels from Cue 2 are sneaked onstage to become manual levels.			
Clear	Sneak	Enter	All channels are again faded out.					



Sneak some channels. Sneak some Subs. Shift-Sneak some channels.

## Part Cues

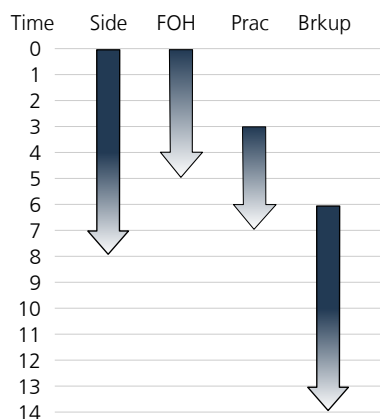
Part cues are a tool that is used when you want to have multiple times on a single cue. As we saw earlier, you can easily "split" the time on a cue, meaning that channels moving higher use one time whilst those moving lower use another.

If you need finer control, Part cues are the answer. Up to 20 parts can be created, each with its own delay and time. Channels in a cue are assigned to a part, either in Live or Blind.

As an example, you may have a cue that requires the sidelight to fade in over 7 seconds (we'll call that normal), the FOH to come in over 4 to pick up the beginning of the scene nicely, a practical to wait (delay) for 3 seconds prior to a 4-second fade, and the breakup pattern to delay for 6 seconds (to allow a bit of flying scenery to clear) and then fade in over 8 seconds.

We can create the parts as:

Part	Delay	Time	Channels
1	-	7	Sidelight
2	-	4	FOH
3	3	4	Practical
4	6	8	Breakup



Part cues can also be used to create simple chases, typically if the chase does not repeat:

Part	Delay	Time	Channels
1	-	1	1
2	1	1	2
3	2	1	3
4	3	1	4
5	4	1	5
6	5	1	6

You will see later, however, that this is probably better achieved with an effect.

You might also use Part cues for:

- Applying different Focus/Color/Beam times to cues
- Delaying a single channel that is too "hot" on the set
- Creating a "growing" pool of light for a dance piece
- Creating a "wave" colour change across scrollers
- Giving one channel a much longer fade out to highlight an actor before a blackout

## Recording Part Cues Live

**Live** Go to Live mode.

**Go To Cue** **0** **Enter** The cue list is reset to the start.

**Delete** **Cue** **1** **Thru** **Enter** **Enter** All cues are deleted.

**Group** **1** **Thru** **2** **At** **5** **Enter** Downlights go to 50%.

**Record** **1** **Part** **1** **Time** **4** **Enter** Cue 1 Part 1 is recorded with a time of 4 seconds.

**Group** **2** **5** **At** **Full** **Enter** Breakup goes to Full.

**Record** **Part** **2** **Time** **2** **Enter** **Enter** Cue 1 Part 2 is recorded with a time of 2 seconds.

**7** **2** **At** **7** **Enter** Channel 72 goes to 70%.

**Record** **Part** **3** **Time** **0** **Delay** **4** **Enter** **Enter** Cue 1 Part 3 is recorded with a time of 0 seconds, but with a 4 second delay.

**STOP BACK** The cue list is reset to the start. **GO** Channels play back as defined by their part. All times and delays begin from the press of **[Go]**.

## Parting Existing Cues in Blind

**Select Active** **Out** A Blackout is created.

**Record** **2** **Block** **Enter** Cue 2 is recorded as a Block cue.

**Recall From** **Cue** **1** **Enter** Cue 1's levels are onstage as manual levels. **Record** **3** **Time** **4** **Enter** Cue 3 is recorded - this is a duplicate of Cue 1, but with no parts.

**Blind** Enter Blind mode to edit the current cue. **Format** **Format** . . . Change to Spreadsheet format to view multiple cues with fewer channels.

**Flexi** **S 3 Show** Change to Show Channels Flexi.

**1** **1** **Thru** **1** **4** **Part** **2** **Enter** **Enter** Cue 3 Part 2 is created with channels 11-14 in it. All other original Cue 3 channels are put into Part 1.

**Part** **2** **Time** **2** **Enter** Cue 3 Part 2 is given a time of 2 seconds.

**7** **2** **Part** **3** **Time** **0** **Delay** **4** **Enter** **Enter** Cue 3 Part 3 is created with timing. Non-Part channels are shown in grey.

**Live** **STOP BACK** **GO** In Live, you see that Cue 3 now plays back identically to Cue 1.



Move some channels between parts, noticing how the text colours change. **[At]** **[Enter]** some channels in a Part to see the results.



## Introduction

The Eos-family are tracking lighting consoles. For some users this will be a new style of working, so this tutorial aims to outline principles and techniques used with tracking consoles.

Computerised lighting consoles have been with us for roughly three decades. In that time, two distinct approaches have emerged within lighting console design:

**Preset, State or Cue-Only desks** (lighting technicians tend to use these terms interchangeably - some would argue that these are all actually different, but it is fine for our purposes.) Classic examples include Strand Galaxy, Strand Gemini, and ETC Express/Expression. Any 2-scene preset console is by definition also in this category.

**Tracking desks** Classic examples include Strand Light Palette 90, ETC Obsession, Whole Hog, GrandMA. Any 1-scene or "piano" console would fall into this category.

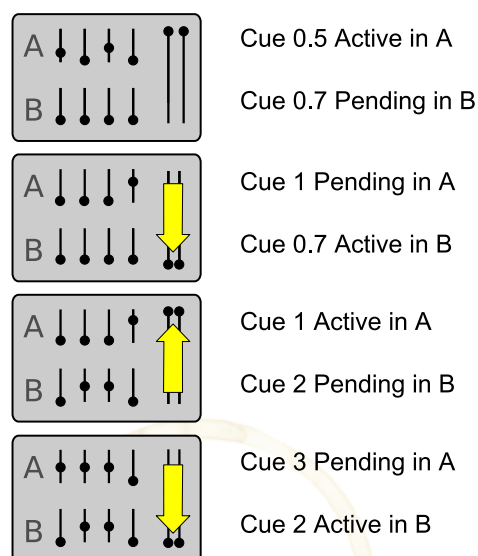
Neither approach is "right" or "wrong" - the requirements of specific users usually dictate which style of console is most appropriate. In general, tracking is preferred when working with a large number of moving lights, as it greatly eases management of non-intensity parameters.

Note: Wondering which category the Strand 500-series console fits into? The answer: Both! The 500-series was designed to succeed both the Light Palette 90 (tracking) and Galaxy (preset). It could be run in either mode by changing the cue tracking field.

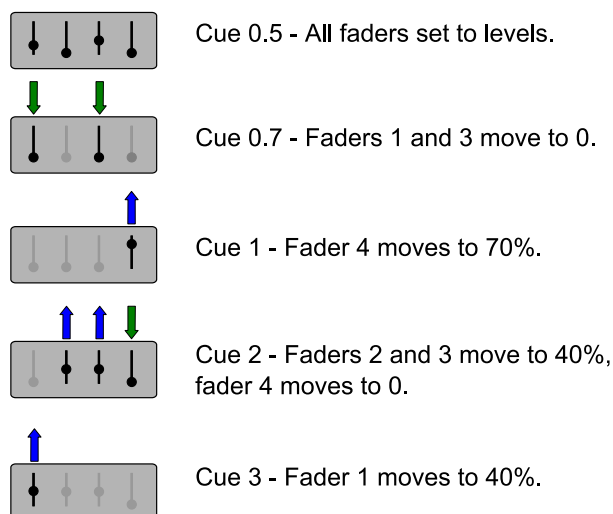
## What is the Difference?

The key difference between a tracking console and a cue-only console occurs when we record a cue:

A **cue-only** console records a cue by remembering the entire lighting state. Each cue therefore contains a value for every intensity/attribute/parameter of each light. The example 2-scene preset console below illustrates this:



A **tracking console** records a cue by remembering the changes from the previous cue being recorded. Each cue therefore only contains values for levels/parameters that are actually changing - these are often referred to as "move instructions". The example single-scene console below illustrates this:



Another difference is revealed when we play back a cue:

**Cue-only** consoles tend to run each cue as a cross-fade - all levels are faded on **[Go]** irrespective of whether they have a move instruction. Channels that are still fading from the previous cue take the new cue's time.

**Tracking** consoles tend to run each cue as a move-fade - only levels with a move instruction are faded on **[Go]**. Channels that are still fading from the previous cue continue in their original time.

## Example

A lighting rig has groups configured for Downlights, Breakup, Backlights and Special. Here is how the same cues would be recorded on a preset and tracking console:

### Preset Desk:

Cue	Time	Down	Breakup	Back	Special	
0.5	5	20	0	40	0	Preset look for audience entrance
0.7	4	0	0	0	0	Blackout
1	2	0	0	0	70	Special DSL
2	3	0	40	40	0	Beginning of scene - breakup and backlight
3	2	40	40	40	0	Downlight in
4	2	0	40	40	0	End of scene - breakup and backlight only
5	1	0	0	20	70	Special on actor
6	2	0	0	0	0	Blackout
7	3	70	25	35	0	Full scene in
7.5	12	40	0	15	60	Scene down, special on dancer
8	4	0	0	0	60	Scene change with special on dancer
9	2	20	10	70	0	New scene - special on dancer out

### Tracking Desk:

Cue	Time	Down	Breakup	Back	Special	
0.5	5	20		40		Preset look for audience entrance
0.7	4	0		0		Blackout
1	2				70	Special DSL
2	3		40	40	0	Beginning of scene - breakup and backlight
3	2	40				Downlight in
4	2	0				End of scene - breakup and backlight only
5	1		0	20	70	Special on actor
6	2			0	0	Blackout
7	3	70	25	35		Full scene in
7.5	12	40	0	15	60	Scene down, special on dancer
8	4	0		0		Scene change with special on dancer
9	2	20	10	70	0	New scene - special on dancer out

Both consoles will play the same lighting states, but the tracking console has recorded far less data into each cue than the preset console. For example, cue 1 contains a single change in level from cue 0.7 - the DSL special coming on. The tracking desk reflects this small change, whereas the preset desk has many redundant zeros. As you can imagine, this distinction becomes more and more important the larger the quantity and complexity of the channels.

## Does This Distinction Matter?

Irrespective of whether we use a cue-only or tracking console, the recorded lighting states will look exactly the same. So, if they look the same, why are you being forced to listen to this propeller-head mumbo-jumbo? The answer is that it has crucial implications on how edits (updating, adding and deleting cues) will affect the show.

On a preset desk, every change affects only that cue - the next cue always contains an entire look, so will be replayed as it was originally recorded. On a tracking desk, changes track forward until a move instruction is encountered. This means, for example, that if you were to change the backlight from 40% to 60% in cue 2 on both the preset desk and tracking desk above, cue 2 would obviously be changed on either desk, but the behaviour of cue 3 would differ. On the preset desk, the backlight would fade back to 40% (it has this level stored), but would stay at 60% on the tracking desk - there was no move instruction. Indeed, it would not change until cue 5 where it has a move instruction to go to 20%. Tracking is not an advanced function or method of working. The difference is largely in your way of thinking - in the above example, you wanted the backlight to be brighter in this scene, and it now is.

## Stopping Tracks

Although tracking is both quick and powerful, you often want to ensure that tracks do not go too far. In general, you want a channel to track for a scene at most, often less. Firstly, remember that move instructions stop tracks by their very nature.

More to the point, it is generally a good idea to set aside points in your cue list that stop any tracks from continuing past that cue. A classic example is a blackout or scene change. Refer again to the example above. It would be wise to put a block on cue 6 so that any additions upstream do not accidentally track into this blackout. Our cue list with blocks (B flag) would look more like this (ignore the lower-case b for now):

Cue	Time	Down	Breakup	Back	Special	
0.5	5	20		40		Preset look for audience entrance
0.7	B 4	0		0		Blackout
1	2				70	Special DSL
2	3		40	40	0	Beginning of scene - breakup and backlight
3	2	40				Downlight in
4	2	0				End of scene - breakup and backlight only
5	1		0	20	70	Special on actor
6	B 2			0	0	Blackout
7	3	70	25	35		Full scene in
7.5	12	40	0	15	60	Scene down, special on dancer
8	b 4	0		0		Scene change with special on dancer
9	B 2	20	10	70	0	New scene - special on dancer out

You can see that the example shows a line above each blocked cue. This line does not appear on cue list - it is a visual representation for this example that changes to levels upstream that track forward will stop at this point and not affect further cues.

## Updating Cue Only

Although the Eos Family are tracking desks, it is still possible to easily make changes to a cue without tracking any changes forward. In this case, any previously tracking levels in the next cue are converted to move instructions. As an example, imagine that we want to add a bit of downlight to Cue 1. When updating the cue, adding the [Cue Only] command has an important difference:

	Update Cue 1	Update Cue 1 Cue Only
0.5	20	20
0.7	0	0
1	20	20
2	40	0
3	40	40
4	0	0

## Recording Cue Only

Similarly, insert a new cue 1.5 between Cues 1 and 2 (to bring in a bit of downlight after the special is up). Recording this cue without or with **[Cue Only]** makes a big difference:

	Record 1.5	Record 1.5 Cue Only
0.5	20	20
0.7	0	0
1	20	20
1.5	35	35
2	40	0
3	40	40
4	0	0

As you can see, the existing (tracking) zero in Cue 2 is converted to a move instruction to zero in the case of a Cue-Only record operation.

## Partial Blocking

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Often, it is more appropriate to only block certain channels. In our example above, we can see that a special comes up on a dancer in Cue 7.5, and this should stay up during an otherwise-dark scene change. Very avant-garde.

We want to maintain the track between Cues 7.5 and 8 for the dancer special to ensure that if we change the level to 50% in cue 7.5, it stays at this lower level until it goes out. At the same time, we want to ensure that any changes or additions upstream (for example bringing the breakup to 25% in Cue 7.5) do not destroy the near-blackout. In this case, a partial block is used - all channels except the Special are blocked - in Eos/Ion, **[-] [channel/] [Block] [Enter]**. Note the lower-case b indicates this partial block.

It is worth noting that many programmers prefer to still block the entire cue and take the risk of the few channels not tracking forward as far as they otherwise might. This is down to experience and personal preference.

## System- or Auto-Blocks

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As a safety measure, the software will sometimes place blocks on channels for you. These are referred to as system blocks or auto blocks.

One circumstance where this happens is when you match a level "upstream". For example, if you were to add downlight at 40% in Cue 2, the existing 40% in Cue 3 would be automatically blocked. This is to ensure that your original intention is maintained, and that modifying the level in Cue 2 does not affect Cues 3 and beyond without your intervention.

It is, however, common that you did indeed wish to "bring that in a cue earlier", and do want this level to track. It is a simple matter of removing this block in Cue 3 to now create a track from Cue 2. This is often done using the **[At] [Enter]** command - remove the block and therefore create a track.

In the Cue List Index, you have a softkey which allows you to perform an Auto-Block Cleanup - remove all auto blocks for an entire cue list or for a range of cues.

## Updating Cues in Tracking

**Live** **Go To Cue** **2** **Enter** In Live, go to cue 2. Note that these cues are different to those you created and edited in previous tutorials. Don't panic! A masked programmer has made some changes.

**Group** **3** **At** **6** **Enter** Group 3 (backlight) is changed from 40% to 60%.

**Update** **Enter** Cue 2 is updated. The backlight was tracking forward from this cue at 40%, but is now tracking at 60% instead.

**Go To Cue** **4** **Enter** **Group** **1** **At** **2** **Enter** **Update** **Enter** Similar to above, Group 1 (downlights) are set to 20% and updated into cue 4. These channels also track.

**GO** **GO** Pressing **[Go]** twice takes you to Cue 6, which is should be a blackout. However, notice that the 20% downlight level has tracked into this cue from the previous update. Uh-oh.

**Undo** **Page ▲** **Enter** **Enter** Pressing **[Undo]** provides a list of your recent commands, with the most recent at the bottom of the list. Press the **[Page Up]** button until the Update command is highlighted. You again have manual levels.

**Cue** **6** **Block** **Enter** Put a Block flag on Cue 6. This will ensure that any tracking levels upstream do not affect this cue.

**Cue** **0** **.** **7** **Block** **Enter** As Cue 0.7 is also a blackout, it is a good idea to block it now to avoid trouble in the future.

**Go To Cue** **4** **Enter** **Group** **1** **At** **2** **Enter** **Update** **Enter** Again set the downlights to 20% and update them with tracking.

**GO** **GO** **[Go]** to Cue 6. Notice that at it is blocked, the downlights now go out when they reach the block. Note also that levels that are the same as the previous cue are now shown in white rather than purple.

**Go To Cue** **1** **Enter** **Group** **1** **At** **2** **Enter** **Update** **Enter** Add downlighting at 20% to Cue 1 and update.

**GO** Use **[Go]** to go to cue 2. Oops, we do not want downlights in this cue! This time, rather than using **[Undo]**, let's just fix the problem.

**Group** **1** **Out** The downlights are no longer on.

**Update** **Enter** Update this change into Cue 2. **Blind** **Blind** **Next** Note that this change does not affect Cue 3, as it has a move instruction on Channels 1-6.

**Blind** **Blind** A double-hit of Blind ensure that you go to Blind in the same cue you are seeing in Live.

**Group** **1** **At** **Enter** Giving the channels a level of **[At] [Enter]** removes the level/block and causes the levels from the previous cue (in this case, 0) to track in.

**Cue** **7** **.** **5** **Enter** Select Cue 7.5 for editing. **Format** **Format** Use **[Format]** as required to view as a spreadsheet.

**Group** **3** **At** **Enter** Give the backlights a level of **[At][Enter]**. This again will cause these channels to inherit their levels from the previous cue. As a result, they are now tracking at 35% rather than moving to 15%.

## Recording Cues in Tracking

**Live** **Go To Cue** **1** **Enter** In Live, go to cue 1.

**7** **3** **At** **7** **Enter** Set channel 73 to 70%.

**Record** **1** **.** **5** **Time** **2** **Enter** Record a new cue 1.5 with this level.

**GO** Go into Cue 2. Note that 73 has tracked into this cue. Again, you could fix this problem by simply setting it to zero, but use **[Undo]** instead.

Undo Page ▲ Enter Enter STOP BACK 7 3 At 7 Enter Undo recording Cue 1.5 and make the level change again.

Record 1 . 5 Time 2 Q Only Track Enter Record a new cue 1.5 with this level, but append the **[Cue Only]** command. This will ensure that Cue 2 plays back as intended.

GO Again go into Cue 2. Note that 73 has not tracked in. This change was recorded to Cue 1.5, but into **that cue only**.

Last Label Note **Lara** Enter Label Cue 1.5.

## Deleting Cues in Tracking

Blind Cue 2 Enter In Blind, select Cue 2 for editing.

Format Format . . . Use **[Format]** as required to view Blind Channel (tombstone).

Delete Cue Enter Enter Delete Cue 2. You are now viewing Cue 1.5.

Next Cue 3 is selected. Note that all of the formerly-tracking levels (the breakup and backlights) are now gone, and that channels 72 and 73 are now in the cue. Why? Cue 2 set these levels on and off respectively, but it has now been deleted.

**Use great care when deleting cues to track, as it can cause drastic changes to your show.**

Undo Page ▲ Enter Enter Undo the deletion of Cue 2. Phew! Last You are again editing cue 2.

Delete Cue Q Only Track Enter Enter Again delete Cue 2, but this time with the Cue Only modifier. This will cause tracks in Cue 3 to be converted to move instructions. As a result, the look is now preserved.

Next Note that Cue 3 contains move instructions to maintain its look before Cue 2 was deleted..

Cue 1 . 5 Enter Cue 1.5 is selected for viewing/editing.

Delete Cue Enter Enter As Cue 1.5 only brings in a special that we have decided is no longer required, it is appropriate to delete this cue to track.

Cue 3 Enter Cue 3 is selected for viewing/editing.

7 3 At Enter Use **[At] [Enter]** to remove the now-redundant "blue zero" in Cue 3. This 0 has no effect on playback - you are only removing it from the list to keep the show looking tidy and to impress your boss.



Practice updating and recording cues with and without tracking. Use Blind in Spreadsheet format to see what effect updates will have on following cues.

Knowing when to use tracking and when to update/record cue-only is an art!



## Assert

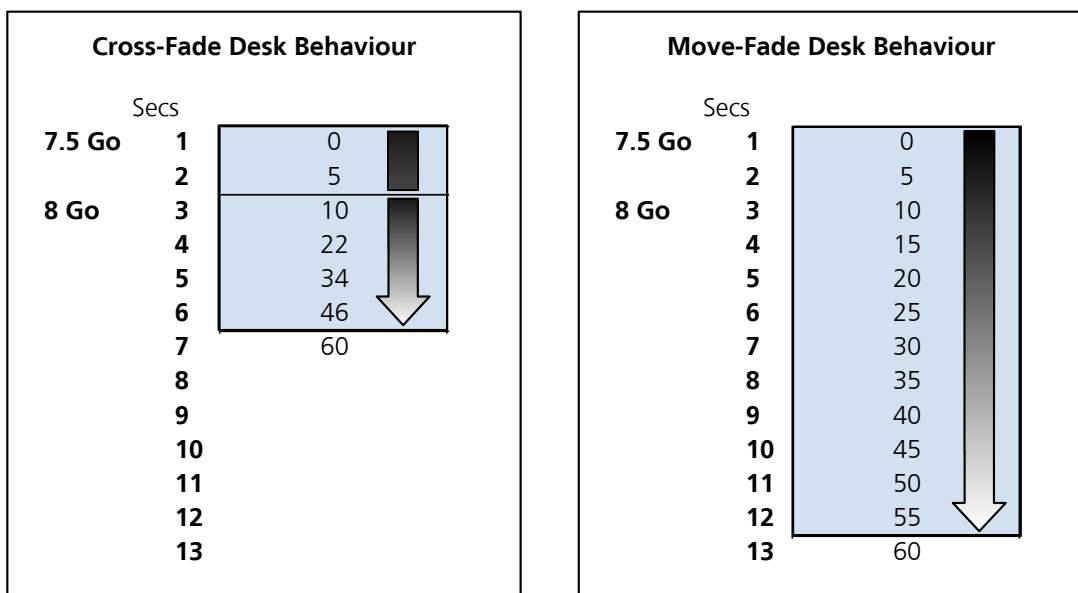
It was mentioned in Tutorial 13 that:

**Cue-only** consoles tend to run each cue as a cross-fade - all levels are faded on **[Go]** irrespective of whether they have a move instruction. Channels that are still fading from the previous cue take the new cue's time.

**Tracking** consoles tend to run each cue as a move-fade - only levels with a move instruction are faded on **[Go]**. Channels that are still fading from the previous cue continue in their original time.

This difference will be seen if Cue 8 is run before Cue 7.5 has completed its 12-second fade. For this example, imagine that you've run Cue 8 just 2 seconds after 7.5 was started, but the special is at the same level in both cues.

On the cross-fade desk, the Special moves to 60% over 4 seconds, as that is what it has stored. On the move-fade desk, however, the Special continues to fade over another 10 seconds - it does not have a move instruction in that cue, so it continues its previous fade instruction from Cue 7.5.



The above move-fade behaviour can be overridden by **asserting** the cue. An asserted cue will cause all levels to be played back as if they have move instructions, even if they have tracking levels. In this case, it will play back as the cross-fade example above. You can also assert only some channels - this is sometimes more appropriate if you want other channels in the cue to continue to fade in the background.

This method of using Asserts to ensure a full crossfade is quite common for blackouts (where you will likely already have a Block cue to stop tracking) and when there are multiple overlapping cues followed by a "recovery" or "all-in" cue where, no matter where the previous fades are, all lights should now go to this new cue - the buildup to a dance sequence, etcetera.

## Trace

Trace is a function which allows you to make a change in the middle or end of a track, and force the change backwards until a move instruction or block is reached. For example, you might change the level of a group of lights in the middle of a sequence. Rather than having to update this change to the source cue (and of course try to remember what cue number that was), you can simply use **[Update] [Trace]**.

Trace does not affect the forward-tracking function in any way - you can still use **[Cue Only]** as appropriate.



## Assert



In Live, go to cue 7.



Cue 7.5 begins to fade, and then Cue 8 is run and completes over 4 seconds. Note that channel 71 and 11-14 continue to fade in the Cue 7.5 time of 12 seconds. Cue 7.5 still shows in red on the PSD.



Cue 8 is asserted. This will force active fades to complete in this cue's time.



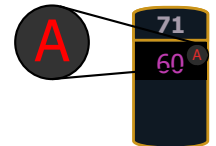
As above, Cues 7.5 and 8 are played back. Note, however, that this time channels 71 and 11-14 complete their fade in the time of Cue 8 due to the assert flag.



Cue 8 is no longer asserted.



Channel 71 is now asserted - this is referred to as a "Partial Assert". Note the red "A" in 71's tombstone.



As partial asserts are channel-level instructions, it is necessary to update the Cue to keep this change. Note that the "A" now turns blue and the lower-case "a" in the PSD flags column.



Note that this time, only channel 71 takes Cue 8's time for its fade - channels 11-14 continues to fade in the 12-second fade, as they are not asserted.

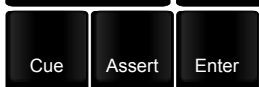
## Asserting Blackouts



Go into Cue 5.



The intention of these cues is that the lights should start to fade as Marilyn gives her last sentence, and then snap to black. However, because Cue 6 does not contain move instructions for any channels other than the special on Marilyn, the blackout is, well, rubbish.



Cue 6 is now asserted.



The Assert flag now forces the channels without moves to still play back in the Cue time.

## Trace



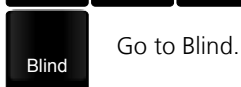
Cue 12 is onstage.



All of the specials go to 60%.



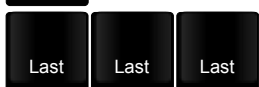
Cue 12 is updated with the specials at 60%, but these levels are also "backtracked" to their source. In this case, cues 9, 10, and 11.



Use **[Format]** as required to view as a spreadsheet.



You may need to page right to see channels 71 thru 74



Note the level of 60% throughout. Note also the autoblock on channel 71 in Cue 9.



In order to remove this autoblock, first block the entire Cue, then unblock it. Note that you could also just select 71 and use **[Block] [Enter]** once, but this is a useful technique to remove several autoblocks.



Cue 7.5 is the cue being edited.



The backlights are modified to 40% in this cue and traced backwards to the top of the scene. As there is no Update in Blind, the **[Trace]** command is part of the level instruction.



Note that in Cue 6, the backlights are at 0. Cue 6 contained a move instruction previously, so that is maintained. Trace will only modify levels along a track, so this 0 is maintained.

## Submasters

---

As you saw in earlier lessons, Submasters allow you to have a collection of channels on a fader. Submaster levels interact with cues, by default, on a Highest-Takes-Precedence basis - the desk outputs the highest level between cues and subs. Manual control from the keypad will still over-ride both.

Submasters can be created in Live or Submaster Blind mode. You can also use Update in Live or edit in Blind to apply changes to Submasters.

By default, Submasters have no timing associated - or rather, they have a time of 0 seconds. This means that when you press the bump button below a submaster's fader, the sub will "flash" to Full for as long as you are holding the bump button (this is referred to as a dwell time of Manual), and will return to zero in 0 seconds upon releasing the button. Remember that the faders are not submasters by default - they have to be assigned as such.

## Sub Timing

---

Submasters can be assigned three different times - an Up, a Dwell, and a Down:

- Up: The length of time for the sub to move to full upon execution
- Dwell: The length of time for the sub to stay at full upon execution. A time of **Manual** indicates that it should stay at Full for as long as the bump button is held down. A time of **Hold** indicates that it should hold at Full until the bump button is pressed a second time.
- Down: The length of time for the sub to return to zero (or the current fader position).

## Exclusive Subs

---

Submasters can be set to Exclusive mode. This mode causes the contribution of this submaster to be ignored at the time of recording. This is often used for "special" lights that you might want to have control of, but not record unless they are made manual. For example, you may put control of your house lights, workers, blues, music stands on subs for ease of technical rehearsals and performances, but not want them recorded into the cue stack.

## Shielded Subs

---

Submasters can be set to have a priority of Shield. This priority will ensure that the submaster has control over its channels at a higher priority than any other playback or even manual control (Park will still over-ride shielded Subs, however). On some other lighting desks, this is referred to as an Independent.

You can still plot levels that are under the control of a shielded Sub into Cues in Blind. These levels will not be played back, however, until the Shield priority of the Sub is lifted.

## Inhibitive Subs

---

Inhibitive subs are a tool used to disallow bringing channels to a level unless the "Inhib" is removed. If an inhibitive submaster contains a channel and that sub is at zero, that channel will not be driven above zero. This works for any level, not just 0.

Some examples of inhibitive sub usage:

- Smoke and Haze inhib - especially useful during technical rehearsals to avoid filling the auditorium with smoke
- FOH inhib - useful when bringing in the safety curtain to avoid showing how ropery the focus is
- 5K blinders inhib - crowd-blinders are fun, but also tend to blind actors, LX crew, directors, creative teams.
- Snow machines, Glitter bombs, Kabuki drops, trick tables, magic effects - these would range from annoying to dangerous if accidentally run as part of a rig check. Often, enabling these devices would be on instruction from the show caller only.

## Recording Subs in Live

Live Go to Live mode. Go To Cue Out Enter Go to Cue Out returns the cuelist to the beginning and fades out all lights. You want to ensure that any recording only includes the lights we are currently using.

1 Thru 6 Full Full The toplight goes to Full.

Select Last Record Sub 1 Label Note **TopLX** Enter Record a new submaster 1 with a label of "TopLX".

(Load) or (Load) or Load the sub to a fader. Note that Sub 1's bump LED is now lit in green. Also note the display above the sub fader.

Bring Sub 1 to 50%. Record 0 . 2 Enter Note that the levels are recorded.

STOP BACK Record 0 . 2 Enter Enter Note that the levels are not recorded.

Clear Sneak Enter Sneak the channels back to zero.

Sub 1 S 4 Exclusive Enter "Exclusive" means "excluded from record".

Return Sub 1 to 0.

Create and load three more subs:

Sub 2	11-14 at 70%	Bkup
Sub 3	21-25 at 50%	Scrls
Sub 4	71-74 at 90%	Spec

## Shielded Subs

Blind Sub 1 0 Enter Label Note **Works** Enter 2 0 0 Full Full A new Sub 10 is created with Channel 200 at Full.

Sub S 6 Priority S 6 Priority Enter A priority of Shield means that these channels cannot be controlled by any other means, including manual control. The Exclusive flag is also automatically set.

(Load) / (Load) / Load submaster 10 to a fader.

Live Return to Live. Note the "S" on channel 200 to indicate it is shielded. 2 0 0 Full Full Manual control has no effect on a channel that is Shielded.

Move Sub 10 to see the channel's level change.

## Creating Inhibitive Subs in Blind

Go To Cue 0 . 2 Enter Sub 1 S 1 Mode Enter

Sub 1 is now given a mode of Inhibitive - when it is at 0, it inhibits its associated channels from being used by playbacks, other subs, or manual control. Note that the fader puts itself at full when it is made inhibitive; this is to stop the creation of an inhibitive sub suddenly setting channels to zero. On non-motorised fader wings, the LED will flash to show that you need to bring the fader up manually to match its actual level (100%)

Lower Sub 1's fader. Little yellow "I" symbols appear in the tombstone, and the channel level is scaled with the fader

Sub 1 S 1 Mode S 1 Mode Enter Sub 1 is again given a mode of "Additive", the normal mode.

## Submaster Timing

Go To Cue Out Enter All manual control and cues are removed.

Sub 2 S 5 Hold Enter Sub 2 now has a Hold flag.

(2) Pressing Sub 2's bump button latches the Sub to Full.

(2) Pressing the bump button again returns the Sub to zero.

Sub 3 Time 2 Time 2 Time 2 Enter The Sub bump now causes the sub to fade over 2 seconds to Full, hold for 2, then fades to zero over 2.

Sub 4 Time 0 Time 0 Time 2 Enter Sub 4 will now flash to Full and fade to 0 over 2 seconds.

Give Sub 4 a timing of Manual to see the results. Double hit [Sub] to bring up the list of submasters, and use [Thru] to select and make timing/mode changes to multiple subs at the same time.

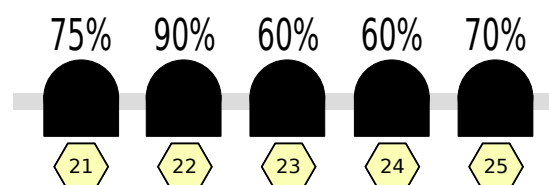
## Intensity Palettes

Intensity Palettes are a feature that allow you to create a "look" once, and then easily re-use it many times. This look can then easily be changed and this change will propagate through the cues in which it was already used.

The name "Palette" comes from a painter's palette. When the painter is setting out to mix the colours that will be used in the painting, it is much easier to create a palette with these colours pre-mixed. When she wants the orangey-red used in the sunset, it doesn't have to be mixed each time - she can simply use the pre-mixed colour. She may then choose to modify the mix on the canvas.

Unfortunately for the painter, once the paint is on the canvas, it no longer references the mix on the palette. Eos-family users have the clear advantage here - any changes to the base palette will be applied to the cues in which it is used. As an example, you may have a row of PARs that focus as high backlights. Due to varying distances, varying lamp age, and varying levels of filth on the gel, having all of the channels at the same level creates a rather unbalanced coverage. You can adjust levels to give a more balanced look.

Once this balanced look is stored to an Intensity Palette, it can be used in cues whenever a balanced wash is required. If a lamp is changed, a gel is cleaned, or for whatever other reason a re-balance is required, this can be done once and the palette updated. These new levels will now be applied in all of the cues that reference that palette as well.

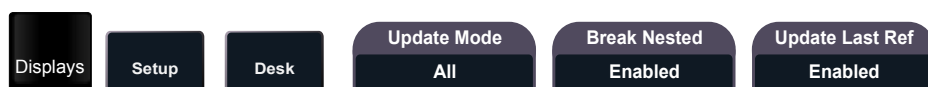


It is also possible to use this Intensity Palette as a starting point but then modify the levels in the cue. These levels are now "absolute" and will not be affected if and when the Intensity Palette is modified. The **{Make Absolute}** softkey has the same effect - it causes the selected channels to no longer be a reference to a palette.

## Update Setup Options

In the **Setup** menu, under **Desk Settings**, there are three options for Updating.

**Update Mode** allows you to determine whether Update operations will, by default, update changes back to the Palettes (or Presets, as you will see in a later tutorial) used in a Cue/Sub, or result in absolute information (hard numbers). For the remainder of these tutorials, it is assumed that you have changed this mode to **All**, which will update changes back to palettes by default.



With the added power of Intensity Palettes there are some risks. When you use absolute data in a cue, you can be reasonably sure that changes to that cue will not affect other non-tracking cues. When you are using IPs, a bit more care is needed. If you modify a channel in a cue that is using an Intensity Palette (or, as you will later see, any kind of palette), updating that cue will update the palette as well. This can of course be over-ridden on each Update operation, but it does require a greater attention to detail.

## Other Examples

Here are some other examples of when Intensity Palettes might be used:

- Record your House Lights into an Intensity Palette labelled "House". Use this palette in the stored cues. If you now see "House" on the Live display in a cue that shouldn't have the House Lights in, it is worth investigating.
- Similarly, the channel which rotates the mirrorball can use an Intensity Palette labelled "MB" for "On". This will make it very obvious when the ball is spinning, even if there are no lights on it.
- In a step-based Effect, you can assign a level for the step channels to go to. Using an Intensity Palette rather than a hard level allows you to have those channels at different levels than each other.

## Using Intensity Palettes in Live


Live   Go To Cue   9   Enter   2   1   Thru   2   5   At   8   Enter   The wash channels in Cue 9 move to 80%.

2   1   ↑ ↓   Adjust channel 21 with the wheel to even out the balance. Set channels 21-25 to the levels shown to the right.

2   1   Thru   2   5   Record   Int Palette   1   Enter   The wash channels are recorded into an Intensity Palette. The channels now show IP1 rather than their levels.

Update   Enter   Cue 9 is updated to contain the wash at an IP rather than absolute levels.

Go To Cue   7   Enter   2   1   Thru   2   5   Int Palette   1   Enter   This same IP is now manually applied to cue 7


 Press and hold **[Data]** to show the absolute data behind the reference (the IP).   Update   Enter   Cue 7 is also updated to contain the cyc at an IP rather than absolute levels.

Chn	Lev
21	65
22	75
23	60
24	55
25	80

2   1   At   6   Enter   Adjust channel 21 to 60%. Note the red **"R"** next to this new level. This is a warning to you that this channel *\*was\** in a reference, but you have applied a manual change.

Update   Enter   Update Cue 7. Note that channel 21 is again showing IP1, not 60.

**Update will, by default, update back to the original source - in this case, Intensity Palette 1.**

Go To Cue   9   Enter    Note that as the IP was updated previously, this new level of 60 carries through to each and every cue where IP1 is used.

2   2   At   6   Enter   Modify channel 22 - again note red **"R"** next to the level.

S 2   Make Abs   Enter   Note that channel 22's level of 60 is now "absolute" - it no longer references IP1. The red **"R"** disappears as well.   Update   Enter   Cue 9 is updated with channel 22 at 60% as absolute data. As a result, no changes are made to IP1.

## Using Intensity Palettes in Blind

Blind   Blind   Go to Blind. Note the double-hitting Blind will force a "re-sync" to the active cue in the main playback.   Format   Format   Use **[Format]** as required to view as a spreadsheet.


Cue   3   Enter   Cue 3 is selected for editing.   Group   3   Int Palette   1   Enter   The wash now uses IP1 rather than 60%.


At   7   Enter   Level changes are immediately absolute in Blind - there is no worry about accidentally updating palettes as in Live.   Int Palette   1   Enter   The wash again uses IP1 for Cue 3.


## Editing Intensity Palettes in Blind

Int Palette   Int Palette   Double-hit Intensity Palette to bring up a list.   S 6   Edit   All record target lists have an **{Edit}** option that will take you to that target in Blind.   Format   Change to Summary (tombstone) format.

2   3   At   7   Enter   As with any changes made in Blind, there is no need to update - the change is made immediately.

Blind   Blind   Again re-sync the active cue in Blind.    Note again that the new level of 70% for channel 23 can be seen in this cue.

Live    Note that channel 23 is still showing at 60%. Changes made in Blind to active Live channels do not automatically refresh.

Go To Cue   Enter    Note that channel 23 is now fading (in the Go To Cue time) to 70%.



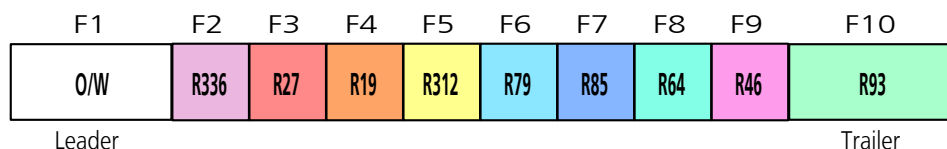
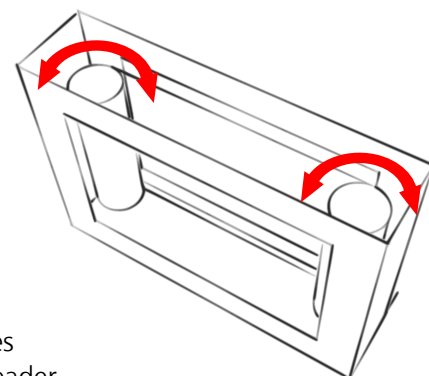
In Live or Blind, create two IPs for a channel to go between 0 and Full, with labels of "Zero" and "11". Now you can brag that your light goes to 11.

## Understanding Scrollers

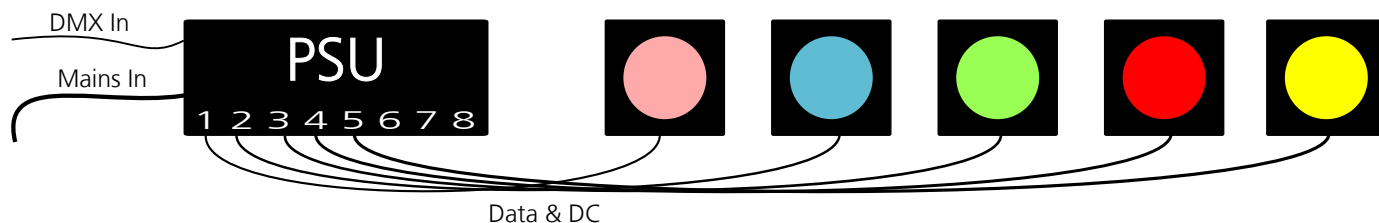
Colour Scrollers are mechanical devices that allow you to choose which gel is in front of your light. There are many different manufacturers and models of scrollers, but they all work in roughly the same fashion.

Internally in the scroller head, there are two spindles that rotate in order to move the scroll roll along from end to end. This places the desired gel in front of the light, and art is made!

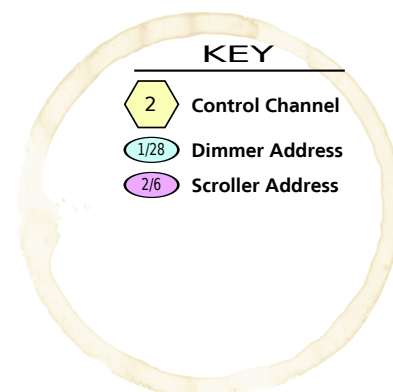
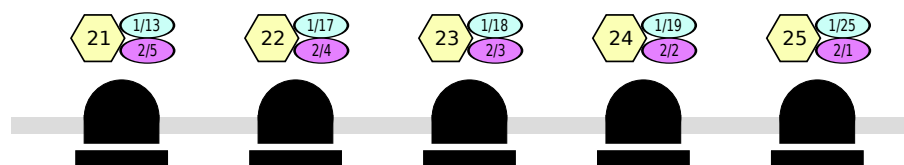
The scroll itself is made up of a number of gels taped together. There is a "leader" as well - a longer strip of colour (or clear gel) at the start of the roll which is taped to the spindle. Similarly, there is a "trailer" as well which attaches to the other spindle. For example, here is a 10-frame scroll with an N/C (clear) leader.



For operation, there is a Power Supply which receives data from the lighting desk and drives multiple scroller heads, usually with a combination DC and Data link. Each scroller head is assigned to one (or sometimes multiple) DMX addresses. A DMX level of 0 indicates that the scroll should be at the beginning, and a level of Full places it at the end.



Because a channel now consists of both a dimmer address (for the luminaire) and a scroller address, it is what we call a "compound channel" - a channel with more than one part. Typically, part 1 will be your dimmer address and part 2 will be your scroller address. This will normally be indicated on your rig plot:



# Patching Scrollers

Displays

S 3 Patch

Enter the Patch display

2

1

Enter

Note that 21 is already patched to address 13 with type Dimmer.

2

1

Part

2

Type

Manfctr

>>

>>

Generic

Scroller

Channel 21 now has two parts - part one remains a Dimmer, but part two now is assigned a type of "Scroller". Although the above syntax may seem long-winded, the philosophy is the same no matter what type of device is placed onto a channel. Note that a default 11-frame scroll is also placed onto the scroller. We will apply a custom scroll later.

At

2

/

5

Enter

Channel 21 part 2 (the scroller) is patched to 2/5 - address 5 on universe 2.

2

2

Part

2

Type

Favorites

Scroller

As above, channel 22 now has two parts, dimmer and scroller. Note that once a device type (eg Scroller) is used in the show, it is usually easier to patch it from the list of existing devices under {Favorites}.

Patch the remaining scrollers:

Hint: Remember the time-saving patching techniques you learned in lesson 3!

Channels	Dim Add	Scr Add
21	1/13	2/5
22	1/17	2/4
23	1/18	2/3
24	1/19	2/2
25	1/25	2/1

# Creating Custom Scrolls

2

1

Thru

2

5

Enter

Channels 21 through 25 are selected.

S 3 Attributes

Scroller

Go to the Channel Attributes view. You can now choose an existing scroll in the show. As this is our first scroll, none of the existing scrolls will be appropriate.

New

You have now created a new empty scroll. The scroll is given the label "New Wheel (1)".

Label

Label

TBT

Enter

Label the scroll "TBT". Using [Label] twice will clear the existing label.

#	Name	Calib	C/G
	New	0	

Select the first grey frame under the C/G column. This will bring up a dialogue asking what gel manufacturer you want to use, and what sub-category, if appropriate.

Open Frame

Select {Open Frame}, as our scrollers have clear media as frame 1.

Frame	Name	C/G
	Generic open open	0
	New	

Select the next empty frame. Again, this will bring up a dialogue asking which gel manufacturer and sub-category you want to use.

Rosco

Roscolux 5

...

R336

Select Rosco as a manufacturer, then Roscolux as a sub-category. Use the navigation arrows to scroll to R336, then select that tile.

Note the number under each gel range, for example 3 under Lee and 5 under Roscolux. These are the universal shortcuts for referring to gel. You can avoid hunting through the gel list by typing in the number on the keypad.

New

5

/

2

7

Enter

Assigns the currently selected "New" field as Roscolux 27

Continue these steps to create 10 frames with the colours:

Frame	Colour	Frame	Colour	Frame	Colour
1	Open Frame O/W	4	R19 Fire	7	R85 Deep Blue
2	R336 Billington Pink	5	R312 Canary	8	R64 Light Steel Blue
3	R27 Medium Red	6	R79 Bright Blue	9	R46 Magenta
				10	R93 Blue Green

Done

Selecting {Done} will take you out of editing mode.



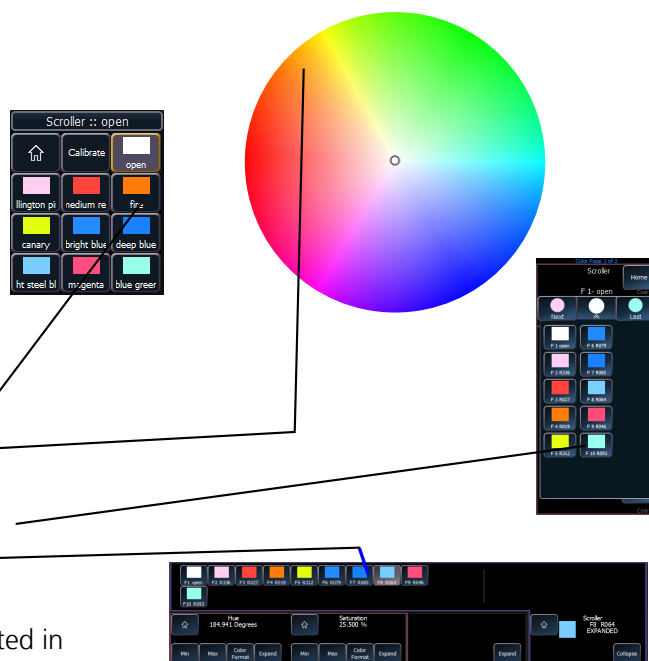
## Scroller Manual Control

There are several methods of controlling scrollers, largely because there are different ways for a designer to indicate what he or she desires. For example:

- "Take channel 21 to frame 4"
- "Put 21 to the next colour"
- "Give me channel 21 in R19"
- "Just make it orange, I'm going for tea."

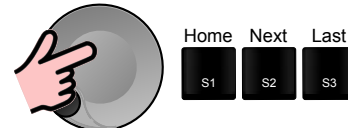
As a result, The Eos Family allow you to use any of the following methods to control a scroller:

- Command Line 21 Scroller 4 Enter
- Command Line 21 Scroller **{Next}** Enter
- ML Controls 21, click on the "fire" colour chip
- Color Picker 21, click in the orange bit
- Encoder 21, move the encoder
- Eos Encoder Display 21, use **{Next}**, **{Last}**, or dropdown
- Gio Encoder Display 21, use **{Next}**, **{Last}**, or expand



You will notice at as soon as a channel with a scroller is selected in Eos and Gio, the encoder LCD will show the gels in that scroll roll, as created in Lesson 17 (you may have to press **[Color]** to go to the Color category). There are direct selections for each frame as well as **{Next}**, **{Last}**, and **{Home}** buttons.

Ion does not have an encoder LCD screen, but you can still use the **{Next}**, **{Last}**, and **{Home}** options by pressing and holding the Scroller encoder and using the appropriate softkeys.



## HTP vs LTP

Remember that the intensity output between a submaster and a cue is "Highest Takes Precedence" or HTP, meaning that whichever source is providing a higher level "wins". If a cue is sending the tab warmers to 20% but a submaster is sending 50%, the sub wins and the output is 50%.

A scroller is referred to as a "Non-Intensity Parameter", or NP. Other desks may refer to these by other names, such as Attribute, Parameter, Function, etcetera. The point is the same, however - these are the parts of a channel that do not dim up and down. As a result, the concept of HTP no longer makes sense. Using the example above, if a cue is telling a scroller to be in R312 (yellow) but a sub is instructing it to be in R46 (magenta), who is right? Just because R46 happens to be in a frame that is achieved with a higher DMX value, that doesn't mean it should win.

The answer is that "Latest Takes Precedence", or LTP, rules are used. This simply means that whichever source is the latest to give an instruction wins. In the example above, if the cue were sending R312 but you then executed a sub with R46, R46 would be output. If you re-played the cue, R312 would again be output. Days of fun!

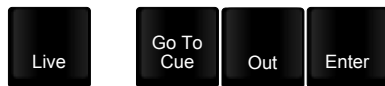
## Home

Every NP of every channel has a "Home" value - the value it goes to if not otherwise instructed. In the case of a scroller, the default Home value is 0, as it is common to place Open White/Clear/NC in the first frame.

During plotting and or rig check, it is useful to send a parameter to Home, especially as the rig moves on from scrollers in complexity. For this reason, the Scroller has a **{Home}** option on the Eos/Gio Encoder LCD and as an Ion softkey when the encoder is pressed down.



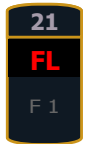
# Scroller Manual Control



The main playback is reset to the beginning. All manual intensities are faded out, and all NPs (non-intensity parameters, such as scrollers) are sent to home as well).



Channel 21 goes to Full. Note that channel 21's "tombstone" is slightly larger than a conventional channel's, and that a colour category is shown with F1 in grey, indicating that the colour category of this channel (in this case, a scroller) is at its Home value. Remember that **red** indicates manual (unrecorded) information about a channel.



The NP controls on the desk are broken into various categories - in this case, the Color category is selected to give us control of the colour scroller. Depending upon your patch, you may need to hit the **[Color]** button more than one time to get to the appropriate page.



Rotate the encoder next to the display that shows "Scroller". Note that channel 21's tombstone now has a red frame number displayed.



You should notice that the encoder is stiff, and clutches every few degrees. This allows you to control framed devices such as scrollers. You should see the scroll move to the individual frames, and see the frame number and associated colour appear. Press and hold **[Shift]** whilst turning the encoder - you now have full control of the scroll's travel.



You can also use the **{Next}** and **{Last}** to move between frames. You will also see a dropdown box to select a gel directly.



The scroll moves along its travel. Press and hold the encoder to reveal **{Next}** and **{Last}** buttons to take you to full frames.



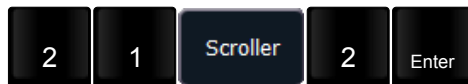
Notice that the display on both the Live screen and encoder display sometimes shows a frame number along with a "+" or "-" symbol. This indicates that the frame is not centred - you may have a split frame. Using **{Next}**/**{Last}** will ensure that you have a full frame.



Remember that many displays have multiple formats. Live Table format is now selected. You may have to hold **[Params]** and select **{Color}** to expand the color category. You should still see that channel 21 is in the same frame or split-frame.



Remember that many displays have multiple formats. Live Table format is now selected. You may have to hold **[Data]** and select **{Color}** to expand the color category. You should still see that channel 21 is in the same frame or split-frame.



You can set frames directly using the CIA **[Scroller]** tile. Channel 21 is now in frame 2.



Pressing on the encoder will post "Scroller" to the command line.



The scroller is returned to frame 1, and is again shown in grey. This indicates that the parameter is at default. Remember that if all parameters of a channel are at default, the channel is not recorded (unless it is specifically added as part of a selective store).



Open an "ML" Control to set the scrollers 21-25 to various colours as well as **{Home}**. Note that the Color Picker will set each scroller to the closest gel match. Remember that you can use **[Sneak]** to move slowly to frames - for example, **[2][1] [Sneak] [8] {fire}** .

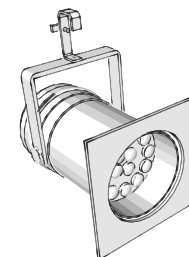


In a Magic Sheet, place five PAR fixtures assigned to channels 21-25, and tick the Scroller option in the Property Editor. Note how the symbol now automatically reflects the colour of the gel in front of the symbol. This is better than the show!

## Understanding LEDs

The newest technology in entertainment lighting is that of multi-coloured LED fixtures. LEDs are generally a lower-power device for the same amount of light output as a conventional fixture. The simplest and most common multi-colour LED fixture is the Red-Green-Blue or RGB variety.

The theory is that as RGB are primary colours, the three colours can be combined to mix any desired colour. In practice, RGB LEDs have a very limited spectrum and as a result tend to perform poorly for less saturated and/or non-primary mixes.



## Controlling LEDs

Most LED fixtures are DMX-controlled, with one DMX channel for each colour. Many also contain a fourth channel for an overall intensity. This "virtual intensity" allows the user to mix colours as desired and then lower the intensity without re-calculating the RGB levels (as these levels are what actually create the intensity). In order to see light output, this intensity channel must be above zero, just as if you were controlling a conventional channel with a colour scroller.

Many LED fixtures also contain "macro" channels for use with lower-end lighting desks that do not have the effect capabilities of the Eos family. In some cases, it may be easier to ignore these parameters. See an example LED DMX chart to the right and note that the "Generic RGBI" profile in Eos only contains 4 parameters.

FabuColour 300	Eos Generic RGBI
1 Red	1 Red
2 Green	2 Green
3 Blue	3 Blue
4 Dimmer	4 Intensity
5 Colour Chase	
6 Colour Fade	
7 Random Strobe	

Note that there are also many RGB LED fixtures that do not contain a virtual intensity, only Red, Green, and Blue LED control. For these fixtures, Eos and Ion still provide the virtual intensity, which operates under the same principle as above - you can mix the RGB colours as desired and then adjust the overall intensity. On the console display, the RGB parameters will still display between 0-100% regardless of the intensity.

## Beyond RGB

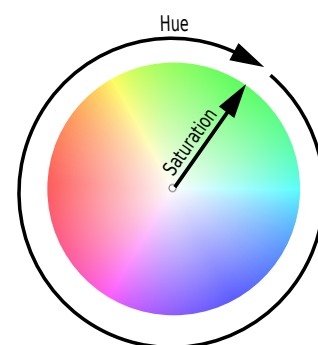
As discussed earlier, RGB LED fixtures do not generally provide a large enough spectrum for more subtle designs. As a result, there are various solutions, such as fixtures with the addition of a white LED (RGBW), or the addition of an amber LED (RGBA).

ETC has a range of LED luminaires called the Selador Series. These lights contain seven different colours in order to "fill in the gaps" left by simpler technologies. In addition, an intensity channel which is optimised to match that of a tungsten light is provided.

## Hue and Saturation

As modern lighting rigs now tend to contain a mixture of technologies for adding colour (CMY, RGB, Selador x7, and gel scrollers), The Eos family supports the use of Hue and Saturation to select colours. Hue and Saturation may not be defined parameters on actual lights, but it is an abstracted "Rosetta Stone" to allow you to use one method of colour selection and colour copying across multiple technologies.

As you can see in the diagram to the right, Hue is a 360° circle for "Which Colour?" and Saturation is a 0-100% level for "How Much Colour?". As a result, at 0% Saturation the Hue is irrelevant.

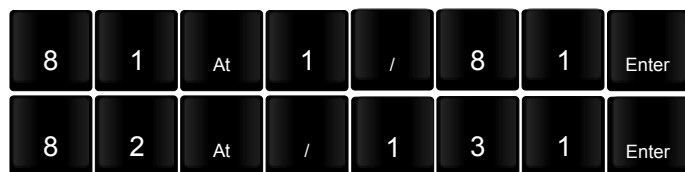


As some technologies fade better between colours in their native format (especially Selador x7 fixtures), a **{Color Format}** button is provided - this simply ensures that record targets use the native mixing format of the luminaire. In addition, you can force fades in native colour space in the Setup menu.

# Patching Selador Desire LEDs



Fixtures with multiple modes are shown in blue, to indicate a further layer of information. For example, the physical device in this case is a D40 Fire, which has been put into RGB mode by the user. Clicking on the fixtures shows you the available modes.



Channel 81 is patched at address 81 on universe 1.

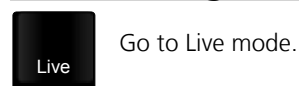
Channel 82 is patched at address 131 on universe 1.



Patch the remaining LED fixtures in the rig:

Channel	Type	Mode	Address
83-84	Selador Desire D40 Ice	Direct+Strobe	1/91, 1/121
61-64	Selador Desire D40 Lustr+	Direct+Strobe	2/471, 10 addresses between
65-66	Selador Desire D40 Vivid	Direct+Strobe	2/11, 10 addresses between
67-68	Selador Desire D40 Vivid	Direct+Strobe	1/301, 10 addresses between

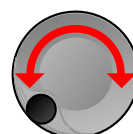
## Controlling LEDs in Live



Channel 83, a Selador Ice, goes to Full. Note that due to the intensity channel, there is no need to bring up the individual colours to full.



Go to the Color category if you are not there already. You should now see controls for Hue and Saturation.



Manipulate the Hue/Sat encoders to see the results. Use **[Home]** to again return Hue/Sat to 0/0.

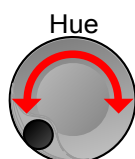


As in Tutorial 18, you have now directly selected Lee 71, and the Hue and Saturation are changed appropriately. Change to a few other colours and then use the Saturation control to mix a very unsaturated blue tint.



The Color Picker uses the same gel range shortcuts that we used while making scroller rolls, so you can call up gel numbers from the command line

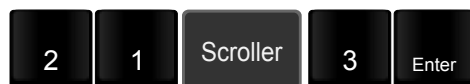
61-68 (Selador Lustrs) recall the data from 83, and go to Full in an unsaturated blue tint.



Manipulate the Hue encoder to see the subtle change in colour. The Saturation is maintained.



Manipulate the Saturation encoder. The Hue is maintained, but the colour becomes much more saturated.



Channel 21 (a scroller) is now in frame 3. Remember you can press the Encoder to post "Scroller" with an Ion.



Channel 21's colour (a lovely red) is copied to the Selador luminaires.



Intensities are faded to zero, and the main cuelist is reset to the top. Note that the manual colour changes you have made are not changed - they simply show in grey.



Both intensities and NPs (Non-Intensity Parameters) are returned to their home value. All cue lists will also be returned to the top.

## Color Palettes

Remember from Lesson 16 that Intensity Palettes are a method used to store a range of levels which can be easily used by cues, and if these levels are subsequently changed, the cues automatically reference these new values.

Color Palettes operate under the same principle - they are a method for storing the Color parameters (and indeed can only store Color parameters) for later use. For example, you could set all of your scrollers to Frame 4 manually for each cue, but it is probably better practice to record them into a Color Palette, because:

- You can make a small adjustment to the scroller, and then update the Palette and not have to update each Cue
- You can change the scroll to another one that has R19 in a different position and quickly update the show
- You can include your LEDs and Colour-mixing MLs in this Palette to not have to mix/recall each time
- It may be easier to "find" this Palette on a Direct Select button rather than on the Color category encoder
- You can use **[Recall From] [CP]** to quickly bring every light that has data for this palette into it
- Color Palettes can be part of a Query operation

## Recording

When recording cues, using a Full Record (see Lesson 4) is normally used, as the entire state of the stage is what should be stored. When recording Palettes, it is more common to use a Selective Record - a channel list is provided before **[Record]**, such as **[2][1] [Thru] [2][5] [Record] [Color Palette] [4] [Enter]**.

In addition, you may find **[Record Only]** a useful tool. **[Record Only]** automatically selects only channels with one or more manual (red) values. As a result, if you are in a Cue and make a colour change to a channel (or a group of channels), using **[Record Only] [Color Palette] [x] [Enter]** will ensure that you don't store the colour of the entire rig into your Palette. If you do, you can easily remove unwanted channels using **[At] [Enter]** in the Palette Blind editor.

## Numbering Conventions

Palette numbering to the thousandths is supported - meaning you can have 9999 Color Palettes ranging between 0.01 and 9999.99. There are various options for which numbers to choose. Some conventions are shown below.

### CP # = Gel #

CP 1	Open White
CP 2	Rosco 02
CP 19	Rosco 19
CP 79	Rosco 79
CP 201	Lee 201

### Advantages

- Easy to use from keypad, especially useful for Ion
- Designers "call by gel"
- No requirement to label each CP

### Disadvantages

- Scroller rig-check more difficult - secondary cue list suggested
- Some gel numbers are shared between manufacturers - must use CP x.1, x.2

### CP # = Frame #

CP 1	Frame 1
CP 2	Frame 2
CP 3	Frame 3
CP 4	Frame 4
CP 5	Frame 5

### Advantages

- Scroller rig-check very easy
- Easy to use Direct Selects
- Quickly record to Direct Selects
- Designers "call by frame"

### Disadvantages

- Slower to use keypad
- Works best with only 1 scroll load

### CP # = Scroll.Frame #

CP 1.02	Scr 1, Fr 2
CP 1.14	Scr 1, Fr 14
CP 2.01	Scr 2, Fr 1

### Advantages

- Scroller rig-check very easy
- Easy to use Direct Selects

### Disadvantages

- Slower to record to Direct Selects
- Slower to use keypad
- Must remember scroll load

Another option is to record Palettes using CP#=Frame# to quickly create and test the Palettes, then move them to CP#=Gel#. If and when Palettes are moved, the show (cues, subs, etcetera) are also updated to reference the new Palette number.

## Creating Color Palettes in Live

Live 2 1 Thru 2 5 At 3 Enter The scrollers are now at 30%. Note that "F1 open" shows in grey in the channel tombstone.

Select Last Scroller 1 Enter Use this or any other method from Lesson 18 to put the scrollers into Frame 1. Note that the channel tombstone now shows "F1 open" in red. By selecting Frame 1, you have forced the scroller to have manual information, which will ensure that **[Record Only]** will store this value.

Record Only Color Palette 1 Label Note o/w Enter 21-25 are stored with the scroller in Frame 1 into CP1 which is labelled "O/W".

Select Last Scroller 2 Enter The scrollers are now in Frame 2, R336. Record Only Color Palette 2 Label Note r336 Enter As above, a new CP 2 is created and labelled.

6 1 Thru 6 8 Recall From 2 1 Enter The Side LEDs are now at 30% in the HS match for R336.

Full Full Seladors go to Full. Sat Move the Saturation of the LEDs to around 40%.

Select Last Record Color Palette 2 Enter Enter The LEDs are also recorded into CP2. Note that a Selective Record rather than **[Record Only]** was used, as you specifically wanted to record only 61-68.

Group 3 Scroller 3 Enter Record Color Palette 3 Enter Note that you have accidentally recorded more than just the Scrollers into CP3. You'll fix this in Blind.

Color Palette Color Palette A list of Color Palettes is opened in a new tab. Use **[Next]** and **[Last]** to navigate in the list. S 6 Edit Color Palette 3 is now open in Blind. Note that this is a shortcut to typing **[Blind][Color Palette][3][Enter]**.

## Editing Color Palettes in Blind

6 1 Thru 6 8 At Enter The LEDs are removed from Color Palette 3 - **[At] [Enter]** removes information. As this is a Blind editor, you can also put new values in.

Recall From 2 1 Enter The LEDs have now pulled in the Hue/Saturation values from 21, a scroller. You will likely want to modify this palette in Live to more closely reflect R27, but it is a good start.

Color Palette 4 Label Note r19 Enter Color Palette 4 is created, but is empty. Group 3 Scroller 4 Enter The scrollers are added to CP4 in frame 4.



Create Color Palettes for each of the scroller frames 1-5. Also copy the scroller data to the Seladors 61-68. Test all Color Palettes in Live using **[Clear] [Recall From] [CP]** to ensure that they are correct.

## Using Color Palettes in Cues

Live Go To Cue 1 4 Enter Group 3 Full Enter Color Palette 3 Enter Modify Cue 14 to put the scrollers in CP3/R312.

Select Last Rem Dim Enter As we only want the scrollers on in this cue, use Rem Dim to take everything else out.

6 1 Thru Next Full Enter Color Palette 4 Enter 2 5 Out LEDs 61-62 are in CP4/R19. Note that 25 is out, but its colour is still in the CP.

Record 1 5 Label Note Colours! Enter Cue 15 is recorded with the scrollers and Seladors using different CPs.

2 1 + 2 3 Color Palette 2 Enter Update Enter Cue 15 is updated with the upstage scrollers in CP2/R336.



Create a Magic Sheet with an array of Color Palettes. Set the fill colour to be linked to channel colour. Note that the highest channel number with data in the palette will be used (useful to create a dummy channel to tweak the displayed colour).

## Marking

---

Marking is, simply put, the action of moving the NPs (Non-intensity Parameters) of a channel before the light's intensity moves from 0 to a non-zero level. This is variously referred to as marking, dark-moving, presetting, but the idea is the same: move the wiggly bits before you see the light.

Why? We've all see how horrible it looks when a light is moving both its intensity and colour at the same time - as it fades up, we see the colour changing from O/W, R336, R27, R19, etcetera. This looks even more horrible if you also add in gobos snapping to positions, ML colour wheels snapping to each intermediate colour, or media server images cycling through. Sad to say, but there are really only two things that the average person will recognise as bad lighting:

1. Bad followspotting.
2. Live moves of scrollers and moving light parameters as a light fades up.

The bad news is that there is little that the console can do about item 1 (short of a followspotter's shock collar), but there are more options for item 2:

### - Manually Mark (preset) ML Parameters

If Cue 15 has a light both moving from 0 to a level and a colour change, record the colour change in Cue 14 (or 13, or 12, etcetera). This works well and has been a tactic to preset lights for many years. The biggest disadvantage to this technique is that if you later change the colour (or position, gobo, whatever) of the light in Cue 15, you must remember to also update the cue where you actually presetting the light, otherwise you will again have a live move, possibly an even more embarrassing one.

### - Automark ML Parameters

Most modern lighting desks have a facility to automatically mark lights. Various desks have various names for this feature - automark, move in black, go in B - but the logic is the same: "If the light is at 0 but in the next cue it is at a level and also has one or more NP move instructions, move it now."

On the Eos Family, Automark Enabled/Disabled is a Setup option and is Disabled by default. The automark happens in the time of this "one-before" cue, unless a Mark Time is specified in the Setup menu.

On a cue-by-cue basis, you can disable Automark if you want to have a live move - for example you do want the LEDs to not only fade from 0 to 75% but also see the blue to red transition. This is also used if you do want ML focus transitions that are live.

### - Use Referenced Marks

The Eos family have a much more powerful marking system called "Referenced Marks" which you will see in a later tutorial. This system allows you to be much more specific about exactly what channels/parameters mark in which cue.

## PSD Automark Flags

---

On the PSD, you will see an "M" column in the Flags section - this will give you an overview of any marking activity.

An "M" flag indicates that at least one parameter of one channel is automarking in this cue. A "D" flag indicates that Automark has been disabled for this cue, and you will see a live move.

# Automark in Live

Live Go To Cue Out Enter All intensities are fade out, and all parameters are reset to their home values.

Go To Cue 1 3 Enter Cue 13 is active in the master fader pair. Note that 21-24 and 61-62 are at 0 in Color Palette 1 (Open White).

GO GO Note the live colour transition between Cues 14 and 15 - the scrollers move from O/W to their various colours and 61-62 (Selador LEDs) move from O/W to CP4 as they fade from 0.

Displays S 4 Setup S 1 Show Show Settings Auto-Mark Enabled Automark is now enabled. This will cause NP moves for channels moving from 0 to occur in the previous Cue.

Live Note that on the PSD, Cue 14 has an M flag. This is an indication that at least one channel is automarking in this cue. STOP BACK STOP BACK You are back in Cue 13.

GO Note that 21-24 now show Q15 in the tombstone - this is an indication that these lights are in a marked state, pulling the NP information from Cue 15. GO Note that as the NPs were marked, there are no live transitions.

6 1 Thru 6 8 Full Color 3 / 1 0 1 Rem Dim Enter The LEDs go to Full in yellow.

Record Next Enter Cue 16 is recorded. Notice that Cue 15 now also has an M flag.

STOP BACK STOP BACK GO GO Note the Seladors Mark for this colour before they come to a level. \*\* Note that 61 and 62 cannot mark, as they already have a level.

6 1 Thru 6 8 S 5 Offset 2 Color 3 / 1 9 Enter Half of the Seladors are now in Orange.

Update Enter STOP BACK STOP BACK GO Note the changed Seladors automark for this new colour before they come to a level. Hold **[Data]** to see the actual colour.

GO 2 1 Thru 2 4 At 5 Enter Color Palette 5 Enter The scrollers move to frame 5 at 50%.

Displays S 4 Setup S 1 Show Show Settings Mark Time 1 The Automark time is now set to 1 second - now all marks will happen in 1 second rather than the cue's stored time. Live

Record Next Time 2 Enter STOP BACK STOP BACK GO Note that 21+23 wait until they have faded to 0 to perform their automark. GO



\*\* As 63-68 have not been used in the Cue list, no MK is displayed in Cue 15. To force the MK display, these channels must be placed into the Cue list prior to Cue 16. Try going into Blind and setting them to 0 in Cue 15, then playing the Cue back in Live again using **[Go To Cue] [Enter]**.

# Automark Disable

2 5 Full Full Color Palette 4 Enter This scroller is at full in a new Color Palette.

Record Next Time 3 Enter Cue 18 is recorded with a time of 3. Note the M flag on the PSD for Cue 17 as seen earlier.

STOP BACK STOP BACK GO Note 25's scroller is marking for Q18. For some weird reason, you want a live move on this colour change. STOP BACK

Cue 1 8 S 6 AutoMarkOff Enter By putting an "Automark Off" flag on Cue 18, no channels will automark in Cue 17, and you will see a live transition on channel 25.

GO GO Note the live colour change. Live transitions of this nature are probably more common with moving light focus, as you will see in a later tutorial.

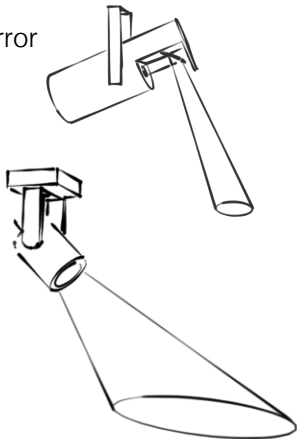


## Moving Lights

"Moving Lights" is a generic term for luminaires that have more parameters than just intensity and colour. There is no hard-and-fast rule, but generally any device with focus parameters (where the light is pointing) is considered an ML.

Most MLs fit into one of two categories - "Moving Mirror" and "Moving Head". Moving Mirror fixtures (aka scanners) use a small mirror to direct the light output - the actual source is static. These have the advantage of generally being very quick-moving. The disadvantage, and probably the reason that they are more and more rare, is that they are quite limited in their range - they can only point in a relatively small cone below where they are rigged.

Moving head devices are characterised by the fact that the entire light source (lamp, optics, colour-changing mechanisms, lens, etcetera) physically moves. As a result, they are slower to move than mirror-based fixtures but have a much greater range. Moving head fixtures are much more likely to be found in a theatrical environment than scanners.



## NP Parameters

"Moving Lights" could legitimately be referred to as "Buckets O' Parameters". Most moving lights have several parameters, which the software categorises into different, well, categories. For example:

Intensity Category	Focus Category	Color Category	Beam Category
Intensity	Pan	CMY Mixing	Frost
	Tilt	Colour Wheels	Gobo wheels
		Colour Temperature	Zoom Mechanism
		Correction	Framing Shutters
			Animation, etcetera...

## Fixture Parameters

Each ML manufacturer decides how to map the DMX (or network-based control) channels for a fixture. For example, two different moving-head fixtures might use the following values:

### Superspot 250

DMX	Function
1*	Pan
3*	Tilt
5	Intensity
6	Zoom
7	Gobo Select
8*	Gobo Angle/Speed
10	Function

### Wonderbeam 700

DMX	Function
1	Intensity
2*	Tilt
4*	Pan
6	Animation
7	Macro
8*	Gobo Angle/Speed
10	Gobo Select

The starred numbers above indicate that these are 16-bit parameters - they actually use two DMX addresses together. This is common for any attribute that requires greater than 255 individual steps. As an example, 255 steps is more than adequate for Zoom, but would cause problems if applied to Pan which has 540 degrees. Using two addresses together gives 255\*255 (~65 thousand) potential values. That should do it!

It would be very difficult to remember how each manufacturer has layed out their mapping. Fortunately, this is where a console's library comes into play - it is a list of manufacturers and fixture models that has this data. You only need to patch the fixture and the desk sorts out which DMX address (offset from the defined start address) should be adjusted for, say, Zoom.

To further complicate things, however, many fixtures have many different modes. Not everyone is lucky enough to have an Eos-family desk, and they may need to run the lights in 8-bit mode, or without fan control, or without reset, etcetera. Also, many fixtures have different options - a fixture may have either framing shutters or an iris - and this must be accounted for when it is patched.



# Patching Moving Lights

Displays

S 3 Patch

Enter the Patch display. Ensure that you are in By-Channel format.

241

Type

Manfctr

ETC

Revolution Wybron

RWM/SM

Channel 241 is set to a type of ETC Revolution with the appropriate modules.

At

51

/

263

293

Enter

Channel 241 is patched to universe 51, addresses 263-293 (the DMX footprint of the device).

243

Type

Favorites

Revolution RWM/SM Wybron

Channel 243 is also now set to a type of ETC Revolution from Favorites.

At

/

201

Enter

Note that selection **[/]** is a shortcut to fill in the last-used universe.

106

Thru

110

Type

Manfctr

Martin

Mac 250 Entour

S

At

201

/

201

More SK

S 5 Offset

20

Enter

Channels 106 through 110 are patched to 2/201, but leaving a gap of 20 addresses between each fixture rather than the default footprint. This allows for easier fixture/mode changes in the future.

Patch five Martin MAC 250 Wash (Standard mode) to channels 101-105, with a starting address of 2/101. These also have an offset of 20.

## Remote Dimmers

115

Type

Manfctr

VariLite

VL1000 TS

Channel 115 is set to a type of Vari\*Lite VL1000TS. Because this fixture requires a remote dimmer, two parts are automatically created, as with scrollers.

At

271

/

97

Enter

Channel 115 Part 1 (the device head) is patched to 2/71-97.

Part

2

At

1

/

5

Enter

Channel 115 Part 2 (the remote dimmer) is patched to 1/5.

## Inverting Pan and/or Tilt

S 2 Attributes

115

Invert Pan Enabled

The encoder for the Pan attribute is now inverted. This will make control of the pan more logical and also the same as the MAC moving lights.

## Lamp Controls

Live

Open an "About" control - this display will give you detailed information about whatever is selected.

101

Thru

110

Enter

The About display now shows details about Channel 101, the first channel in your selection.

Lamp Controls

The **[About]** display contains built-in controls that send the appropriate control channel to the manufacturer-defined levels for various lamp and reset commands are shown.

Lamp On

Enter

The command to strike the discharge lamp is sent.

Add the following gobos to the VL1000 (channel 115):

Open

Apollo 3240

Rosco 77722

Rosco 77787

Rosco 77614

Rosco 77616

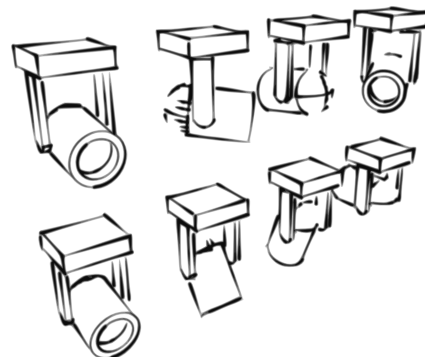
## Pan and Tilt

Most MLs' focus (also referred to as position) is achieved using two different but related parameters: Pan and Tilt.

Pan moves the entire assembly clockwise and anticlockwise about the Y axis - it is similar to panning a conventional lantern on the bolt attaching the yoke to the hook clamp.

Most modern moving lights have the ability to pan 540° or so, which is about 270° either side of "straight forward".

Tilt moves only the optical assembly about the X axis - it is similar to tilting a conventional light up and down. Most movers can tilt around 270°, which is about 135° either side of "straight down".



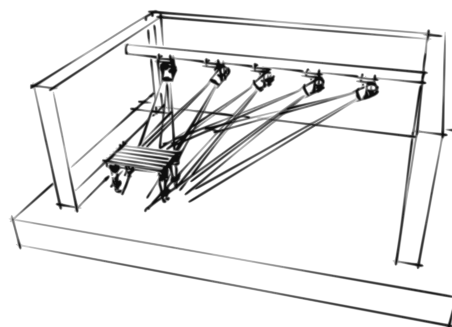
Focus is probably the simplest function of moving lights, but is also fraught with the most danger in terms of Bad Programming. Why? Because most moving-head fixtures can pan more than 360° and can tilt in either a positive or negative direction, there are usually at least two if not three Pan/Tilt combinations to hit the same spot. This is not normally a big problem unless you are using live moves (the light moving whilst the intensity is up) - a light spinning around 380° to hit a new position looks, well, horrible. The **{Flip}** function can help to fix these errors by re-pointing the light at the same position but "the other way around", but following some golden rules will prevent these nasty flips entirely:

- Tilt before you Pan - it is nearly impossible to judge the correct Pan angle when a light is pointing straight down
- Go Home - home the focus (pointing straight down) before you create a new focus position
- Think Ahead - before deciding which way to tilt or pan, think about the other possible future positions - can you reach them using this Pan/Tilt orientation?

## Focus Palettes

In Lesson 20 you looked at Color Palettes - a tool to re-use and automatically update colours in your show. Focus Palettes operate under the same principle.

A classic example of the use of a Focus Palette is the table in *Death of a Salesman*. You will be pointing various MLs at this table over and over again throughout the show. The colour, or frost, or intensity might change, but the light(s) will still be routinely asked to point at that table. It is wise to create a Focus Palette called "Table" which contains the data for all of the appropriate MLs so that you don't have to manually place it each time.



When the designer calls for channel 101 to point at the table, you simply use the palette. If it is later decided that the table needs to move upstage by half a metre, you simply re-focus the lights and then update the Focus Palette. As the Cue references this palette rather than absolute Pan/Tilt information, cues will now use this new information. This is also a crucial tool on a tour, where the actual Pan/Tilt values will be different in each venue.

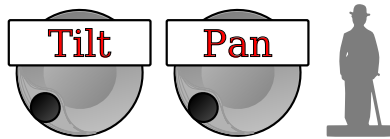
It is also a win for the designer - rather than seeing Pan -24° and Tilt +48° (whatever that means!), they will see "Table" on the Live/Blind summary (tombstone) display (if **Show Reference Labels** is set to **Enabled** in Setup).

Focus Palettes do not have to contain data for lights pointing at one location, of course. You could (and probably should) create Focus Palettes for your Stage Wash, Cross Wash, Audience Blinders - any combination of Pan and Tilt information that you will routinely re-use and/or may want to keep as a reference rather than absolute data.

## Using Pan and Tilt Encoders



Channel 101, a MAC 250 Wash, is selected and brought to Full. Note that it is pointing straight down, sometimes called its "50/50" position.



First use the Tilt encoder to raise the light up to an approximate angle to provide backlight for Charlie. Then use the Pan encoder to finish the job. In the Live channel display, if you are in Table format you should see the Pan/Tilt degrees onscreen.



Repeat this process with 102 - 105, using Tilt and then Pan to pick up Charlie. Use **[channel] [Home] [Enter]** if you find yourself lost or are unsure of your tilt orientation.

## Recording New Focus Palettes



A new Focus Palette is created with these MLs pointing at Charlie.



This FP is now labelled.



Note that this FP is also available on Direct Selects that are assigned as type Focus Palette.



Create Focus Palettes for the remainder of the characters (Lara, Marilyn and Nessie) for 101-105. Going **[Home]** between each Palette is good practice. Test each palette when complete by using **[Home]** and then the FP direct select. Don't forget about **[Next]** and **[Last]**! Put 101-105 at 0% when you're done.

## Recording Into Existing Focus Palettes



Focus channel 106, a MAC 250 Entour, at Charlie. These profiles will act as specials for our figures.



Channel 106 is added to FP1. Because FP 1 already exists, you must confirm any additions to the Palette. Using **[Select Last]** or a keyed selection before recording a palette ensures that you only record the desired Channels.



Add Channels 106-110 into each Palette. Don't forget to use **[Select Last]** or a keyed channel selection before **[Record]** to ensure that you only store the desired channel(s). Again test each palette to ensure that all of the lights point at the same character.



Focus channel 115 at the bottom of the cyc.



You may not realise it now, but it's all gone horribly wrong! Because you did not provide a leading channel selection, you have recorded 101-110 into FP5. Leave it for now, you can fix it later in Blind.

## Editing Focus Palettes in Blind



You are now in a Blind editor for Focus Palette 5. Remember that Blind edits happen immediately - there is no need for **[Update]** or **[Record]**.



101-110 are removed from FP5. This is largely a house-keeping exercise - it gets very confusing very quickly to have data in a Palette that isn't "right".

## Beam

The Beam category for intelligent lighting is sort of a catch-all - it is where all of the parameters that are not part of Intensity, Focus, or Color are grouped. Because the Beam category tends to be rather larger than Focus or Color, it is further sub-categorised into **Image**, **Form**, and **Shutter**:

### Image

Projected components and their related controls

- Gobo Select
- Gobo Mode (Index/Rotate/Special)
- Gobo Index/Speed (Index angle/Rotation Speed)
- Animation Wheels
- Effects Wheels

### Form

Components that affect the light output

- Zoom
- Edge (focus)
- Iris
- Shutter/Strobe
- Diffusion
- Internal Media Frame

### Shutter

Framing shutters and related controls

- Frame In 1,2,3,4
- Frame Angle 1,2,3,4

## Palettes

You will remember from earlier tutorials that Palettes are used to create references in cues (or submasters) - instead of recording "absolute" data, you link to a palette to make it easier to update quickly. Another benefit of referenced data is that it is, by its nature, self-documenting - when you store a light in Focus Palette "DSR" and Color Palette "R336", you can quickly see on your Live or Blind display what that light is doing. Beam Palettes work in exactly the same way - you create references in cues rather than absolute data.

There is a difference with Beam Palettes, however, which is related to their general usage. With Focus and Color Palettes, you generally only use one Focus/Color Palettes on a given light at the same time (although you might break colour temperature controls out in Color Palettes). With Beam Palettes, it is normal for a light to be in multiple BPs at the same time. This is because you are much more likely to only have only a subcategory (e.g. Shutter) or even a single parameter (e.g. Gobo Select) in a Palette. As an example, you might have a VL1000 in the following Palettes:

Focus: **FP 27** "John Bax"  
 Color: **CP 336** "R336"  
 Beam:  
     **BP 12** Gobo Wheel 1, Gobo Select 2 "Leafy Breakup"  
     **BP 19** Gobo Wheel 1, Gobo Mode Index "Index"  
     **BP 34** Zoom 48 "Medium"  
     **BP 44** Shutter Subcategory "Centred Box"

Note that not all of the Beam category is palettised - you have kept the Edge, Indexing angle and Diffusion as absolute data, as they are specific to this cue. There are no right or wrong answers here - some programmers might like to store an entire Beam Palette called "John Bax" to store all of this data, others might also create individual palettes for Edge, Indexing angle, and Diffusion.

We'll tease you with the idea of a reference type that can include all of the parameters - this is called a Preset. But we're not there yet.

## Controlling Beam Parameters



Channel 115, a VL1000, is selected and brought to Full in its Home position.

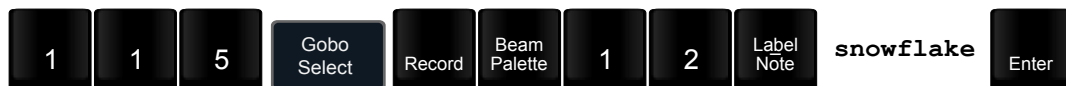


Tilt and Pan the light onto the Cyc.

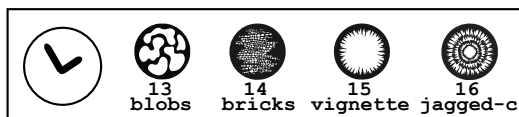


Use the Gobo Select encoder (or ML Controls) in the Image sub-category to put the snowflake gobo in the gate.

## Recording Beam Palettes



Channel 115's Gobo Select parameter is recorded into Beam Palette 12.



Create Beam Palettes for all of the VL1000 (Channel 115) gobos, ensuring that only the Gobo Select parameter is recorded. If you make a mistake and record too much, use **[At] [Enter]** in the Blind Beam Palette editor to fix it.



Channel 106, a Martin MAC250 Entour, is selected and brought to Full in its Home position.

## Using Filter



Enable filtering - only parameters/categories that are filtered in will be recorded.



Note that filtering does not affect control, only what is recorded.



Use the Gobo Select encoder (or ML Controls) in the Image sub-category to put the Eclipse gobo in the gate.



Channel 106's Gobo Select parameter is recorded into Beam Palette 22.



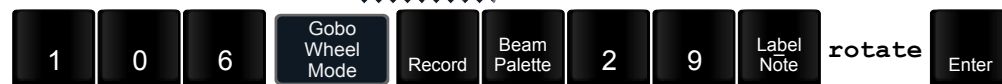
Create Gobo Palettes for the remaining gobos in Channel 106. Test each Palette. If you make a mistake and record too much, use **[At] [Enter]** in the Blind Beam Palette editor to fix it.



Disable filtering - all parameters will now, by default, be recorded again.



Using the ML Controls, put Channel 106's gobo wheel into Rotate mode. Note that the only change on your Live display is "Gobo Wheel Mode" to a value of 76.



Channel 106's Gobo Wheel Mode parameter is recorded into Beam Palette 29.



Create BP 30 with channel 106 in Index mode. Also create two BPs 19 & 20 for the VL1K for both rotate and index. Create BPs 11 and 21 called "gobo-home" for channels 115 and 106, respectively. These palettes should have the gobo in it open/home position but also include the mode and index/speed parameter at home.



Create two BPs with different framing shutter combinations, saving them as BPs 41 and 42. Ensure that you only include the Shutter subcategory. If you make a mistake, as always - fix it in Blind!

## Absolute Palettes

---

"Absolute" is a flag that can be put on a Palette, either at the time of Recording or at a later time. This flag forces data from a Palette, upon use, to display and record as absolute data - it is just as if you used the command line, ML Controls, or Encoders to put the value in. For example, you might create 5 Zoom Palettes for None, Small, Medium, Wide, and Full to speed up programming. These palettes are available on direct selects and via the command line as normal, but you have absolute data in Live and don't have to worry about storing/updating with references.

## Locked Palettes

---

You can lock a Palette either at Record-time or at a later time. This will ensure that this Palette cannot be over-written by a global Update command or with a non-selective Record. This is a useful flag for Palettes that you are reasonably sure will not need to change after they are created - for example, Gobo Palettes, generic Focus Palettes (DSR, DSL, CS), scroller frame Palettes with matched CMY/RGB/x7 mixes.

## By-Type Palettes

---

"By Type" is a flag that can be put on a Palette which forces it to use one channel as a "master" and other channels will track it. This allows you to, for example, have one channel in Gobo 3, store it as a By-Type Palette, and have other channels of the same type have the ability to also use that Palette. Any channel of the same type that is later added to the show will also have the ability to use this Palette.

This is also a very useful function in Color Palettes - you can mix a colour on stage with a MAC250 Wash, store it as a By-Type Palette, and now that Color Palette can be used by any other MAC250 Wash in your rig. You can also set individual channels within a By-Type Palette as "Discrete", which means that they have their own, non-tracking information. You can also have multiple By-Type channels within a given By-Type Palette - three different fixture types will have three different sets of information to achieve the same diffusion or colour, for example.



# Absolute Palettes

Live

1

1

5

Full

Full

Rem Dim

Enter

Frame In 1

Frame In 3

Frame In 2

Frame In 4

3

5

Enter

Select Last

Shutter

Record

Beam Palette

5

0

S 2 Absolute

Enter

Label Note

shutters 35

Enter

Channel 115, a VL1000, is selected and brought to Full.

All of the VL1000 shutters are in at 35%, a good starting point for creating shutter cuts.

BP50 is created as an Absolute Palette - this Palette will bring the shutters to 35% as absolute data.

# Locked Palettes

Color Palette

Color Palette

Bring up a list of Color Palettes

1

Thru

5

S 2 Lock

Enter

Your CPs 1-5 are now locked. You cannot over-write the data in these Palettes with a global Update or non-Selective Record operation.

⌚

In Live, make changes to Cue 15, mixing 61&62 to a new colour. Update and note that the Cue now shows absolute information rather than the Color Palette R19. Re-apply R19 and Update the cue. Again change the colour. This time, do a selective Update: **[6][1] [Thru] [6][2] [Update] [Color Palette] [4] [Enter]**. Now CP4 is updated.

⌚

Lock all of your Gobo Select and Gobo Mode Palettes. Unlock your Color Palettes, and re-mix 61&62 to match R19. Re-lock your CPs.

# By-Type Palettes

Live

1

0

6


Full

Full

Rem Dim

Enter

Gobo Select 2



oriental fire

MAC250 Entours have two Gobo wheels - one with rotating gobos, one with fixed.

Select Last

Gobo Select 2

Record

Beam Palette

3

2

S 1 By Type

Enter

1

0

7

Full

Full

Beam Palette



3

2

Enter

Note that 107 (another MAC250 Entour) can also use BP32 as it is By-Type.

⌚



wiggles peardrops

Create two more By-Type Beam Palettes with channel 106's Gobo Select 2 parameter. Test each Palette using channels 107-110.

# Editing By-Type Palettes

Live

1

0


1

Full

Full

Rem Dim

Enter



Use the Color Picker in the ML Controls to put Channel 101 into a fetching shade of Cyan.

Select Last

Record

Color Palette

1

1

S 1 By Type

Enter

A new By-Type CP is created with 101 as the By-Type channel.

Blind

Color Palette

1

1

Enter

1

0

5

S 6 Discrete

Enter

Color Palette 11 now has Channel 101 as the By-Type source, but 105 with discrete data - 105 will not track 101's changes.

1

0

2

S 1 By Type

Enter

Channel 102 is now the By-Type source channel for CP11. Note that Channel 101's data has automatically become discrete.

1

0

1

At

Enter

Channel 101 is now tracking the source channel, 102.

⌚

Reset Channel 101 as the By-Type source for CP11 with all other MAC250 Washes tracking it. Add Channel 115 to CP11 as a By-Type as well. Patch Channel 116 as a VL1000TS, note that it is also included. Delete 116 from the Patch again.



## Updating into Palettes

You'll remember from earlier tutorials (especially tutorial 16 about Intensity Palettes) that if a parameter in a cue contains a reference to a palette, and you make a change to that parameter, the Update function will, by default, update all the way through to the palette.

For example, if a lamp is in a Color Palette called "Red", and you tweak the colour to a slightly less saturated shade, and then press the **[Update]** button, you'll see that the target for the update is the palette, not the cue directly. The **{Make Absolute}** button will change that behaviour for this update (not future updates, though) and put absolute information in the Cue.

There is no right or wrong answer here - sometimes, an update back to the palette might be exactly what you desire, other times that might be exactly what you don't want! For example if the Focus Palette was "Bob's Backlight", and Bob has now been moved, you probably do want the change to be propagated back to the Focus Palette (unless that FP is used elsewhere in its original position). If, however, you have made a one-off change to a Focus (because an actor is cheating downstage for one scene) and you don't have the time to create a new FP (make time!), you can use the **{Make Absolute}** option to ensure that the original FP is preserved.

## Last Reference

There is an Update option (at both Update-time and as a user-definable Setup default) called **Last Reference**. With this option enabled, the most recent reference that a channel was in prior to manual changes being applied is the target for Update, rather than the original stored reference.

## Reference Only

Sometimes, you want to only update the reference (FCB Palette) but not update the change into the Cue - this most frequently occurs when you are in a Cue and decide to work on other palettes. **{Ref Only}** makes this easy.

## Update Dialogue


When you are updating cues, it is a good idea to make a habit of looking at the Update Dialogue in the CIA before confirming with [Enter]. This dialogue will tell you exactly where the update will be made - to the Cue or to the references. Note that this dialogue is interactive - simply touch/click on an item to remove it from the update.


LIVE: Cue 0.5 : Update _		
Target	Label	Channels
Cue 0.5	aud ent	
Color Palette 32	very nice colour	31>35



## Updating into Palettes

**Live** **Go To Cue** **0** **.** **5** **Enter** Go to Cue 0.5 in Live. Don't panic, that pesky masked programmer has been at it again! The show has been re-imagined.

**Group** **4**  **Enter** **Record Only** **Color Palette** **3** **1** **Enter** You have a new Color Palette - it is still showing in red on your Live display, but is not yet part of the Cue.

**Update** **Enter** This new CP is now updated into the Cue. **Select Last**  **Enter** **Update** **Enter** Note that your Live display still shows CP31 - the colour change has been updated directly into the Color Palette, and therefore the Cue as well.

**Undo** **Enter** You've travelled back in time. Don't concern yourself with the Grandfather Paradox. **Update** **Make Absolute** **Enter** You have now updated the Cue with absolute values for the Cyc.


**Select Last** **Record** **Color Palette** **3** **2** **Enter** You have a new CP, but it is not stored in the Cue. **Update** **Enter** Now it is!



In Cue 0.5, tweak Color Palette 4 for channels 101-105, and update the Palette. Make another tweak, and update the cue with Absolute data. If some of your Color parameters are still Palettised - ensure that the entire Color category is absolute, then update the Cue.


## Last Reference

**Go To Cue** **8** **Enter** **Group** **4** **Color Palette** **3** **1** **Enter** You have changed the Cyc from CP6 (R79) to CP31 (a colour you mixed earlier), which needs tweaking.

 **Tweak!** **Update** Notice that on the left side of the CIA Update Dialogue, this colour change will be updated into CP6 rather than into CP31. (Actually, because CP6 is locked, you'd end up with absolute data.)

**Last Ref** Notice that now, CP31 is listed as the target for Update. **Enter** This change is updated into CP31.

**Displays** **S 4 Setup** **S 2 Desk** **Record Defaults** **Update Last Ref Enabled** This setting causes the last manual reference to be the Update target rather than the original Cue reference.

**Live** **Group** **4** **Color Palette** **3** **2** **Enter**  **Tweak!** **Update** Note that the last reference is now, by default, the Update target. **Enter**




- Copy Color Palettes 6-10 to 26-30. Only channels 101-105 should be in these Palettes.
- In Cue 3 Part 1, change 101-105 to CP26 then to CP27, then modify this colour slightly. Update CP27.



The director has changed her mind! Marilyn is no longer going to sit where she was, she'll now be nearly down-stage centre. In Cue 4, move 115 from FP12 (Marilyn Sitting) to FP42 (DSC). This is nearly right, tweak it slightly. Update this new focus as the original "Marilyn Sitting" palette.

## Reference Only

**Go To Cue** **5** **Enter** You're in Cue 5. This Cue looks lovely, wouldn't change a thing. However, the director and Marilyn have chosen this time to discuss whether she should be wearing the stripey socks or the spotty socks. Let's use this time to sort out a few palettes!

**Group** **1** **1** **Full** **Sneak** **Enter** **Sneak** **Color Palette** **2** **9** **Enter**  Make the r46 palette look a bit nicer. Note the cheeky sneak so nobody even notices!

**Select Last** **Update** **Ref Only** **Enter** Note that only CP29 appears in the list to the left - the Cue will not be updated. **Sneak** **1** **0** **Enter** 101-105 are sneaked back to their Cue state.



Fix CPs 26 & 27, using Ref Only as above. Turn off Update Last Reference in the Setup menu and note that you would now use both **{Last Ref}** and **{Ref Only}** to avoid putting changes into the wrong palette.

## Presets

---

One of the strengths of Palettes (including Intensity, Focus, Color and Beam) is that they are "self-categorising" - you can only store color data in a Color Palette, only focus data in a Focus Palette, etcetera.

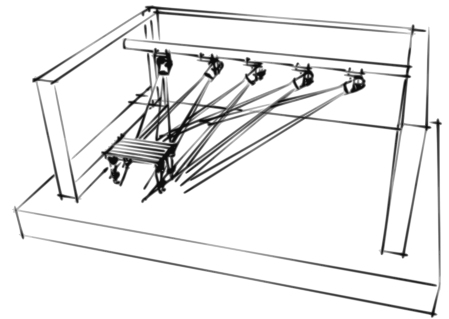
Presets are another reference type - one that, by default, includes all of the parameter information for a channel. So, if you have a light (or group of lights) pointing downstage at 80%, in blue, in Gobo 4, zoomed to 60%, you can store all of this information in just one Preset. The syntax **[channel] [Record] [Preset] [7] [Enter]** will do just that.

Often, however, it is more useful to select which categories, sub-categories or even parameters you wish to store in a given Preset. For example, using the same light as above, you may want to store just the focus and beam information in the Preset. You will still store cues using Color Palettes and absolute intensity levels.

## An Example

---

See the following example - 5 moving lights pointing at the table. This is the same example as seen in Tutorial 23 (Focus Palettes). There is a twist, however - you want to capture not only the focus information but also the fact that the diffusion is set to 75%. You could use both a Focus Palette and a Beam Palette to capture this "look", but it would quickly become tedious to remember both of these numbers (let alone to remember to use both!)



A Preset can capture all of the desired parameters - in this case Focus and Beam.

## Nested Palettes

---

When a Preset is stored (be it in Live or in Blind), it is possible (and sometimes mistakenly-done) to "nest" a palette reference into a Preset.

Using the same example as above - you use the "table" Focus Palette to set the lights. You then set the diffusion to 75% manually (with absolute information). If you record a Preset from this, the Focus Palette will be nested into the Preset. This is not, in and of itself, a Good or Bad Thing - if the "desk" Focus Palette is updated, this Preset will also automatically be updated.

The danger usually lies when updating "from the other direction" - you have a Cue which uses this Preset (we'll call it "DESK" to differentiate from the the "desk" Focus Palette. If you then change the focus slightly and update the cue, you will, by default, update to the "deepest" reference - in this case the "desk" Focus Palette. This will cause problems if "desk" is used elsewhere in the show, not as part of the Preset.

The "Break Nested" update modifier can be used to over-ride this behaviour (either at Update-time or as a Setup default). With "Break Nested" enabled, manual changes are applied directly to the Preset, and the link to the nested palette is broken.

## Home

---

We have seen in various tutorials that it is useful to send a light "home". It is, however, frequent that you want to re-define what "home" is for one or more parameters of a channel. As Presets can contain information for as many or as few parameters of a channel as you'd like, they are also a useful storage point for customised home values. In the Setup menu, you nominate a Preset as the Home Preset. If a parameter of a channel has information in that Preset, that value is used rather than the default home value as pre-designated in the fixture's personality.

## Recording Presets

Live Go To Cue 8 Enter Go to Cue 8 in Live. This all looks a bit too happy, let's sort a few problems out.

7 1 Thru 7 4 Out Update Enter As you're sure that 71-74 have no place in this Cue, it is wise to update the Cue now.

1 1 5 Full Full Note that 115 is still pointing at Marilyn - tracking from a previous cue. Home Enter Setting a light to Home before using it in a new position is good practice.

Focus Palette 4 7 Enter Zoom 40% Beam Palette 1 3 Enter Color Palette 1 Enter

Beam Palette 5 0 Enter Shutters Various parameters of channel 115 are in palettes, others are absolute data. You may notice that all of these palettes are Locked.

Select Last Record Preset 1 Enter Note that all parameters (including Intensity) are now in Preset 1. This wasn't supposed to happen! Undo Enter

Select Last Focus Beam Record Preset 1 Enter Label Note LARA WNDW Enter Only the Focus and Beam parameters are stored in Preset 1.

1 1 5 Rem Dim 3 0 Enter Any levels other than 115 are dropped to 30%. Update Enter The cue is stored, and it looks a bit less happy.



In Cue 0.5, put 101-105 into FP11 and BP51. From this state, record Focus and Beam into a Preset 2 called "WASH". If you press and hold **[Data]**, you should see that these Palettes have nested into the Preset. Update the Cue.

Tweak the focus of 101-105 downstage slightly, and press Update. Note that the changes will be updated all the way back into FP11.

Tweak the focus of 101-105 back upstage. Update again, but this time use the **{Break Nested}** option - note that the changes are updated into the Preset, but the link to the Focus Palette is broken (again, use **[Data]**).

To set the **{Break Nested}** modifier to be enabled by default, go to **Setup | Desk | Record Defaults**.



In Cue 8, bring 108 at 80% at Focus Palette 1 (Charlie) in the Pear Drops Beam Palette. Put these lights into CTC and create Color Palette 11 labeled "ctc". This should be copied to all of the MACs. Store the Focus and Beam as Preset 3 "CHARLIE", ensuring that no palettes are nested. Update Cue 8.

Use the syntax **[1][0][9] [Recall From] [1][0][8]** and a manual focus to put 109 on Charlie as well. Store 109 into Preset 3, and again update the Cue.

## Using a Preset for a Custom Home

Go To Cue Out Enter 1 1 5 Full Full Beam Palette 1 2 Beam Palette 1 9 Enter

Gobo Ind/Spd -50 Channel 115's gobo is rotating clockwise rather quickly. Gobo Ind/Spd Home Enter The gobo is now rotating at full speed - the fixture's home value.

Gobo Ind/Spd 0 The gobo is now stopped. Select Last Gobo Ind/Spd Record Preset 9 0 0 Enter

Displays S4 Setup S1 Show Show Settings Home Preset 900 A parameter's home values are now derived from Preset 900 if it contains data for that parameter.

Live Select Last Gobo Ind/Spd -50 Gobo Ind/Spd Home Enter 115's gobo rotation now homes to 0 rather than -100.



Change the Mac 250 Wash lights' home focus to be tilted slightly downstage. Now, remove this custom home position from the Preset in Blind using **[At] [Enter]**.

## Intensity Blocks

You'll remember from earlier tutorials that blocking is a way of ensuring that changes earlier in a cue stack do not affect certain later cues - especially blackouts, big lighting changes (such as cross-fades to new scenes) and the like.

One of the disadvantages of Block Cues, however, is that if you make a change to a Non-Intensity Parameter (such as a new focus, a new colour, etcetera), this change will not affect the blackout cue. The result is a rather horrid-looking live move back to the original position/colour as the lights fade to black.

The result? All of the programmers in the audience (having paid full-price for the show, naturally) will cringe and look in the programme at the interval to find out who is responsible. You have two choices: use a pseudonym for your programming work, or use Intensity Blocks.

Take, as an example, the following cue structure, shown with both a full Block and an Intensity Block on Cue 1. Again, a line is shown to indicate the blocking:

Cue 1 w/ Block			
Cue		Int	Focus Color
0.5		50	WASH R79
1	B	0	WASH R79
2			
3		FL	MAR R71
4			

Cue 1 w/ Intensity Block			
Cue		Int	Focus Color
0.5		50	WASH R79
1	I	0	
2			
3		FL	MAR R71
4			

As you saw in Tutorial 13 (Tracking), the Block vs Intensity Block will make no difference to playback - as you fade from Cue 0.5 to Cue 1, the light will fade to 0 and the focus/color will remain the same.

The important distinction is the result of an edit to Cue 0.5's focus and/or color:

Cue 1 w/ Block			
Cue		Int	Focus Color
0.5		50	CHAR L201
1	B	0	WASH R79
2			
3		FL	MAR R71
4			

Cue 1 w/ Intensity Block			
Cue		Int	Focus Color
0.5		50	CHAR L201
1	I	0	
2			
3		FL	MAR R71
4			

After this edit, with the full Block, the light would return to its original position and colour when you fade to black. That would look horrible. With the Intensity Block, the focus/color change will track into the blackout cue, and therefore you wouldn't need a pseudonym.

## Discrete Timing

In Tutorial 12, you learned about Part Cues - a method to have different timing on various channels/parameters within the same cue. Although Part Cues are widely used (largely due to the fact that you can put a label on each Part to document the reason, it is often faster to use discrete timing on a channel/parameter. This timing can include not only a discrete fade/snap time but also a discrete delay time.

## Intensity Blocks

Live Go To Cue 0 . 5 Enter Go to Cue 0.5 in Live. This needs a bit of looking-at...

Group 1 1 Color Palette 3 Enter Update Enter You've made a colour change to Cue 0.5 and updated it.

GO Note the live colour change back to R79 as the lights fade to black. Undo Page ▲ Enter Enter Undo back to the point before you made the colour change.

Cue 1 Intensity Block Enter You changed the Block on Cue 1 from a full Block to an Intensity Block. Note the "I" rather than "B" in the Flags column of the PSD (in both Cue Parts).

STOP BACK Group 1 1 Color Palette 3 Enter Update Enter You've again made a colour change to Cue 0.5 and updated it.

GO Note that the colour change has now tracked through into the blackout. Because the intensity is blocked on a Cue level, STOP BACK Go back into Cue 0.5.

8 1 + Next Recall From 1 0 1 Enter Update Enter The Desire Fire D40s match the colour of the MAC Washes.



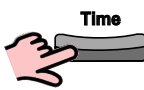
In Cue 9, put 106-110 in BP37 (splash) and update the cue. Note the snap to the water gobo (part of Preset 4) in the fade to Cue 10. Fix this by going into Cue 10 in Blind and using **{Beam} [At] [Enter]** on these channels. Also flag Cue 10 as an Intensity Block.

In Blind, return Group 12 to Pr4 in Cue 9 and note that the gobo change now tracks into Cue 10.

## Discrete Times

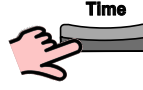
Live Go To Cue 8 Enter You are in Cue 8 in Live.

1 0 8 + Next + 1 1 5 Intensity Delay 2 Enter

These channels have been given a discrete delay of 2 seconds. Note the red "t" in Live.  Holding **[Time]** shows the discrete delay/time. Use **[Shift] & [Time]** to lock this display.

Update Enter This discrete delay has been stored. Note that the "t" is now blue. Also note the "+" symbol on the PSD alerting you to discrete timing. STOP BACK GO Note the 2sec fade time.

Blind Blind 1 0 8 Thru Next Intensity Time 3 Enter As with all changes in Blind, there is no need for Update.

Live STOP BACK GO Note the discrete times and delays. If required, remove delays and times with **[Delay] [Enter]** or **[Time] [Enter]**.  Note the new time\*.



In Cue 10, give 106-110 a discrete time of 6 and a delay of 2. Note that the PSD Duration field now shows 8 rather than 7.

In Blind, create a new Cue 11. Put 31-35 at Full in (gel picker) Lee 179. Copy this colour to Color Palette 12 with a label of "L179". These channels now exist in this Palette, but you must still put them in the Palette in the Cue.

Give 31-35 a time of 1 with a delay of **[0] [Thru] [2]**. Play this Cue in Live to see the results.

## Marking

---

You'll remember from earlier tutorials that marking is the process of presetting non-intensity parameters (NPs) prior to a light going above 0%.

The Automark feature allows you to have the console mark lights one cue before they come up. This approach, whilst fast, can be fraught with problems - channels that are marking often make a fair bit of noise (for example, scrollers rolling from one end to the other) or can be distracting if the lights are in view of the audience (such as an advance truss or boom position). Moreover, you may very well be over-lapping cues, so a mark might not be complete before you take the Cue.

The Eos family software offers a more sophisticated method of manually marking lights referred to as the Referenced Mark system.

## Referenced Marks

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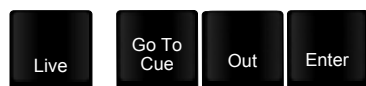
The referenced mark system works by allowing you to define, for each and every NP of each channel, which previous cue should be the marking point.

For example, you may have a light that comes up in Cue 15 in a new position and colour. Rather than automarking this light in Cue 14 (for the reasons discussed above), you can give it the instruction to mark in Cue 10. This cue could be chosen for a variety of reasons - it is a loud cue, a blackout, or a cue where the audience routinely makes a lot of noise (hopefully with applause, not booing - unless it's Panto).

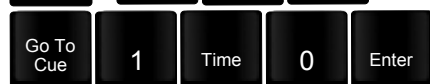
This system also allows you to stagger marks over various cues in order to cut noise to a minimum, or to create specific marking cues that will be called by stage management.

In addition, you can choose which categories or even parameters that you wish to mark and which should remain live moves (for fly-in effects or live colour changes).

# Referenced Marks



Go to Cue Out. You might notice that some joker has not only turned off AutoMark, but has also gone through and deleted all of the marks that remain when you turn it off.



A blackout! So far, so good.



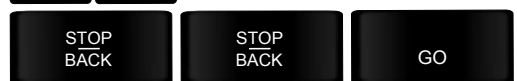
Channel 106 swings around to point at Charlie, a rather ugly Live move. Note the L in the PSD flags - this indicates that there is at least one live move in this cue. This Cuelist has more Ls than Robert Llewellyn!



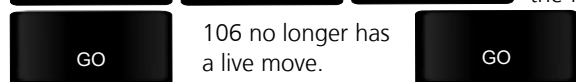
Note that 106 has a red "M" on the Live display. Live any channel-level instructions in Live, you must Update to store changes.



This mark instruction is now stored. Note the green M (indicating success) on the Live display. Also note the M (Mark) and R (Reference) flags on the PSD.



Note that 106 is marked in Cue 1 for Cue 2 (you don't see the MK - see the footnote in TBT 21).



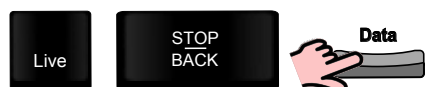
Again you see live changes - this time on Groups 4 & 11.



These lights will also mark in Cue 1, as it is the most recent "M" cue. It is much faster to mark in Blind as a) there is no need to update and b) you can quickly evaluate which cue is best to mark in using **[Next]** and **[Last]**.

Note the Green M in Blind as well - a quick "sanity" check after choosing a Cue.

Mark Indications in Live			
No Mark.	Manual Need to Update!	Success Marked in earlier Cue	Marking For later Cue
	(red M)	(green M)	



Press and hold **[Data]** - you can see the focus and color that 31-46 and 101-105 are marking for in Cue 3. Note specifically that 101-105 are in CP27 (R85).



You are looking at Cue 2 again.



Note that as marks "look ahead" to their reference (R) cue, it is now marking for CP29 (r46) rather than the information in use when the Mark was applied. This is one of the real advantages to referenced marks over manually marking.



In Cue 4, mark channel 115 in Cue 2 with **[Mark] [2] [Enter]**. Note the + in the PSD M column - this indicates that Cue 2 is both an "M" and an "R" Cue. Put a hard 0 on channel 115 in Cue 2 to see the "MK" indication.

In Cue 5, give all NPs for 106-110 a discrete time of 0. Mark them in Cue 4. Run the cues from 3 to see the result - you should see these channels mark using their discrete time of 0 rather than the Cue time (5) or the Mark Time as defined in the Setup menu.

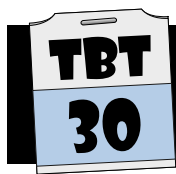
In Cue 8, mark the scrollers using **[Mark] [Enter]** - this will cause them to mark in Cue 4. As Cue 4 is a snap cue, this ends up being rather noisy. Move the mark to Cue 6 - still too noisy! Give 21-25 a discrete Color time of 15 in the R Cue, they will then use this time when they mark in cue 6.

Note the ugly transition between Cues 8 & 9. Create an intermediate cue 8.5 to fade 21-25 and 108-109 to black first. Mark these channels for Cue 9. Create an auto-follow into Cue 9. Use discrete times and delays as required to avoid Live moves.

Flag Cue 10 as a mark cue with **[Cue] [1][0] [Mark] [Enter]** before anything marks in it - this is a useful tool if you know in advance that a given Cue is a good place to mark lights in subsequent cues that you have yet to plot (blackouts are a common example). Note the lower-case "m" in the PSD flags column.

In Cues 12-15, you can now mark 101-104 with the simple **[Mark] [Enter]** command - this will mark them in Cue 10. Note that Cue 10's flag turns from a lower-case "m" to a capital "M".





# Effects



## Step-Based Effects

The Eos family software supports 3 different types of Effects: Step-Based, Absolute, and Relative.

Step-Based Effects are the simplest of the three, and are created in a similar manner to those on many other lighting control desks. Within the effect, you create a number of steps. Each of these steps contains a list of channels and an "On State" and "Off State". Individual steps can be given timing information as well.

By default, the Effect will loop, and play each step in order. When a given step is active, the associated channels will go to the On State, when it is not active, it will go to the Off State. By default, these states are 100% and 0%, but this can be easily changed.

In Live or Blind, you "trigger" the Effect with the command **[Recall From] [Effect] [x] [Enter]**. Unlike many other lighting desks, this does not trigger the Effect externally - the level generated by the effect is embedded in the Cue and recorded in the same manner as "normal" levels - for example, **[Record] [Cue] [x] [Enter]**. This effect level will continue to track until it is given a stop command **[channels] [Effect] [x] [Enter]** or a new level.

## Absolute Effects

Absolute Effects contain a list of instructions which your Live selection will perform. For example, you might create an Absolute Effect which sends selected channels between two Focus Palettes, or absolute levels, or Color Palettes, or really any other record target. This list can, of course, have a mixture of instructions - ie "Go to Charlie, Fade to Full, move to Marilyn, fade to Red, fade back to Blue, then snap to 0".

One of the great advantages of Absolute Effects is that because they do not have an embedded Channel list, you can recycle the same Effect with different channels. For example, you might write a fun disco effect and use it, in various different cues, over the MAC Wash lights, the scrollers, the Cyc and any other set of channels. It is often useful to create a Preset to contain each end state, as Presets can contain all of the NPs as well as intensities.

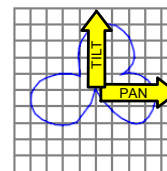
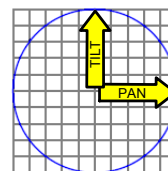
## Relative Effects

Relative Effects use a channel's current information and allow you to provide offsets of a given shape and size.

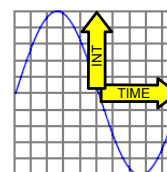
Relative Effects also have a Grouping function which allows you to define how many different groups should spread themselves along the shape - the default grouping is "Spread", meaning one group for each channel that you select.

Relative Effects are further categorised into Focus, Linear and Color.

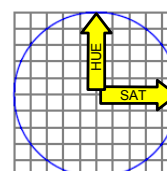
Focus Effects default to a Circle shape about the Pan and Tilt axis. Any shape, however, can be drawn, and the X/Y scaling can be modified. This type of Effect is the best option for drawing shapes about a given starting point - many of the built-in Effects (901 and higher) are Focus Effects.



Linear Effects default to a sinewave shape with Time on the X axis and Intensity on the Y. Again, any shape can be drawn instead of the sinewave, and any parameter or group of parameters can be used instead of Intensity. Some common examples are Iris, Tilt, Pan, Zoom, and Scroller. The Cycle Time will adjust the length of time between repeats.



Color Effects also default to a Circle shape with Hue and Saturation on the axis. In its default state, it will move a channel through the Hue spectrum, leaving saturation static. Again, any shape can be drawn, and the controls are largely the same as Focus and Linear Effects.





## Step-Based Effects

Live Go To Cue 1 6 Enter Group 3 At 5 Enter Color Palette 3 Enter From the blackout, put the scrollers in red.

Effect Effect Open a list of Effects. 901-916 are built-in Effects you can use later. 1 Enter StepBased You see a spreadsheet-style interface. This is where you can define the steps, levels, timing, etcetera.

Step 1 Thru 5 Enter Five steps are created. Page ▶ 2 1 Thru 2 5 Enter Channels 21-25 are inserted, one to each step.

Live Recall From Effect 1 Enter The effect plays in Live. Once it is playing, changes to the Effect will happen immediately. Effect Effect You are editing Effect 1 again.

Cycle Time 2 Enter The overall time to complete one pass of the Effect is set to 2 seconds. Note that the step times have been adjusted proportionally. Cycle Time 1.5 You can also adjust the cycle time on an encoder.

Step 1 Thru 5 Enter On/Off 8 Page ▶ 1 Enter The On and Off states are now 80% and 10%. You could also change individual steps.

Attributes Bounce There are many other behaviours that you can change, such as grouping, random rate (for which you also give a **[low] [Thru] [high]** range), and duration options. Leave yours as created above.

Live Record 1 7 Label Note **cylon attack** Enter Effect-generated levels are recorded into Cues in the same manner as you've recorded throughout - with **[Record]!**

Group 2 Full Full Record Next Label Note **frack!** Enter Note that the Effect continues to track as you add additional cues.

Group 3 Effect Enter The Effect stops, and 21-25 return to their original value, 50%. Out 21-25 are Out. Note that you wouldn't actually need to stop the Effect with **[Effect] [Enter]** - a new level stops Step-Based Effects automatically.

Select Active Out Record Next Intensity Block Assert Mark Label Note **dbo** Enter This blackout is recorded and given the appropriate flags.



Create a new step-based Effect 2 with four steps. Chase 71-74, snapping each light to 70% in with 0 time and then fading out to 0% over 2 seconds. The entire sequence should take 3 seconds. This should be recorded as Cue 20 with a time of 2 seconds. Stop this effect in Cue 21, leaving the lights at 20%. Create a blackout with flags as appropriate for Cue 22.

Remember that you still need to mark 21-25 in Cue 17 as well.

Try changing the Entry/Exit times from "Cue/Sub" to set times to see the results.

## Cue-Level Overrides

Live Go To Cue 1 8 Enter Effect 1 is tracking from Cue 17. You want it to be a bit faster in the this Cue, which is where we find out that two of the four characters onstage are Cylons.

Effect The CIA shows the Effect Status Display, a list of all running Effects. 1 Enter Effect 1 is selected. Rate 210 Effect 1 is now playing faster, at 210% of its stored cycle time.

Update Enter This Cue-level override is updated into Cue 18. STOP BACK GO Note that Effect 1 accelerates over 5 seconds, the time of Cue 18.



Create a new Cue 20.5 which contains a Cue-level override for Effect 2, dropping its rate to 45% over 2 seconds.



Open the "FX Channels" control. With an effect running on multiple channels, experiment with over-rides on a channel-by-channel basis. Remember that red means you need to update!

# Absolute Effects

Live Go To Cue Out Enter Kill all running effects from the last tutorial. Effect Effect Open the Effects List.

Effect 1 1 Enter Absolute The Absolute spreadsheet is much smaller and simpler than the Step-Based one. Individual stages are called Actions rather than Steps.

Action 2 Enter Page ▶ Page ▶ Page ▶ 1 0 0 Enter A second Action is created, with a value of 100. The first Action's value is still 0.

Live Go To Cue 5 1 Enter That's all that's required for a basic Absolute Effect, so back in live, bring up a base state for our effect.

Group 3 Effect 1 1 Enter We have achieved a very similar effect to our first Step-Based one, using far less information. This effect can also be reused on any group or selection of channels.

Effect Effect Open the Effects List again. Cycle Time 1 Enter Halving the cycle time speeds up the effect as before. Again, you could also use the Cycle Time encoder.

Grouping 2 Trail Solo Watch what happens on stage when you apply each of these settings. Rather than defining a set list of steps, Absolute Effects allow you to define how the Actions will be distributed over the channels used in the effect.



Try out other settings for Grouping and Trail. Apply Effect 11 to another set of channels in Live. A single Absolute Effect can be applied to several sets of channels at once. Note that any changes you make in the Effects List will apply to any channels currently referencing that effect. If you want independent control over similar effects, you can make multiple copies using the **[Copy To]** command in the Effects List.

# Referencing Palettes

Live Go To Cue 5 2 Enter Above we set the value of each action to be a level, i.e. 0 or 100. This is something any channel can relate to (any channel with an intensity at least, which is most of them). Values can also reference Palettes and Presets.

Effect Effect Open the Effects List. Effect 1 2 Enter Absolute Create a new Absolute Effect.

Action 1 Thru 4 Enter Page ▶ Page ▶ Page ▶ Page ▲ Create 4 Actions and select the Level field for Action 1.

Focus Palette 1 Enter Focus Palette 1's name, charlie, appears in the Level field (You could also use a direct select for this).

Page ▼ Focus Palette 2 Page ▼ Focus Palette 3 Page ▼ Focus Palette 4 Enter

The four Actions now have the first four Focus Palettes as their Levels. If, in your excitement, you pressed the Page Down key instead of enter at the end, a 5th Action is inserted. To remove an Action, use **[Effect] [12] [Action] [5] [Delete]**. Note that this is backwards compared to the usual way of deleting things.

Live Group 1 1 Effect 1 2 Enter The Mac 250 Washes perform the effect around the 4 Focus Palettes.



The Macs are struggling to physically reach each character. Slow the effect down by increasing the cycle time, or by using a Cue-level override.

Apply Effect 12 to the Mac 250 Entours. Note that as the effect only contains Focus information, you'll have to give them a level manually.

Create a new Absolute Effect, using Color Palettes 3, 5, 7 and 9 as your levels. Apply the effect to the Mac 250 Washes, the Cyc Seladors, the D60s. Anything that references those Color Palettes can join in, although the scrollers won't do a great job. Time for an upgrade? Contact your local ETC sales representative.


## Relative Effects - Linear

Live Go To Cue Out Enter Kill all running effects from the last tutorial. Effect Effect Open the Effects List.

Effect 2 1 Enter Linear Linear is the general category of Relative Effects, allowing you to plot any parameter against time. The default is a sine wave on Intensity.

Live Go To Cue 6 1 Enter That's it, you now have a fully functional relative effect.

Group 3 Effect 2 1 Enter Once again, we've achieved a chase effect running across the scrollers. This time, however, it's a bit ... underwhelming.

 **Data** Because the channels had a level of 0 when the effect was applied, the channels are moving between 25% and -25% (i.e. spending a lot of time at 0). Group 3 At 5 Enter That's a bit better.

Effect Effect **Scale** 5 0 Enter The channels are now moving between 0 and 100%. Much nicer!

## Relative Effects - Focus

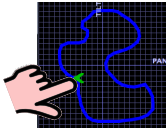
Live Go To Cue 6 1 Enter Back to a blackout. Effect Effect Open the Effects List.

Effect 2 2 Enter Focus The axes of the graph are now labelled Pan and Tilt. The default shape is a circle.


Live 1 1 5 Full Full Focus Palette 5 Enter The VL1000 is pointed at the cyc. This will serve as the centre for our focus effect.

Select Last Effect 2 2 Enter The VL1000 spins in a circle.

Effect Effect Edit Clear The default circle is cleared, and the graph area is now editable.

 Using the touchscreen or mouse, draw a shape to your liking (an amoeba is a popular choice).

**Apply** The VL1000 will do its best to reproduce your shape.

 Use your encoders to stretch, squeeze and rotate your shape. This can be useful to tweak an effect which is the right shape, but is hitting a backcloth or audience.



Insert a new Focus Effect 23, apply it to the VL1000 and use the scale and axis functions to squash the default circle so that it doesn't hit the floor or spill off the top of the cyc

Create a new Linear Effect 24, clear the default shape and make a random flicker. Apply it to Group 1, and adjust it to look like a mad scientist has put an axe through your dimmers (ask your local ETC office for replacement options).

## Relative Effects - Color

Live Go To Cue 6 2 Enter Cyc Seldadors to Full. Effect Effect Open the Effects List.

Effect 2 5 Enter Color The axes of the graph are now labelled Hue and Saturation. Again, the default shape is a circle. The results of this are harder to visualise, so let's apply it immediately.

Live Group 4 Effect 2 5 Enter The cyc Seladors perform a lovely hue-saturation rainbow.

Displays **S 2** Color Picker While the fixtures are selected, the color picker shows a visual representation of the effect.

## Highlight

---

Highlight is a toggle state which allows you to quickly bring channels to prominence without affecting their background state. When Highlight is activated, any selected channels will perform a default set of behaviours:

- **Intensity** will go to Full
- **Color** and **Image** will be sent Home
- **Focus**, **Shutter** and **Form** will stay where they are

For moving lights or LED fixtures, this allows selected fixtures to stand out, for example if they were part of a soft gobo wash, so you can tweak them individually. Deactivating Highlight will revert Intensity, Color and Image to background levels, but will preserve any changes you made to other NPs.

Using **[Next]** and **[Last]** within a channel selection will Highlight only the specified channel, which can be very useful when focusing moving lights.

You can also set a custom Highlight Preset, which allows you to choose how fixtures behave in Highlight mode. For example, you may wish for the Gobo Select to not be set to home when Highlighting, or for Shutter Strobe to be set to 0. Channels not included in these Presets will perform the default behaviours outlined above.

## Highlight Rem Dim

---

There is also a Highlight Rem Dim setting in Setup, which determines the behaviours of non-specified channels (i.e. the whole rest of the rig) while you're working with Highlight. This can be a level or a Preset. For example, you may always wish for non-selected channels to go to a dim level, blue if possible, whenever you are highlighting. Note that even without a Highlight RemDim level/Preset defined in Setup, you can still use this feature from the command-line when needed:

**[Highlight] [RemDim] [2][5]** will temporarily change non-selected channels to 25% if they are currently higher.

## Lowlight

---

If you also define a Lowlight Preset in the Setup menu, channels that are selected but not specified will use this information. For example, you may want to select a group of moving lights to focus, and make it very obvious with a green colour which are the lights in the selection and which you are currently focusing.



# Highlight

Live

Go To Cue

1

1

Enter

A lovely state, but the Mac 250 Entours have been inexpertly focussed on the characters by someone who doesn't know about Highlight .

EOS  
GIO

High

ION

S 4  
Highlight

Enter

Highlight is turned on. Note that the word Highlight appears on the left of the command line, reminding you that you are in Highlight mode.

Group

1

2

Enter

Group 12 is Highlighted.  
Now we can see what we're doing .

Next

Channel 106 is the selected channel. Channels 107 thru 110 remain in their cue state.

✓

Tidy up the focus on 106 thru 109, using **[Next]** and **[Last]**. Channel 110 is not used. When done, press **[Select Last]** to reselect all the Macs. Turn off Highlight, and update the cue.

# Lowlight

Live

Go To Cue

1

2

Enter

Another state, this time with the Mac 250 washes at full. The masked programmer has deleted our character Focus Palettes. We're going to rebuild them using Highlight.

Group

1

1

At

3

/

1

8

1

The Macs go to Lee 181, Congo Blue. This is going to be our Lowlight state.

At

3

Enter

And a low level.

Select Last

Intensity

Color

Record

Preset

9

5

0

Enter

Displays

S 4  
Setup

S 2  
Desk

Manual Control

Lowlight Preset

9

5

0

Enter

You have now defined a Lowlight Preset.

Live

Sneak

Enter

EOS  
GIO

High

ION

S 4  
Highlight

Enter

Group

1

1


Enter

All the Macs are in Highlight mode, no change there

Next

Channel 101 remains Highlighted, but the other Macs go to their Lowlight Preset, making it much easier to focus them.

✓



Focus all the Mac 250 Washes on Charlie, using **[Next]** and **[Last]**. Record Focus Palette 1 again.

# Highlight Rem Dim

Lowlight made the focusing process easier, but the rest of the rig was still quite bright.

Displays

S 4  
Setup

S 2  
Desk

Manual Control

Highlight RemDim

3

0

Enter

Highlight RemDim is now set to 30%.

Live

Go To Cue

1

2

Enter

Back to our working state again.

EOS  
GIO

High

ION

S 4  
Highlight

Enter

Group

1


1

Enter

Next

This time, the non-selected Macs go to their Lowlight Preset, and the rest of the rig is dimmed to 30%.

✓



Focus all the Mac 250 Washes on Lara, using **[Next]** and **[Last]**. Record Focus Palette 2 again.

## Query

Query is a powerful selection tool that allows you to choose channels based on a set of conditions. This can be anything from the fixture's type, its current level, its inclusion in certain cues, or keywords assigned in patch.

When the Query key is pressed, the softkeys show the operators **{Is In}** **{Isn't In}** **{Can Be}** and **{Can't Be}**, and the CIA shows a list of keywords and fixture types. With these tools, it is possible to select very specific sets of channels.

Examples:

- Select all the channels in Cue 4
- Select all arc source fixtures
- Select all channels currently referencing Focus Palette 4
- Select all channels with a discrete time
- Select all channels with gel is L202

This last example would be based on a keyword entered in Patch. Each channel has four Text fields which can be used for this purpose.

Live	Go To Cue	8	Enter						
Query	S 1 Is In	Cue	1	Enter	All channels which have a level in Cue 1 are selected.				
Query	S 1 Is In	Color Palette	5	Enter	All channels currently referencing Color Palette 5 are selected.				
Query	S 3 Can Be	Color Palette	5	Enter	All channels with information in Color Palette 5 are selected. Note the distinction from the previous command.				
Query	Fixture Types	Scroller	Record	Group	3	Enter	A quick way of recording Groups of certain fixture types.		
Displays	S 3 Patch	S 3 Database	1	Thru	6	Text 1	S4 Par	Text 2	Downlight

This part of the Patch display allows you to assign arbitrary text tags to channels. These will then show up as Keywords when you press Query



Use Query to select any Source Four PARs that are used in your show. This is a good way to calculate how many "spare" fixtures are in the rig!

Blind	Cue	1	1	Enter	Query	Delay	Enter	All channels with a discrete delay are selected - in this case the cyc channels.
Query	Time	Enter	All channels with any discrete time or delay are selected.					
Select Last	Time	Enter	Delay	Enter	This is a quick way to remove all discrete timing information from a Cue.			
Query	At	5	S 5 Or	At	7	Enter	Channels with a level of 50% or 70% are selected.	



Use Query to select only those channels that are moving head fixtures, with a level or 50, currently in Focus Palette 1, but which also have information recorded for Beam Palette 23.

## Capture

Capture is a toggle state used for locking off channels in Live, so that they are unaffected by playback commands. This is useful if you want to grab certain channels (or even certain attributes of channels) as they look on stage, and see how they would look in a different cue.

Examples of when Capture can be useful:

- You've been fiddling around in a tea break, and accidentally mixed a perfect cyc colour for a completely different scene.
- You've tweaked a focus, and want to see what it looks like with another cue's intensity and gobos.
- You want to lock off a special at a level as you run through the show, updating it into cues as you go.

Capture may seem similar to Park in some ways, but they are distinct: Captured channels can be changed in Live, their level is shown in the Live display, and they can be recorded as normal. Captured channels are only immune from **[Go]**, **[Back]** and **[Go To Cue]** commands.

Capture can also be latched on, so that all manual commands result in captured channels. This is similar to the "programmer" concept used on some other consoles, in which channels must be released, otherwise they will be stuck at their last manual value. Capture can be used to temporarily invoke this behaviour when needed.

Time for tea on stage, so let's work on the cyc for Nessie's swamp scene.

Live Go To Cue 2 1 Enter

Group 4 At 4 Thru 8 Enter Fan the Intensities across the cyc. At 3 / 1 7 2 Enter

We love it, but this is the wrong cue. If you use GoToCue now, all your hard work will be lost.

Group 4 Capture Enter Group 4 is captured in its entirety. Note the yellow Cs in Live. Go To Cue 4 4 Enter

The swamp scene appears on stage, with our cyc mix on top.

Update Enter

Because the levels are manual, we can simply update them into this cue.

However, the cyc channels remain captured and manual.

Capture Enter

Sneak Enter

The channels are returned to the cue level. Sneak on its own will do this too.

1 1 5 Full Full

Put the VL1000 at Full.

Pan Tilt



Focus the VL on Charlie.

Select Last Focus Capture Enter

Only the Focus of 115 is captured.

Go To Cue 4 6 Enter

Onward to Cue 46 - this is where we want the previous focus change placed. Again, because of **[Capture]**, we did not lose this manual data with the **[Go To Cue]** command.

Update Enter

The Cue is updated.



Use **[Capture]** to lock channels 1 thru 6 at 50%. Starting from the top of your cuelist, use **[Shift] & [Go]** to hop through the cues, updating the toplight into cues which you think would benefit from it. Watch out for tracking!



## Macros

---

Macros are simply a recorded series of key presses. They are a quick way of automating actions you perform often. They can be as long or short as needed, and can be placed on direct selects for quick playback or run from the command line. It is also possible to execute macros along with a cue.

Macros can be recorded in Live or created in a Blind editor. In Live, once you start recording a Macro, every single key press you make will be recorded, including **[Clear]** and paging keys.

The Macro editor display is similar to other Record Target Lists. To edit Macros in blind, there is an Edit softkey. Once this is pressed, all key presses are recorded in the Macro editor window, apart from the 6 softkeys, the 4 arrow keys, Select and Escape. While editing, the CIA is populated with tiles containing every softkey you encounter on the console, for example **{Action}** from the Effects editor, **{Lock}** from Palette lists, etcetera.

There are two modes for Macros - **Foreground** mode runs Macros straight into the command line, so the key presses appear as if the operator had pressed them. **Background** mode runs Macros in the background, without affecting the command line.

By default, Macros run in the foreground unless triggered by an external source (time code, switch inputs, etcetera). The possibilities for creative timesaving with Macros are endless. Some common examples include:

- A lamp on Macro that sends the lamp on command to all your arc fixtures
- A simple series of keys you press often, for example **[Select Last] [Focus] [Color] [Shutter] [Record]**, after which you can keep typing
- **[Block] [Enter] [Block] [Enter]** removes a partial block by blocking and unblocking the cue

Eos Ti, Eos, and Gio consoles have direct Macro keys between the touchscreens for easy access.



# Macros

Live

Go To Cue

Out

Enter

Starting from a blackout, we're going to record a "lamp on" Macro for our Mac 250s.

Learn

Macro

1

Enter

The Learn key starts to flash, and a mini red information bar above the command line shows the text **Learning Macro 1**. Any keystrokes from this point will be recorded into Macro 1.

1

0

1

Thru

1

0

5

Enter

About

Lamp Controls

The Lamp Controls for these fixtures are shown. Note that mouse or touchscreen clicks like this are also recorded.

Lamp On

Lamp On

The fixtures are lamped on.

1

0

6

Thru

1

1

0

Enter

Lamp On

Lamp On

The Entours are lamped on too.

Learn

That's all we wanted in the Macro. Pressing Learn again stops the recording.

Macro

1

Enter

The Macro is played back, exactly as it was recorded.

Macro

Macro

Open the Macro Editor.

1

S 5 Macro Mode

S 5 Macro Mode

Enter

Macro 1 is set to background mode, which means that it is not posted to the command line when it played back (it is run by "User 0").

Now let's create a Macro directly in the Macro editor.

2

Enter

Macro 2 is created.

S 6 Edit

You are now editing Macro 2. Note the flashing cursor.

Select Last

Shuttter

Record

Beam Palette

Next

Label

A useful Macro if you're creating several shutter palettes in Live. When the Macro finishes, it will leave you with an unterminated command line, and you can type the label manually.

Out

Clear

Oops! You pressed the wrong key, and now the Macro is ruined. If you press **[Clear]** now, the Clear key will also appear in the Macro editor, so that's no help .

◀ Page

S 4 Delete

◀ Page

S 4 Delete

Using the Page keys and Softkeys allows you to edit the text already in the Macro Editor, in this case highlighting the unwanted commands and deleting them.

S 5 Done

Macro editing is now off, and your useful beam Macro is complete.

Create a Macro which flags a cue as a Block, Assert and Mark.

Create a Macro to turn Automark on and off.

# Macro Wait

Within the Macro Editor, there is a Macro Wait function. This allows you to put pauses between steps in a Macro.

The first Macro we created lamps on channels 101 thru 110. Due to power supply limitations, it may be better to not lamp on all 10 fixtures at once.

1

Enter

Macro 1 is selected.

S 6 Edit

Page ▶

Page ▼

...

Page across and down to the end of the second Lamp-On command, so the cursor is at the end of the 3rd line.

Enter

A new line is inserted.

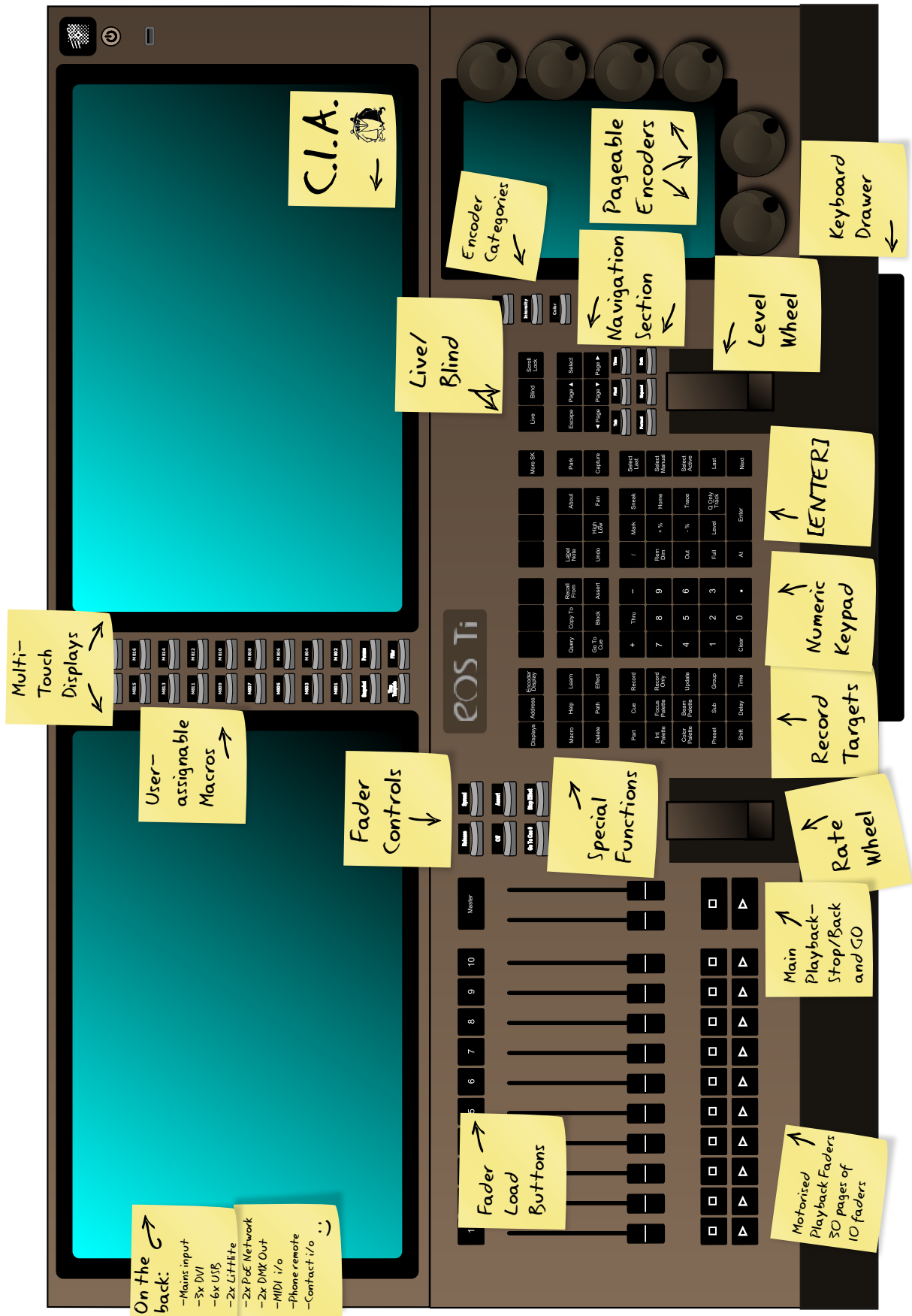
S 3 Wait

3

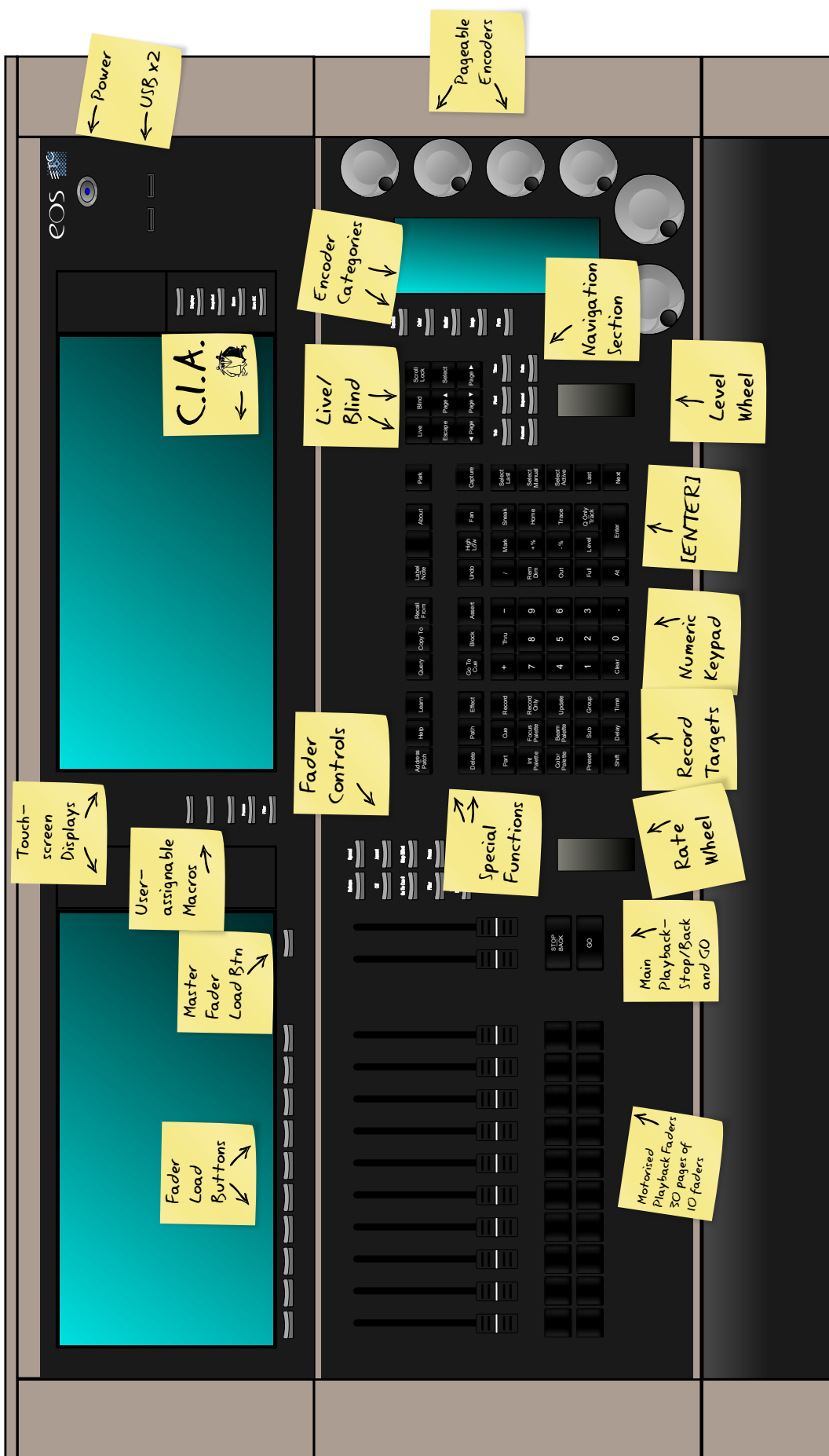
S 6 Done

A wait of 3 seconds is inserted between the two sets of lamp on commands.

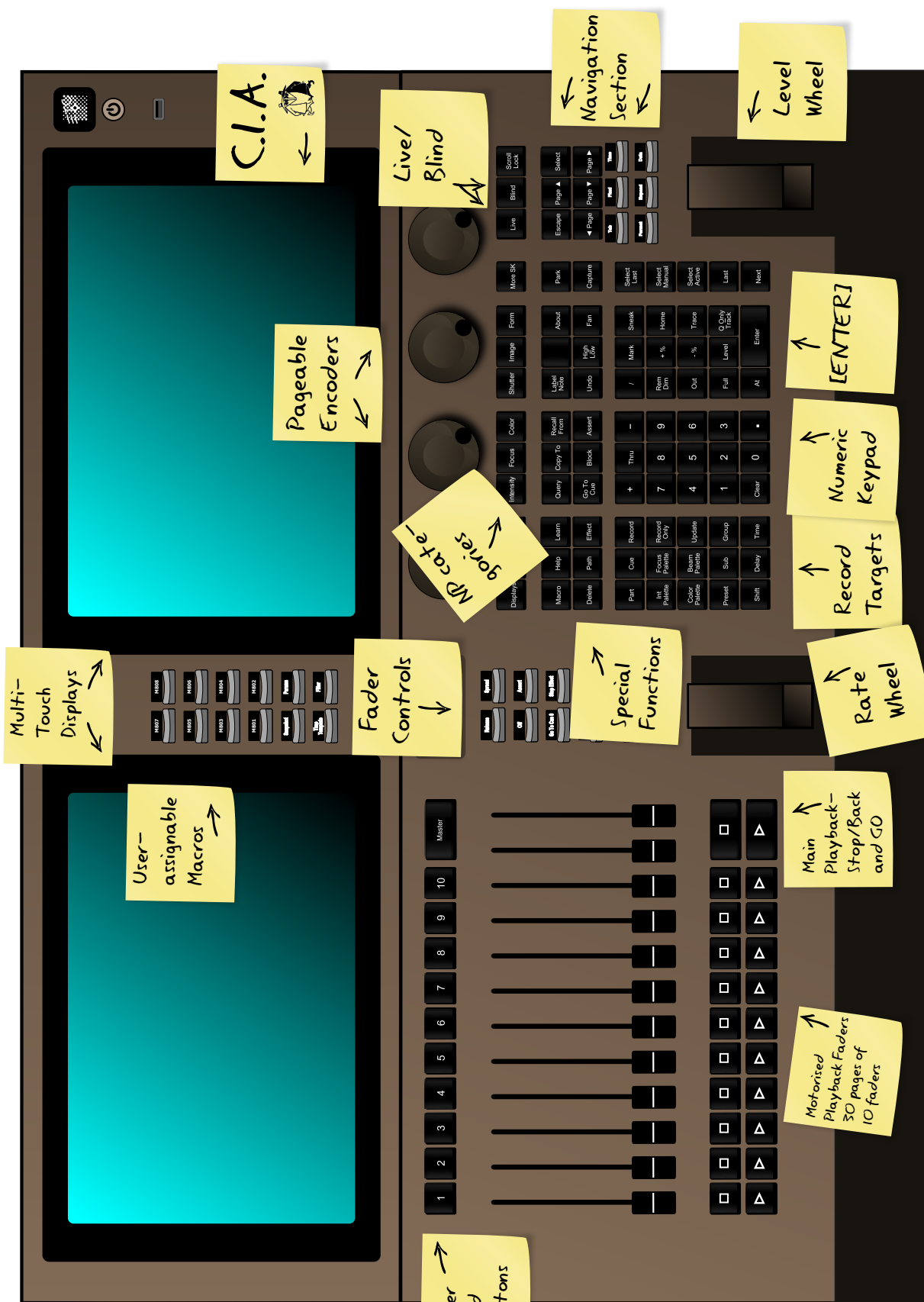
# Eos Ti Hardware Overview



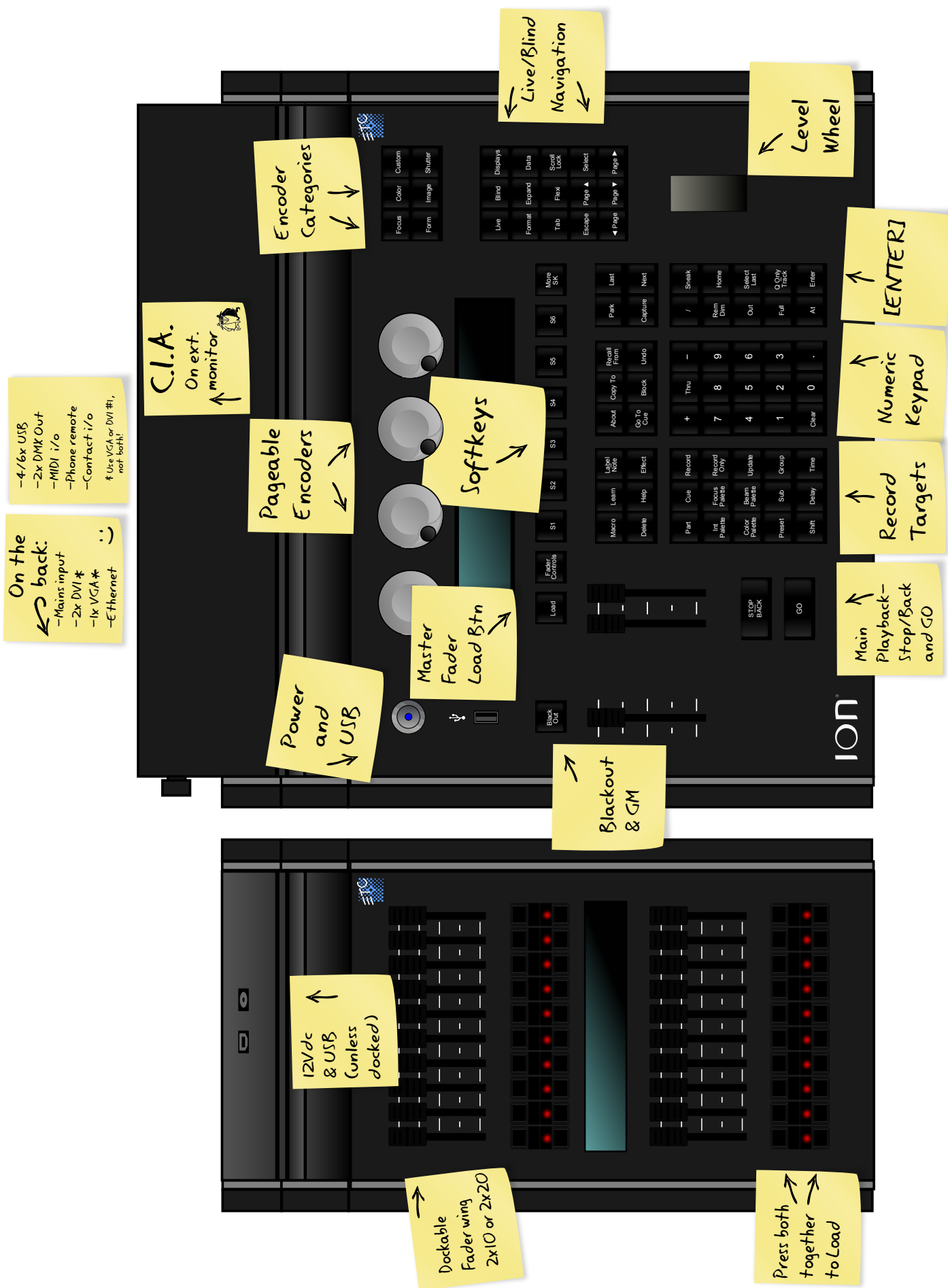
# Eos Hardware Overview



# Gio Hardware Overview



# Ion Hardware Overview



# Element Hardware Overview

On the back:  
 ↳ Main input  
 ↳ 2x DVI\*  
 ↳ 1x VGA\*  
 ↳ Ethernet  
 :)

-6x USB  
 -2x DMX Out  
 -MIDI i/o  
 -Phone remote  
 -Contact i/o  
 \* Use VGA or DVI #1, not both!

Littlite & Dimmer

C.I.A.  
 On ext. monitor

Fader Selection

Channel Faders

Live/Blind & Displays

Channels: 1-40  
 Submasters: 81-100

Cue List Load

Softkeys

Power and USB

Blackout & GM

Main Playback-Stop/Back and GO

Record Targets

Numeric Keypad

[ENTER]

Level Wheel

Sub-Masters  
 (Element GO only)

