

**CARBONITE**

**Carbonite &  
Carbonite eXtreme**

**OPERATION MANUAL**

**v10.0**

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# Thank You For Choosing Ross

*times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

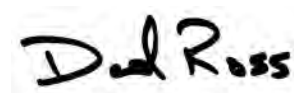
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  - offer the best product quality and support
2. Make Cool Practical Technology
  - develop great products that customers love

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David Ross  
CEO, Ross Video  
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3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in*

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## Document Information

- Ross Part Number: **4802DR-110-10.0**
- Release Date: **November, 2014**. Printed in Canada
- Equipment: This document applies to all Carbonite frames and control panels.

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Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

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The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

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## Supporting Documentation

Ross Video provides a wide variety of helpful documentation for the setup and support of your equipment. Most of this documentation can be found either on the Product Resources disk that came with your equipment, on the Ross Video website (*www.rossvideo.com*), or on the Ross Video Community site (*community.rossvideo.com*)

- **Carbonite Online Help for DashBoard** — visit *help.rossvideo.com/carbonite*.
- **Operation Manual (4802DR-110)** — operational instructions for all Carbonite switchers
- **Carbonite Setup Manual (4802DR-120)** — setup and configuration instructions for Carbonite, Carbonite+, and Carbonite MultiMedia frames
- **Carbonite eXtreme Setup Manual (4803DR-120)** — setup and configuration instructions for Carbonite eXtreme frames
- **Carbonite QuickStart Poster (4802DR-200)** — setup information and specifications for the Carbonite, Carbonite+, and Carbonite MultiMedia frames
- **Carbonite eXtreme QuickStart Poster (4803DR-200)** — setup information and specifications for the Carbonite eXtreme frame
- **Upgrade Notes (4802DR-500)** — upgrade instructions, new features, and known issues for a given software version
- **Carbonite eXtreme Upgrade for NK-3G144-X** — upgrade instructions for the NK-3G144-X router to a Carbonite eXtreme switcher
- **Software Licenses (4802DR-502)** — third-party software licences
- **Carbonite Multilingual Safety Information (4802DR-503)** — translated product safety information
- **Carbonite Frame Fan Replacement (4802DR-300)** — instructions for replacing cooling fans in the Carbonite, Carbonite+, or Carbonite MultiMedia frames
- **Carbonite Frame RAM Replacement (4802DR-301)** — instructions for replacing the RAM in the Carbonite, Carbonite+, or Carbonite MultiMedia frames
- **Control Panel Desk Mounting (4802DR-302)** — desk mounting instructions for Carbonite control panel
- **1-2 ME Upgrade (4802DR-303)** — 1 to 2 ME upgrade instructions for C1-A and C1M control panels
- **SideBox Installation (4802DR-304)** — installation and mounting instruction for SideBox module
- **Auxiliary Control Panel Installation (4802DR-305)** — installation and mounting instruction for remote aux panel (CPS-AUX-053B)
- **C10 2 ME Upgrade (4802DR-306)** — 1 to 2 ME upgrade instructions for the C10 control panel

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- **GVG100 Supported Command (4802DR-401)** — connection and GVG100 commands supported by the switcher
  - **RossTalk Commands (4802DR-403)** — supported commands using RossTalk protocol
  - **Device Setup Sheets (4802DR-6xx)** — setup information for controlling external devices from the switcher
  - **Robotic Camera Control (4802DR-131)** — overview of the operational interface when controlling a robotic camera from the switcher
  - **Audio Mixer Control (4802DR-132)** — overview of the operational interface when controlling an audio mixer from the switcher
  - **Video Server Control (4802DR-133)** — overview of the operational interface when controlling a video server from the switcher
  - **Configuration Guide (4802DR-100)** — product description and marketing codes for switchers and options

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## Features

Thank you for buying a Ross Video Carbonite Series Multi-Definition Live Production Switcher. The Carbonite series builds on the Ross Video reputation for designing switchers that fit the needs of any production environment.

### Analog Reference Input and Output

The switcher supports both external and internal reference sources. The external reference can be an input from a house sync to the single reference input BNC. The internal reference can also be used as a house sync with selectable tri-level sync or analog black burst with independent H/V settings for each of the two reference output BNCs.

Although tri-level sync is recommended as your reference source for all HD applications, analog black burst can be used when operating the switcher.

### 3G and 1080p 29.97 Video Formats

The switcher supports the 1080p 59.94Hz, 1080p 50Hz, and 1080p 29.97Hz video formats. To operate in these modes, the switcher must be restarted and some features and resources are limited or unavailable.

### Integrated Up/Down Converters

All switchers come with integrated up/down converters and frame synchronizers (FSFC) capable of converting 1080i or 720p to SD, as well as convert SD signals to 1080i, or cross-convert 720p to 1080i.

Format conversion is not supported on the Carbonite frame when the switcher is operating in 720p or 1080pSF. The Carbonite MultiMedia frame supports de-interlacing on the multimedia inputs, except for progressive segmented frame (pSF) formats. The multimedia inputs support de-interlacing of the 720p format.

In a 3G or 1080p 29.97Hz switcher mode, the FSFC functionality is limited on the Carbonite MultiMedia and Carbonite+ switchers, and is not available on the Carbonite and Carbonite eXtreme switchers.

### Custom Controls

This feature brings the power of macros to the switcher operator. A series of button presses can be easily recorded and assigned to any custom control button. Step through complex show openings as easily as pressing Custom Control buttons 1, 2, then 3.

**Note:** The C10 does not support recording or running custom controls from the control panel. Custom controls can be recorded and run from the Custom Control node in DashBoard.

### Device Control

The switcher can control a number of external devices, such as video servers and robotic cameras. For a complete list of supported devices, and information on how to set up and control these devices, visit the Ross Video website ([rossvideo.com/production-switchers/carbonite/interface-list](http://rossvideo.com/production-switchers/carbonite/interface-list)).

### OverDrive® Caprica Support

Carbonite can be controlled from OverDrive® using the Caprica interface. This interface allows OverDrive® to perform memory recalls, most transitions (MediaWipe is not supported directly), and run custom controls on the switcher. For information on setting up Caprica to interface with the switcher, refer to the documentation that came with your Caprica server.

Carbonite must be in a 2.5 ME mode to be controlled by Caprica.

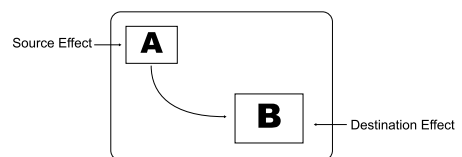
### DVE (Fly Key)

The advanced 2D DVE comes standard with each switcher, and can be used for performing over the shoulder, or picture in picture shots. This allows all key types to be zoomed, cropped, and repositioned horizontally and vertically to create the look you want, or you can use one of the useful pre-built 2D effects to perform 2D background transitions.

The Carbonite+ and Carbonite MultiMedia frames have eight channels of DVE, or 4 channels in a 3G MiniME™ or 3G 2.5 ME switcher mode. The Carbonite and Carbonite eXtreme frames can select between 8 channels of DVE and no FSFC resources, or 4 channels of DVE and 6 FSFC resources.

### Effects Dissolve

The Effects Dissolve feature allows you to interpolate from one memory to another using a memory recall. The switcher will interpolate from the starting memory to the destination memory, creating a smooth, two key frame effect.





Only elements such as clip level and pattern position can be interpolated in the effects dissolve. Other elements, such as crosspoint selection, pattern, and next transition data are recalled first, and then the switcher will slew to the recalled memory.

An effects dissolve can be performed on as many elements and MEs as required, based on the memory that is being recalled.

## General Purpose Interface

The switcher is equipped with 34 GPI I/Os that can be assigned as either an input or output independently.

The GPI inputs allow the switcher to interface with peripheral equipment such as editors. Each GPI input can be used to perform simple editing and switcher functions such as fade to black or an auto transition.

## LiveEDL

Edit Decision Lists (EDL) are files used by non-linear editing (NLE) suites to aid in post-production. Your switcher can capture EDL data in a file that you load into your NLE suite.

For information on using the LiveEDL feature, visit the Ross Video Website ([rossvideo.com](http://rossvideo.com)).

## Media-Store

Up to four (4) independent channels of still/animations are available switcher-wide, allowing for thousands of full screen stills and logos that can be cached and used on the switcher.

Animation-Store comes standard with 8 Gigabytes of cache. Channels 1 and 3 have 4 Gigabytes, and channels 2 and 4 have 4 Gigabytes. The number of images cached increases considerably when smaller, non-full screen images like logos are loaded from USB.

## MediaWipe

A MediaWipe allows you to use an animation from the Media-Store to perform background and key transitions. When the transition starts, the switcher plays the selected animation over top of the background and keys that are being transitioned. A cut is then performed behind the animation to bring up the next shot when the animation ends.

## UltraChrome

The UltraChrome chroma keyers uses advanced video processing technology to provide exceptional blue spill reduction and clean edges, even with difficult source material. Glass, smoke, translucent materials, and natural shadows are handled superbly.

Two floating Chroma Keys are available across both ME outputs.

## MemoryAI Recall Mode

We take the guessing out of memory recalls by ensuring that a memory recall will not affect what is currently on-air. MemoryAI uses the content of the memory to configure the Next Transition area and Preview bus for the background and keyers so that the next transition takes the same sources on-air that were on-air in the memory.

For example, store a memory that has a key on-air with CAM1 and CAM2 selected on the background. When this memory is recalled normally, it pops the same key on-air with CAM1 and CAM2 on the background. When the memory is recalled with MemoryAI turned on, CAM1 is selected on the preset bus, and CAM2 is selected on a key that is not on-air. The transition area is then set up for a background transition to bring CAM2 onto the background, take any on-air keys off, and take a key on-air with CAM1.

## Memory System

Storage for 100 complete switcher snapshots per ME, MiniME™, and MultiScreen comes standard with all switchers. All of these memories can be stored to a USB media drive, providing custom tailored memories for every operator and every show.

## ME Effect System

The ME (Multi-level Effect) systems are standard. The number of MEs depends on the chosen switcher model.

Each ME provides four keyers supporting pattern mask, box mask, self-key, linear key, and UltraChrome advanced chroma key for each ME and is available to each keyer.

## Half ME

The half ME option is available for any 2 ME switcher and adds a third ME with limited functionality.

**Table 1: Half ME vs. Full ME Comparison**

	Half ME	Full ME
MiniME™	No	Yes
MultiScreen	No	Yes
Floating FSFCs	No	Yes (if frame supports it)
Keyers	2	4

	Half ME	Full ME
Key Types	Auto Select and Self Key	Auto Select, Self Key, Chroma Key, and DVE Key
Transition Types	Dissolve, Cut, and MediaWipe	Dissolve, Cut, Wipe, DVE, and MediaWipe
Pattern Mask	No	Yes

## MiniME™

The MiniME™ is an additional ME that is provided with the switcher to perform basic dissolves and cuts. Each MiniME™ has a DVE key (Key 1), an Auto Select, Self key, or Chroma key (Key 2), and a Background and Preset. Unlike a full ME, the MiniME™ only supports dissolves and cuts, and has no preview output. The MiniME™ shares all the same sources as the ME.

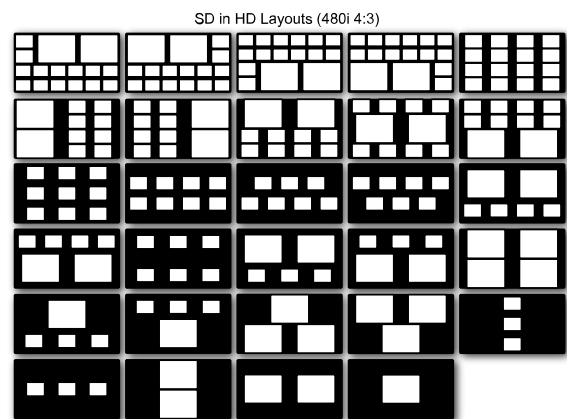
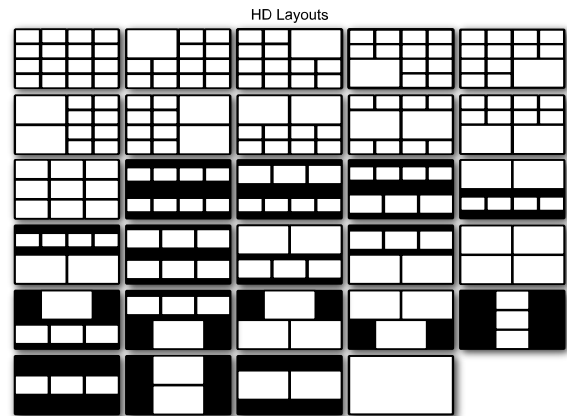
## MediaManager

The MediaManager allows you to easily manage stills and animations on the switcher in a graphics interface.

## MultiViewer

All Carbonite switchers come standard with two broadcast-quality integrated MultiViewer generators. Each MultiViewer generator allows you to view up to 16 video sources, in 29 different layouts, from a single output BNC. Any video source on the switcher, including ME 1 and ME 2 Program, Preview, and Media-Store channels, can be assigned to any box on the MultiViewer output. All boxes on the MultiViewer output include mnemonic source names and red and green tallies.

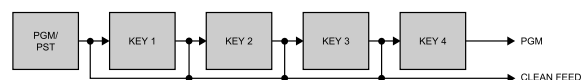
If the switcher is operating in a standard-definition video format, the MultiViewer can be set to output high-definition. In HD output mode, the MultiViewer is only available on specific output BNCs.



## Clean Feed Output

Clean feed is typically used for bilingual and live-to-tape productions. It provides a second Program output that is derived from a different location than the standard program output. A frequent application is the recording of shows for later airing without call-in phone numbers inserted.

The clean feed output can come from before or between the keyers.



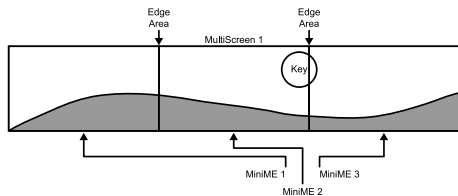
## MultiScreen

All Carbonite switchers come standard with two integrated MultiScreen generators. Each MultiScreen can break a scene into up to four outputs that can be sent to independent projectors or displays to make a unified picture. Integrated edge blending allows you to

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compensate for the overlap in projector outputs, or the outside bezel of your display.

Each screen in the MultiScreen output uses a MiniME™ to create the background and keys of the output. This allows you to have two MultiScreen generators with two screens each, or one MultiScreen generator with three or four screens.



## Pattern and Matte/Wash Generators

A single pattern generator dedicated to wipes comes standard, and is equipped with 10 classic wipes. Most wipes can be rotated, bordered, multiplied, aspectized, and repositioned.

### Matte/Wash Generator

A matte generator and complex wash generator per ME, capable of multi-color washes comes standard. Any one of the color generators can be assigned to MATTE, or wipe pattern edges. An additional simple color generator is available for an Aux Bus.

### Tally Outputs

The switcher has 34 assignable tally relays located in the rack frame. Each tally can be assigned to any number of combinations of input and output or bus.

# Control Panel Overview

This chapter provides a basic introduction to the Carbonite switcher, including an overview of the different areas on the control panel, using the menu system, as well as an introduction to the various ports, and video buses.

## Control Panel Areas

Each Carbonite control panel is made up of a number of distinct areas that control different aspects of the switcher. Some of these areas may vary in size or function, depending on the control panel you have.

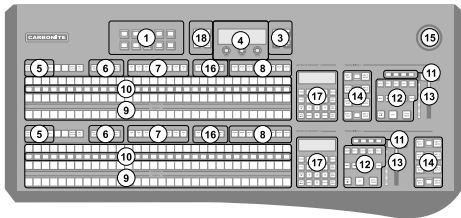


Figure 1: C2X Control Panel

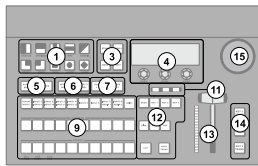


Figure 2: C10 Control Panel

- 1. Pattern/Menu Selection Buttons** — These buttons are used to select a pattern for a wipe transition, or to access switcher menus. The C10/C1 control panels have the name of the menus below the pattern button.
- 2. Custom Control Command Buttons** — These buttons are used to start, stop, edit, and navigate through custom controls.
- 3. Menu Navigation and Memory Control Buttons** — These buttons are used to access switcher menus, move back and forth between menus. On the C10, these buttons are also used to store and recall switcher memories.
- 4. Main Display and Selection Knobs** — The three selection knobs are used to adjust and select various menu items or values. The knobs are rotated to choose a value, and pressed to make a selection. The main display shows the menu system of the switcher.
- 5. Key Type Buttons** — These buttons are used to choose the type of key you want to use. Use these

buttons with the key select buttons to select the keyer, and the type of key you want to use.

- 6. Key Select Buttons** — These buttons are used to choose which keyer is selected. The key type buttons and key bus follow the selected keyer.
- 7. Aux Bus Select Buttons** — These buttons are used to choose which aux bus is selected. The aux bus follows the selected aux bus.
- 8. Custom Control Bank Select Buttons** — These buttons are used to choose which custom control bank is selected. The custom control bus follows the selected custom control bank.
- 9. Video Source Buses** — These buses are broken into the Preset, Program, and Key/Aux/Custom Control buses. The Preset bus is the bottom row of source buttons and selects the video source that will be taken on-air with the next background transition. The Program bus is the middle row of source buttons and selects the video source that is currently on-air on the background. The Key/Aux/Custom Control bus is the top row of source buttons and selects the video source that is chosen on the selected keyer or aux bus, or the custom control that is chosen on the selected custom control bank.
- 10. Mnemonic Displays** — The mnemonic display shows the name of the source assigned to the source button directly below it. The mnemonic display-name and color for each video source can be adjusted.
- 11. On-Air Lights** — These lights glow red to show which keyers are currently on-air.
- 12. Transition Area** — These buttons are used to select which video source buses will be included in the next transition and what type of transition will be performed. The Cut and Auto Trans buttons are used to perform transitions. The user button on the C2S/C2X/C3S/C3X control panel is not implemented at this time.
- 13. Manual Transition Fader Bar** — The fader is used to manually control the rate of a transition. What is being transitioned, and the type of transition, are controlled from the Transition Area.
- 14. Keyer Transitions Buttons** — These buttons are used to perform cuts or auto transitions on keys directly, without having to include them as part of the next transition.
- 15. Positioner** — The positioner is used to control some wipe, border, and wash parameters, as well as some external devices.

- 
- 16. ME Selection Buttons** — These buttons are used to assign the control panel row to an ME, MiniME™, or MultiScreen.
  - 17. Effects Memory Area** — This area is used to store and recall memories on the assigned ME, and to select the various transition rates used on the switcher.
  - 18. Memory Store/Recall Buttons** — These buttons are used to store or recall memories to one or more MEs at the same time. On the C3S/C3X control panels, there are additional buttons for selecting specific MEs, MiniME™s, or MultiScreens.

# Menu System

The menu system is accessed either by pressing **MENU** and the Pattern/Menu Selection button for the menu you want to access, or through an auto-follow for selected functions.

## Menu Navigation

The menu system allows you to access all of the setup and configuration information for the Carbonite switcher. In some cases, a menu can be accessed either by pressing the **MENU** button and navigating to the menu, or by double-pressing a button on the control panel.

1. Press **MENU**. The Pattern/Selection Mnemonics change to the menu names. On the C10/C1, the Pattern/Menu Selection buttons light up.
2. Press the Pattern/Menu button for the menu you want to navigate to. The first page of the menu is shown on the display.
3. Press **NEXT** to navigate to the next page of the current menu. If the **NEXT** button is not lit, there are no other pages to the current menu.

**Tip:** If you want to return to the first page of a menu, press and hold **NEXT** and press **HOME** (**STORE** on the C10/C1). You can also navigate up one level in a menu tree by pressing and holding **NEXT** and pressing **UP** (**RECALL** on the C10/C1).

## Auto-Follow Menus

The switcher navigates to auto-follow menus automatically when you select certain functions on the switcher. For example, when you press the **KEY 1 SEL** button, the key adjustment menu is shown on the display.

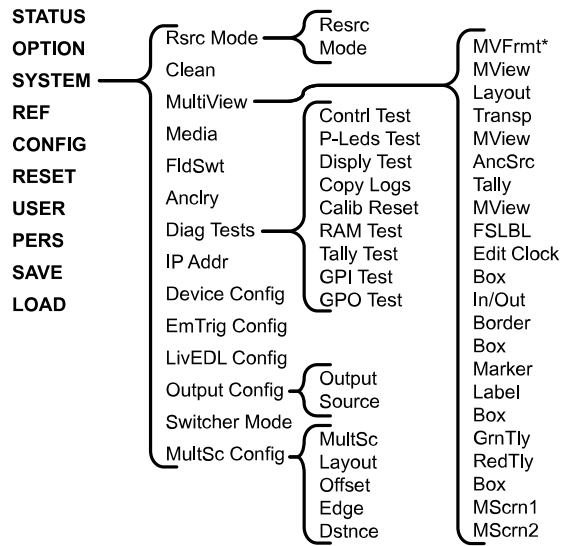
Auto-Follow functionality also applies to video source buttons that have external devices assigned to them. If you select a source button that an external device is assigned to, the peripheral control menu for that specific device is shown.

## Menu Trees

The items on the branches of the menu tree can change, depending on the selections that are made on that branch. The menu trees below show the default state of the menu system.

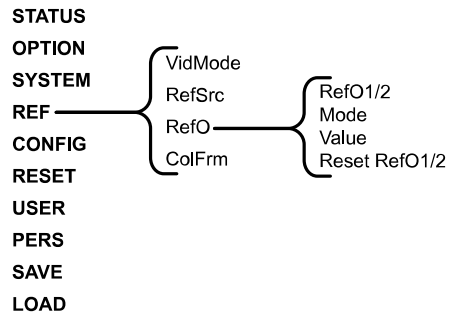
The Status and Options menus display the software version and reference format and the hardware serial number.

### System



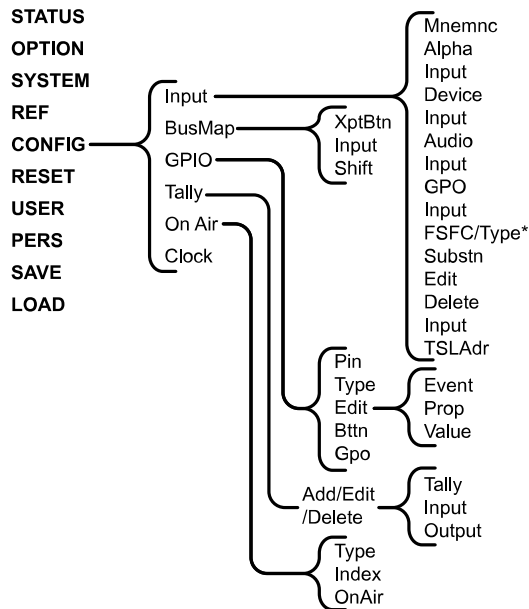
**Note:** (\*)The **MVFrmt** menu item is only used for the SD MultiViewer in HD option.

### Reference (Ref)



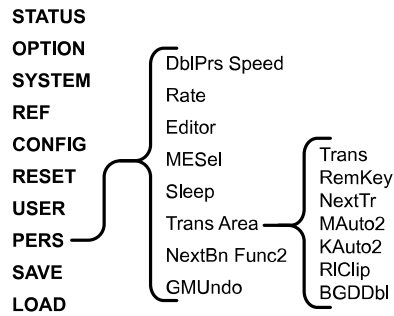
**Note:** The **ColFrm** and **RefO** menu items are not available on the Carbonite eXtreme frame.

## Configuration (Config)

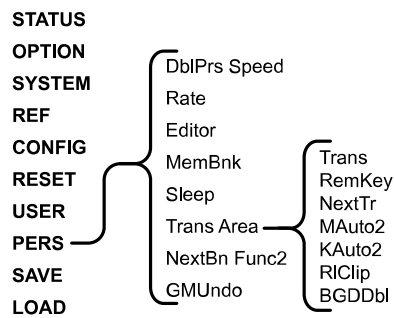


**Note:** The **FSFC** menu item is labelled **Type** when a MultiMedia input on the MultiMedia frame is selected.

## Personality (Pers) (C10/C1)

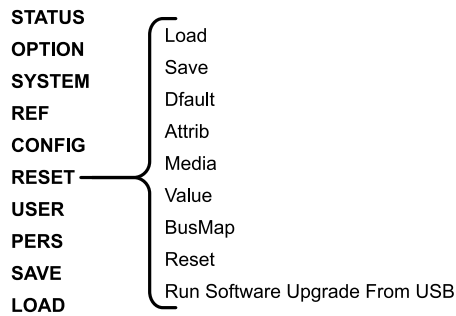


## Personality (Pers)

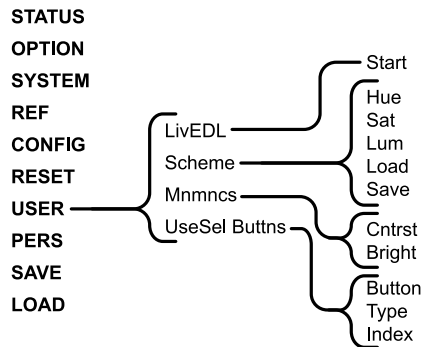


**Note:** The **MemBnk** option is only available on the C2S/C2X/C3S/C3X control panel.

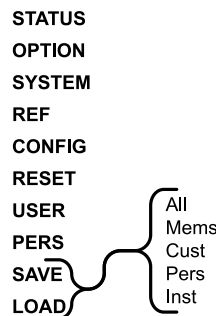
## Reset



## User



## Save/Load



# Switcher Basics

Before using your switcher, it is important to become familiar with the how audio and video is handled by the switcher. Some important concepts includes video sources, video layering and re-entry, and preview. For information on setting up video inputs, refer to the Setup Guide that came with your switcher.

## Audio and Video Processing

Video and audio signals are processed and passed through the switcher in different ways, depending on how the switcher is being used or is set up. A better understanding of how the switcher is processing these signals help you to achieve the production you want.

### Video Processing and Flow

Video is processed in a number of blocks in the switcher. After video comes into the switcher, the frame synchronizers / format converters are applied (depending on the frame you have). At this point any required color correction is also applied. After input the video signal is routed through the crosspoint. The crosspoint can route any input to any output for straight switching, or to the video processor and DVE and back for video manipulation. Just before the video signal is sent to the output, the processing of the ancillary data is performed.

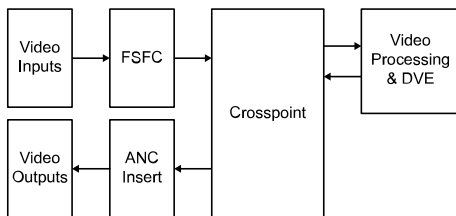


Figure 3: Video Flow Through the Switcher

### Audio Processing and Flow

Unlike video, the switcher does not handle audio signals independently. An audio signal is embedded into the ancillary data of a video signal before it comes into the switcher. As the signal comes into the switcher and is manipulated, you must ensure not to perform an operation that will force the ancillary data to be stripped. Specifically, this includes any format conversion on the input video signal or stripping of the ancillary data.

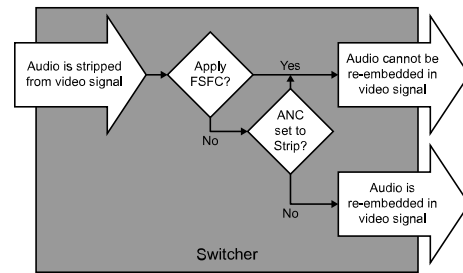


Figure 4: Audio Flow Through the Switcher

When you are performing a transition, or keying, the embedded audio is carried in the ancillary data of the background video signal. The ancillary data from the background source is replaced with the ancillary data from the preset source, and the ancillary data for keyed sources is stripped. In the case of the MultiViewer, you can select which ancillary data stream is included in the MultiViewer output.

## Video Sources

The switcher has access to two basic types of video sources, external and internal. All video sources can be assigned to video source buttons. By pressing a video source button on a bus, the video source assigned to that button is selected on that bus.

- **External** — External video sources come from cameras, video servers, character generators, or other external devices into the switcher.
- **Internal** — Internal video sources come from internally generated video, such as Media-Store channels, matte color, and black.

### To Select a Source on a Bus

To select a video source on a bus, you must identify the ME, MiniME™, Aux, or MultiScreen and bus you want to assign a video source to, and then press the source button you want to select on that bus.

The user buttons on the control panel can be assigned to any ME, MiniME™, Aux Bus, or MultiScreen for quick access, or any button can be held to allow you to select the ME, MiniME™, Aux, or MultiScreen.

**Tip:** Source selection can also be made from the **Buses** tab on the Live Assist node in Dashboard. Key bus source selections can also be made using the **Key Source** button on the **Keyers** tab on the Live Assist node in Dashboard.

1. Select the ME, MiniME™, Aux, or MultiScreen that you want to select a source on.
  - **ME** — press the user button assigned to the ME, or press and hold a user button assigned



to an ME/MiniME™ and press **ME1** or **ME2** on the key bus.

- **MiniME™** — press the user button assigned to the MiniME™, or press and hold a user button assigned to an ME/MiniME™ and press **MinME1-4** on the key bus.
- **Aux** — press the user button assigned to the Aux, or press and hold a user button assigned to an Aux and press **AUX 1-8** on the key bus.
- **MultiScreen** — press the user button assigned to the MultiScreen, or press and hold a user button assigned to an ME/MiniME™ and press **MultS1** or **MultS2** on the key bus.

**Tip:** You can also press **AUX X** and press the knob for the Aux Bus you want to select.

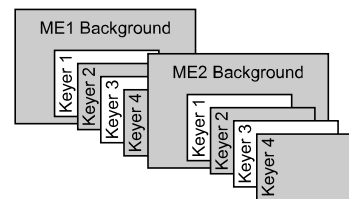
2. Select the bus you want to select a source on.
  - **Background Bus** — use the BACKGROUND bus.
  - **Preset Bus** — use the PRESET bus.
  - **Key Bus** — press **KEY 1 SEL** to assign the KEY/AUX/CUSTOM CONTROL bus to Key 1
  - **Aux Bus** — use the KEY/AUX/CUSTOM CONTROL bus.
3. Select the source you want to use on the bus. Use the **Shift** button to access additional sources.

**Tip:** You can assign special sources to an Aux Bus by pressing and holding the **AUX X** button and pressing the **AUX PGM** (Program), **AUX PV** (Preview), or **AUX CLN** (Clean Feed) source button on the Preset bus. These are the first three buttons on the row.

For information on assigning video inputs to source buttons, refer to the Setup Guide that came with your switcher.

## Video Layering

How video is layered in the output of the switcher depends on how an ME is re-entered onto the other, and what keyers are on-air for the ME. If we assume that each ME has all keyers on-air, and that ME 1 is re-entered into the ME 2, the layering will start with ME 1 Background and progress to ME 2 Keyer 4.



**Figure 5: Video Layering**

**Tip:** You can select a MiniME™ on an ME or different MiniME™ to re-enter it. Up to two MiniME™ re-entries, including an ME is allowed.

## ME Re-Entry

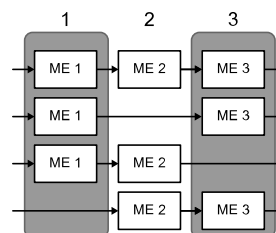
Re-entry is the term used to describe the process of selecting another ME on an ME. For example, if you select ME 1 on ME 2, ME 1 is said to be re-entered onto ME 2. Re-entry takes the output of an ME and uses it as the background or key on the other ME. If you select an ME on the background bus, the ME becomes background video source of the other ME. If you select an ME on a Key Bus, the ME becomes the key source of the other ME.

### Keep the following in mind when working with re-entries:

- You cannot re-enter ME 2 into ME 1, or ME 3 into ME 2.
- You cannot re-enter an ME, or the Clean Feed of an ME, into itself.

### Re-Entry Timing

To maintain proper video timing through the switcher, each ME or MiniME™ exists in a specific timing window. These windows restrict what can be re-entered into what.



**Figure 6: Re-Entry for 3 ME Mode Timing Windows**

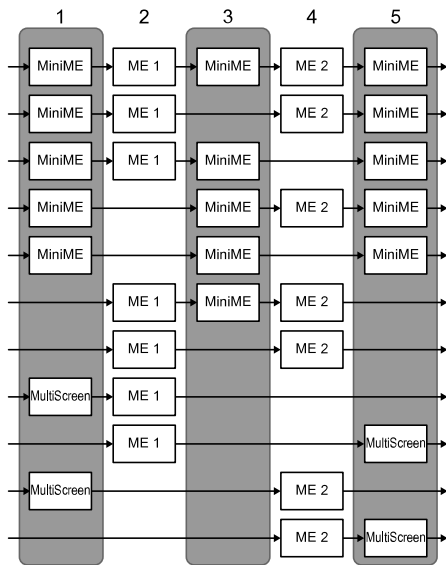


Figure 7: Re-Entry for MiniME™ Mode Timing Windows

### To Re-Enter an ME

1. Set up ME 1 with a background and a key.

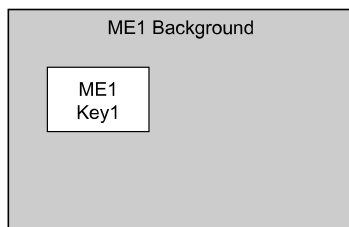


Figure 8: ME 1

2. Set up ME 2 with a key.

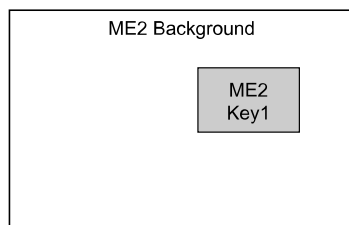


Figure 9: ME 2

3. Select ME 1 as a source on the Background Bus of ME 2. Notice that the output of ME 1 is now being used as the background of ME 2.

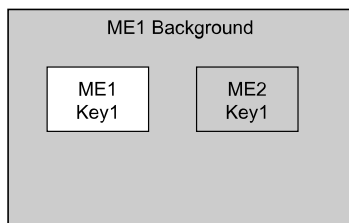


Figure 10: ME 1 Re-entered onto ME 2

## FlexiClean Clean Feed

FlexiClean provides a second program output that is derived from a different location than the standard program output. A frequent application is the recording of shows for later airing without call-in phone numbers inserted.

The clean feed output can come from before or between the keys.

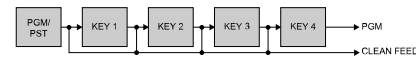


Figure 11: Clean Feed Modes

## Video Preview

Video preview allows you to use an additional monitor to preview what the next shot is going to be. The preview for an ME shows what is selected for the next transition on that ME. This includes the keys and background video sources that will be on-air after the next transition.

## MultiViewer

Each MultiViewer generator allows you to view up to 16 video sources, in 29 different layouts, from a single output BNC. Any video source on the switcher, including ME 1 and ME 2 Program, Preview, and Media-Store channels, can be assigned to any box on the MultiViewer output. All boxes on the MultiViewer output include mnemonic source names and red and green tallies.

If the switcher is operating in a standard-definition video format, the MultiViewer can be set to output high-definition. In HD output mode, the MultiViewer is only available on specific output BNCs.

## ME Copy

You can copy the entire contents of an ME to another keyer in the same, or a different ME. The entire contents of the destination ME is replaced with the contents of the source ME.

When you copy an ME, the switcher tries to assign resources to the destination ME to match the source ME. If these resources are not available, the switcher may need to steal resources. If you are performing the copy from the control panel you will be asked to confirm the stealing of any required resources. From DashBoard you will not be asked and the required resources will be stolen.

**Note:** If you copy from the half ME to a full ME, keys 3 and 4 are defaulted.

---

## To Copy an ME Using the Control Panel

**Note:** You must have at least a 2 ME control panel to perform an ME copy from the control panel. If you only have a 1 ME control panel, you must perform the copy from DashBoard.

This procedure copies the contents of ME 1 to ME 3 as an example. Use the same procedure for any ME combination.

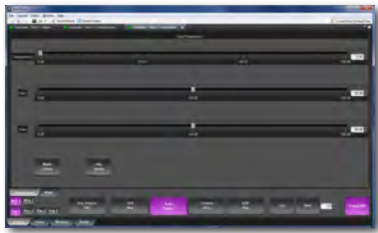
1. Press and hold the **BKGD** button on the transition area of the ME that you want to copy to.  
This is the destination ME that you want to copy to.
2. Press the **BKGD** button on the transition area of the ME you want to copy.  
This is the source ME that you want to copy from.

## To Copy an ME Using DashBoard

1. On the **Live Assist** node, click on the **ME Copy** tab.
2. Click a **Source** button to select the ME you want to copy.
3. Click a **Destination** button to select the ME that you want to copy to.
4. Click **Copy**.

# DashBoard

The DashBoard control system allows remote access to multiple pieces of Ross Video equipment, including OpenGear® cards, Carbonite production switchers, and BlackStorm™ video servers. From the DashBoard client you can control the various cards in your OpenGear® frame, load media into a channel on BlackStorm™, or set up a Chroma Key on Carbonite.



Download and install the latest version of DashBoard from <http://www.opengear.tv/>. Review the documentation that comes with DashBoard for information on installing and launching DashBoard.

**Note:** If you are using Carbonite eXtreme, you must use DashBoard 6.0 BETA, or higher.

**Tip:** For detailed instructions on using DashBoard with Carbonite, navigate to the online help at [help.rossvideo.com/carbonite](http://help.rossvideo.com/carbonite).

## Connecting to the Switcher

You must manually connect DashBoard to the switcher to establish communications. Once connected, DashBoard will remember the connection until you remove it.

### To Manually Connect to Carbonite from DashBoard

You need the IP address of your switcher to connect to it manually from DashBoard.

1. Click **File > New > TCP/IP openGear Frame**.
2. In the **IP Address** field, enter the IP address of the switcher frame.

**Tip:** The IP address can be found by pressing **MENU > SYSTEM > NEXT > NEXT > IP Addr**.

3. In the **Display Name** field, enter the name you want to appear in the **Tree View**.
4. On the **Port** list, select **5253**.
5. Click **Finish**.

The frame appears in the **Tree View**.

## Status

The Status node provides a read only overview of the state of a number of important switcher components and equipment.

The following items are available on the **Status** node:

- **Software Version** — the current version of the software running on the switcher
- **Serial Number** — the serial number of the frame
- **Video Mode** — the video format that the switcher is operating in
- **Video Reference Source** — the source of video reference to the switcher
- **External Reference** — the video format of the external reference, if connected
- **Reference** — status of whether the switcher has locked to the reference format
- **Field Dominance** — the switching field
- **Ancillary Mode** — how ancillary data is handled (strip or pass)
- **Temperature** — status of the ambient temperature in the frame
- **CPU Temperature (C)** — the temperature of the frame CPU in degrees Celsius
- **FPGA Temperature (C)** — the temperature of the frame FPGA in degrees Celsius
- **Fan #1** — status of fan 1 in the frame (left fan)
- **Fan #2** — status of fan 2 in the frame (right fan)
- **Timecode** — the current timecode being received by the switcher

## Configuration

The Configuration node provides a graphical interface to switcher settings such as Reference, Inputs, Outputs, and MultiViewer. You can switch between the different by selecting the tabs at the bottom of the DashBoard window.

**Note:** Carbonite Configuration in DashBoard requires a screen resolution of 1920×1080.

## Live Assist

The Live Assist node provides a graphical interface to functions such as keying, transition, and memory settings of the switcher. You can switch between the different settings by selecting the tabs at the bottom of the DashBoard window.

---

## PaneLINK

Live Assist can be set to either mirror actions on the switcher control panel, or only show actions on the currently selected ME and Keyer on the current tab. For example, with **PaneLINK** turned on, pressing **KEY 1 SEL**, **WIPE**, and then **SELF KEY** causes Live Assist to show the **Keyers** tab, the **Trans** tab, and then the **Keyers** tab again. With **PaneLINK** turned off, Live Assist does not switch between tabs.

The **PaneLINK** button is located at the bottom right corner of the window.

## Custom Controls

The Custom Control node provides a graphics interface for recording, editing, and running custom controls.

## MediaManager

The MediaManager node allows you to connect to the MediaManager web interface from within DashBoard.

**Tip:** You can either launch the MediaManager directly using the switcher IP address, or you can access it using the MediaManager node in DashBoard. If you are logging into MediaManager from DashBoard, you must have Internet Explorer® 10, or higher, installed.

# ViewControl

The ViewControl interface through DashBoard allows you to coordinate control of the Carbonite switcher, XPression Live Graphics System, and the BlackStorm™ Playout Server all through a touchscreen interface. Through ViewControl you can select sources, perform transitions, and run custom controls.

### Keep the following in mind when working with ViewControl

- ViewControl requires DashBoard 5.1, or later.
- Only the sources assigned to the MultiViewer boxes are available for direct selection. Custom controls can be used to select other sources.
- A running custom control, or a custom control that is paused or held, are not shown on the ViewControl interface.
- The control panel does not follow key and bus selections made on ViewControl.

## ViewControl Overview

The ViewControl interface provides quick access to a number of custom control buttons as well as the transition functionality of the switcher.

### Custom Control Buttons

The custom control buttons can be assigned to any custom control on the switcher and given unique names and icons. The button groups on the left (shown below) are organized into groups, or tabs.



Figure 12: Custom Control Buttons

### Bus Selection Buttons

The bus selection buttons allow you to select the different buses on different ME outputs of the switcher.

To select a source on a bus, press the bus selection button, and press the MultiViewer box for the source you want to select. For example, to select camera 1 on ME 2 Key 3, press **M2 K3** and then press the box for the camera 1 source.



Figure 13: Bus Selection Buttons

### Keyer Transition Buttons

The Keyer Transition buttons allow you to perform a cut or dissolve of the keys on the Program bus, without having to include them as part of the next transition. These buttons act the same as the Keyer Transition Buttons on the control panel.

**Tip:** The Cut buttons turn red when a key is on-air.



Figure 14: Keyer Transition Buttons

### Transition Buttons

The transition buttons allow you to select what is included in the next transition, what type of transition is to be performed, and perform the transition. These buttons function similarly to the buttons in the Transition Area on the control panel.

**Tip:** The Transition Buttons on ViewControl only control the transition area of ME 2. To control ME 1 you can create a custom control to perform the effect you want and assign it to one of the custom control buttons.

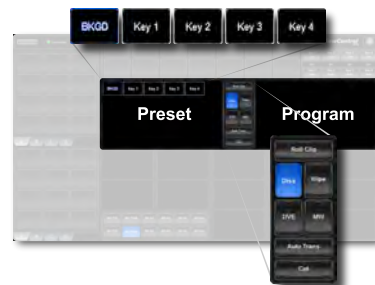


Figure 15: Transition Buttons

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## Custom Control Button Setup

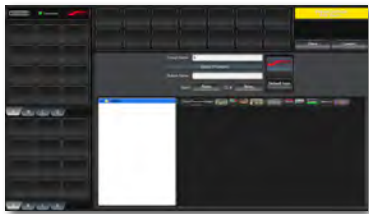
When you assign a custom control to a button, you can give that button a unique name and assign an icon to it. The images for the icons must be on a USB drive in the frame when you assign them. Once assigned the icons are stored in the frame and the USB can be removed. Each of the tabs can be named.

The configuration of the tabs and custom control assignment to buttons are stored with the switcher personality settings.

### To Set up the Custom Control Buttons

If you want to assign icons to the custom control buttons, you must have the images you want to use for the icons stored on a USB drive installed in the frame. After the images have been assigned you can remove the USB drive.

1. Click the  icon in the upper right corner of the window.



**Figure 16: ViewControl Edit Button**

2. Press the custom control button that you want to set up.
3. Enter a name for the button in the **Button Name** field.

**Tip:** You can change the name of a tab by selecting a button on the tab and then entering a new name in the **Group Name** field.

4. Click the **Bank** button and select the number of the bank you want to select a custom control from.
5. Click the **CC X** button and select the number of the custom control you want to assign to the button.
6. Navigate the files on the USB drive and click the image you want to assign as the icon for the button.

**Tip:** Press **Default Icon** to switch back to the default icon.

7. Set up additional custom control buttons as required.
8. Press **Done** when you are done setting up custom control buttons.

# Transitions

Transitions are used to change the background video and take keys on and off-air. A transition can include any combinations of background and keyers for an ME. The background and each keyer can be transitioned independently and at the same time using the dedicated **KEY CUT** and **KEY AUTO** buttons.

## Performing Transitions

What you can include in the transition, and the type of transition you can perform, depend on the number of media resources you have, and if you are performing a background and keyer transition at the same time.

### Keep the following in mind when performing transitions:

- If any of the sources going on-air have an assigned GPI output, the GPI output is triggered and the switcher then waits the configured pre delay interval before performing the transition. If you perform a transition with the fader handle, the GPI output is triggered but the pre delay interval is ignored.
- If any of the sources going on-air are assigned to a video server, you can have the video server play when the source is taken on-air by using the **RIClip** knob to select **On**.
- If any of the sources going on-air are assigned to a video server, the switcher waits for the configured pre delay interval before performing the transition. If you perform a transition with the fader handle, the pre delay interval is ignored.
- If the fader is moved during an auto transition, control of the transition is passed to the fader. You must complete the transition with the fader. This allows you to override any auto transition in progress with the fader.
- A key only transition can be performed by pressing the **KEY CUT** or **KEY AUTO** button for the key you want to transition.
- You can pause an auto transition by pressing the **AUTO TRANS** button during the transition. Press the button again to continue the transition.
- On a MiniME™, Background and key 2 only support Dissolve and Cut transitions. Key 2 can support a Dissolve, DVE, or Cut transition.
- There is no preview output for a MiniME™.

## Understanding the Transition Menu

When you select a transition type button, the menu system displays a number of options that allow you to adjust how a transition is performed or appears. The options that are available depend on the type of transition that is selected.

**Table 2: Transition Menu Items**

Menu Item	Description
<b>Time</b>	selects the amount of time (Transition Rate), in frames, that an auto transition takes
<b>RIClip</b>	selects whether GPI outputs assigned to input sources are triggered before a transition
<b>Dirctn</b>	selects the direction that the wipe is performed (forward or reverse), as well as turns the Flip-Flop feature on or off
<b>Key X</b>	selects the amount of time, in frames, that an auto transition dissolve for the keyer takes
<b>Patrn</b>	selects the pattern for the wipe transition
<b>X Pos</b>	selects the horizontal position for the wipe pattern
<b>Y Pos</b>	selects the vertical position for the wipe pattern
<b>Aspect</b>	selects the aspect ratio for the wipe pattern
<b>Border</b>	turns the border feature on and selects the size of the border on the wipe pattern
<b>Soft</b>	selects the amount of softness that is applied to the wipe border
<b>Load</b>	selects the color for the wipe border from a pre-set list
<b>BHue</b>	adjusts the hue of the wipe border color
<b>BSat</b>	adjusts the saturation of the wipe border color
<b>BLum</b>	adjusts the luminance of the wipe border color
<b>Rot</b>	selects the rotation for the wipe pattern
<b>HMult</b>	multiplies the wipe pattern horizontally (1-32)
<b>VMult</b>	multiplies the wipe pattern vertically (1-32)
<b>Browse</b>	selects an animation for a media transition
<b>Attrib</b>	used with the <b>Value</b> knob to adjust parameters for the MediaWipe ( <i>Media-Store Attributes</i> on page 51)
<b>Func</b>	selects how the <b>Attrib</b> adjustments are saved
<b>Limit</b>	turns the Transition Limit feature on or off
<b>Effect</b>	selects the pattern for the DVE transition

## To Perform a Transition

All transitions, with the exception of cuts on the background or key bus, have the same basic setup. To perform a transition, you must select what sources you want to transition on what buses, and how you want the transition to appear.



1. In the Transition Area, select the elements (**BKGD**, **KEY 1**, **KEY 2**, **KEY 3**, **KEY 4**) you want to include in the next transition. To select multiple keys and background, press and hold the first element, and select the additional elements.
2. Select the video sources you want to take on-air.  
For a background transition you must select the source you want to transition to on the preset bus.
3. Select the type of transition (**DISS**, **WIPE**, **DVE**, **MEDIA**) you want to perform.

**Note:** On the C2S/C2X/C3S/C3X control panel, the **USER** button is not implemented at this time.

4. Use the **RIClip** knob to select whether you want any video server clips assigned to a source being taken on-air to play with the transition (**On**), or not (**Off**).
5. Perform the transition.

**Tip:** You can preview the transition on the preview output by pressing and holding the transition type button and perform the Auto Trans or Fader transition. You cannot preview the independent key-only transitions or a MiniME™ transition.

- **Auto Transition** — press **AUTO TRANS**. The transition is performed at the set transition rate
- **Cut** — press **CUT**
- **Fader** — move the fader from one limit to the other. The rate at which you push the fader determines the rate of the transition.

If a pre-delay has been set, the switcher will apply the pre-delay interval before performing the transition.

## To Override the Pre-Delay Setting

During the pre-delay time, you can override the pre-delay count and cut the sources on-air immediately.

- While the switcher is waiting for the pre-delay countdown to complete, perform one of the following
  - Press the source button on the background bus that is going-on air. The pre-delay countdown and the transition are aborted and the source is cut to air on the background bus.
  - Initiate a transition with the fader handle. The pre-delay countdown is aborted and the transition proceeds as you move the fader handle.

## To Abort a Transition During the Pre-Delay

During the pre-delay time, you can abort the transition completely.

- While the switcher is waiting for the pre-delay countdown to complete, perform one of the following
  - Press any source button on any bus other than the source button on the background bus that is going-on air.
  - Press the **BKGD** or **Key X** button in the next transition area.
  - Press the **CUT** or **AUTO TRANS** button.
  - If a key is included in the transition, press one of the dedicated key transition button.
  - Recall a memory. The pre-delay countdown and transition are aborted and the memory register is recalled.

## Cut Transitions

A Cut is an instantaneous transition between video sources. Unlike all the other transition types, there are no intermediate steps between the video source that is on-air, and the video source you are transitioning to.

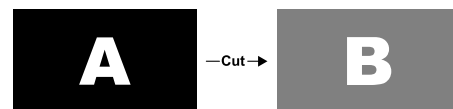


Figure 17: Example Cut Transition

A cut is performed either by selecting difference sources on a background or key bus, or by pressing a **CUT** button.

## Dissolve Transitions

A Dissolve is a gradual fade between video sources. For a Background transition, the video signal on the Background bus and the video signal on the Preset bus are mixed together until the Preset bus video signal completely replaces the Background bus video signal.



Figure 18: Example Dissolve Transition

## To Set Up a Dissolve

A dissolve transition requires that you set a background and key transition rate for the auto transition. A fader transition does not use the transition rate.

1. Press **DISS**.

**Tip:** You can use the same procedure for a MiniME™ or MultiScreen.

- Use the **Time** knob to set the length of the background transition.

**Tip:** You can also select a time by pressing one of the **5** through **60** buttons.

**Tip:** If you have a C2S/C2X/C3S/C3X control panel, press **ME RATE** in the Effects Memory area for the ME you want to change the rate for, use the keypad to enter the new rate, and press **Enter**.

- Press **NEXT**.
- Use the **Key X** knobs to select the length of the key transitions.

**Tip:** If you have a C2S/C2X/C3S/C3X control panel, press **KEY RATE** in the Effects Memory area repeatedly to select the Keyer you want to set the rate for, use the keypad to enter the new rate, and press **Enter**.

## Wipe Transitions

A Wipe is a gradual transition where one video signal is replaced with another according to a wipe pattern. In the example below, a line wipe is being used.



Figure 19: Wipe Transition

For Key transitions, the key is wiped on or off-air with the transition and the background remains untouched. The duration of a wipe transition depends on either the transition rate for the ME, or the rate at which the fader is moved.

### To Set Up a Wipe

A wipe transition requires that you select a wipe pattern, set the direction and number/size of wipe pattern, as well as set a background and key transition rate for the auto transition. A fader transition does not use the transition rate.

- Press **WIPE**.
- Use the **Time** knob to set the length of the background transition.

**Tip:** If you have a C2S/C2X/C3S/C3X control panel, press **ME RATE** in the Effects Memory area for the ME you want to change the rate for, use the keypad to enter the new rate, and press **Enter**.

**Tip:** If you have a C2S/C2X/C3S/C3X control panel, press **KEY RATE** in the Effects Memory area repeatedly to select the Keyer you want to set the rate for, use the keypad to enter the new rate, and press **Enter**.

- Use the **Dirctn** knob to select the direction that the wipe travels.
- Press the **Dirctn** knob to select whether the wipe runs forward during the first transition and then reverse during the second (**FF**), or if it always goes in the same direction.
- Press **NEXT**.
- Use the **Pattn** knob to select the wipe pattern you want to use. You can also select the pattern by pressing the pattern button directly.
- Use the **X Pos** and **Y Pos** knobs to position the wipe pattern. You can also use the positioner.
- Press **NEXT**.
- Use the **Aspect** knob to adjust the aspect ratio of the mask.  
Not all patterns can be adjusted.
- Use the **Border** and **Soft** knobs to apply a border to the mask.  
Refer to the section *To Apply a Border to a Pattern* on page 26 for information on borders.
- Press **NEXT**. If a border is applied to the wipe, you must press **NEXT** multiple times to get to the next step.
- Use the **Rot** knob to rotate the pattern.  
Not all patterns can be rotated.
- Use the **HMult** knob to multiply the pattern horizontally.
- Use the **VMult** knob to multiply the pattern vertically.

### To Apply a Border to a Pattern

- Press **WIPE > NEXT > NEXT**.
- Use the **Border** knob to adjust the size of the border around the pattern.
- Use the **Soft** knob to adjust the softness of the pattern border.
- Press **NEXT**.
- Select a default or custom color for the border.
  - Default** — use the **Load** knob to select a preset color for the border.

- **Custom** — press **NEXT** and use the **BHue**, **BSat**, and **BLum** knobs to select your own color.

## DVE Transitions

A DVE transition is a gradual transition where one video signal is replaced with another according to a 2D DVE pattern.

**Keep the following in mind when performing DVE transitions:**

- You must include the background when performing a DVE transition on a Chroma Key, Self Key, or Auto-Select Key. If you do not include the background, a dissolve transition is performed.
- Performing a DVE transition on a DVE Key without including the background scales the transition effect to the size of the DVE Key. This transition does not consume an additional DVE resource.
- Performing a DVE transition on a DVE Key with the background included does not scale the transition effect. This transition consumes the second DVE resource.

## To Set Up a DVE Transition

A DVE transition requires that you select the DVE pattern and duration for the transition.

1. Press **DVE**.

**Tip:** You can use the same procedure for a MiniME™ or MultiScreen.

2. Use the **Time** knob to set the length of the background transition.

**Tip:** If you have a C2S/C2X/C3S/C3X control panel, press **ME RATE** in the Effects Memory area for the ME you want to change the rate for, use the keypad to enter the new rate, and press **Enter**.

**Tip:** If you have a C2S/C2X/C3S/C3X control panel, press **KEY RATE** in the Effects Memory area repeatedly to select the Keyer you want to set the rate for, use the keypad to enter the new rate, and press **Enter**.

3. Use the **Dirctn** knob to select the direction that the wipe travels.
4. Press the **Dirctn** knob to select whether the wipe runs forward during the first transition and then reverse during the second (**FF**), or if it always goes in the same direction.

5. Press **NEXT**.

6. Use the **Effect** knob to select the DVE pattern you want to use. You can also select most of the patterns by pressing, or double-pressing, the pattern button directly.

- **PushL** — Push Left (◀)
- **PushR** — Push Right (▶) (double-press ▶)
- **PushU** — Push Up (⬆)
- **PushD** — Push Down (⬇) (double-press ⬇)
- **SqzHor** — Squeeze Horizontally (◀▶)
- **SqzVert** — Squeeze Vertically (⬆⬇) (double-press ⬆)
- **SqzCtr** — Squeeze to the Center (◻)
- **PushUL** — Push to Upper-Left (↖)
- **PushUR** — Push to Upper-Right (↗) (double-press ↗)
- **PushDL** — Push to Lower-Left (↙) (double-press ↙)
- **PushDR** — Push to Lower-Right (↘) (double-press ↘)
- **SqzUR** — Squeeze to Upper-Right (↗) (◻)
- **SqzUL** — Squeeze to Upper-Left (↖) (◻)
- **SqzDR** — Squeeze to Lower-Right (↘) (double-press ↘)
- **SqzDL** — Squeeze to Lower-Left (↙) (double-press ↙)
- **CirclL** — Circle Left (◻)
- **CirclR** — Circle Right (double-press ◻)
- **FlyTru** — Fly Through (double-press ◻)
- **Strtch** — Stretch Horizontally to Black (◻)
- **Tumble** — Tumble Down (double-press ◻)
- **1000lb** — Falls and then Bounces
- **SqzU** — Squeeze Up
- **SqzD** — Squeeze Down
- **SqzL** — Squeeze Left
- **SqzR** — Squeeze Right

## MediaWipe Transitions

A MediaWipe allows you to use an animation to cover a transition. When the transition starts, the switcher plays the selected animation over top of the background and keys that are being transitioned. When the cut point is reached, the switcher performs a cut transition.

It is important to use a full-screen image in the animation at the cut point so that the cut is not visible on-air.

### Keep the following in mind when performing MediaWipe:

- Although you can select a still image for a media transition, it is not recommended.
- Only Auto Transition should be used for Media transitions. Using the fader to perform the transition manually could result in jumps in the animation.
- The duration of the transition (Time) is set by the length of the animation and the play speed of the animation.
- The audio associated with a MediaWipe is embedded in the video stream of the ME that the transition is performed on. The audio can also be taken out of the video stream of the Media-Store channel used for the MediaWipe. The **M1MW** and **M2MW** outputs are dedicated to these Media-Store channels.

### To Set Up a MediaWipe

A MediaWipe™ requires that you select the animation you want to use. How the animation plays and appears during the transition is stored in the animation. Refer to *Media-Store* on page 49 for information animations.

1. Press **MEDIA**.

**Tip:** Press and hold the **MEDIA** button and select the Media-Store channel you want to assign the animation to on the Preset bus. The Media-Store channels must be assigned to source buttons with the bus map to be selectable. The Media-Store Mode must be set to Swish+.

2. Use the **Dirctn** knob to select the direction that the wipe travels.
3. Press the **Dirctn** knob to select whether the wipe runs forward during the first transition and then reverse during the second (**FF**), or if it always goes in the same direction.
4. Press **NEXT**.
5. Press the **Browse** knob.
6. Use the **Browse** knob to select the location where the animation is stored. You can also load an animation by entering the media number using the pattern buttons.
  - **Internal(0)** — Internal cache (flash memory containing sample images only)
  - **USB(1)** — USB drive installed in the frame
7. Press the left knob.
8. Use the left knob to select the animation you want to use for the transition.

9. If you have not set a cut frame for the animation, use the fader to move through the animation to the point where you want the video behind the animation to cut to the new video source.
10. Press and hold the **MEDIA** button and press **CUT** to set the new cut frame.

### Transition Limits

The Transition Limit allows you to set the point in a transition where an auto transition stops. When active, the point in the transition where the auto transition will stop is indicated by a flashing segment on the transition progress bar next to the fader handle. The auto transition proceeds to this point and stops. The second auto transition starts from the transition limit point and goes back to where the first transition started.

**Tip:** If you turn Limit off when the transition has stopped at the transition limit point, the next transition starts from the transition limit point and goes forward to complete the transition, instead of going back to the start.

### To Set Up a Transition Limit

A transition limit is set using the fader of the ME that you want to set up the transition limit on. The transition limit is specific to the ME it is set on.

1. Set up the transition you want to perform.
2. Press **NEXT** until **Limit** is shown on the menu.
3. Move the fader to the position in the transition where you want to set the transition limit point.
4. Toggle the **Limit** knob (**On**) to set the transition limit point.

**Tip:** You can use the same procedure for a MiniME™ or MultiScreen.

The segment on the transition progress bar next to the fader handle flashes, indicating the location of the transition limit point.

The transition limit is set and active for the ME you set it on. You can turn transition limit on and off by toggling the **Limit** knob while the fader is at either the top or bottom limit. If the fader is not on a limit when you toggle the transition limit on, a new transition limit will be set. Double-press the **Limit** knob to reset the transition limit point.

### GPI Output Triggers

Each video source can have a GPI output assigned to it. This GPI can be used to trigger an external device, such as a video server, to play the cued clip when the video

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sources from the video server are taken on-air. This trigger can be set up to occur automatically any time the video source is transitioned on-air, or it can be triggered manually.

An automatic GPI output trigger can be overridden if required.

**Note:** *The Next Button Secondary Function must be set to GPO to be able to trigger a GPI output manually using the NEXT button.*

### Keep the following in mind when working with GPI output triggers:

- The **RIClip** knob must be set to **On** to trigger a GPI output with a transition.
- Edge triggered GPI outputs remain triggered for the configured duration.
- Level triggered GPI outputs toggle between high and low each time they are triggered.

### To Manually Trigger a GPI Output

The GPI must already be set up as an output and the Next button functionality must be set to GPO before you can manually trigger it.

1. Press and hold the **NEXT** button.  
While holding the Next button, the mnemonic/pattern buttons light for each GPI output that is currently triggered.
2. Press the mnemonic/pattern button for the GPI output you want to trigger. The number of the GPI is shown on the mnemonics of the buttons. The numbers on the pattern buttons on the C10/C1 correspond to the GPI.

### To Override a GPI Output

The RIClip personality option must be set to User for you to override GPI output triggering.

1. Prepare the transition as required, but do not perform the transition.
2. Press the transition type button again to bring up the transition menus.
3. Use the **RIClip** knob to select whether the GPI output is triggered (**On**), or is not triggered (**Off**).

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# Patterns, Washes, and Mattes

Patterns, Washes, and Mattes are internally generated graphical elements that can be used for key or background fill, key shapes, and transition effects. The switcher has a limited number of pattern and matte generators dedicated to each ME.

## Patterns

Pattern generators are used for wipes, masks, and washes. Each pattern generator can create a single pattern output that can be adjusted to create a specific look.

Patterns can be applied to the following:

- **Wipes** — Press **WIPE**.
- **Masks** — Select the key you want apply the mask to and use the **Mask** knob to select **Pattern**.
- **Washes** — Select the matte generator (**BG**) on a background or key bus and use the **Wash** knob to select **On**.

## To Set Up a Pattern

When a pattern generator is assigned to a wipe, mask, or wash, the pattern setting are displayed. Selecting the **WIPE** button, **KEY SEL** button, or the matte generator (**BG**) returns to this menu. When a pattern generator is assigned the pattern settings are part of the setup menu.

1. Use the **Patrn** knob to select the wipe pattern you want to use. You can also select the pattern by pressing the pattern button directly.
2. Use the **X Pos** knob to position the wipe pattern horizontally. You can also use the positioner.
3. Use the **Y Pos** knob to position the wipe pattern vertically. You can also use the positioner.
4. Press **NEXT**.
5. Use the **Aspect** knob to adjust the aspect ratio of the patten. Not all patterns can be adjusted.
6. Use the **Border** knob to apply a border to the wipe.
7. Press **NEXT**. If a border is applied to the wipe or mask, you must press **NEXT** multiple times to get to the next step.
8. Use the **Rot** knob to adjust the aspect ratio of the patten. Not all patterns can be rotated.
9. Use the **HMult** knob to multiply the pattern horizontally.

10. Use the **VMult** knob to multiply the pattern vertically.

## Washes

Washes are applied to matte generators selected on the background or key buses and allow you to apply a two-color effect based on a selected pattern.

## To Set Up a Wash

A wash applies colors to a pattern selected for a matte. The first color is preset to the matte color, but both are selectable. Selecting the source button again, or **KEY SEL** button returns to this menu. Refer to the sections on mattes and patterns for information on setting them up. You can load a preset color instead of creating the first custom color.

1. Use the **Hue 1** knob to adjust the hue of the first custom color.
2. Use the **Sat 1** knob to adjust the saturation of the first custom color.
3. Use the **Lum 1** knob to adjust the luminance of the first custom color.
4. Press **NEXT**.
5. Use the **Wash** knob to select **On**.
6. Press **NEXT**.
7. Use the **Size** knob to select the size of the wash pattern.
8. Press **NEXT > NEXT > NEXT > NEXT**.
9. Use the **Hue 2** knob to adjust the hue of the second custom color.
10. Use the **Sat 2** knob to adjust the saturation of the second custom color.
11. Use the **Lum 2** knob to adjust the luminance of the second custom color.

## Mattes

Mattes are solid color signals that can be applied to backgrounds and keys, and borders. Color selection is done either by picking a preset color, or by adjusted hue, saturation, and luminance to create a custom color.

Mattes can be applied to the following:

- **Background** — Select the matte generator (**BG**) on a background or key bus. The full region of the background or key is filled with the selected color.
- **Border** — Assign a border to a **WIPE** transition or a key. The wipe border is filled with the selected color.

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## To Set Up a Matte Color

When a matte generator is assigned to a background or key, the matte settings are displayed. Selecting the source button again, or **KEY SEL** button returns to this menu. When a matte generator is assigned to a key border or wipe border, the matte settings is part of the setup menu, and become active when **Border** is set to greater than 0.

1. Press **NEXT**.
2. Use the **Load** knob to select the preset color you want to use.
3. Press the **Load** knob to load the selected color. If you want to use the preset color, ignore the rest of this procedure.
4. Press **NEXT**.
5. Use the **Hue** knob to adjust the hue of your custom color.
6. Use the **Sat** knob to adjust the saturation of your custom color.
7. Use the **Lum** knob to adjust the luminance of your custom color.

# Keying

Keying is the term used to describe when you insert (or electronically cut) portions of one scene into another, or place titles over background images. Keys are made up of two basic components, an alpha, that cuts the hole in the background video, and a fill, that fills the hole with different video.

Keys, like MEs, are layered onto the background video signal from the lowest numbered key to the highest on an ME.

**Note:** DashBoard Live Assist will not notify you of error messages or if a confirmation is required. For example, if there are no available resources for the DVE Key, or Chroma Key, you are trying to create, the switcher will not create the key and no notification will be shown.

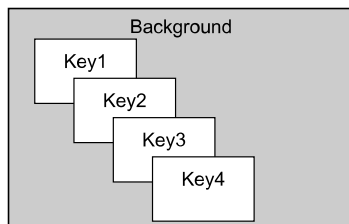


Figure 20: Key Priority

If you are using a MiniME™, key 1 only supports a DVE key type, and key 2 only supports the Self Key, Auto Select, and Chroma Key types. Key priority on a MiniME™ is the same as on an ME.

## Understanding the Keying Menu

When you select a key type button (⊞ ⊞ ⊞ ⊞ ⊞), the menu system displays a number of options that allow you to adjust how a the key appears. The options that are available depend on the type of key that is selected.

The switcher supports Self, Auto Select, Chroma, and DVE keys in each ME.

Table 3: Keying Menu Items

Menu Item	Description
<b>Clip</b>	removes lower-saturated colors from the video image
<b>Gain</b>	adjusts the transition between video image, and the parts of the video image that are removed
<b>Transp</b>	adjusts the overall transparency of the key video
<b>Linear</b>	sets the clip, gain, and transparency values for self keys back to the default
<b>Invert</b>	reverses the polarity of the key alpha so that the holes in the background are cut by dark areas of the key alpha instead of bright areas

Menu Item	Description
<b>Mode</b>	overrides the shaped setting for the key
<b>Mask</b>	selects the type of mask that is applied to the key ( <i>Masks</i> on page 39)
<b>M-Frce</b>	turns the force mask feature on or off ( <i>To Pattern Mask a Key</i> on page 39)
<b>M-Inv</b>	turns the invert mask feature on or off ( <i>To Pattern Mask a Key</i> on page 39)
<b>Size</b>	adjusts the size of the mask or DVE key
<b>Patrnr</b>	selects the pattern for the pattern mask
<b>X Pos</b>	selects the horizontal position of the mask or DVE key
<b>Y Pos</b>	selects the vertical position of the mask or DVE key
<b>Aspect</b>	selects the aspect ratio for the mask pattern or DVE key
<b>Border</b>	turns the border feature on and selects the size of the border on the mask pattern or DVE key
<b>Soft</b>	selects the amount of softness that is applied to the mask or DVE key border
<b>Load</b>	selects the color for the border from a pre-set list
<b>BHue</b>	adjusts the hue of the border color
<b>BSat</b>	adjusts the saturation of the border color
<b>BLum</b>	adjusts the luminance of the border color
<b>Rot</b>	selects the rotation for the mask pattern
<b>HMult</b>	multiplies the mask pattern horizontally (1-32)
<b>VMult</b>	multiplies the mask pattern vertically (1-32)
<b>HCrop</b>	press to toggle between <b>HCrop</b> , <b>Left/R</b> , and <b>L/Rght</b> <ul style="list-style-type: none"> <li><b>HCrop</b> — adjusts the horizontal cropping of the DVE key</li> <li><b>Left/R</b> — adjusts the cropping of the left side of the DVE key</li> <li><b>L/Rght</b> — adjusts the cropping of the right side of the DVE key</li> </ul>
<b>VCrop</b>	adjusts the vertical cropping of the DVE key <ul style="list-style-type: none"> <li><b>Top/B</b> — adjusts the cropping of the top of the DVE key</li> <li><b>T/Bttm</b> — adjusts the cropping of the bottom of the DVE key</li> </ul>
<b>Left/R</b>	press to toggle between <b>Left/R</b> and <b>L/Rght</b> <ul style="list-style-type: none"> <li><b>Left/R</b> — adjusts the cropping of the left side of the box mask</li> <li><b>L/Rght</b> — adjusts the cropping of the right side of the box mask</li> </ul>
<b>Top/B</b>	press to toggle between <b>Top/B</b> and <b>T/Bttm</b> <ul style="list-style-type: none"> <li><b>Top/B</b> — adjusts the cropping of the top of the box mask</li> <li><b>T/Bttm</b> — adjusts the cropping of the bottom of the box mask</li> </ul>



## Self Keys

A Self Key is a key in which the luminance, or brightness, values of the key source are used as the alpha for the key.

**Tip:** To select a Self Key on the C10 control panel you must press the **AUTO SELECT** button. The Auto Select key defaults to a Self Key when there is no alpha associated to the video source. If there is an alpha associated to the video source, you must press and hold the **AUTO SELECT** button and press the source button again, like you were setting up a Split Key.

### To Set up a Self Key

A self key is set up by selecting the keyer and video source you want to use, and adjusting the key parameters.

**Tip:** You can return the clip and gain values to the default settings by pressing the **Make Linear** knob.

1. Select the keyer that you want to set up a Self Key on.

**Tip:** You can use the same procedure for a MiniME™ or MultiScreen.
2. Select the video signal, on the key bus, that you want to use for the key.
3. Press **SELF KEY**.
4. Use the **Clip** knob to remove lower-saturated colors from the video image.
5. Use the **Gain** knob to adjust the transition between the video image and the parts of the video image that are removed.
6. Use the **Transp** knob to adjust the transparency of the key from opaque (**0%**) to fully transparent (**100%**).
7. Press **NEXT**.
8. Use the **Invert** knob to reverse the polarity of the key alpha (**On**) so that the holes in the background are cut by dark areas of the key alpha instead of bright areas.
9. Use the **Mode** knob to override the shaped setting for the key.
  - **Normal** — use the shaped/unshaped setting from the key setup.
  - **Addtve** — set to an additive keyer for a shaped source.
  - **Full** — set the alpha to fully opaque (white). The **Clip**, **Gain**, **Make Linear**, and **Key Invert** functions are disabled in this mode.

**Note:** The mode is reset to **Normal** when a different source is selected on the key bus, the alpha is changed, or a memory is recalled.

10. Press **NEXT**.

11. Use the **Mask** knob to apply a mask to the key.

## Auto Select Keys

An Auto Select key is a key in which two video signals are required to make the key. The alpha is used to cut the hole in the video and the fill is used to fill the hole. These signals often originate from external devices such as character generators, external still stores, or other graphics systems.

### To Set Up an Auto Select Key

An auto select key is set up by selecting the keyer and video source you want to use, and adjusting the key parameters. The pairing of the video and alpha video signals is done when configuring video inputs. Refer to the Setup Guide that came with your switcher for information on setting up Auto Keys.

**Tip:** You can return the clip and gain values to the default settings by pressing the **Make Linear** knob.

1. Select the keyer that you want to set up an Auto Select on.

**Tip:** You can use the same procedure for a MiniME™ or MultiScreen.
2. Select the video signal, on the key bus, that you want to use for the key.
3. Press **AUTO SELECT**.
4. Use the **Clip** knob to remove lower-saturated colors from the video image.
5. Use the **Gain** knob to adjust the transition between the video image and the parts of the video image that are removed.
6. Use the **Transp** knob to adjust the transparency of the key from opaque (**0%**) to fully transparent (**100%**).
7. Press **NEXT**.
8. Use the **Invert** knob to reverse the polarity of the key alpha (**On**) so that the holes in the background are cut by dark areas of the key alpha instead of bright areas.
9. Use the **Mode** knob to override the shaped setting for the key.

- **Normal** — use the shaped/unshaped setting from the key setup.
- **Addtve** — set to an additive keyer for a shaped source.
- **Full** — set the alpha to fully opaque (white). The **Clip**, **Gain**, **Make Linear**, and **Key Invert** functions are disabled in this mode.

**Note:** *The mode is reset to **Normal** when a different source is selected on the key bus, the alpha is changed, or a memory is recalled.*

10. Press **NEXT**.

11. Use the **Mask** knob to apply a mask to the key.

The Auto Select key uses the pre-assigned Auto Key association to select the proper video and alpha. If you want to temporarily select a different video source for the alpha, press and hold the **AUTO SELECT** button and select the video source you want to use as the new fill.

## UltraChrome Chroma Key

An UltraChrome Chroma Key is a key in which the hole is cut based on a color value, or hue, rather than a luminance value or alpha signal. The color is removed and replaced with background video from another source. The default color is blue.

Chroma Key adjustments are persistent and are not affected by a soft reset or switcher reboot. However, initializing the Chroma Key or performing a factory reset returns all adjustments to default values.

## Chroma Key Modes

The UltraChrome Chroma Key operates in one of two modes, Basic or Advanced, depending on the complexity of the Chroma Key you are setting up.

- **Basic Mode** — In basic mode, UltraChrome provides a simple background/foreground chroma key with adjustment for background spill and edge softness.
- **Advanced Mode** — In advanced mode, UltraChrome provides advanced background shadow and translucency control, as well as control over background/foreground transition areas.

Although it is possible to switch back and forth between advanced and basic mode, the additional image correction of the advanced mode is only applied in the advanced mode. For example, if you use the basic mode to set up the Chroma Key and then switch to the advanced mode, the entire image may change as the image correctors

provided by the advanced mode are applied at their default settings.

## Chroma Key Basic Mode

The following chroma key parameters can be adjusted in Basic Mode:

- **Background Gain** — Allows you to modify the range of colors that are considered background and are masked out of the Chroma Key.
- **Edge Softness** — Allows you to adjust the amount of edge softening applied to the foreground. This helps blend the foreground into the new background.
- **Foreground Clip/Hue/Reject** — Allows you to modify the range of colors that are considered foreground and are not masked.
- **Spill Range** — Allows you to remove background color casts that may spill into the foreground image (green color cast on the foreground from a green-screen for example).

### To Set Up a Chroma Key in Basic Mode

The UltraChrome chroma key tries to automatically adjust for the scene you are trying to chroma key. For the best results, initialize the key first, and then identify the areas where you need to adjust the key.

1. Select the keyer that you want to set up an Chroma Key on.

**Note:** *You can use the same procedure for a MiniME™.*

2. Select the video signal, on the key bus, that you want to use for the key.
3. Press **CHR KEY**.
4. Use the **Mode** knob to select **Basic**.
5. Use the **Color** knob to select the color you want to key out.
6. Press the **Init** knob to initialize the chroma key. Every time the key is initialized, the switcher resets all the Chroma Key parameters to their default settings.
7. Press **NEXT**.
8. Use the **Type** knob to select **Bkgd** and use the **Value** knob to adjust the background gain.
  - Increasing the gain value causes the background to appear more opaque. This results in less of the background color being removed.

- Decreasing the gain value causes the background to appear more transparent. This results in more of the background color being removed.
9. Use the **Type** knob to select **Edge** and use the **Value** knob to add or remove edge softening of the foreground image and alpha channel.
    - Increasing the softness value increases the amount of softness applied to the foreground edges and alpha channel.
    - Decreasing the softness value decreases the amount of softness applied to the foreground edges and alpha channel.
  10. Use the **Type** knob to select **Foregd**.
  11. Use the **Cntrl** knob to select **Clip** and use the **Value** knob to adjust the foreground clipping.
    - Increasing the clip value removes lower-saturated colors from the foreground image.
    - Decreasing the clip value includes lower-saturated colors in the foreground image.
  12. Use the **Cntrl** knob to select **Hue** and use the **Value** knob to select the central (base) color for the foreground.
    - Increasing the hue value moves counter-clockwise around the color wheel to select a base color.
    - Decreasing the hue value moves clockwise around the color wheel to select a base color.
  13. Use the **Cntrl** knob to select **Reject** and use the **Value** knob to include or reject hues adjacent to the base color
    - Increasing the Reject value decreases the amount of adjacent hues that are included in the foreground.
    - Decreasing the Reject value increases the amount of adjacent hues that are included in the foreground.
  14. Use the **Type** knob to select **Spill** and use the **Value** knob to remove any color cast onto the foreground.
    - Increasing the range value causes more of the foreground colors to be corrected for background color spill.
    - Decreasing the range value causes fewer of the foreground colors to be corrected for background color spill.

15. Press **NEXT**.

16. Use the **Mask** knob to apply a mask to the key.

## Chroma Key Advanced Mode

An UltraChrome chroma key, in advanced mode, breaks the image into five elements which determine, or partially determine, which part of the image is keyed out, or removed.

- **Background** — Background elements are those pixels in the source video that are the same color as the one you chose to key out. Note that the Shadow and translucent areas (see below) are completely contained within the Background area.
- **Shadow** — Shadow elements are those pixels in the source video with colors that are within the Background range, but with lower luminance values, depending on the shadow range. You modify the Shadow range to cover darker areas of the background (e.g. where the foreground is casting a shadow on the background screen).
- **Translucency** — Translucent elements are those pixels in the source video that are in the Background range, but with higher luminance values than the Shadow range. You can control the upper-end of the Translucency range by setting a wider hue-range to constrain the area. You can also control the transparency of the Translucent area.
- **Transition** — Transition elements are those pixels in the source video with colors that are not within any of the previous three ranges and are also not considered part of the Foreground area. These are typically the pixels near the edge of the foreground, where it blends into the background.
- **Foreground** — Foreground elements are those pixels that are not within the Background, Shadow, Translucency, or Transition ranges. This is the area with colors that will not be keyed out and will remain solid.
- **Spill Suppress** — Spill Suppression elements are those pixels in the Foreground that have a noticeable tint of the Background color. This typically occurs around the edge of the foreground subject as glow from the background blue-screen or green-screen “spills” onto them.
- **Edge Softness** — Edge Softness lets you apply varying degrees of softening to the Foreground edges to help it blend in with the underlying background image that it is being keyed over.
- **Luminance** — Luminance allows you to control the overall brightness of Shadow, Translucency,

and Transition areas as well as partial reflections to more closely match the Foreground brightness.

### To Set Up a Chroma Key in Advanced Mode

The UltraChrome chroma key tries to automatically adjust for the scene you are trying to chroma key. For the best results, initialize the key first, and then identify the areas where you need to adjust the key.

1. Select the keyer that you want to set up a Chroma Key on.

**Note:** You can use the same procedure for a MiniME™.

2. Select the video signal, on the key bus, that you want to use for the key.
3. Press **CHR KEY**.
4. Use the **Mode** knob to select **Adv**.
5. Use the **Color** knob to select the color you want to key out.
6. Press the **Init** knob to initialize the chroma key.  
Every time the key is initialized, the switcher resets all the Chroma Key parameters to their default settings.
7. Press **NEXT**.
8. Use the **Type** knob to select **Bkgd**.
9. Use the **Cntrl** knob to select **NegHue** and use the **Value** knob to adjust the range of hues that are included in the Background, expanding counter-clockwise around the color wheel.
10. Use the **Cntrl** knob to select **PosHue** and use the **Value** knob to adjust the range of hues that are included in the Background, expanding clockwise around the color wheel.
11. Use the **Cntrl** knob to select **Sat** and use the **Value** knob to adjust the saturation range of the background color.
  - Increasing the saturation range value includes a wider range of saturation values to be included in the background.
  - Decreasing the saturation range value includes a narrower range of saturation values to be included in the background.
12. Use the **Type** knob to select **Edge**.
13. Use the **Cntrl** knob to select **Sens** and use the **Value** knob to set the edge sensitivity.
  - **Low** — Reduces the level of detail in the edges of the chroma key as well as the overall noise in the key image that can be the result

of certain lighting conditions or high detail camera settings. This is the default setting.

- **High** — Include the maximum detail in the edges of the chroma key.
14. Use the **Cntrl** knob to select **Soft** and use the **Value** knob to add or remove edge softening of the foreground image and alpha channel.
    - Increasing the softness value increases the amount of softness applied to the foreground edges and alpha channel.
    - Decreasing the softness value decreases the amount of softness applied to the foreground edges and alpha channel.
  15. Use the **Type** knob to select **Foregd**.
  16. Use the **Cntrl** knob to select **Clip** and use the **Value** knob to adjust the foreground clipping.
    - Increasing the clip value removes lower-saturated colors from the Foreground image.
    - Decreasing the clip value includes lower-saturated colors in the Foreground image.
  17. Use the **Cntrl** knob to select **Hue** and use the **Value** knob to select the central (base) color for the foreground.
    - Increasing the hue value moves counter-clockwise around the color wheel to select a base color.
    - Decreasing the hue value moves clockwise around the color wheel to select a base color.
  18. Use the **Cntrl** knob to select **Reject** and use the **Value** knob to include or reject hues adjacent to the base color.
    - Increasing the reject value decreases the amount of adjacent hues that are included in the foreground.
    - Decreasing the reject value increases the amount of adjacent hues that are included in the foreground.
  19. Use the **Type** knob to select **Lum**.
  20. Use the **Cntrl** knob to select **BkLuma** and use the **Value** knob to change the overall brightness of Shadow, Translucent, and Transition areas.
    - Increasing the background luminance value increases the brightness of Background, Translucent, and Transition areas.

- Decreasing the background luminance value decreases the brightness of Background, Translucent, and Transition areas.
21. Use the **Cntrl** knob to select **Refl** and use the **Value** knob to change the brightness of semi-transparent reflections (like reflections from glasses).
    - Increasing the reflections value increases the brightness of semi-transparent reflections.
    - Decreasing the reflections value decreases the brightness of semi-transparent reflections.
  22. Use the **Type** knob to select **Shadow**.
  23. Use the **Cntrl** knob to select **Gain** and use the **Value** knob to adjust the shadow appearance.
    - Increasing the gain value creates darker shadows.
    - Decreasing the gain value creates lighter shadows.
  24. Use the **Cntrl** knob to select **Range** and use the **Value** knob to adjust the range of the shadow colors.
    - Increasing the range value widens the shadow area by including lower-luminance background colors. The increased range comes as a result of colors moving from the translucent area to the shadow area.
    - Decreasing the range value narrows the shadow area by excluding high-luminance colors. These excluded colors move back into the translucent area.
  25. Use the **Type** knob to select **Spill**.
  26. Use the **Cntrl** knob to select **Clip** and use the **Value** knob to adjust spill suppress clipping.
    - Increasing the clip value removes higher-saturated colors from spill suppress correction.
    - Decreasing the clip value includes higher-saturated colors in spill suppress correction. If your foreground image contains bright-colored areas that are suffering from background spill, decrease the clip value to have it corrected.
  27. Use the **Cntrl** knob to select **Hue** and use the **Value** knob to select the central, or base, color for spill suppress correction. If the color spill does not appear to be the same color as the background, use this control to adjust which hue is considered to be "spilled" into the foreground.
    - Increasing the hue value moves counter-clockwise around the color wheel while selecting a base color.
    - Decreasing the hue value moves clockwise around the color wheel while selecting a base color.
  28. Use the **Cntrl** knob to select **Reject** and use the **Value** knob to include or reject adjacent hues to the base.
    - Increasing the reject value increases the amount of adjacent hues that are included in spill correction.
    - Decreasing the reject value decreases the amount of adjacent hues that are included in spill correction.
  29. Use the **Type** knob to select **Trans**.
  30. Use the **Cntrl** knob to select **Gain** and use the **Value** knob to adjust the appearance of the Transition colors.
    - Increasing the gain value makes the transition area pixels more opaque.
    - Decreasing the gain value makes the transition area pixels more transparent.
  31. Use the **Type** knob to select **Trnslc**.
  32. Use the **Cntrl** knob to select **Gain** and use the **Value** knob to adjust the appearance of the translucent colors.
    - Increasing the gain value causes the translucent colors to appear more opaque.
    - Decreasing the gain value causes the translucent colors to appear more transparent.
  33. Use the **Cntrl** knob to select **Range** and use the **Value** knob to adjust the range of the translucent colors.
    - Increasing the range value widens the translucent area by including more hues from the background range (the lower-end of the range is defined by the shadow range you just set).
    - Decreasing the range value narrows the translucent area by excluding hues.
  34. Press **NEXT**.
  35. Use the **Mask** knob to apply a mask to the key.

## DVE Keys

The DVE key allows you to apply digital video effects, such as scale, crop, aspect ratio, position, and border to

video image or another key type. When the DVE is applied to another key type, it is said to be flying (Fly Key).

**Keep the following in mind when working with a Fly Key:**

- The Fly Key feature consumes a single DVE channel for self keys and chroma keys, but two DVE channels for an auto select key.
- The Fly Key feature is not available when the switcher is in Standard mode.
- The Fly Key feature cannot be applied to a DVE key.
- The Key Invert feature is not available for a Fly Key.
- The self key Fly Key can be used with all MultiScreen layouts. The auto select and chroma key Fly Key can only be used with the Dual Vert or Dual Horiz MultiScreen layouts.

## To Set Up a DVE Key

The DVE resources for this key may not be available. Depending on how your switcher is configured, you may be asked to steal the resources from another element, or be prevented from using the resources.

1. Select the keyer that you want to set up a DVE key on.

**Tip:** You can use the same procedure for a MiniME™ or MultiScreen.

2. Select the video signal, on the key bus, that you want to use for the key.
3. Press **DVE**.
4. Use the **X Pos**, **Y Pos**, and **Size** knobs to position and size the key. You can also use the positioner.
5. Press **NEXT**.
6. Use the **Aspect** knob to adjust the aspect ratio of the key.
7. Use the **Border** knob to apply a border to the key.  
Refer to the section *To Apply a Border to a DVE Key* on page 39 for information on borders.
8. Press **NEXT**.
9. Crop the key horizontally as follows:

- a) Use the **HCrop** knob to crop the key horizontally on both the left and right sides at the same time.

- b) Press **HCrop** and use the **Left/R** knob to crop the key horizontally on the left side only.
- c) Press **Left/R** and use the **L/Rgt** knob to crop the key horizontally on the right side only.

10. Crop the key vertically as follows:

- a) Use the **VCrop** knob to crop the key vertically on both the top and bottom sides at the same time.
- b) Press **VCrop** and use the **Top/B** knob to crop the key vertically on the top side only.
- c) Press **Top/B** and use the **T/Btm** knob to crop the key vertically on the bottom side only.

11. Press **NEXT**.

12. Use the **Mask** knob to apply a mask to the key.

## To Apply a DVE to a Key (Fly Key)

The DVE resources for this key may not be available. Depending on how your switcher is configured, you may be asked to steal the resources from another element, or be prevented from using the resources.

You should set up your key as you want it before applying the Fly Key.

1. Press and hold **SELF KEY**, **AUTO SELECT**, or **CHR KEY** for the key you want to apply the DVE to and press **DVE**.

**Tip:** Hold the **SELF KEY**, **AUTO SELECT**, or **CHR KEY** button again and press **DVE** to turn off the Fly Key.

2. Press the **KEY X SEL** button for the key you are setting up.
3. Use the **X Pos**, **Y Pos**, and **Size** knobs to position and size the key. You can also use the positioner.
4. Press **NEXT**.
5. Use the **Aspect** knob to adjust the aspect ratio of the key.
6. Use the **Border** knob to apply a border to the key.

Refer to the section *To Apply a Border to a DVE Key* on page 39 for information on borders.

7. Press **NEXT**. If a border is applied to the pattern, you must press **NEXT** multiple times to get to the next step.

8. Crop the key horizontally as follows:
  - a) Use the **HCrop** knob to crop the key horizontally on both the left and right sides at the same time.
  - b) Press **HCrop** and use the **Left/R** knob to crop the key horizontally on the left side only.
  - c) Press **Left/R** and use the **L/Rgt** knob to crop the key horizontally on the right side only.
9. Crop the key vertically as follows:
  - a) Use the **VCrop** knob to crop the key vertically on both the top and bottom sides at the same time.
  - b) Press **VCrop** and use the **Top/B** knob to crop the key vertically on the top side only.
  - c) Press **Top/B** and use the **T/Bttm** knob to crop the key vertically on the bottom side only.
10. Use the **Mask** knob to apply a mask to the key.

### To Apply a Border to a DVE Key

1. Select the keyer that you want to set up a DVE key border on.
 

**Tip:** You can use the same procedure for a MiniME™ or MultiScreen.
2. Select the video signal, on the key bus, that you want to use for the key.
3. Press **DVE**.
4. Use the **Border** knob to turn on the border and adjust the size of the border around the key.
5. Use the **Soft** knob to adjust the softness of the border.
6. Press **NEXT**.
7. Select a default or custom color for the border.
  - **Default** — use the **Load** knob to select a preset color for the border.
  - **Custom** — press **NEXT** and use the **BHue**, **BSat**, and **BLum** knobs to select your own color.

## Masks

A Mask is a technique in which a pattern is combined with the key source to block out unwanted portions of the key source.

Two types of masks are available, Box masks and Pattern masks. All key types can be masked.

- **Box Mask** — uses a simple box shape to mask out a portion of the key
- **Pattern Mask** — uses a pattern from the pattern generator to mask out a portion of the key

A Pattern Mask cannot be applied to a DVE key.

### To Pattern Mask a Key

Pattern masks can be adjusted for size, location, rotation, and multiplication.

1. Select the keyer that you want to set up a mask for.
2. Press **NEXT**. Depending on the key type and features set up for the key, you must press **NEXT** multiple times to get to the next step.
3. Use the **Mask** knob to select **Pattn**.
4. Press **Edit Params**.
5. Use the **M-Frc** knob to force the area inside the mask region to the foreground (**On**).  
Force mask is not available for all key types.
6. Use the **M-Inv** knob to invert the masked area with the unmasked area (**On**).  
The portion of the key that was masked out is now visible, and the portion that was visible is masked.
7. Press **NEXT**.
8. Use the **Size** knob to adjust the size of the mask region. You can also twist the positioner.
9. Press **NEXT**.
10. Use the **Pattn** knob to select the mask pattern you want to use. You can also select the pattern by pressing the pattern button directly.
11. Use the **X Pos** and **Y Pos** knobs to position the mask. You can also use the positioner.
12. Press **NEXT**.
13. Use the **Aspect** knob to adjust the aspect ratio of the mask.  
Not all patterns can be adjusted.
14. Use the **Border** and **Soft** knobs to apply a border to the mask.

Refer to the section *To Apply a Border to a Pattern* on page 26 for information on borders.

15. Press **NEXT**. If a border is applied to the pattern, you must press **NEXT** multiple times to get to the next step.
16. Use the **Rot** knob to rotate the pattern.  
Not all patterns can be rotated.
17. Use the **HMult** knob to multiply the pattern horizontally.
18. Use the **VMult** knob to multiply the pattern vertically.

### To Box Mask a Key

Box masks can be adjusted for size, location, rotation, and multiplication.

1. Select the keyer that you want to set up a mask for.
2. Press **NEXT**. Depending on the key type and features set up for the key, you must press **NEXT** multiple times to get to the next step.
3. Use the **Mask** knob to select **Box**.
4. Use the **M-Frc** knob to force the area inside the mask region to the foreground (**On**).  
Force mask is not available for all key types.
5. Use the **M-Inv** knob to invert the masked area with the unmasked area (**On**).  
The portion of the key that was masked out is now visible, and the portion that was visible is masked.
6. Press **NEXT**.
7. Use the **X Pos** and **Y Pos** knobs to position the mask. You can also use the positioner.
8. Use the **Size** knob to adjust the size of the mask region. You can also twist the positioner.
9. Press **NEXT**.
10. Adjust the position of the left and right sides of the box mask as follows:
  - a) Use the **Left/R** knob to adjust the position of the left side of the box mask.
  - b) Press the **Left/R** knob.
  - c) Use the **L/Right** knob to adjust the position of the right side of the box mask.
11. Adjust the position of the top and bottom sides of the box mask as follows:
  - a) Use the **Top/B** knob to adjust the position of the top side of the box mask.

- b) Press the **Top/B** knob.
- c) Use the **T/Btm** knob to adjust the position of the bottom side of the box mask.

### Split Keys

A Split key allows you to assign a different alpha source for a key than the fill/alpha associations that are set up during configuration, or to use a separate alpha source for a Self key.

A split key can be applied to an **AUTO SELECT**, or **SELF KEY**.

### To Set Up a Split Key

A split key works on an **Auto Select** or **Self Key** that has been set up and you want to apply a different alpha to.

1. Set up your key with the video source you want to use.
2. Press and hold the **Auto Select** or **Self Key**, depending on the key type you are splitting.
3. Press the source button on the key bus for the alpha source you want to use.

**Tip:** If the new alpha source is not assigned to a source button, press any other button on the key bus and use the **Alpha** knob to select a different alpha source.

### Key Copy

You can copy the entire contents of a keyer to another keyer in the same, or a different ME. The entire contents of the destination keyer are replaced with the contents of the source keyer.

When you copy a key, the switcher tries to assign resources to the destination key to match the source key. If these resources are not available, the switcher steals resources in the following order.

1. From off-air keys that are not the source key.
2. From the source key, if it is not on-air.
3. From on-air keys that are not the source key.
4. From the source key, even if it is on-air.

### To Copy a Key

This procedure copies the contents of Key 1 to Key 3 as an example. Use the same procedure for any key combination.

1. Press and hold the **KEY 3 SEL** button.



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This is the destination keyer that you want to copy to.

2. Press the **KEY 1 SEL** button.

This is the source keyer that you want to copy from.

## Key Swap

You can swap the entire contents of any two keyers in the same, or different MEs. The video source, position, and key type are all swapped between keyers. This allows you to change the apparent key priority, or layering, of the keys in the video output. For example, key 3 appears over key 2. If you perform a swap between key 3 and key 2, it appears as if key 2 is now over key 3.

Keep the following in mind when performing a key swap:

- Key swap does not change the on-air status of a keyer.
- If a DVE key is set to freeze, it will be unfrozen by the swap.
- A key swap can be recorded as part of a custom control.
- You cannot swap between keyers on different MEs on a C10/C1 control panel.

## To Perform a Key Swap

This procedure swaps the contents of Key 2 and Key 3 as an example. Use the same procedure for any key combination.

1. Press and hold the **KEY 2 SEL** button.
2. Press the **KEY 3** button in the next transition area.

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## Memory Functions

A memory register is a snapshot of the current state of the switcher that can include one or multiple ME, MiniME™, or MultiScreen outputs. Up to 100 memory registers (10 banks of 10 registers) per ME, MiniME™, or MultiScreen can be stored and recalled on the switcher. Each of these memory registers can store as little as the information of one ME, or as much as the current state of the entire switcher, including all ME, MiniME™, MultiScreen outputs, Aux Buses, and DVE settings.

### Memory Access Mode

Switcher memories can be accessed either through **Direct Access** or **Bank** mode.

- **Direct Access** — enter the bank and memory number to store or recall a memory
- **Bank** — enter the memory number to store or recall a memory (the bank is locked)

### To Set the Memory Access Mode

The memory access mode applies to both memory storing and recalling.

1. Press **STORE**.
2. Use the **Mode** knob to select the memory access mode you want to use.

### Storing Memories

When you store a memory, you are storing the complete state of that panel row. This includes the current state of all the areas on the ME, including keyer settings, transition rates, wipe and pattern selections, and source selections. In addition to the current state of the panel, the current settings for the various keyers, such as chroma key settings, and clip and gain settings, are also stored.

### To Store a Memory (C10/C1)

To store a memory, you must select which ME to store the memory for, and then use the pattern buttons to select the bank and register to store the memory in.

1. Press and hold **STORE** and select the source buttons on the key bus to select the ME, MultiScreen, or MiniME™ that you want to store the memory for.
2. Use the numbers on the pattern buttons to select the bank and register you want to store the memory to. For example, press **4** and then **9** to select bank 4, register 9.

The memory has been stored to the selected memory register and the **RECALL** button is selected.

### To Store a Memory (C1-A/C1M/C2/C2M/C2S/C2X)

To store a memory, you must select which ME to store the memory for, and then use the pattern buttons to select the bank and register to store the memory in.

1. Press and hold **STORE** and select the source buttons on the key bus to select the ME, MultiScreen, or MiniME™ that you want to store the memory for.
2. Use the numbers on the mnemonic buttons to select the bank and register you want to store the memory to.

The memory has been stored to the selected memory register and the **ME 1 RECALL** button is selected.

### To Store a Memory on the Effects Memory Area (C2S/C2X/C3S/C3X)

1. Press **Store** in the Effects Memory area for the ME you want to store the memory to.
2. Select the recall mode that you want to store with the memory. Toggle the button on (lit) to have it stored with the memory.
  - **PGM** — selects the PGM recall mode
  - **MEM AI** — selects the Memory AI recall mode
  - **EFF DISS** — selects the Effects Dissolve recall mode
3. Press **BANK**.
4. Press the number for the bank you want to select.
5. Press the number for the memory register you want to select.

The memory is stored in the selected location and the Effect Memory area is assigned to recall.

### To Store a Memory on the Global Memory Area (C3S/C3X)

1. Press **STORE** next to the display.
2. Select the MEs, MultiScreens, or MiniME™s that you want to store the memory for.
3. Use the numbers on the mnemonic buttons to select the bank and register you want to store the memory to.

## Recalling Memories

When you recall a memory, the existing configuration of that ME is replaced with the settings stored in the memory.

### Keep the following in mind when recalling memories:

- How a memory is recalled depends on the how the **Memory Attributes** are set.
- Recalling a memory that includes a new Media-Store image to be loaded from a USB drive may result in the currently loaded image to be displayed for a few frames while the new image is loaded.
- Recalling a memory that includes a source assigned to a camera also recalls the shot stored in the memory for that camera if the **CamRcl** memory attribute is set to **Recall**. There is no delay in the memory recall so camera movement may be visible while the shot is recalled.
- You can exit without recalling a memory register by pressing any button other than a Wipe Pattern, dedicated key transition, CUT, AUTO TRANS, or source button.
- You can override the video source stored in a memory by pressing and holding a source button and recalling the memory (**Bus Hold**). The held source button overrides the source that is recalled with the memory for that bus. The memory is not affected by a Bus Hold and will recall properly without the Bus Hold.
- Enabling Memory AI mode changes the way key elements are recalled. If a key is currently on-air, the element for that key is recalled in the next available off-air key. If there is no available off-air keys, the element is not recalled. All resource sharing is set to FLOAT mode so that key elements may be recalled to other keys than originally stored.

### To Recall a Memory (C10/C1)

To recall a memory, you must select which ME to recall the memory for, and then use the pattern buttons to select the bank and register to recall the memory from.

1. Press and hold **RECALL** and select the source buttons on the key bus to select the ME, MultiScreen, or MiniME™ that you want to recall memory for.
2. Use the numbers on the pattern buttons to select the bank and register you want to recall the memory from. For example, press **4** and then **9** to select bank 4, register 9.

**Tip:** Press the memory number button again to undo the last recall. This can be turned off from the **Personality** menu.

### To Recall a Memory (C1-A/C1M/C2/C2M/C2S/C2X)

To recall a memory, you must select which ME to recall the memory for, and then use the pattern buttons to select the bank and register to recall the memory from.

1. Press and hold **RECALL** and select the source buttons on the key bus to select the ME, MultiScreen, or MiniME™ that you want to recall memory for.
2. Use the numbers on the mnemonic buttons to select the bank and register you want to recall the memory from.

**Tip:** Press the memory number button again to undo the last recall. This can be turned off from the **Personality** menu.

The memory has been stored to the selected memory register and the **ME 1 RECALL** button is selected.

### To Recall a Memory on the Effects Memory Area (C2S/C2X/C3S/C3X)

1. Press **Recall** in the Effects Memory area for the ME you want to recall the memory to.
2. Select the recall mode that you want use with the memory. Toggle the button on (lit) to select the recall mode, or toggle none of them on to have the memory recalled as it was stored.
  - **PGM** — selects the PGM recall mode
  - **MEM AI** — selects the Memory AI recall mode
  - **EFF DISS** — selects the Effects Dissolve recall mode
3. Press **BANK**.
4. Press the number for the bank you want to select.
5. Press the number for the memory register you want to select.

**Tip:** Press the memory number button again to undo the last recall. This can be turned off from the **Personality** menu.

## To Recall a Memory on the Global Memory Area (C3S/C3X)

To recall a memory, you must select which ME to recall the memory for, and then use the pattern buttons to select the bank and register to recall the memory from.

1. Press **RECALL** next to the display.
2. Select the MEs, MultiScreens, or MiniME™s that you want to recall the memory for.
3. Use the numbers on the mnemonic buttons to select the bank and register you want to recall the memory from.

**Tip:** Press the memory number button again to undo the last recall. This can be turned off from the **Personality** menu.

## Memory Recall Mode

The Memory Recall mode sets how a memory is recalled. This includes whether a memory is recalled on-air, or only on the program bus, or if effects such as Effects Dissolve or DVE Dissolve are used.

### To Set Up the Recall Mode Memory Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **Recall Mode**.
3. Use the **Value** knob to select the memory recall mode you want to use.
  - **Memory** — the memory recall mode (**PGM**, **MemAI**, or **EffDis**) stored with the memory is used
  - **PGM** — all elements are recalled as stored (default)
  - **MemAI** — current on-air elements are unchanged and the transition area is configured to take the on-air elements of the memory on-air with the next transition
  - **EffDis** — on-air elements listed below are transitioned to the elements stored in the memory
    - Matte colors (background, wash or borders)
    - Keyer settings like clip, gain, transparency
    - Mask position and size
    - Chroma key settings, except the background color
    - Pattern settings like size, position, aspect, border, softness, rotation

- DVE settings like size, position, aspect, border, softness, cropping
- Media-Store x/y position
- Transition Progress

## To Set the Effects Duration

Effects duration applies to Effects Dissolves, and sets the length of time that the switcher will use to transition from the on-air scene to the scene stored in the memory.

**Tip:** If you have a C2S/C2X/C3S/C3X control panel, press **EFF DISS** in the Effects Memory area to turn Effects Dissolve on (lit) or off (unlit) for that ME.

1. Press **RECALL > NEXT**.

**Tip:** If you want to store the effects dissolve rate in the memory, press **STORE > NEXT**.

2. Use the **Attrib** knob to select **EffDur**.
3. Use the **Value** knob to select duration you want to use to transition from the current on-air scene to the one stored in the memory.
  - **Memory** — the duration stored in the memory is used
  - **1-999fr** — sets a specific duration in frames

**Tip:** If you have a C2S/C2X/C3S/C3X control panel, press **EFF RATE** in the Effects Memory area for the ME you want to change the rate for, use the keypad to enter the new rate, and press **Enter**. A value of 0 selects the duration stored in the memory.

## Memory Attributes

Memory Attributes allow you to specify what elements are recalled with a memory, as well as adding effects to memory recalls. These elements include the background/preset buses, keyer bus, Aux bus, and Media-Store selections, as well as keyer on-air status, and transition selections.

In addition to setting which sources to recall with the memory, effects such as performing an auto transition after the memory recall or running a custom control after the memory recall, can also be included.

Memory attributes can be set both when the memory is stored, and when it is recalled. This allows you to store a set of attributes with a memory and then recall it as stored, or override the attributes stored in the memory and apply different ones when the memory is recalled. A memory attribute does not need to be stored in the memory to be recalled.

**Tip:** It is recommended that if you are new to working with memories, use the memory store attributes to set how you want a memory to be recalled and set the recall attributes to be **Memory**.

### To Set the Program Bus Source Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **PGMBus**.
3. Use the **ME** knob to select the ME, MiniME™, or MultiScreen output that you want to set the attribute for.
4. Use the **Value** knob to select how the sources selected on the program bus are recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — sources are not recalled on the program bus
  - **Recall** — sources are recalled on the program bus (default)

### To Set the Preset Bus Source Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **PSTBus**.
3. Use the **ME** knob to select the ME, MiniME™, or MultiScreen output that you want to set the attribute for.
4. Use the **Value** knob to select how the sources selected on the preset bus are recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — sources are not recalled on the preset bus
  - **Recall** — sources are recalled on the preset bus (default)

### To Set the Transition Type Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **Trans**.
3. Use the **ME** knob to select the ME, MiniME™, or MultiScreen output that you want to set the attribute for.
4. Use the **Value** knob to select how the next transition type and parameters are recalled.
  - **Memory** — settings come from the memory being recalled

- **NoRcl** — transition selections are not recalled
- **Recall** — transition selections are recalled (default)

### To Set the Next Transition Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **NextTr**.
3. Use the **ME** knob to select the ME, MiniME™, or MultiScreen output that you want to set the attribute for.
4. Use the **Value** knob to select how the next transition area is recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — next transition area settings are not recalled
  - **Recall** — next transition area settings are recalled (default)

### To Set the Run Auto Trans Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **RnAuto**.
3. Use the **ME** knob to select the ME, MiniME™, or MultiScreen output that you want to set the attribute for.
4. Use the **Value** knob to select whether a transition is performed after the memory is recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRun** — a transition is not performed after the memory is recalled (default)
  - **Run** — a transition is performed after the memory is recalled

### To Set the Shared Pattern Generator Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **SrdPat**.
3. Use the **ME** knob to select the ME output that you want to set the attribute for.
4. Use the **Value** knob to select whether the settings for the shared Key Mask/Wash pattern generator is recalled.
  - **Memory** — settings come from the memory being recalled

- **NoRcl** — shared pattern generator settings are not recalled
- **Recall** — shared pattern generator settings are recalled (default)

### To Set the Key Bus Sources Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **KeyBus**.
3. Use the **Key** knob to select the keyer you want to set the attribute for.
4. Use the **Value** knob to select whether sources selected on the selected key bus are recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — sources are not recalled on the key bus
  - **Recall** — sources are recalled on the key bus (default)

### To Set the Key On-Air Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **KActiv**.
3. Use the **Key** knob to select the keyer you want to set the attribute for.
4. Use the **Value** knob to select whether sources selected on the selected key bus are recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — sources are not recalled on the key bus
  - **Recall** — sources are recalled on the key bus (default)

### To Set the Key Type Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **KType**.
3. Use the **Key** knob to select the keyer you want to set the attribute for.
4. Use the **Value** knob to select whether the key type is recalled for the selected key.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — key type is not recalled
  - **Recall** — key type is recalled (default)

### To Set the Key Mask Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **KMask**.
3. Use the **Key** knob to select the keyer you want to set the attribute for.
4. Use the **Value** knob to select whether mask settings for the selected key are recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — key mask settings are not recalled
  - **Recall** — key mask settings are recalled (default)

### To Set the Media-Store Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **Media**.
3. Use the **Media** knob to select the Media-Store channel you want to set the attribute for.
4. Use the **Value** knob to select whether Media-Store image and settings for the selected channel are recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — Media-Store image and settings are not recalled (default)
  - **Recall** — Media-Store image and settings are recalled

### To Set the Aux Bus Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **Aux**.
3. Use the **Aux** knob to select the aux bus you want to set the attribute for.
4. Use the **Value** knob to select how the sources selected on the aux bus are recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRcl** — sources are not recalled on the aux bus (default)
  - **Recall** — sources are recalled on the aux bus

### To Set the Camera Shot Attribute

1. Press **RECALL > NEXT**.

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2. Use the **Attrib** knob to select **CamRcl**.
  3. Use the **Value** knob to select whether camera shots are recalled.
    - **Memory** — settings come from the memory being recalled
    - **NoRcl** — camera shots are not recalled
    - **Recall** — camera shots are recalled (default)

### To Set the Roll GPO Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **RIIGPO**.
3. Use the **Value** knob to select whether GPI outputs attached to sources are triggered when recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRoll** — GPI outputs are not triggered
  - **Roll** — GPI outputs are triggered (default)

### To Set the Roll VTR Attribute

1. Press **RECALL > NEXT**.
2. Use the **Attrib** knob to select **RIIVTR**.
3. Use the **Value** knob to select whether a play command is triggered when a source that is assigned to a video server is recalled.
  - **Memory** — settings come from the memory being recalled
  - **NoRoll** — play command is not triggered
  - **Roll** — play command is triggered (default)

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## Switcher Sets

The switcher stores configuration and operation data in a number of registers that contain the individual entries for items such as memories or personality settings. These registers can be stored as a single archive file, or as a register set that contains all the individual register of that type; all memories for example. These files are stored into Sets on USB drive. Different Sets can be created for different shows or applications, allowing you to quickly locate and recall the switcher configurations.

The switcher stores information in the following registers:

- **Memory** — contains all the memories for all MEs
- **Custom Control** — contains all the custom control banks and macros
- **Personality** — contains all the user interface settings, such as transition rates, that are stored under the **PERS** menu
- **Installation** — contains all the external device setup, and software settings for the switcher

## To Store a Set

Switcher Sets can only be stored to a USB drive. The USB drive must be present before you try to store the Set. A total of 10 Sets of switcher setup information can be stored onto the same USB drive.

1. Insert a USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.
2. Press **MENU > SAVE**.
3. Use the **Save** knob to select the set (**0-9**) you want to store the switcher registers to.
4. Press the knob to select the registers you want to store to the selected set. If an (\*) is shown on the menu, that register already exist in the set and will be overwritten.
  - **ALL** — store all registers to the set
  - **Mems** — store only the memory registers to the set
  - **Cust** — store only the custom control registers to the set
  - **Pers** — store only the personality registers to the set
  - **Inst** — store only the installation registers to the set
5. Press **Confirm**.

## To Load a Set

Switcher Sets can only be loaded from a USB drive. The USB drive must be present before you try to load the settings.

1. Insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.
2. Press **MENU > LOAD**.
3. Use the **Load** knob to select the set (**0-9**) you want to load the switcher registers from.
4. Press the selected set. Only registers with an (\*) shown on the menu exist in the set.
  - **ALL** — recall all registers from the set
  - **Mems** — recall only the memory registers from the set
  - **Cust** — recall only the custom control registers from the set
  - **Pers** — recall only the personality registers from the set
  - **Inst** — recall only the installation registers from the set
5. Press **Confirm**.



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## Media-Store

Media-Store allows you to load stills, animations, or audio files from the USB drive and make them available across all MEs. Two channels of Media-Store with alpha, or four channels without alpha, are provided.

### Keep the following in mind when working with Media-Stores:

- A still, animation, or audio can be loaded either by browsing the file system, or by entering the still number using the pattern buttons.
- You can clear a Media-Store channel by loading media number 000.
- If you are loading an Auto Key into a Media-Store channel, you must have another Media-Store channel associated with the current one to load the alpha into.
- An FTP connection using RossLinq can be created from an external device directly to a Media-Store channel on the switcher.

## Working With Media-Store Animations

Media-Store animations are used for things animated backgrounds, branding "bugs", or media transitions. You can set up an animation to loop, play automatically when take on-air, play in reverse, or even play at different speeds.

You can play an animation manually by selecting the source button for the Media-Store channel with the animation you want to play, and pressing **Run**. The knob changed to **Stop** as the animation is playing.

### Keep the following in mind when working with Media-Store animations:

- When you load an animation to an off-air Media-Store channel, or the animation goes off-air with a transition, the preview shows the cut point (**CutFr**) for that animation, and not the first frame of the video.
- You can manually cycle through frames by turning the **Run** knob while the animation is stopped.
- Double-pressing the **Run** knob stops playback and re-cues the animation to the first frame.
- You can shuttle forwards and backwards through the animation by turning the positioner clockwise or anti-clockwise when the animation is stopped. Shuttle speed is increased and decreased by turning the positioner more or less in each direction.

- You can run or stop an animation by pressing the button on the top of the positioner.

## Working with Media-Store Audio

Audio can be added to the playout of a Media-Store channel either by loading the file directly, or by naming the audio file the same as the animation or still you want it to play out with. When you load the still or animation, the switcher will automatically load the audio file of the same name.

### Keep the following in mind when working with audio:

- Audio plays out on Program, Preview, Aux, and MultiViewer outputs only.
- Audio files must be 20-bit or 24-bit wav files at a 48kHz sample rate.
- Audio files must be in the same folder and have the same name as the still or animation they are to be associated with.
- An audio file does not need to be of the same length as the animation it is associated with.
- A still with audio or audio only have the Auto Play and Looping attributes. These apply to the audio playout.
- The looping time of an animation with audio is the length of the animation.
- Audio is embedded in the ancillary data of the output video stream. You must have ancillary data set to pass to include the audio in the output.
- If you are using audio with a MultiViewer, you must set the ancillary source for the MultiViewer. This is the only source that audio will be available for in the MultiViewer output.
- A Media-Store channel can be loaded with Audio only.

## Media-Store Modes

Media-Store channels can be set up to operate independently, or paired, with one channel providing the key, and the other the alpha.

- **Swish** — Two channels of Media-Store are available. Each channel can contain an image or channel 1 can contain an image and an associated alpha in channel 3. Channels 2 and 4 are reserved for media transitions.
- **Swish+** — Four channels of Media-Store are available. Channel 2 (video) and channel 4 (alpha) can also be used for media transitions. Channels 2 and 4 are not reserved.

## To Set the Media-Store Mode

1. Press **MENU** > **SYSTEM** > **NEXT**.
2. Use the **Media** knob to select the Media-Store mode.
  - **Swish** — two (2) channels are available or channel 1 for key and channel 2 for alpha (channels 2 and 4 are reserved for Media Transitions)
  - **Swish+** — four (4) channels are available
3. Press the **Media** knob.
4. Press the **Confrm** knob.

## Loading Stills or Animations

Stills or animations can be loaded into Media-Store channels either from USB or the internal cache using the media number, or by browsing to the file.

**Note:** *The internal cache is used for sample images only and cannot be used to store user stills or animations.*

Media numbers are 4-digit numbers that are assigned to stills or animations and allow you to load stills or animations directly using the pattern buttons. Each media number is made up of three sections, the Place (0-1), the Bank (00-99), and the Item Number (0-9). The Place is either 0 for internal stills, or 1 for external.

## Media-Store File Specifications

Media-Store images and animations can be TGA, PNG, or JPG file formats. For animations, the files must be numbered to indicate the order they go in, and the name and the number must be separated with an underscore. For audio, 20-bit or 24-bit wav files of the same name as the still or animation are used to associate audio with a still or animation.

Anim\_001.tga  
Anim\_002.tga  
Anim\_003.tga  
...  
Anim\_100.tga

Together, these files are treated as a single animation named Anim that is 100 frames long.

**Note:** *An animation must start with \_001 as the end of the name of the first frame.*

Files names cannot contain symbols such as ! @ # & \* ( ) / , ? ' " and cannot start with an underscore ( \_ ).

## To Load a Still or Animation

Stills or animations can be loaded from the USB drive, or from the internal cache. Only the default images that came with your switcher are available on the internal cache.

1. If you are loading a file from USB, insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.

If the files on your USB are new, it takes about 2 seconds per file for the switcher to generate the thumbnail for the MediaManager. Once all the thumbnails are generated, they are displayed in the MediaManager window.

2. Press the source button for the Media-Store channel that you want to load a still into. If the file has an alpha, the paired channel will load the alpha as well.
3. Press the **Browse** knob.
4. Use the left knob to navigate to the file you want to load. Press the knob to make a selection.
  - **<.>** — up one
  - **USB(1)** — the USB drive
  - **Internal(0)** — the internal cache
  - **<folder>** — a sub-folder of the name "folder"
  - **image** — a still of the name "image"
  - **image.tga.wav** — a still with an associated audio file (not in the database)
  - **image [V][A]** — a still with an associated audio file (in the database)
  - **animation [V10]** — a 10 frame animation of the name "animation" (in the database)
  - **animation.tga[10].wav** — a 10 frame animation with an associated audio file (not in the database)
  - **animation [V10][A]** — a 10 frame animation with an associated audio file (in the database)

**Tip:** *If you want to associate an audio file with the still or animation but the .wav does not appear in the name, ensure that the audio file is named the same as the still or animation and in the same folder.*

A still or animation can be loaded using the **Media Number** for the still and the pattern buttons.

## To Load Stills Using Media Numbers

How you load a still using the media number depends on whether the Place or Media are locked. If the Place is locked, you only have to enter the 3-digit Media number. If the Place and Media are locked, you only have to enter the last digit of the Media number.

**Note:** Loading 000 clears the current Media-Store channel.

1. Insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive. If you are loading a file from the internal cache, you do not need the USB drive.
2. Press the source button for the Media-Store channel that you want to load a still into. If the file has an alpha, the paired channel will load the alpha as well.
3. Using the pattern buttons, enter the media number for the still you want to load.  
  
For example, press **1051** to select the USB(1) drive, Media 051.
4. Press **Select**.

## Media-Store Capture

Still images can be captured from any input BNC, as well as the program, preview, and clean feed from any ME.

### To Capture a Still

1. If you are capturing to a USB, insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive.
2. Press the source button for the Media-Store channel that you want to capture a still into.
3. Press the **Capt** knob.
4. Press the **P/B** or **E/E** knob to select the mode you want the Media-Store in.
  - **E/E** — electronic-to-electronic, or record, mode allows you to record a still
  - **P/B** — playback mode allows you to review your still
5. Use the **P/B** or **E/E** knob to select the video source that you want to perform the capture of.
6. Press **NEXT**.
7. Use the **USB** knob to select the location that you want to store the captured still to.

8. Use the **Alpha** knob to select whether you want to capture the alpha signal (**Yes**) or not (**No**). You must have an input BNC selected as the capture source to capture the alpha.
9. Press **NEXT**.
10. Use the **Capt** knob to select a number for the still you want to capture.
11. Press the **Capt** knob to perform the capture. The new media item is stored and the media number is increased by one.

## Media-Store Attributes

Attributes are applied to the image or animation directly, regardless of the channels that the image or animation are loaded in. If you adjust the attributes of the still in one channel, these settings are applied to that image or animation in all other channels that the same image or animation is loaded into.

### Understanding the Attributes Menu

When you select a still or animation, the menu system displays a number of attributes that allow you to adjust how a the image or animation appears. The options that are available depend on the type of Media-Store image or animation that is selected.

**Table 4: Attributes Menu Items**

Menu Item	Description
<b>X Pos</b>	selects the horizontal position of the image or animation
<b>Y Pos</b>	selects the vertical position of the image or animation
<b>Shaped</b>	selects shaped or unshaped for the alpha of the image or animation
<b>Looping</b>	selects whether the animation loops automatically or not
<b>Reverse</b>	selects whether the animation plays in reverse or not
<b>AutoPly</b>	selects whether the animation starts playing automatically when taken on-air or not
<b>Speed</b>	selects the speed that an animation plays at (0.1-10)
<b>MediaX</b>	selects the media number that you want to use to recall the still or animation
<b>CutFr</b>	selects the point, in frames, from the start of the animation that the background cut occurs
<b>GPO</b>	selects the GPI output that you want to trigger by a media transition
<b>GPOFr</b>	selects the time, in frames, from the start of the media transition that the GPI output is triggered
<b>Mute</b>	selects whether the associated audio is turned on or off during playback

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## To Set Media-Store File Attributes

The attributes that you can set depend on whether the file you are setting them for is a still or animation.

1. Insert your USB drive into the USB Port on the switcher. You must wait 5 seconds for the switcher to recognise the USB drive. If you are loading a file from the internal cache, you do not need the USB drive.
2. Press the source button for the Media-Store channel that you want to load a still into. If the file has an alpha, the paired channel will load the alpha as well.
3. Press **NEXT**.
4. Use the **Attrib** knob to select the attribute you want to set, and the **Value** knob to select the value you want to assign to the attribute.
  - **X Pos** — selects the horizontal position of the image or animation
  - **Y Pos** — selects the vertical position of the image or animation
  - **Shaped** — selects shaped or unshaped for the alpha of the image or animation
  - **Looping** — selects whether the animation loops automatically or not
  - **Reverse** — selects whether the animation plays in reverse or not
  - **AutoPly** — selects whether the animation starts playing automatically when taken on-air or not
  - **Speed** — selects the speed that an animation plays at (0.1-10)
  - **MediaX** — selects the media number that you want to use to recall the still or animation
  - **CutFr** — selects the point, in frames, from the start of the animation that the background cut occurs
  - **GPO** — selects the GPI output that you want to trigger by a media transition
  - **GPOFr** — selects the time, in frames, from the start of the media transition that the GPI output is triggered
  - **Mute** — selects whether the associated audio is turned on or off during playback
5. Use the **Func** knob to select how you want to save the attributes.
  - **Save** — saves the adjustments for the selected **Attrib** value only

- **SavAll** — saves the adjustments for all **Attrib** values
- **Revert** — undoes the adjustments for the selected **Attrib** value only
- **RevAll** — undoes the adjustments for all **Attrib** values

6. Press the **Func** knob to make the selection.

## To Lock a Media Number Place and Bank

Locking the Media Number Place and Bank means that you do not have to enter them when loading a still. Lock setting are specific to the channel they are set on.

1. Press the source button for the Media-Store channel that you want to set the Place and Bank lock settings for.
2. Press the **Browse** knob.
3. Press **NEXT**.
4. Use the **Place** knob to select USB or Internal.
5. Press the **Place** knob to toggle the lock on or off. Locked is shown with [] around the name.
6. Use the **Media** knob to select the bank you want to lock to.
7. Press the **Media** knob to toggle the lock on or off. Locked is shown with [] around the name.

## MediaManager

The MediaManager provides a graphical interface to the operation of the Media-Store from. The layout of the MediaManager window is stored in Perspectives. The last loaded Perspective is used when the browser is refreshed or opened.

From the Menu Bar at the top of the window you can manage Perspectives.

**Tip:** You can either launch the MediaManager directly using the switcher IP address, or you can access it using the MediaManager node in DashBoard. If you are logging into MediaManager from DashBoard, you must have Internet Explorer® 10, or higher, installed.

## Using MediaManager

To use the MediaManager, you must have a computer connected to the same subnet as the switcher, the IP address of your switcher, and the Google Chrome™ browser installed on your computer. In the web browser, navigate to the IP address of the switcher, the MediaManager is displayed.

When you are communicating with the switcher, a moving status indicator is shown in the lower right corner

of the browser window. If you lose communications with the switcher, refresh the browser window to reconnect. Refreshing the browser will reset your Perspectives.

**Keep the following in mind when logging in and using the MediaManager:**

- Ross Video recommends using Google Chrome™ v14.0 running on Windows 7® or Mac® OS X™ Lion to connect to the MediaManager.
- Your browser must have JavaScript and cookies enabled.
- Ross Video recommends that you do not connect more than 5 MediaManager clients to a single switcher at the same time.

**The MediaManager Window**

The MediaManager window provides a graphical interface to the Media-Store. From this window, you can load stills or animations from the internal cache or USB into a Media-Store channel or edit the on-air properties. Media-Store channels have a red background when on-air and green when going on-air with the next transition.

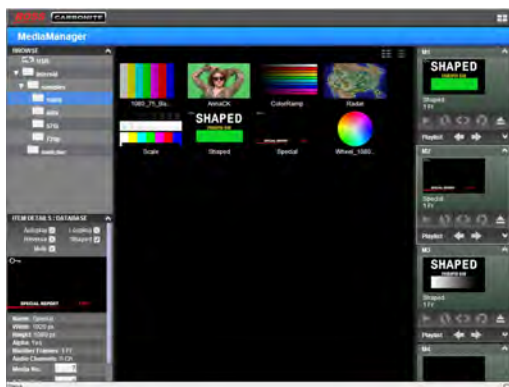


Figure 21: MediaManager Window

**Tip:** The film-strip symbol (🎞️) on a thumbnail indicates that the media item is an animation, the key symbol (⌨️) indicates that the still or animation has an alpha, and the speaker symbol (🔊) indicates that the media item has audio associated with it.

Stills and animations can be loaded into a channel by either selecting the channel and double-clicking on the file, or by dragging a file and dropping it onto the channel. When a channel or file is selected, the properties for the animation or still can be viewed in the **ITEM DETAILS** area.

**Note:** If the files on your USB are new, it takes about 2 seconds per file for the switcher to generate the thumbnail for the MediaManager. Once all the thumbnails are generated, they are displayed in the MediaManager window.

**Animation Controls**

The MediaManager interface allows you to manually control the play-out of an animation.



Figure 22: Media-Store Channel — Animation Controls

Table 5: Animation Controls

Icon	Name	Description
	<b>Play</b>	Play the animation loaded in the Media-Store channel.
	<b>Looping</b>	Turns <b>Looping</b> of the animation on or off.
	<b>Reverse</b>	Toggle the direction that the animation is played in.
	<b>Recue</b>	Loads the animation again.
	<b>Eject</b>	Eject the current still or animation from the Media-Store channel. This is the same as loading media number <b>000</b> on the panel.

**Playlists**

Playlists allow you to create a rundown of stills or animations that you want to load into a Media-Store channel. Using the left and right arrows, you can advance to the next or previous still or animation in the playlist.

**Note:** Items on the playlist are not pre-cached. As you advance to the next item in the list, the switcher must load that still or animation. Depending on what you are loading, and if the item has been loaded before, this could take a few seconds.

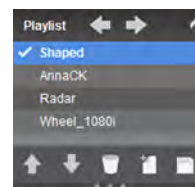










Figure 23: Playlist

**Table 6: Playlist Controls**

Icon	Name	Description
	<b>Previous</b>	Advance to the previous item in the playlist. The item in the playlist that is being shown on the Media-Store channel indicated with a check-mark. The playlist does not loop back to the top when it reaches the last item.
	<b>Next</b>	Advance to the next item in the playlist.
	<b>Up and Down</b>	Move the currently selected item up in the playlist.
	<b>Up and Down</b>	Move the currently selected item down in the playlist.
	<b>Delete</b>	Delete the selected item from the playlist. This does not delete the item, or clear the Media-Store channel.
	<b>New Playlist</b>	Clears the current playlist.
	<b>Load or Save Playlist</b>	Allows you to load, save, or delete a playlist on the switcher. If you delete a playlist that was loaded into a Media-Store channel, it does not clear that channel.
	<b>Expand or Collapse</b>	Expand or Collapse the playlist area for the Media-Store channel.

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## Custom Controls

Once programmed, a custom control can be played back by pressing a button. The custom control can be as simple as triggering an output GPI pulse, or as complex as recalling a specific memory register on an ME, performing a switcher transition, and selecting a group of keys.

**Note:** *The C10 does not support recording or running custom controls from the control panel. Custom controls can be recorded and run from the Custom Control node in DashBoard.*

You can record, edit, and run custom controls from the Custom Control node in DashBoard.

## Custom Control Setup

The custom control interface on your switcher can be customized to show custom control names on the mnemonics just below the Custom Control bus, or automatically add delays between each custom control event as you are recording a custom.

### To Set Custom Control Options

1. Press **BANK 1 > EDIT > NEXT**.
2. Use the **Row** knob to select the control panel row that you want to set how the custom control names appear on the mnemonics.
3. Use the **CCMem** knob to set how custom control names are shown on the mnemonics.
  - **Off** — only video source names are shown
  - **Split** — mnemonics are split with custom control names on the top and source names on the button
  - **Full** — only custom control names are shown
4. If you selected **Split**, use the **MColor** knob to select whether the mnemonics use the bus map color (**Xpt**) or the custom control color (**CC**).
5. Press **NEXT**.
6. Use the **CCPaus** knob to set whether pauses are added automatically after each event.
  - **Manual** — pauses are not added automatically
  - **Record** — each command is automatically separated from the previous command by a pause equal to the real-time delay between the user entering commands

## Recording Custom Controls

When you create a custom control, you record a series of button presses on the panel, as well as special functions, that are played back when you run the custom control.

Almost any action or setting can be stored in a custom control, with the following exceptions:

- Diagnostic Functions
- Confirmation Dialogs
- Panel-Specific Functions

### To Record a Custom Control

A basic custom control records a series of button presses on the control panel.

**Tip:** *If the **CCPaus** feature is set to **Record**, pauses will automatically be added between button presses. If it is set to **Manual** you will have to go back and edit the custom control to add the pauses.*

1. Press **MENU > BANK 1 > START/STOP**.
2. Use the **Bank** knob to select the bank that the custom control you want to record will be stored on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to record to, or select the custom control on the bus directly. If the custom control already has a macro recorded, an \* is shown next to the number.
4. Press **Record Start** to start recording. On the C1 this is the **START/STOP** button.
5. Insert the events you want to record. These can include source selections, key types, transitions, and menu selection, for example. Special functions can also be inserted.

Each custom control can have a maximum of 99 events, plus the End event.
6. Press **Record Stop** to finish recording. On the C1 this is the **START/STOP** button.

**Tip:** *Press **CANCEL** if you do not want to store your changes to the custom control.*

## Special Functions

Special functions allow you to include events not associated with a button press into a custom control. A special function can be inserted into any existing custom control, or used when creating a new custom control.

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## Hold

Allows you to place a command in a custom control that will stop the custom control at the hold event. You must press the custom control button again, or use a GPI trigger, to continue the custom control.

## Pause

Allows you to place a command in a custom control that will stop a custom control at the pause event. The length of the pause is set when the pause is inserted.

When holding the **INSERT** button, pauses are shown as **Px**, where **x** is the length of the pause in frames.

## Loop

Allows you to have a custom control run continuously until stopped, or a Cancel/Cancel All custom control command is executed from another custom control.

## GPO

Allows you to trigger a pre-selected GPI output using a custom control. The specific GPI output is set when the GPO command is inserted.

## CutKey

Allows you create a custom control that will cut keys on or off. The specific key and whether the key is cut on or off is set when the key cut command is inserted.

## TrnKey

Allows you to create a custom control that will transition keys on or off. The specific key and whether the key is transitioned on or off is set when the key transition command is inserted.

## IncKey

Allows you to create a custom control that will include a key with the next transition to take the key on-air, or off-air. The specific key and whether it should go on-air, or off-air is set when the include key command is inserted.

## Resume

Allows you to resume a particular custom control that is at a hold. The specific custom control is set when the resume is inserted. If the target custom control is not at a hold event, the resume command will not start the target custom control.

## Cancel

Allows you to stop a particular custom control. The specific custom control is set when the cancel is inserted.

## CancelAll

Allows you to stop all running custom controls.

## State

Allows you to embed the entire state of the switcher into a custom control. A state in a custom control behaves just like a memory.

## To Insert a Special Event into a Custom Control

A special function can be inserted into any existing custom control, or used when creating a new custom control.

1. Start recording or editing your custom control where you want to insert the special event.
2. Press **INSERT**.
3. Use the **INSERT** knob to select the event you want to insert.

You can also press and hold the **INSERT** button and press the source button on the custom control bus for the event you want to insert. The event names are shown on the mnemonics.

- **Hold** — press the **Insert** knob to insert a hold event
- **Pause** — use the **Secs** and **Frames** knobs to enter the length of the pause event
- **Loop** — press the **Loop** knob to loop the custom control back to the beginning
- **GPO** — use the **Pin** knob to select the GPI output
- **CutKey** — use the **Key** knob to select the key, and the **State** knob to select whether you want the key cut on or off
- **TrnKey** — use the **Key** knob to select the key, and the **State** knob to select whether you want the key transitioned on or off
- **IncKey** — use the **Key** knob to select the key, and the **State** knob to select whether the key should be transitioned on-air or off-air with the next transition
- **Resume** — use the **Bank** knob to select the custom control bank, and the **CC** knob to select which custom control to resume



- **Cancel** — use the **Bank** knob to select the custom control bank, and the **CC** knob to select which custom control to cancel
  - **CancelAll** — press the **CancelAll** knob to insert a cancel all custom controls command
  - **State** — press the **Insert** knob to insert the state
4. Press the **Insert** knob to insert the event.
  5. Press **START/STOP**.

## Running a Custom Control

Once a custom control has been programmed, you can run that custom control by pressing the button that the custom control was recorded to.

**Keep the following in mind when running custom controls:**

- A custom control will continue to run until it reaches a hold event, is stopped by another custom control, you edit a custom control, or the custom control reaches the end.
- When a custom control is running, the button on the custom control bus is red.
- When a custom control is held (at a Hold event), the button on the custom control bus flashes white.
- You can run multiple custom controls at the same time. The number of running custom controls is shown on the display when in custom control mode.
- You can stop a running custom control by pressing the red custom control button on the custom control bank.
- A maximum of 128 custom controls can be run at the same time.

## To Run a Custom Control

Once a custom control has been recorded, you can run that custom control at any time.

1. Press **MENU**.
2. Select the bank that the custom control you want to run is on by pressing the bank button.
3. Select the custom control you want to run by pressing the source button on the custom control bus.  
The custom control starts to play immediately.

## Editing Custom Controls

After you have recorded a custom control, you can go back and edit that custom control to add or remove events.

### To Edit a Custom Control

When editing a custom control, you can delete and insert events at any point in the custom control, or append events to the end.

**Tip:** When editing a custom control, press **RUN EVENT** to run the currently selected event. This can help you diagnose problems in a custom control.

1. Press **MENU > BANK 1 > EDIT**.
2. Use the **Bank** knob to select the bank that the custom control you want to record will be stored on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to edit, or select the custom control on the bus directly. The custom control will have an \* next to the number.
4. Use the **Func** knob to select where and how you want to edit the custom control.
  - **Edit** — select the position in the custom control to edit events
  - **Append** — add events to the end of the custom control
5. Press the **Func** knob to start editing.

**Tip:** You can also start editing a custom control by pressing and holding **EDIT** and selecting the bank and custom that you want to edit to.

The display changes to show the name and duration of the custom control, and the currently selected event in the custom control.

6. Delete an event in a custom control as follows:
  - a) Use the left knob to select the event you want to delete. You can also use the **PREV** and **NEXT** buttons.
  - b) Press **DELETE**.
7. Insert an event into a custom control as follows:
  - a) Use the left knob to select the event you want to insert an event before. You can also use the **PREV** and **NEXT** buttons.
  - b) Press **INSERT**.
  - c) Insert the events you want.

- d) Press **START/STOP** to finish recording.

## Naming Custom Controls

Each custom control can be given a unique name and mnemonic color. The name is shown in the mnemonic display when CCMnem is set to Split or Full.

### To Name a Custom Control

The procedure to name or rename a custom control is the same.

1. Press **MENU > BANK 1 > EDIT**
2. Use the **Bank** knob to select the bank that the custom control you want to name is stored on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to name, or select the custom control on the bus directly.
4. Use the **Func** knob to select **Rename**.
5. Press the **Func** knob.
6. Select a name as follows:
  - a) Use the **Pos** knob to select the character position to edit. A name can have up to 8 character.
  - b) Use the **Char** knob to select a character for the current position.
7. Press **NEXT**.
8. Use the **Size** knob to select the text size for the mnemonic label.
  - **Small** — 6 characters displayed on the top line, and 2 on the bottom
  - **Medium** — 4 characters displayed on the top line, and 4 on the bottom
  - **Large** — first 2 characters are displayed
9. Use the **Color** knob to select the background color of the mnemonic.
10. Use the **Inv** knob to swap the color of the text and the background.

The Invert (Inv) selection is not applied when the mnemonic is in split mode. In split mode, the top half of the display is inverted, and the bottom is not.

## Deleting Custom Controls

Any custom control on the switcher can be deleted to remove unused customs to free up space for new custom controls.

### To Delete a Custom Control

There is no undo for this delete function.

1. Press **MENU > BANK 1 > DELETE**
2. Use the **Bank** knob to select the bank that the custom control you want to delete is stored on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to delete, or select the custom control on the bus directly.
4. Press the **Func** knob.
5. Press the **Confrm** knob to delete the custom control.

## Copying and Pasting Custom Controls

The contents, or events, of a custom control can be copied from one custom control and pasted to another. Along with the events, the name and mnemonic settings are also copied.

### To Copy and Paste a Custom Control

1. Press **MENU > BANK 1 > Edit**.
2. Use the **Bank** knob to select the bank that the custom control you want to copy is on, or select the bank button directly.
3. Use the **CC** knob to select the custom control that you want to copy, or select the custom control on the bus directly. If the custom control has a macro recorded, an \* is shown next to the number.
4. Use the **Func** knob to select **Copy**.

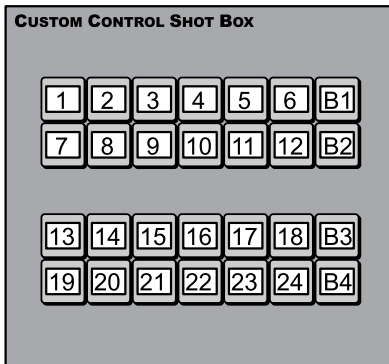
**Tip:** If you do not have a C10 or C1 control panel, you can press the **Copy** mnemonic button to perform the copy instead of using the **Func** knob.
5. Press the **Func** knob to perform the copy.
6. Select the custom control that you want to paste into.
7. Use the **Func** knob to select **Paste**.

**Tip:** If you do not have a C10 or C1 control panel, you can press the **Paste** mnemonic button to perform the copy instead of using the **Func** knob.

8. Press the **Func** knob to perform the paste.

## SideShot Custom Control Shot Box

The SideShot connects to the switcher and provides quick access to all 24 custom controls on each custom control bank. Refer to the instructions that came with SideShot for setup information.



**Figure 24: SideShot Button Mapping**

The four buttons on the right side of the module select the active custom control bank, and the remaining buttons trigger the custom control on the bank. The mnemonic for the custom control is inverted if the custom control is running.

# Switcher Soft Reset

If required, the switcher can be reset to return it to a user-defined default setting, or the factory default state. A reset can be performed for the entire switcher, or individual components, such as keys.

## Soft Reset

The software reset returns the switcher to the default state. Black is selected on all buses, all keys are cut off-air, and the transition rate is set back to default. This is useful if you need to return the switcher to a known state.

### To Reset the Switcher Software

1. Press and hold **MENU**.
2. Press **Reset All (RESET)** on the C10/C1).

## Custom Reset Settings

You can customize many of the default switcher parameters and save them as a user-defined reset settings. These custom reset settings can then be recalled when you want to return the switcher to a previous state.

### To Save a Custom Reset Setting

You can customize many of the default switcher parameters and save them as a user-defined custom reset.

**Tip:** Custom reset settings can also be set from the **Memory > RState** tabs on the Live Assist node in DashBoard.

1. Press **MENU > RESET > NEXT**.
2. Use the **Attrib** knob to select **Media**.
3. Use the **Media** knob to select **Media1**.
4. Use the **Value** knob to select whether the Media-Store channel is reset with a switcher reset or not.
  - **NoRst** — the Media-Store channel is not reset
  - **Reset** — the Media-Store channel is reset with a switcher reset
5. Repeat this for the remaining Media-Store channels.
6. Use the **Attrib** knob to select **Aux**.
7. Use the **Aux** knob to select **Aux 1**.
8. Use the **Value** knob to select whether the Aux bus is reset with a switcher reset or not.

- **NoRst** — the Aux bus is not reset
- **Reset** — the Aux bus is reset with a switcher reset

9. Repeat this for the remaining Aux buses.
10. Press **NEXT > NEXT > NEXT**.
11. Press **RState Save** and **Confirm**.

### To Load a Custom Reset Setting

**Tip:** Custom reset settings can also be set from the **Memory > RState** tabs on the Live Assist node in DashBoard.

1. Press **MENU > RESET**.
2. Press **RState Load**.

You can also press and hold **MENU** and press **Reset All (RESET)** on the C10/C1).

## Factory Default Settings

You can restore the switcher to the factory default state. All installation and personality settings are reset.

### To Factory Reset the Switcher

1. Press **MENU > RESET > NEXT > NEXT**.
2. Press the **Factory Reset** knob.
3. Press the **Confirm** knob to load the factory default settings.

## Resetting Individual Components

You can reset only the component that you want, instead of the entire switcher. Individual MEs, keys, aux buses, dissolves, wipes, and menu items can be reset.

**Table 7: Resetting Individual Components**

To Reset	Buttons to Press	Result
Wipes	<b>WIPE</b> and <b>RESET</b>	all wipe parameters, including position, pattern, and border, are reset
Dissolves	<b>DISS</b> and <b>RESET</b>	all dissolve parameters are reset
Keys	<b>KEY X SEL</b> and <b>RESET</b>	key parameters for key X including clip, gain, and mask, are reset, but not key type, or chroma key color selection (each keyer is reset individually) (X is the number of the key)
MEs	<b>ME X</b> and <b>RESET</b> (C10/C1)	ME X parameters, including source selections, are reset (each ME is reset individually) (# is the number of the ME)
	<b>ME X STORE</b> and <b>ME X RECALL</b> (C1AC1MC2C2MC2SC2X)	

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To Reset	Buttons to Press	Result
	<b>STORE</b> and <b>RECALL</b> for the selected MEs (C3S/C3X)	
Aux Buses	<b>AUX X</b> and <b>RESET</b>	Aux bus X parameters, including source selections, are reset (each Aux is reset individually) (X is the number of the aux bus)
Menu Items	double-press the knob for the value you want to reset	the value for that knob is reset

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# Glossary

## Auto Key

A pairing of two video signals, a key video and a key alpha, to create a key. In the switcher, you associate the fill and alpha so that the switcher knows which alpha to use when the video is selected.

## Auto Transition

An automatic transition in which the manual movement of the fader handle is simulated electronically. The transition starts when the **AUTO TRANS** button is pressed and takes place over a pre-selected time period, measured in frames.

## Chroma Key

Chroma Key is a key in which the hole is cut based on a color value, or hue, rather than a luminance value or alpha signal. The color is removed and replaced with background video from another source.

## Cut

An instantaneous switch from one video signal to another.

## Dissolve

A transition from one video signal to another in which one signal is faded down, while the other is simultaneously faded up. The terms mix or cross-fade are often used interchangeably with dissolve.

## Dynamic Host Configuration Protocol

An Ethernet protocol where a device, such as the switcher, is given an IP address by the network host. This eliminates the need to manually enter the network parameters and IP address.

## Field

One half of a complete picture (or frame) interval containing all of the odd, or all of the even, lines in interlaced scanning. One scan of a TV screen is called a field; two fields are required to make a complete picture (which is a frame).

## Frame

One complete picture consisting of two fields of interlaced scanning lines.

## File Transfer Protocol

A network protocol that is used to transfer files from one host computer to another over a TCP-based network.

## Gain

Gain represents the range of signal values present in a video signal from a lowest to a highest point (from black to white for example). Increasing gain expands this range, while decreasing gain compresses this range. Clipping occurs if applied gain changes cause output signal values

to fall outside the allowable range. Generally, increasing the gain for a specific color component causes the video signal colors to become increasingly saturated with that color. Similarly, decreasing the gain for a specific color component progressively removes that color component from the output video signal.

## Gamma

Gamma corrections introduce non-linear corrections to a video signal. A gamma correction can be described as taking a point on the output versus input video signal line and pulling it perpendicularly away from the line. The result is a Bezier curve between the start, the new point, and the end point. Generally, increasing the gamma value adds more of the component to the video signal in the location of the gamma offset point. Decreasing the gamma value reduces the amount of the component in the video signal in the location of the gamma offset point. Moving the gamma offset point allows you to select which part of the input video signal receives the gamma correction. For example, if you increase the red gamma correction to the part of the video signal that has no red component you will add red to those areas while having little effect on areas that already contain a significant amount of red. This allows you to add a red tint to the image while minimizing the amount of red-clipping that occurs.

## General Purpose Interface

A simple high/low signal that is used to trigger an action either on an external device or on the switcher. A GPI can be an input or an output to the switcher.

## High Definition

A high definition (720p or 1080i) video signal.

## Hue

The characteristic of a color signal that determines whether the color is red, yellow, green, blue, purple, etc. (the three characteristics of a TV color signal are chrominance, luminance, and hue). White, black, and gray are not considered hues.

## Hue Rotation

Hue rotate affects the color of the entire video signal by rotating the input video hues. This produces an output video signal with colors that are shifted from their original hues. By rotating colors around the wheel, hue values will shift. For example, a clockwise rotation where yellows become orange, reds become magenta, blues become green. The more rotation applied, the further around the wheel colors are shifted.

## Key

An effect produced by cutting a hole in the background video, then filling the hole with video or matte from another source. Key source video cuts the hole, key fill

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video fills the hole. The video signal used for cut and fill can come from the same, or separate, sources.

**Key Alpha**

The video signal which cuts a hole in the background video to make a key effect possible. Also called Key Video or Source. In practice, this signal controls when a video mixer circuit will switch from background to key fill video.

**Key Invert**

An effect that reverses the polarity of the key source so that the holes in the background are cut by dark areas of the key source instead of bright areas.

**Key Mask**

A keying technique in which a pattern is combined with the key source to block out unwanted portions of the key source.

**Key Video**

A video input which is timed to fill the hole provided by the key source video. An example of key video is the video output of a character generator.

**Linear Key**

Linear keys make it possible to fully specify the transparency of a key from opaque, through transparent, to fully off. The transparency is specified by the key alpha that is associated with the key video. A keyer capable of a linear key converts the key signal voltage directly to the transparency effect on the screen.

**Mnemonics**

A green, orange, or yellow display used to show the names of a source above or below the source button or used as a custom command or pattern button.

**Offsets**

Offsets shift the video signal by a set amount. Depending on the offset applied, different parts or all of the video signal may be affected. Clipping occurs if applied offsets cause output signal values to fall outside the allowable range.

**Pre-Delay**

A pre-delay is a delay that is inserted into a transition between the triggering of a GPI output and performing the transition. The length of the pre-delay is usually the length of time your video server requires to start playing a clip or your character generator required to load a page.

**Rosstalk**

An ethernet based protocol that allows the control over Ross devices using plain english commands.

**Standard-Definition**

A standard definition (480i or 576i) video signal.

**Self Key**

A key effect in which the same video signal serves as both the key signal and key fill.

**Shaped Key**

An additive key where the Key Alpha cuts a hole based on the monochrome value of the alpha. Shades of gray are translated into either white or black, giving the key a hard edge. Shaped Key alphas are sometimes used with Character Generators to cut very precise holes for the fill.

**Split Key**

A Split key allows you to assign a different alpha source for a key than the fill/alpha associations that are set up during configuration or to use a separate alpha source for a Self key.

**Tally**

An indicator which illuminates when the associated button, or control, is selected or is on-air.

**Unshaped Key**

A multiplicative key where the Key Alpha cuts a hole based on the gradient values of the alpha. Shades of gray are translated into transparency levels, giving the key a soft edge. Unshaped Key alphas can also be considered true linear alphas. Key alphas are set to unshaped by default.

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