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Ross Video Limited



## Operation Guide

Software Issue: 16.10-S100

The logo for ROSS, featuring a stylized, bold, black letter "R" followed by the word "ROSS" in a bold, black, sans-serif font.

**Cool Practical Technology™**

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## Synergy 100 • Operation Guide

- Ross Part Number: **4100D-003**
- Document Issue: **16A**
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- Software Issue: **16.10-S100**

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# Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, refer to the “**Important Safety Instructions**” listed below to avoid personnel injury and to prevent product damage.

Product may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

## Symbol Meanings

	<b>Protective Earth</b>	This symbol identifies a Protective Earth (PE) terminal, which is provided for connection of the supply system’s protective earth (green or green/yellow) conductor.
		This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.
	<b>Warning</b>	The symbol with the word “ <b>Warning</b> ” within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.
	<b>Caution</b>	The symbol with the word “ <b>Caution</b> ” within the equipment manual indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
	<b>Notice</b>	The symbol with the word “ <b>Notice</b> ” within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation, which could place the equipment in a non-compliant operating state.
	<b>Warning Hazardous Voltages</b>	This symbol is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons
	<b>ESD Susceptibility</b>	This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

## Important Safety Instructions



### Warning

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with a dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with manufacturer’s instructions.

- 8) Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit in to your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 13) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way. This includes power-supply cord or plug damage, liquid being spilled or objects having fallen into the apparatus, the apparatus being exposed to rain or moisture, the apparatus having been dropped, or the apparatus not operating normally.
- 14) Do not expose this apparatus to dripping or splashing, and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.
- 15) To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.
- 16) The mains plug of the power supply cord shall remain readily operable.
- 17) The SD (Video Production Switcher) chassis is to be rack mounted only.
- 18) **Indoor Use: WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture
- 19) The safe operation of this product requires that a protective earth connection be provided. A grounding conductor in the equipment's supply cord provides this protective earth. To reduce the risk of electrical shock to the operator and service personnel, this ground conductor must be connected to an earthed ground.
- 20) **WARNING:** This apparatus, when equipped with multiple power supplies, can generate high leakage currents. To reduce the risk of electric shock, ensure that each individual supply cord is connected to its own separate branch circuit with an earth connection.
- 21) **CAUTION:** These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. (Installation Guide only.)
- 22) This apparatus contains a Lithium battery, which if replaced incorrectly, or with an incorrect type, may cause an explosion. Replace only with the same type. Dispose of used batteries according to the manufacturer's instruction.
- 23) Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after servicing.
- 24) Certain parts of this equipment still present a safety hazard with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing.
- 25) This product contains safety critical parts, which, if incorrectly replaced, may present a risk of fire or electrical shock. Components contained within the product's power supplies and power supply area are not intended to be customer-serviced and should be returned to the factory for repair.
- 26) To reduce the risk of fire, replacement fuses must be the same type and rating.



## Warning

27) Use only power cords specified for this product and certified for the country of use. Refer to the Product Power Cord Requirement section that follows.

28) The safe operation of this equipment requires that the User heed and adhere to all installation and servicing instruction contained within the equipment's manuals.

## Product Power Cord Requirements



### Caution

### **North American Line Voltages 100 - 120 Volt**

This product is supplied with certified 10A/125V SVT type supply cords. Conductors are color coded white (neutral), black (line) and green or green/yellow (ground).

Operation of this equipment at line voltages exceeding 130V requires that alternative supply cords with appropriate voltage and current ratings be used.

### **International Line Voltages 200 - 240 Volts**

This product has been designed for use with certified IEC 320- C13 10A/250V - **H03 VV-F3G 1.00mm<sup>2</sup>** type line cord.

International product orders are supplied with a certified 10A/250V line cords, utilizing a molded 3-pin IEC 320-C13 type connector at one end and stripped conductors on the other. One line cord is provided. Conductors are CEE color coded; blue (neutral), brown (line), and green/yellow (ground).

Installation by a qualified electrician, of an appropriately approved A/C wall plug certified for the country of use, is required.

Alternatively, other IEC 320 C-13 type power cords may be used, provided that they meet the necessary safety certification requirements for the country in which they are to be used. Refer to the correctly specified line cord above.

## EMC Notices

### **United States of America**

#### **FCC Part 15**

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



### Notice

Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.

### **CANADA**

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe "A" est conforme a la norme NMB-003 du Canada.

## **EUROPE**

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

## **INTERNATIONAL**

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002**, and found to comply with the limits for a Class A Digital device.



### **Notice**

This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.

## **General Handling Guidelines**

- Careful handling, using proper ESD precautions, must be observed.
- Power down the system before PCB removal.

## **A Word About Static Discharge**

Throughout the many procedures in this guide, please observe all static discharge precautions.



### **Notice**

Avoid handling the switcher circuit boards in high static environments such as carpeted areas, and when synthetic fiber clothing is worn. Touch the frame to dissipate static charge before removing boards from the frame, and exercise proper grounding precautions when working on circuit boards.

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## Warranty and Repair Policy

Ross Video Limited (Ross) warrants its switchers and related options, to be free from defects under normal use and service for a period of THREE YEARS from the date of shipment. Fader handle assemblies are warranted for the life of the product. If an item becomes defective within the warranty period Ross will repair or replace the defective item, as determined solely by Ross.

Warranty repairs will be conducted at Ross, with all shipping FOB Ross dock. If repairs are conducted at the customer site, reasonable out-of-pocket charges will apply. At the discretion of Ross, and on a temporary loan basis, plug in circuit boards or other replacement parts may be supplied free of charge while defective items undergo repair. Return packing, shipping, and special handling costs are the responsibility of the customer.

Software upgrades for switchers may occur from time to time, and are determined by Ross Video. The upgrades are posted on the Ross Video website, and are free of charge for the life of the switcher.

This warranty is void if products are subjected to misuse, neglect, accident, improper installation or application, or unauthorized modification.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profit). Implied warranties, including that of merchantability and fitness for a particular purpose, are expressly limited to the duration of this warranty.

This warranty is TRANSFERABLE to subsequent owners, subject to Ross' notification of change of ownership.

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## Environmental Information

**The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.**

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

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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# Introduction

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## A Word of Thanks

Congratulations on choosing the Ross **Synergy 100 SD** digital video production switcher. You have purchased the power and versatility of an advanced Multi-Level Effects (MLE) digital switcher that is ready to take on all creative challenges in today's competitive broadcast environment. You will be pleased at how easily your Synergy 100 switcher fits into your working environment.

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# About This Guide

This guide covers the operation of the **Synergy 100** switcher. The following chapters are included:

- Chapter 1, “**Introduction**” summarizes the guide and describes the components and features that comprise the switcher system.
- Chapter 2, “**Control Panel Introduction**” provides an overview of the Synergy 100 control panel. You will learn the various panel sections and details about basic functionality.
- Chapter 3, “**Using the Menu System**” provides an introduction to the switcher’s menu system.
- Chapter 4, “**Switcher Basics**” presents basic operating rules and procedures regarding crosspoints, buses, knobs and preview mode.
- Chapter 5, “**Transitions**” outlines operating procedures for manual transitions, cuts, dissolves, auto transitions and a variety of other basic transition modes.
- Chapter 6, “**Pattern and Effects Control**” provides information and instructions for using the switcher’s pattern generators and **Effects Control** groups.
- Chapter 7, “**Keying**” provides instructions for using the switcher’s **Effects Keyers** and **Downstream Keyer**.
- Chapter 8, “**Memory Functions and More**” provides instructions for using the switcher’s **Memory System**.
- Chapter 9, “**Peripheral Device Control and More**” provides instructions for operating **Remote Aux Panels**, the **Serial Tally Interface**, and **Remote Audio Mixer Control Interface**.
- Chapter 10, “**Ultimatte Insider**” provides instructions for operating the optional **Ultimatte Insider™** chroma keyer function.
- Appendix A, “**Menu Trees**” lists the various menu trees that are used within the Synergy 100 switcher.
- The **Glossary** provides a reference list of important switching and video terms used throughout this guide.
- An **Index** is also provided for your reference.

If, at any time, you have a question pertaining to the operation of your Ross switcher, please contact us at the numbers listed in the front of this guide. Our technical staff is always available for consultation, training or service.



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# Documentation Conventions

The following conventions are used throughout this guide:

- Rear panel connectors are indicated in bold-faced upper case letters. For example:  
The **AUX 1** connector is...
- Control Panel buttons are indicated in bold-faced upper case letters, using a sans-serif font. For example:  
Press **WIPE** to...
- Menu names on the preview overlay and switcher control panel areas are indicated in bold-faced text. For example:  
The **Inputs Menu** allows you to ...  
The **Downstream Keyer** group consists of ...

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## Documentation Terms

The following terms are used throughout this guide:

- “**DVE**” refers to the *optional* Digital Video Effects daughter board that is installed directly onto the Synergy 100 frame processor board.
- “**Frame**” and “**Electronics Frame**” both refer to the Synergy switchers’s electronics frame.
- “**Operator**” and “**User**” refer to the person who uses the Synergy 100 production switcher.
- “**Panel**” and “**Control Panel**” both refer to the Synergy 100 control panel.
- “**SDI**” refers to Serial Digital Interface video, a component digital video signal that is distributed via a single coaxial cable with BNC connectors.
- “**Storage device**” refers to a standard 1.44 MB high-density floppy disk or a USB key. Either type of storage device can be used to save and recall configurations, setups and certain files to the Synergy switcher.
- “**System**” refers to the entire Synergy 100 system, consisting of its electronics frame and control panel.
- “**Video system**” refers to the mix of interconnected digital equipment (including the edit controller, VTRs, DVEs, etc.) in which the Synergy 100 system is included.

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# Abbreviations

The following abbreviations are used throughout the text:

*Abbreviations*

<b>Abbreviation</b>	<b>Definition</b>
A-D	Analog-to-Digital
AUX	Auxiliary
BKGD	Background Transition
CG	Character Generator
D-A	Digital-to-Analog
DA	Distribution Amplifier
DDR	Digital Disk Recorder
DSK	Downstream Keyer
DVE	Digital Video Effects
DVR	Digital Video Recorder
ID	Identification
MLE	Multi-level Effects
PGM	Program Bus
PST	Preset Bus
PST PATT	Preset Pattern
PV	Preview
RU	Rack Unit
TD	Technical Director
VCR	Video Cassette Recorder
VDCP	Video Disk Communications Protocol
VTR	Video Tape Recorder

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## Product Overview

Ross Video developed the Synergy series for live news, live sports and live production. Because the switcher is the center of the action, it must be powerful and versatile, yet easy to operate. This operational simplicity frees operators to concentrate on the content — instead of the equipment.

The Synergy series (our fourth generation of switchers) was designed with the direct input of video professionals experienced in news, sports, and mobile production. Key members of the Synergy design team are part of an ongoing program where they demonstrate the product, assist with installations and provide operator training. As a result, the Synergy line continues to advance Ross Video's traditions — power, ease of use and logical panel layouts.

## Product Highlights

The following list summarizes the key features of the Synergy 100:

- **Fully Digital System.** The Synergy 100 switcher is fully-digital, including the reference video connection. No analog input/output circuitry is provided. This unique concept simplifies the design, minimizes the power requirements and reduces the overall cost.

By requiring all A-D and D-A conversion to be performed *outside* the system, digital noise stays *out* of the converters. In addition, customers are guaranteed the latest converter technology, *without* burdening the cost of the switcher and *with* the added option to use those converters for other purposes — as they gradually convert to the digital domain.

- **Multi-Panel Flexibility.** For superb flexibility and versatility, the Synergy 1 frame is designed to operate with eight different control panels, four of which previously operated in an analog environment:
  - ~ GVG 100 (analog)
  - ~ GVG 110 (analog)
  - ~ RVS-210A (analog)
  - ~ RVS-216A (analog)
  - ~ RVS-210D (digital)
  - ~ RVS-216D (digital)
  - ~ Synergy 1 (digital)
  - ~ Synergy 100 (digital)
- **Large Input Matrix.** The Synergy 1 frame can accept up to 16 digital video inputs — not including black and two color background signals (which are generated internally). On the Synergy 100 panel with its 10 available crosspoints, you have several crosspoint layout options:
  - ~ Assuming that **Black** and **Color Background** are mapped to crosspoints 1 and 10, respectively, and you have not mapped a **SHIFT** button, the panel gives you direct access to 8 inputs. The remaining sources can be mapped internally, allowing you to associate key (alpha) signals with their respective fill sources.
  - ~ If you wish to map a **SHIFT** button to crosspoint 10, with **Black** and **Color Background** mapped to crosspoints 1 and 9, respectively, the panel gives you direct (and shifted) access to all 16 inputs. In this configuration you can also internally associate key and fill inputs, for full input matrix flexibility.



## Note

If you prefer, the **SHIFT** button can be mapped to crosspoint 1, with **Black** being mapped to an alternate crosspoint.

- **Compact Size.** The 2 RU frame accepts 16 inputs and one fully optional MLE, including eight untimed Aux Buses. There is no extender board available, but the frame top can be removed easily for servicing if required. The CPU board has convenient ejector handles on each side and plugs easily into the frame's backplane.
- **Low Power.** The only power requirements are a maximum 180 watts for the frame and a maximum of 19 watts for the control panel. The frame's power supply is designed for easy removal if an exchange is required.
- **Growth Path.** The Synergy 1 frame provides a versatile growth path, regardless of your entry point within the system. If you start with a GVG 100, GVG 110, Ross RVS-210A or 210D, Ross RVS-216A or 216D control panel, or a Synergy 100 control panel, you can move up to the Synergy 1 control panel and benefit from a full range of advanced features. If you start with the Synergy 1 control panel already in place, you can optionally add two more Downstream Keyers for added flexibility and creativity in your productions. Furthermore, knowledge and skill gained on the Synergy 1 panel allows a seamless transition to the larger Synergy switchers — as operation is almost identical.
- **Three Powerful Keyers (Standard).** The Synergy 100 panel provides access to three powerful keyers (two Effects keyers and one Downstream keyer):
  - ~ The **Effects Keyers** provide self, auto select, preset pattern and chroma key capabilities.
  - ~ The **Downstream Keyer** provides self and auto select keys.
  - ~ A key border can be generated on the downstream key if the optional border card is installed.
  - ~ With the optional **Squeeze & Tease 2D** or **Squeeze & Tease WARP** feature installed, the **Effects Keyers** can also perform simple 2D or more complex 3D DVE effects and **Squeeze & Tease 2D** boxes. Refer to the section "**Squeeze & Tease**" on page 1-12 or the *Squeeze & Tease 3D/WARP Owner's Guide* for more information.
- **Squeeze & Tease 2D and Squeeze & Tease WARP.** A simple 2D or more complex 3D DVE can be built into the **Effects Keyers**. With either option installed, all key types can be repositioned, squeezed, and zoomed.

With 2 D, you can simultaneously crop, reposition, squeeze or zoom, and adjust the border on a key inside a *single* keyer. With WARP, you can simultaneously crop, rotate, squeeze or zoom, and reposition a key in 3D space inside a *single* keyer.

Refer to the section "**Squeeze & Tease**" on page 1-12 or the *Squeeze & Tease 3D/WARP Owner's Guide* for more information.
- **Chroma Keying.** A standard feature in the **Effects Keyers**, the chroma keyer features auto chroma key, hue suppression, rejection, and adjustable clip and gain parameters. Our chroma keyer was designed for use in today's fast-paced productions.
- **Two Pattern Generators (Standard).** The Synergy 100 is equipped with a primary pattern generator for creating wipes, plus a secondary pattern generator for **PST PATT** keys. The primary generator is equipped with extensive classic, rotary, and matrix wipes.
- **Fully Featured "Program/Preset."** The Program/Preset buses have *full multi-level effects capability* including wipes, chroma keys, and preset patterns.

- **Effects Functions** (Preview Overlay). This powerful feature presents safe title, center crosshairs, and more. Displays are individually selectable on the preview monitor for quick reference.
- **Rugged Construction**. Ross products are tough — they’re built to handle years of demanding, continuous use. In addition, the Synergy series is backed by a **three-year transferable warranty**.

## Standard Features

The following features are standard in the Synergy 100 switcher:

### ***Complete Control Panel***

Regardless of what options are ordered, your control panel is always equipped with every button, knob, display, and light. This means that your Synergy 100 switcher and your control room will look their very best – even if your budget is tight.

- **Serial Digital Inputs**

Sixteen serial digital inputs are standard on the Synergy 100. Any input can be assigned to any button on the Program/Preset bus, thus simplifying installation and your ability to customize the panel layout. Inputs can be used for either video or alpha channels.

- **Panel Tallies**

There are 16 panel tallies on the Synergy 100 control panel.

### ***Full MLE Effects***

The Synergy 100 switcher includes a *full-featured* MLE that includes the following functions:

- Two wipe generators are standard.
- The MLE includes three keyers that each offer matte fill, key invert, mask, adjustable clip and gain, and self (luminance) key and linear (auto select) key modes.
- The downstream keyer offers extensive optional bordering that works with both key types.
- The optional **Squeeze & Tease 2D** or **Squeeze & Tease WARP** feature can be installed in the Effects Keyers, allowing you to squeeze, zoom, or in the case of the WARP option, rotate any key type. Refer to the section “**Squeeze & Tease**” on page 1-12 or the *Squeeze & Tease 3D/WARP Owner’s Guide* for details.
- The MLE features five comprehensive matte generators.
- Full preview capability is provided.

### ***Copy and Swap Functions***

The following convenient copy and swap functions are available as standard:

- **Copy Key** – allows you to copy the contents of one keyer to another keyer.
- **Swap Key** – allows you to swap the contents of one keyer with another keyer.

## Pattern Generators

The Synergy 100 includes (as standard) both primary and secondary pattern generators that are used for wipe transitions and preset patterns. The primary generator is equipped with extensive classic, rotary, and matrix wipes. The secondary generator provides classic patterns.

## Chroma Keying

Chroma keying is available in the **Effects Keyers**. Each high quality chroma keyer features internal 4:4:4 chroma channel interpolation from any of the 4:2:2 inputs. Using the control panel, you can adjust the Chroma key's clip, gain, rejection, suppression, and hue. The **Auto Chroma Key** feature allows the user to quickly and automatically achieve the best chroma key for a selected color.

## Untimed Aux Buses

Eight untimed Aux Buses are standard, each of which can be used to route video to monitors, DVE channels, still stores, tape machines, etc. Aux Buses 3 through 10 can be used to route any untimed signals to other external sources, including:

- Black (as supplied by the "601 REF IN" BNC), plus all primary inputs
- Clean feed (if the option is installed)
- MLE program and preview outputs



### Note

Black, clean feed, and program and preview outputs can only be routed to the Aux Buses using a Remote Aux Panel. All other signals (primary inputs) can be routed using either the remote panels or the Synergy 100 control panel itself.

Since the Synergy 1 frame generates its own internal black signal, selecting **BLACK** on an untimed Aux Bus will route to the output whatever is connected to your "601 REF IN" BNC. See table below.

*Aux Bus Capabilities by Timing Status*

Aux Bus	Timing	Black	PV	Clean Feed	PGM
3 - 10	Untimed	Ref	Yes	Yes	Yes

## Standard Digital Outputs

The following table lists all standard Synergy 100 digital outputs:

*Synergy 100 Digital Outputs*

Output Type	Quantity
Program	2
Preview	2
Aux Bus	8
Total Outputs	12



## Note

If the **Clean Feed** option is installed, an additional output is provided, for a total of 13 outputs.

Aux Buses 1 and 2 are available with the Synergy 1 panel. Contact **Technical Support** for information.

## Disk Drive

Using a standard high-density 3.5-inch floppy disk, you can quickly and easily upgrade your switcher software as new versions are released. In addition, each operator can store and recall their own complete switcher setups, including memory functions, switcher personalities, installation parameters, and 3D wipes.

## Memory System

The Synergy 100 switcher is equipped with a standard 100-event memory for complete switcher snapshots. At the touch of a button, the entire switcher setup can be recalled using the numbered buttons in the **Effects Control** group, or the **10** and **1** buttons (in conjunction with the **SEL** button) in the **System Control** group.

## Matte Generators

The Synergy 100 switcher has five simple color generators. These color generators allow you to adjust the hue, color saturation, and luminance of the BKGD, wipe pattern borders, Effects key fill, or the Downstream key border and matte fill.

## Displays and Indicators

The Synergy 100 switcher always keeps you informed.

- **PGM** bus crosspoints are illuminated red, signifying “on-air” status, except when the panel is faded to black. In this case, the crosspoint LEDs will be orange.
- **PST** bus crosspoints are lit orange, except during a background transition, when they will be red.
- **KEY** bus crosspoints will be lit orange when the key is not on air, and red when the key is contributing to the program output.
- The secret-till-lit LEDs to the left of each crosspoint bus will be lit green when the source selected on the bus is synchronous, and orange if the source is non-synchronous.
- Functions that have control of the **Effects Control** groups will be lit green (e.g. **FLY KEY**).
- The **ON AIR** secret-till-lit LEDs in the **Effects Keyers** group and under the key and DSK transition buttons in the **Transition Control** group glow red when the key is on air.
- The **EDIT** secret-till-lit LED under the **MENU** button in the **System Control** group is lit when the **Editor** option is installed and enabled.
- The auto transition rate in the **System Control** group is constantly visible.
- When the switcher is in “memory mode”, the last memory register accessed is displayed in the **System Control** group.
- The four-character **MODE** displays in the **Effects Control**, **Mattes**, and **System Control** groups, always inform you of which function has control of each group.



- The LEDs in the **Transition Progress Bar** show you how far the transition has progressed, and which direction the fader must travel to complete it.

## **General Purpose Interface**

The Synergy 100 switcher is equipped with twelve dedicated GPI inputs.

- **GPI Inputs** allow the switcher to interface with peripheral equipment. Each input can be assigned to perform functions such as a fade-to-black, a memory recall, or an MLE or DSK transition.

## **Effects Functions (Preview Overlay)**

The **Effects** function makes it possible to present various types of useful information on the two preview or Aux1/Aux2 outputs. The overlay can be displayed according to user preferences. A variety of overlay information is available:

- The “**Safe Title and Safe Action Area**” overlay places a SMPTE standard safe title or safe action area indication over the switcher’s main preview output.
  - ~ Safe title is a box that outlines the area within which the vast majority of home TV sets will be able to read text.
  - ~ Safe action area is a box that outlines the region within which viewers should be able to follow the action on the screen.
- The “**Center Cross Hairs**” overlay places cross hairs on the preview output to indicate the center of the picture. It is useful in the alignment of text and other information.
- The “**Menu Bkgd**” gives you the option of placing a blue background behind the menu, as opposed to having the text on top of the preview output.

## **Digital Reference**

The Synergy 100 switcher requires a digital reference signal connected to the **601 REF IN BNC**. Internal black is regenerated from this digital reference. If only an analog reference is available, an external A-D converter is required.

## **Synergy Slots**

The Synergy 100 incorporates a special mode in which pseudo-random information is statistically measured on a cumulative basis.

## **System Options**

This section lists the options available for the Synergy 100.



### **Note**

Refer to the section “**Options Menu**” on page 3-7 for instructions on how to verify the status of your installed hardware options.

## **USB Removable Media Drive**

The **USB Removable Media Drive** replaces the floppy disk drive for the control panel, and supports industry standard USB keys. This option makes it possible to store and recall complete switcher setups including memory functions, switcher personalities, installation parameters, and more, to a

USB key. Operators and technical staff can easily back up their switcher setups and transfer these settings to other Synergy production switchers.



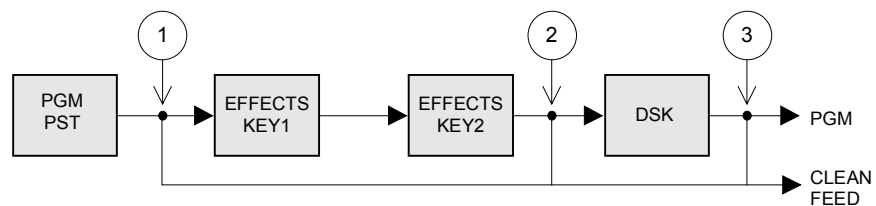
### Note

This option requires version 16 or higher Synergy 100 SD software, and version 3 or higher of the control panel CPU board.

## Clean Feed

The **Clean Feed** option provides an additional “program” output that is derived from a *different location in* than the standard program output. Typical applications are live-to-tape productions and recording shows for later airing without “call in” numbers inserted.

The **Clean Feed** output can be generated from *before* or *after* all keys, including the DSK, or after the Effects Keys but before the DSK. The Clean Feed alpha output can be derived from any key type on Key 1. The point from which the feed is derived is software-configurable. Refer to the diagram below.



Clean Feed Modes

1. At point **1** above, the clean feed output is pulled after the MLE’s program/preset bus, but *before* the three keys are added.
2. At point **2** above, the clean feed output is pulled downstream of the two Effects keys, but upstream of the DSK.
3. At point **3** above, the clean feed output is pulled downstream of the three MLE keyers and effectively mirrors the program output.

Note that the **Clean Feed** option comprises software plus a hardware “serializer” module that installs on the Frame Processor Board. Please call Ross Video **Technical Support** for more details.

## Squeeze & Tease

One **Squeeze & Tease** option puts the power of a simple 2-D (two dimensional) or 3D (three dimensional), 2 channel, WARP DVE into both Effects keys. Once installed, the Squeeze & Tease 2D option can perform the following digital video effects – using only one keyer.

- Squeeze, crop, and reposition an image with variable colored borders.
- Squeeze, crop, and reposition a self key or a chroma key.
- Push on and push off any type of key as a transition.
- Squeeze, crop, and reposition an auto select key. Note that this function “steals” the other Effects keyer’s Squeeze & Tease option in order to process the alpha signal, but the remaining functionality of the other keyer is unaffected.
- Perform Squeeze & Tease wipes, such as push-offs, pull-ons, and other similar 2D DVE transitions.

One **Squeeze & Tease WARP** option can perform the following digital video effects.

- 10-bit processing using sub-pixel motion for great looking pictures.

- Warp effects include page turn, ripple, wave, mirror, swirl, melt, twist, slats, splits, spheres, lenses, star, heart, old film, shards, and more.
- Squeeze, crop, rotate, and reposition any kind of key.
- Create objects (such as slabs) from two images and manipulate them in 3D space.
- Preprocessor effects include defocus, mosaic, posterization, colorization, and strobe effects.
- Advanced picture frame borders can be the simple, single color type, or a fancy picture frame, including Roman column, tubular, beveled, computer style, tri-color, and more.
- All images can have natural lighting effects applied using a positionable light source with ambient light min/max controls.

Operationally, Squeeze & Tease is exceptionally easy to control. Most effects can be produced simply by pressing the **FLY KEY** button in the **Effects Keyer** group and using the 3-axis joystick and associated end stop knobs. Additional adjustment can be made through the menu system.



#### Note

Both Squeeze & Tease options comprise software plus “daughter boards” that install on the Frame Processor Board.

### ***Tally Outputs***

There are 16 optional frame tally relays available. Any tally can be assigned to any video input or the program output. Note that the **Tallies** option comprises the hardware relays that install in the switcher frame.

### ***Floating Border Generator***

The **Floating Border Generator** option provides visually dynamic border, shadow, and outline effects to the **Downstream Keyer** group, with either hard or “soft” edges. You can move the border to any position on the screen — even above the key.

Borders are “flown” in real time with the joystick (just like wipe patterns and DVE effects). Please note:

- All border edge effects can be modified through the parameters of **X** and **Y** position, border size, border color, density, and glow (giving a soft defocused look).
- The **Floating Border Generator** option comprises software plus a “daughter board” that installs on the Frame Processor Board.

### ***Editor Interface***

The **Editor Interface Option** allows the Synergy 100 to interface with all popular editing systems. The option itself comprises software plus security codes and once installed, the switcher can be controlled using an RS-232 or RS-422 interface and industry standard editor protocol. The editor can be used to read and write switcher functions including video input selection, pushbutton enable and disable, control settings, and memory registers. If GPI control is not sufficient and control of all switcher parameters from an editor is necessary, this option is required.

### ***Remote Audio Mixer Control Interface***

The **Remote Audio Mixer Control Interface Option** enables serial control from the Synergy 100 over an audio mixer for enhanced audio-follow-video, making an integrated A/V production possible.

This protocol supports the association of *any* audio input with *any* video input, and is easily configured using the Synergy 100 menu system.

## Serial Tally Protocol Interface

The **Serial Tally Protocol Option** allows you to set up communication parameters with tally system interface equipment using industry standard protocol. Note that the standard parallel tally interface will continue to operate normally when this option is enabled.

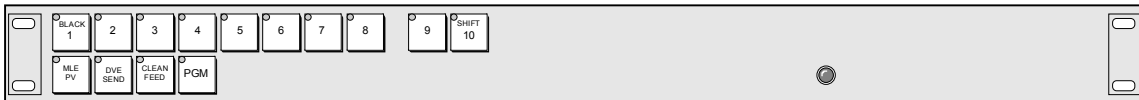
## Ultimatte Insider

**Ultimatte Insider™ Option** is a hardware option that adds true Ultimatte capability — directly *inside* the Synergy 100 switcher. The option comprises a hardware board designed by Ultimatte, the Oscar-winning industry leader in compositing technology.

## Dedicated and Assignable Remote Aux Panels

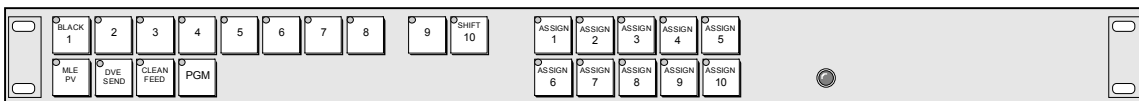
A **Remote Aux Panel** is a self-contained switching unit that has its own power supply. It mounts in a 19-inch rack and fills 1 RU (Rack Unit). There are two types of remote Aux panels available for the Synergy 100 switcher:

- A **Dedicated Remote Aux Panel** controls one Aux Bus output. A sample panel is shown below:



*Dedicated Remote Aux Panel*

- An **Assignable Remote Aux Panel** controls all 8 Aux Bus outputs. A sample panel is shown below:



*Assignable Remote Aux Panel*

In addition to the source buttons, each panel includes dedicated buttons for MLE PV, Clean Feed, Program, and future DVE Send capabilities, plus a bright “on air” LED. Assignable panels include buttons that are used to access the 8 Aux Bus outputs.

The remote panel itself is connected to the rear of the switcher’s frame via a single six-conductor Telco control cable. Typical applications include routing signals to one or more DVE channels and switching a monitor between various signals.

Up to eight Aux panels can be connected to the frame in daisy-chain fashion.

Please note:

- Both the **Dedicated** and **Assignable** Aux panel options include a 33-foot (10 meter) cable. Custom cable lengths are available.
- The maximum cable length between panels (as limited by RS-422 specifications) is 1000 feet (305 meters).
- The communications signal is re-buffered at each Aux panel.

## Conversion Frames

All switcher inputs and outputs are 10-bit SDI, including the system reference. Signal sources of other video formats must be converted to serial digital. Ross Video chose to do this conversion externally to ensure that the very latest conversion technology and most competitive pricing is available to our customers. An added bonus of external conversion is the ability to use those converters elsewhere in your facility as you eventually upgrade your switcher sources to serial digital. The table below lists the Ross products that qualify as converters.

*Ross Converters*

<b>Converter</b>	<b>Description</b>
ADC-8032B	Analog Composite to SDI Digital Decoder
ADC-8032B-S	Analog Composite to SDI Digital Decoder with Frame Sync
ADC-8033	Analog Component to SDI Converter
ADC-8035	Dual Analog Composite to SDI Converter
CMA-8011A	SDI Component Monitoring Amplifier
CMA-8011A-7	SDI Component Monitoring Amplifier with 7 reclocked SDI Outputs
DAC-8013	SDI to Analog Component Converter
DAC-8016A	SDI to Analog Composite Converter
DAC-8016A-S	SDI to Analog Composite Converter with Frame Sync
DAC-8016A-SX	SDI to Analog Composite Converter with Frame Sync and X-Color Filter
DAC-8016A-X	SDI to Analog Composite Converter with X-Color Filter
QMA-8044	Quad SDI to Analog Composite Monitoring Amplifier
UMA-8017	Universal SDI Monitoring Amplifier

Please visit our website at <http://www.rossvideo.com> or contact your Ross Video representative to obtain a current Ross Video Product Catalog for detailed information on our complete line of converters.

## Spare Parts Kit

A **Spare Parts Kit** is available which provides switcher parts according to the following criteria:

- the part comes into frequent contact with the user
- the part can be easily damaged or may wear out with excessive use
- the part can be damaged by connecting excessive voltage to an external connector
- the part is used in system power management
- the part can be lost easily

## Custom Main Panel Cable

The **Main Panel** cable connects the control panel to the electronics frame. It is a shielded 8-pin Telco cable and the ends are finished with the appropriate connectors. The control panel and frame can be separated by a maximum of 1,000 feet (305 meters).

A 33-foot (10 meter) control panel cable is supplied as standard with the switcher. If cable lengths other than 10 meters are needed, a custom cable can be ordered (by the meter).

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## A Word about Technical Support

At Ross, we take pride in the quality of our products, but if problems occur, help is as close as the nearest telephone.

Our 24 Hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support is provided directly by Ross personnel. During business hours (eastern standard time), technical support personnel are available by telephone any time. After hours and on weekends, a direct emergency technical support phone line is available. If the technical support personnel who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. These people are available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

For **Technical Support**, call (+1) 613-652-4886 and, for **After Hours Emergency**, dial (+1) 613-349-0006.

## Product Comparison Charts

For your reference, following are detailed charts that compare the features and options that are available with the different control panel configurations of the Synergy 1.

### Feature Comparison Chart

Feature	Synergy 100	Synergy 1	GVG-110 GVG-100	Ross 210A Ross 210D	Ross 216A Ross 216D
100 Event Memory	Yes	Yes	Yes (*10)	Yes (*10)	Yes (*10)
Number of Keyers	3	4 (*3)	2	2	3 (*4)
All 16 Inputs Accessible	Yes (*1)	Yes	Yes (*1)	No (*2)	Yes
Chroma Key Clip, Gain and Hue controls	Yes	Yes	Yes	Yes	Yes
Chroma Key Reject, Blue spill suppression controls	Yes	Yes	Yes (*8)	No (*9)	No (*9)
Custom Control (Macros)	No	Yes	No	No	No
DSK Borders	Yes	No (*6)	Yes	Yes	Yes
DSK DVE Send Transitions	No	No (*6)	No (*7)	Yes	Yes
DSK Still Store and Animated Logo Generator	No	Yes (*6)	No	No	No
DVE Send	No	Yes	Yes	Yes	Yes (*5)
Extended Wipe Patterns	Yes	Yes	Yes	Yes	Yes
Favorite CG Button	Yes	Yes	No	Yes	Yes
Internally Generated Black	Yes	Yes	Yes	Yes	Yes
Internally Generated Color	Yes	Yes	Yes	Yes	Yes
Key 1 Borders	No	Yes	No	No	No
Key 1 Squeeze and Tease	Yes	Yes	Yes	Yes	Yes
Non-Sync LEDs	Yes	Yes	No	Yes	Yes
Preview Overlay	Yes	Yes	Yes (*11)	Yes (*11)	Yes (*11)
Remote Aux Panel GPIs	Yes	Yes	No	No	No
Software Reset from Panel	Yes	Yes	No	No	No
Transition Preview	Yes	Yes	No	Yes	Yes

Notes:

- (\*1) Panel supports **SHIFT** button.
- (\*2) The hidden (inaccessible) inputs can be configured as key signals.
- (\*3) 2 keyers are standard and 2 external DSKs are optional.
- (\*4) In this mode, external DVE Sends are not available. The DSK “next transition” button becomes the MLE Key 2 button and the DSK is then controlled by dedicated buttons (for CUT, AUTO TRANS).
- (\*5) In 2 Keyer mode only. Timed Aux Bus option must be installed.
- (\*6) DSKs on Synergy 1 are optional and external. They only have Self and Auto Select key capability.
- (\*7) DSK can only perform Mix and Cut transitions.
- (\*8) Variable via Chroma Key button hold down
- (\*9) Fixed settings
- (\*10) Bank selectable using the Auto Trans display
- (\*11) Displays only center, safe action, and safe title area.

## Option Comparison Chart

The following chart details which options are available with each Synergy 1 switcher configuration.

Option	Synergy 100	Synergy 1	GVG-100/110	Ross 210A/D 216A/D
Audio Server Control	No	Yes	No	No
Clean Feed	Yes	Yes	Yes	Yes
Dual Aspectizer	No	Yes	No	No
Dual Border Generator (*4)	Yes	Yes	Yes	Yes
DVE Send	No	Yes	Yes	Yes
Editor Interface	Yes	Yes	Yes	Yes
External DSKs (up to 2)	No	Yes	No	No
Frame Tallies	Yes	Yes	Yes	Yes
Panel Tallies	Yes (*2)	Yes (*2)	No	Yes (*2)
Redundant Power	No	Yes (*3)	No	No
Remote Audio Mixer Control	Yes	Yes	No	No
Remote Aux Panels	Yes	Yes	Yes	Yes
Remote Camera Control	No	Yes	No	No
Routing Switcher Control	No	Yes	No	No
Serial Tally Interface	Yes	Yes	No	No
Squeeze & Tease	Yes	Yes	Yes	Yes
Squeeze & Tease 3D	Yes	Yes	No	No
Still Store Control	No	Yes	No	No
Timed Aux Buses	No	Yes (*1)	Yes (*1)	Yes (*1)
Ultimatte Insider	Yes	Yes	No	No
Video Server Control	No	Yes	No	No
VTR Remote Control	No	Yes	No	No

Notes:

- (\*1) Aux 1 and Aux 2 can be timed.
- (\*2) Panel tallies are standard. See table below.
- (\*3) In the control panel only
- (\*4) Floating Border Generator for the Synergy 100.

## Tally Comparison Chart

The following chart details the *optional* tally combinations that are available with each Synergy 1 switcher configuration.

Tally Configuration	Synergy 100	Synergy 1	GVG-100/110	Ross 210A/D	Ross 216A/D
Panel Tallies	16 (Standard)	16 (Standard)	—	8 (Standard)	14 (Standard)
Frame Tallies	16	16	16	16	16
Maximum Tallies	32	32	16	24	30



# Control Panel Introduction

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## In This Chapter

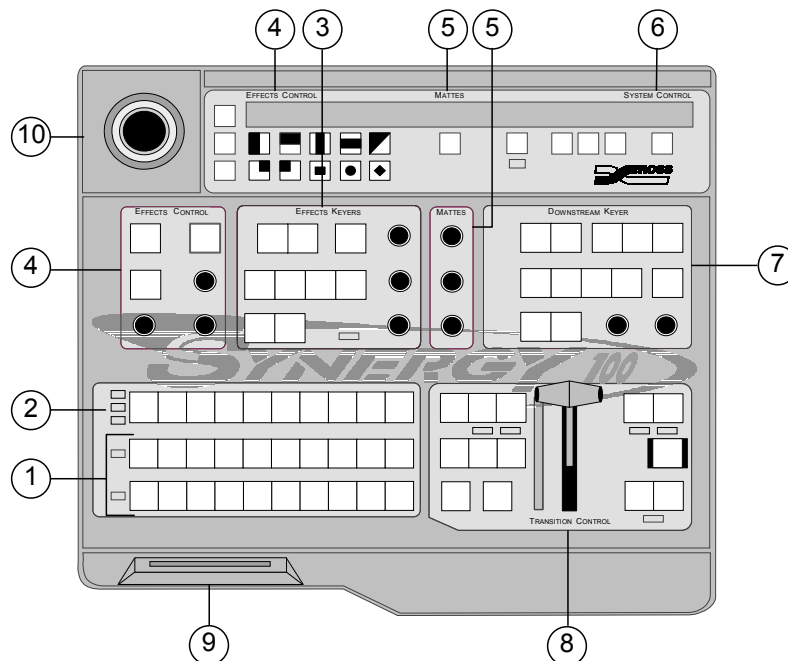
This chapter provides an introduction to the **Synergy 100 SD** control panel. You will learn the various sections of the panel and details about the basic functionality of each. The following topics are discussed:

- Control Panel Sections
- Video Flow through the Switcher
- Switcher Timeout
- Resetting the System

# Control Panel Sections

The following figures display a top view of the **Synergy 100** control panel, with each control panel section identified. The legend beneath the illustrations names each section. An overview of each section follows the figures.

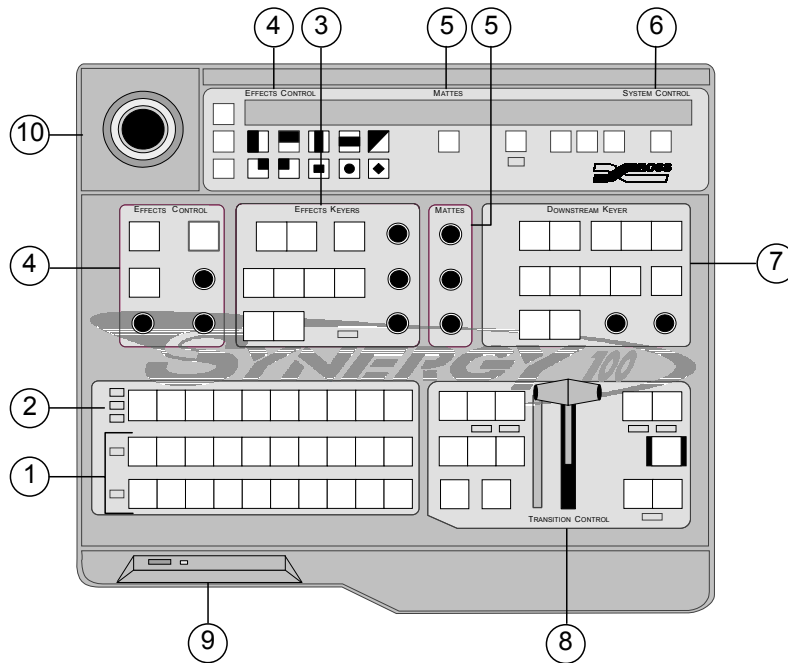
## Synergy 100 Control Panel — Floppy Disk Drive



Synergy 100 Control Panel — Floppy Disk Drive

1) Program/Presel Buses	5) Mattes Groups	8) Transition Control Group
2) Key Bus	6) System Control Group	9) Floppy Disk Drive
3) Effects Keyers Group	7) Downstream Keyer Group	10) Positioner
4) Memory and Effects Control Groups		

## Synergy 100 Control Panel — USB Port



Synergy 100 Control Panel — USB Port

1) Program/Presets Buses	5) Mattes Groups	8) Transition Control Group
2) Key Bus	6) System Control Group	9) USB Port
3) Effects Keyers Group	7) Downstream Keyer Group	10) Positioner
4) Memory and Effects Control Groups		

The following is an overview of each control panel section. For more detailed graphic descriptions, including button labels, please refer to the appropriate sections of this guide.

### 1. Program/Presets Buses

The **Program/Presets Buses** are two rows of crosspoint buttons (one button per video input source) that represent your primary switcher output selection area.

- The **Program** bus is the video source *currently on air*. This is the switcher's background image — that is, the image that is visually behind all other images (or farthest upstream, electronically).
- The **Presets** bus selects the source on the MLE that you are transitioning to — using a cut, dissolve, wipe or DVE transition.

### 2. Key Bus

The **Key Bus** row is used to select key sources that can be keyed (electronically cut) into the background. The **Key** bus is *shared* between the three keys (**2 Effects Keyers** and **Downstream Keyer**).

### 3. Effects Keyers Group

The **Effects Keyers Group** allows you to select the key type and associated parameters for the Effects keys. Choose between **Self Key**, **Auto Select Key**, **Chroma Key**, and **PST PATT Key**. Within the group, you can also select a variety of key modifiers and

parameters. When any button is selected in the group, the **Key** bus is assigned to the **Effects Keyers**.

Electronically, the **Effects Keyers** are downstream (visually in front) of the background buses, but upstream (visually in back) of the **Downstream Keyer**.



#### Note

The **Effects Keyers** group is used to set up both Key 1 and Key 2. Each key can be set to a different key type, if desired, and have its own individual set of key modifiers and parameters.

#### 4. Memory and Effects Control Groups

The **Memory and Effects Control Groups** are *assignable* groups of controls that allow you to choose wipe patterns and adjust various parameters of the selected pattern. In addition, the pattern buttons are used to store and recall switcher parameters, and as a means of navigation within the switcher menu system.

#### 5. Mattes Groups

The **Mattes Groups** are *assignable* modules that allow you to adjust matte and border generator colors. By pressing any matte-related button on the switcher, or the **SEL** button beneath the **Mattes** display, the **Mattes** groups are assigned.

#### 6. System Control Group

The **System Control Group** includes the **SEL** button, which, when used in conjunction with the **100**, **10**, and **1** buttons, allows the user to navigate through the menu system and assign transition rates to AUTO TRANS, DSK DISS and FADE TO BLACK auto transitions. The **MENU** button is used to access the switcher's menu system.

#### 7. Downstream Keyer Group

The **Downstream Keyer Group** allows you to select the key type and associated parameters for the Downstream key. Choose between **Self Key** or **Auto Select Key**.

The **CLIP** knob adjusts the key's luminance or *threshold* level and the **GAIN** knob adjusts the sharpness or softness of the key edges.

With the optional **Floating Border Generator** installed, the **BORD**, **SHDW**, and **OUTL** buttons place a border, drop shadow or outline around the key.

In addition, there are **CHAR GEN1** and **CHAR GEN2** buttons, which allow you to pick your *favorite CGs* for immediate keying.

When any button is selected in the group, the **Key Bus** is assigned to the Downstream Keyer. An **ON AIR** LED under the **DSK CUT** and **DSK DISS** buttons in the **Transition Control** group, advises the user when the downstream key is contributing to the program output.

Electronically, the Downstream key is downstream (visually in front) of both the background buses and the Effects keys.

#### 8. Transition Control Group

The **Transition Control Group** allows you to select the type of transition that you want to perform between the current scene and the next scene. You can transition *any combination* of the **Program/Preset** and **Key** buses using a cut, wipe, or dissolve.

The **DVE** button allows you to perform transitions using effects from an *optional* internal 2D or 3D DVE daughter board. Transitions can be performed manually with the **Fader** or automatically with the **AUTO TRANS** button.

The **Fade to Black** button allows you to fade the switcher to black.

#### 9. **Floppy Disk Drive or USB Port**

The **Floppy Disk Drive** and the **USB Port** allows you to store and recall your entire switcher setup to and from floppy disk. In addition, it serves as a means of upgrading your Synergy 100 software, ensuring you have all the latest standard features.



#### **Note**

If you have the **USB Removable Media Drive** option installed, the USB port replaces the floppy disk drive.

#### 10. **Positioner**

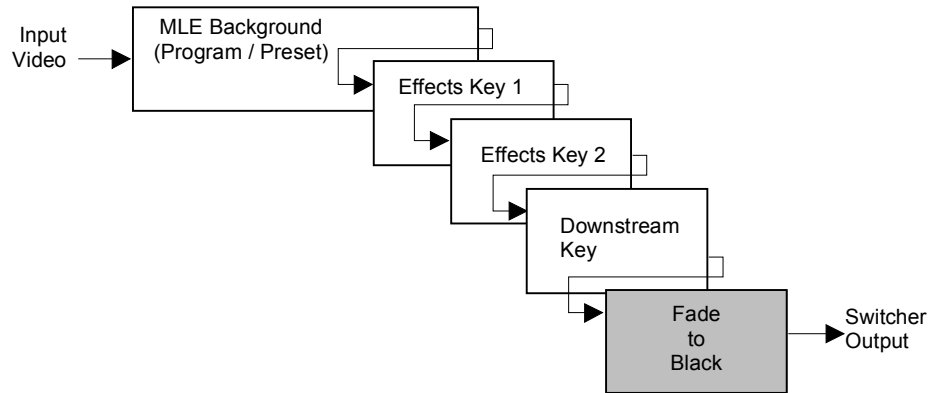
The **Positioner** allows you to position wipe patterns on screen. By pressing the **WIPE** button in the **Transition Control** group or the **PST PATT** button in the **Effects Keyers** group, the **Positioner** is assigned. Note that, if the **Squeeze & Tease 2D** or **Squeeze & Tease WARP** option is installed, the **Positioner** can be used to manipulate the X, Y, and in the case of the Squeeze & Tease WARP option, the Z position of a **Squeeze & Tease** key.

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## Video Flow through the Switcher

The following diagram illustrates how video flows through your switcher. The drawing illustrates the switcher's visual and electronic concepts of upstream and downstream and are designed to help you visualize and understand the switcher's architecture *from a production standpoint*.

The simplified block diagram below illustrates the flow of video through the Synergy switcher.



*Synergy 100 Video Flow*

Please note the following important points:

- The Synergy 100 is a single MLE switcher with 16 inputs. Video flows *into* the MLE as indicated above, where crosspoints can be selected for effects creation.
- The Program and Preset buses are electronically the farthest upstream, the Effects keys appear mid stream and the Downstream key appears downstream.
  - ~ Visually, all images on the Background bus appear *behind* both keyers. A key enabled on the Effects Keyer appears visually *over* the Background bus (and all transitions), but visually *under* the Downstream Keyer.
  - ~ A key enabled on the Downstream Keyer appears visually *over* the Background bus and the Effects keys.
  - ~ The **Fade to Black** function is electronically downstream of the entire switcher. Regardless of the combination of keys selected, **Fade to Black** will visually take the entire switcher to black.

---

## Switcher Timeout

If no control panel buttons are touched and no fader arms are moved for a period of 10 minutes, the switcher goes into a “sleep” mode and all lights are automatically turned off. This function is specifically designed to extend the life of the displays and the button LEDs.

If this timeout occurs, press any button or move the fader or joystick to “wake” the switcher and turn on all lights.



### Note

The switcher does *not* act on a button push when it is coming out of “sleep” mode.

The factory default timeout interval is 10 minutes. For instructions on programming an alternate timeout interval, refer to the section, “**Personality Setup**” in Chapter 8 of the *Synergy 100 Installation Guide*.

# Resetting the System

If required, the switcher can be reset manually from the frame. A **Full Reset** affects hardware and software simultaneously.



## Important

As an operator, you should never have to perform this procedure. However, if a full reset becomes necessary, it should be carried out by qualified service personnel, such as your facility engineer. All cautionary rules regarding static discharge apply.

## Full Reset

This function performs both a hardware (a frame reboot) and a software reset simultaneously. Switcher memory registers, personality registers, and installation registers are not affected by the reset, but all other switcher parameters (for example, the current state of the panel) are reset. **BLACK** will be selected on all buses.

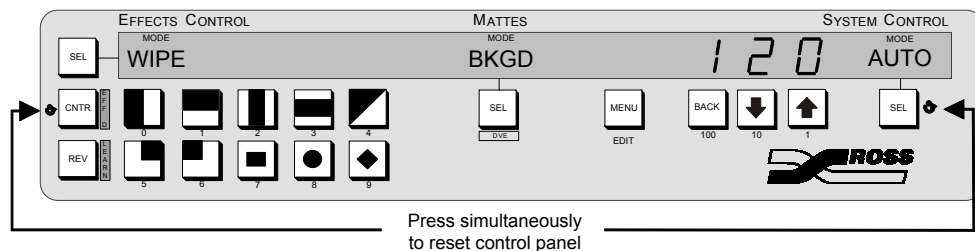
- To reset the frame and all system hardware and software, press the blue **RESET** button on the front edge of the **Frame CPU Board**.

In the *Synergy 100 Installation Guide*, refer to the “**Frame Jumpers and Switches**” section in Chapter 2 for more information on the frame **RESET** switch.

It is not recommended to reset the frame by turning the power off and then on. However, if this is done, the frame software will be reloaded, but the panel settings will come back to the point they were at, before the loss of power.

## Software Reset

The software reset function is performed in the **Effects Control** and **System Control** groups. Use the following figure for reference. Note the small “reset” symbols beside each button.



*Software Reset Function*

Use the following procedure to perform a software reset on the Synergy 100 control panel:

1. Press and hold **CNTR/EFF D** in the **Effects Control Group**.
2. Press **SEL** in the **System Control Group**.



## Note

This procedure can also be performed in reverse, holding **SEL** and pressing **CNTR/EFF D**, with the same result.

This resets the control panel to its default values. Switcher memory registers, personality registers, and installation registers are not affected by the reset, but all other switcher parameters (e.g., the current state of the panel) are reset. **BLACK** will be selected on all buses.



# Using the Menu System

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## In This Chapter

This chapter provides an introduction to the **Synergy 100 SD** menu system. The following topics are discussed:

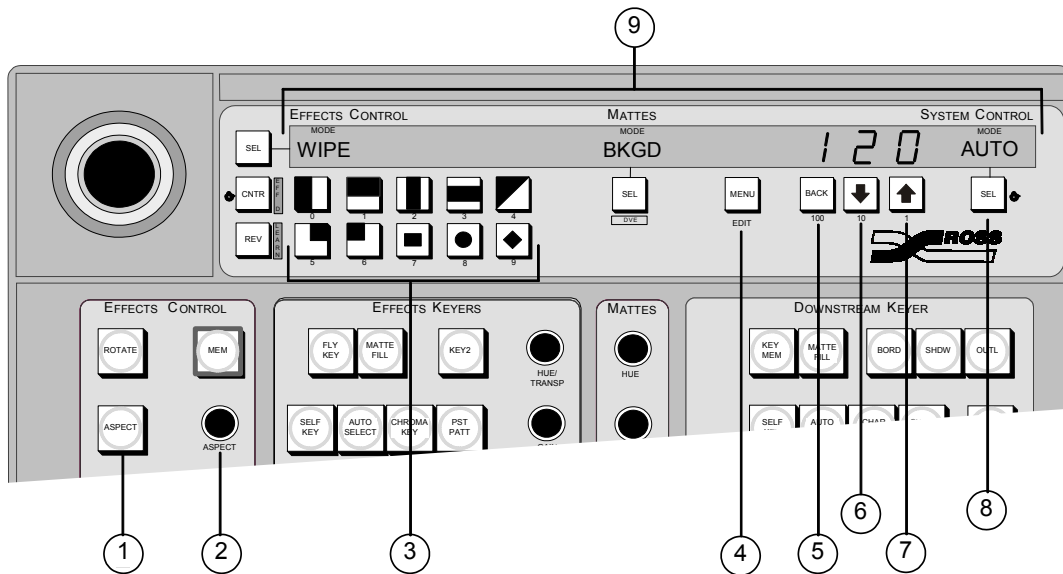
- Menu System Basics
- Menu Information
- Pop-Up Help
- Options Menu

# Menu System Basics

The menu system is accessed via the **MENU** button in the **System Control Group** and is displayed on the preview monitor as a **Preview Overlay**.

The user manually navigates or scrolls through the menu tree using either the **100**, **10** and **1** buttons, the **Effects Control** buttons, or the **ASPECT** knob to reach the desired menu or function.

The following figure details the panel buttons on the Synergy 100 that are used to access the menu.



*Synergy 100 Panel*

1) ASPECT Button	4) Enter/Exit (MENU)	7) UP Arrow
2) Scroll Knob (ASPECT)	5) BACK	8) Select/Accept (SEL)
3) Effects Control Buttons	6) DOWN Arrow	9) Display

Each button has its own specific function:

1. **ASPECT Button**

The **ASPECT** button lights to indicate that the associated knob is functional and can be used to scroll through values in the menus.

2. **Scroll Knob (ASPECT)**

The scroll knob can be used to scroll through the menu values when the **ASPECT** button is lit.

3. **Effects Control Buttons**

Once you have entered the menu system, you can go directly to any menu, sub menu or heading, by pressing the button in the **Effects Control Group** that corresponds to its number.

As well, when in a particular menu, if you press another **Effects Control** button after you have set a value, it will automatically save the value and jump directly to the new menu heading.

4. **Enter/Exit (MENU)**

The **Preview Overlay** menus are *entered* and *exited* by pressing the **MENU** button.

5. **BACK Button**

Pressing the **BACK** button will take you to the *previous* menu or position in the menu tree.

6. **DOWN Arrow (10)**

Pressing the **10** button (DOWN arrow) will send you **DOWN** the screen to the next menu heading.

7. **UP Arrow (1)**

Pressing the **1** button (UP arrow) will send you **UP** the screen to the previous menu heading.

8. **Select/Accept Button (SEL)**

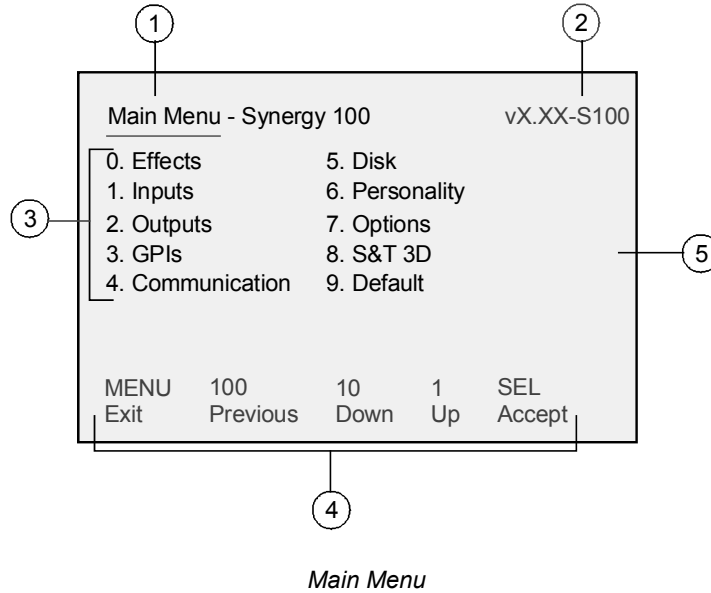
Pressing the **SEL** button will select/accept your option, setup or position in the menu tree.

9. **Display**

Located within the display, you will find three individual four-character displays (under the heading “**MODE**”) which identify the area of the panel that has control of the **Effects Control**, **Mattes**, or **System Control** functions. When you are in the menu system, **MENU** will appear in the displays in the **Effects Control** and **System Control** groups.

## Menu Information

Each menu comprises the following elements:



1) Menu Title	3) Headings	5) Background Color
2) Software Version	4) Navigation Keys	

### 1. Menu Title

Each menu is named in the upper left corner.

### 2. Software Version

The **Main Menu** is the only one that displays the software version number in the upper right hand corner.

### 3. Headings

Headings that have not been selected are white.

There will always be one menu heading number highlighted in yellow to indicate that it is *active* and can be selected via the **SEL** button or the button in the **Effects Control Group** associated with its heading number. When selected, the information for that heading will turn to cyan.

However, if a value associated with a heading is *grayed out*, it indicates that the value can not be changed. In addition, some headings simply state “Reserved”, waiting for new features to be added. If you try to select it, the heading will turn yellow, but will not be selectable.

### 4. Navigation Keys

The **MENU**, **100**, **10**, **1**, and **SEL**, navigation button functions are displayed on the preview overlay as a reminder.

### 5. Background Color

The default background color for the **Preview Overlay** is blue. However, the background color can be turned off in the **Effects Menu**, leaving the menu displayed on top of the selected **PST** bus output. Refer to the section “**Menu Background**” on page 3-5 for details.

## Pop-Up Help

The **Pop-Up Help** feature is designed to alert the operator when an illegal function is attempted. When the illegal button is pressed, a message appears on the preview output, providing a brief explanation of why the operation can not be performed. A sample message is shown below.



*Pop-Up Help on Preview Monitor*

The Pop-Up Help disappears after approximately five seconds.



### Note

If you have the **Squeeze & Tease WARP** option installed, and the 3D Fan is not installed or not functioning properly, a Pop-Up Help message will appear on the Preview output. As well, a Help message will appear on the **Main Menu**, where it will remain until the fan is functioning correctly. Refer to the *Synergy 100 Squeeze & Tease 3D/WARP Owner's Guide* for details.

## Menu Background

The **Menu Background** feature enables you to display the Synergy menu system with a blue background, covering the preview output. This function is provided strictly for the user's preference, and has no impact on the output of the preview monitor.

Use the following procedure to enable the **Menu Background** feature:

1. Navigate to the **Effects Menu** as follows:
  - Press **MENU** to display the **Main Menu**.
  - Press **0. Effects** to display the **Effects Menu**.

Effects				
0. Editor				On
1. GPIs				Off
2. Center				Off
3. SafeTitle				Off
4. Menu Bkgd				On
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Effects Menu*

2. Enable the **Menu Background** feature as follows:
  - Press **4. Menu Bkgd**.
  - Toggle the **4. Menu Bkgd** button between **On** and **Off** as follows:
    - ~ **On** — Use this option to enable the blue background of the Synergy menu system on your preview monitor.
    - ~ **Off** — Use this option to display the Synergy menu system on top of the selected **PST** bus output.
3. Press **SEL** to accept the new setting.
4. Press **MENU** to display the **Installation Change Screen**.
5. Accept or cancel these changes as follows:
  - Press **0. Confirm** to accept the changes.
  - Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure to enable the **Menu Background** feature. For more information on the features of the **Effects Menu**, refer to the section “**Effects Menu Functions**” on page 6-4.

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# Options Menu

The **Options Menu** lists both the software and hardware options that have been installed in your system. The following topics are discussed in this section:

- Verifying Your Software Options
- Hardware Options
- Other Options

## Verifying Your Software Options

There are three software options available with the Synergy 100 panel – **Editor** control, **Audio Mixer** control, and the **Serial Tally** Interface. The **Software Options Menu** will indicate if an option is installed, with either an **On** or an **Off** indicated in gray.

Use the following procedure to verify your software options:

1. Navigate to the **Options Menu** as follows:
  - Press **MENU** to display the **Main Menu**.
  - Press **7. Options** to display the **Options Menu**.

Options S/N:F422342234				
0. Software Options		5. Panel ID	4100-2	
1. Opt Card	Ultimatte	6. Frame ID	4216-4	
2. S&T DVE	3D			
3. Border	Yes			
4. Tallies	16			
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Synergy 100 Options Menu*

2. Press **0. Software Options** to display the **Software Options Menu**.

Software Options - S/N:F422342234				
0. Add	A6F8			
1. Editor	On			
2. DVE	Off			
3. Audio	On			
4. Ser Tal	On			
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Software Options Menu*



### Note

The DVE option is not yet implemented.

3. Verify that your software options have been installed as follows:
  - **On** — If the software option heading is toggled to **On**, installed on your system.
  - **Off** — If the software option heading is toggled to **Off**, it is *not* installed on your system.

This completes the procedure to verify your installed software options.

## Hardware Options

On the **Options Menu**, the installation status of each hardware item, **Options 1 – 4**, is indicated in grey to the right of the option.



### Note

When a word in any menu is *greyed out*, this indicates that it is for information only and can not be changed.

Use the following procedure to verify your hardware options:

1. Navigate to the **Options Menu** as follows:
  - Press **MENU** to display the **Main Menu**.
  - Press **7. Options** to display the **Options Menu**.

Options S/N:F422342234				
0. Software Options	5. Panel ID	4100-2		
1. Opt Card Ultimatte	6. Frame ID	4216-4		
2. S&T DVE 3D				
3. Border Yes				
4. Tallies 16				
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Synergy 100 Options Menu*

2. Verify your installed hardware options as follows:
  - **Opt Card** — This option displays either **None** or **Ultimatte** depending on whether you have installed the Ultimatte Insider option.
  - **S&T DVE** — This option displays either **2D**, **3D**, or **None** depending on whether you have installed either the Squeeze & Tease 2D or the Squeeze & Tease 3D / WARP DVE option.
  - **Border** — This option displays either **Yes** or **No** depending on whether you have installed the **Floating Border Generator** option.
  - **Tallies** — This option shows either **16** or **32**. If you have installed the frame tally option, **32** will be displayed. If you have only the standard panel tallies, **16** will be displayed.



### Note

Refer to **Appendix B** of the *Synergy 100 Installation Guide* for all hardware installation instructions.

This completes the procedure to verify your hardware options.



## Other Options

On the **Options Menu**, the version numbers of the Synergy 100 control panel and Synergy 1 frame processor boards, headings **5** and **6**, are indicated in grey to the right of the option.

Use the following procedure to verify the Panel ID and Frame ID of your system:

1. Navigate to the **Options Menu** as follows:
  - Press **MENU** to display the **Main Menu**.
  - Press **7. Options** to display the **Options Menu**.

Options S/N:F422342234				
0. Software Options			5. Panel ID	4100-2
1. Opt Card Ultimatte			6. Frame ID	4216-4
2. S&T DVE	3D			
3. Border	Yes			
4. Tallies	16			
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Synergy 100 Options Menu*



### Note

When a word in any menu is *grayed out*, this indicates that it is for information only and can not be changed.

2. Verify your Panel ID and Frame ID as follows:
  - **Panel ID** — This heading displays the version number of the Synergy 100 panel's processor board.
  - **Frame ID** — This heading displays the version number of the Synergy 1 frame's processor board.

This completes the procedure to verify the Panel ID and Frame ID of your system.



# Switcher Basics

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## In This Chapter

This chapter presents detailed *basic* switcher operating procedures, rules and methods. The following topics are discussed:

- Before Starting
- Software Reset
- System Reset Notes
- Power Fail Indicators
- Power Failure Recovery
- Basic Switcher Functions
- General Button Rules
- Crosspoint Buttons
- SHIFT Button
- Reverse SHIFT Mode
- Flip Flop Operations
- Key Bus
- On-Air Indicators
- Knobs
- Fade to Black
- Changing Fade to Black Rates
- Using Fade to Black

---

## Before Starting

If you are unfamiliar with the operation of a multi-level effects switcher, it is *always* advisable to check the initial condition of the switcher's control panel and *reset* the panel if required. By performing a software reset, you can guarantee a base default condition and eliminate any special setups that may be present on the panel (as left by the last TD).

### Software Reset

Refer to the section “**Software Reset**” on page 2-8 for the procedure to perform a software reset.

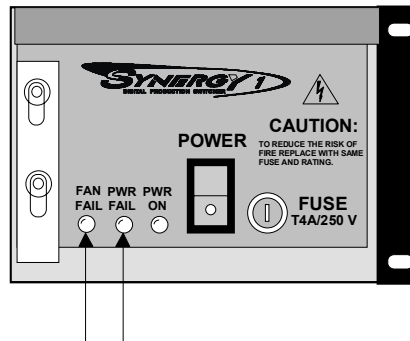
### System Reset Notes

Please note the following important point regarding the system reset function:

- Turning the frame power off and then on again does not reset the control panel. When frame power is restored, the panel is restored with all control panel settings returned to their previous state.

### Power Fail Indicators

There are two important **POWER FAIL** indicator LEDs on the front of the Synergy 1 frame:



*Fan Fail and Power Fail LEDs*

- The **FAN FAIL** LED, when lit, indicates that the fan is drawing too much current or has stopped turning.
- The **PWR FAIL** LED, when lit, indicates that the power supply has failed or is not connected properly.
- The **PWR ON** LED should be lit green during normal operations. It indicates that there are no error conditions in the fan or power supply. This LED is off if any of the two “fail” LEDs are lit.

### Power Failure Recovery

The Synergy frame's power failure recovery feature protects the *entire panel setup* in situations where power is lost. When power is restored after a failure, the panel is restored to its previous state before the failure.

---

# Basic Switcher Functions

This section provides basic information and general rules regarding Synergy 100 operation. The following topics are discussed:

- General Button Rules
- Crosspoint Buttons
- Flip Flop Operations
- Key Bus
- On-Air Indicators
- Knobs

## General Button Rules

Please note the following general button rules:

- All button presses are *registered* (acknowledged) by the switcher when a selected button lights. Pressing a button can switch a crosspoint (and affect the video output), perform a transition, toggle a function or have no affect (if the function is not valid for the current setup).
- Buttons can be *latching* (in the case of valid crosspoints and “toggle” functions such as key parameters), or *momentary* (in the case of transition buttons such as **CUT**). *Latching* buttons remain lit when selected, while *momentary* buttons illuminate when pressed but do not stay lit.

## Crosspoint Buttons

When a button (or crosspoint) is pressed on the **PGM**, **PST** and **KEY** buses, a video source is selected. Video sources can be internally generated or derived from external sources that are connected to the chassis via BNC connectors.

Please note the following important rules:

- There are two *internally* generated sources available:
  - ~ **BLACK** (defaulted to the first or left-most crosspoint in a bus row).
  - ~ **COLOR BKGD** (defaulted to the first shifted crosspoint in a bus row).



### Note

To have access to black on a **Remote Aux Panel**, you must feed the “601 REF IN” BNC on the rear of the chassis with a stable black signal that is low in jitter and that originates from a reliable digital source.

- External sources can be *turned off* as part of switcher setup or placed on *more than one* crosspoint. In the *Synergy100 Installation Guide*, refer to Chapter 6, “**BNC Configuration and Check**” for details.
- If you enabled the **Look Ahead Serial Tally** option, crosspoint selections on the Key Buses will be delayed by the specified number of fields. Refer to Chapter 7, “**Communications Setup**” in the *Synergy 100 Installation Guide* for instructions on how to enable the **Look Ahead Serial Tally option** with a delay.

## SHIFT Button

On each bus, the **SHIFT** button is used to access video and key sources that have been mapped to crosspoints *beyond* the number of available buttons. The mapping itself is performed during the installation procedure.



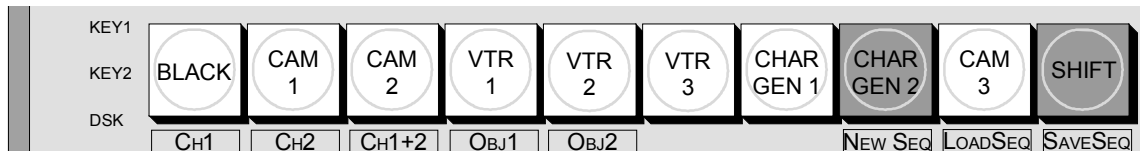
### Note

Active crosspoints **11** through **20** can only be accessed via **SHIFT**.

Use the following procedure to access a shifted source on any bus:

1. Press and hold the **SHIFT** button.
2. Press the desired crosspoint.
3. Release both buttons.

The **SHIFT** button plus the selected source both stay lit, as indicated in the sample illustration below:



*Shifted Crosspoint Selected on Key Bus*

Please note:

- With a shifted source selected on a bus row, to take an *unshifted* source, simply press its button.
- With a shifted source selected, to take another shifted source, repeat the 3-step procedure above.
- If you press **SHIFT** and then decide *not* to select a source, simply release the **SHIFT** button. No change will occur on the bus.

## Reverse SHIFT Mode

A special mode called **Reverse SHIFT** can be activated during switcher setup. Activating the **Reverse SHIFT** mode makes each **Key Bus** button shifted *all the time* — as its default state.

This effectively acts as a shift lock, giving you one-button access to the higher-numbered inputs on the **Key Bus** (without having to press **SHIFT** each time to reach them).

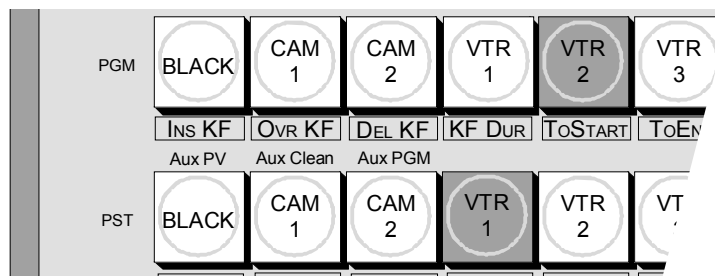
If the **Reverse SHIFT** mode has been implemented, you may notice that the crosspoint labels on each **KEY** bus will be *different* from the **PGM** and **PST** bus labels.

Please consult with your facility's engineer to determine if the **Reverse SHIFT** mode is implemented. For additional information, refer to the “**Setting Up Panel Buttons**” section in Chapter 6 of the *Synergy 100 Installation Guide*.

## Flip Flop Operations

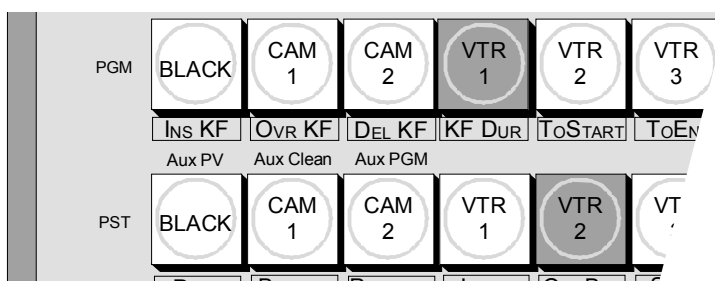
The **Program** and **Preset** buses are configured to operate in flip-flop mode. When you perform a cut, dissolve or wipe transition between the **Program** and **Preset** buses, the two selected sources *exchange* places. This is called a flip-flop.

For example, in the following figure, **VTR 2** is selected on the **PGM** bus and **VTR 1** is selected on **PST**.



*Buses Prior to Transition*

After the cut, dissolve or wipe transition is performed, the two buses flip-flop as shown below. **VTR 1** is now selected on **PGM** and **VTR 2** is selected on **PST**.

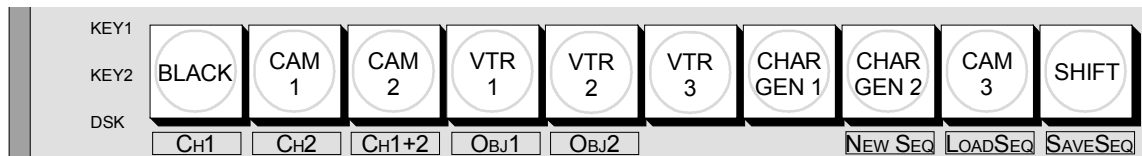


*Buses Flip-flopped, after Transition*

In this manner, the **PGM** bus *always* provides the background output source and the **PST** bus always provides the *next* source to be brought to air with a transition. In addition, after a transition, the **PST** bus *always* shows the source last-selected on **PGM**, until you change it.

## Key Bus

The **Key Bus** is the following illustration:



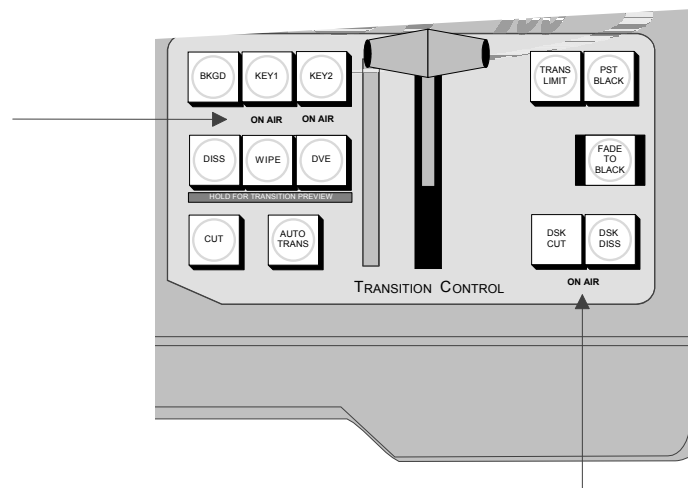
*Key Bus*

The **Key Bus** allows you to make key and fill selections on *all three* keys — the **2 Effects Keys** and the **Downstream Keyer**. Even though the **Key Bus** buttons are *shared* between the three keyers, each keyer can have its own independent key and fill selections. Please note:

- Pressing any button in a keyer switches control of the **Key Bus** to *that keyer*.
- When the **Key Bus** is assigned to the **Effects Keys**, changing a button on the bus has no effect on the **Downstream Keyer**. Similarly, when the bus is assigned to the **Downstream Keyer**, changing a button has no effect on the **Effects Keys**.

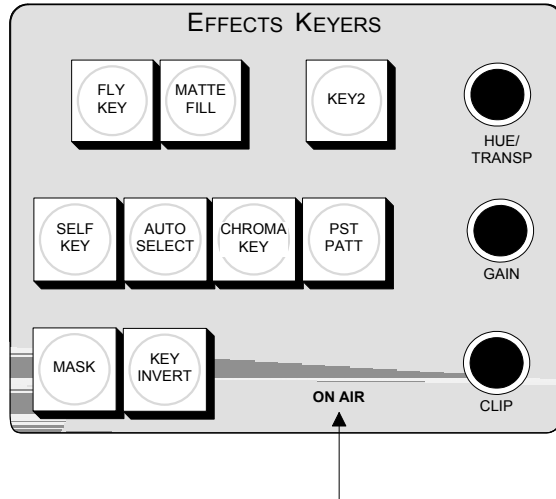
## On-Air Indicators

There are several **ON AIR** Indicators on the Synergy 100 control panel. Refer to the following figures.



*On Air Indicators, Transition Control Group*



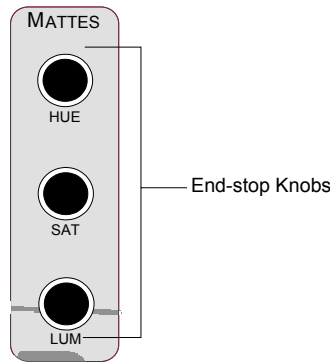


*ON AIR Indicator, Effects Keyers Group*

The **ON AIR** lamps indicate, when lit, that the Effects keys and Downstream keys are contributing to the switcher's main program output. These lamps illuminate at the beginning of a transition to bring a key on air and remain lit until the key is taken off air.

## Knobs

The rotary knobs used on the Synergy 100 control panel are **End-stop Knobs**.



*End-stop Knobs, Mattes Group*

Note the following important points regarding **End-stop Knobs**:

- All **End-stop Knobs** cannot be rotated past the absolute upper and lower limits of the function being adjusted.
- Because an **End-stop Knob**'s electrical position can be *overwritten* by memory recalls, the electrical knob position *may not match* the knob's current physical position. In this case, the knob can be adjusted but you may not have the full range available.



### Operating Tip

To fully re-synchronize an **End-stop Knob**'s physical-to-electrical position, turn the knob fully clockwise, then fully counter-clockwise. Full-range adjustments can now be made.

---

# Fade to Black

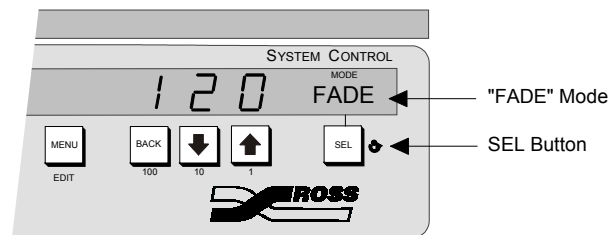
The following topics are discussed in this section:

- Changing Fade to Black Rates
- Using Fade to Black

## Changing Fade to Black Rates

Use the following procedure to change the Fade to Black rates:

1. Press the **SEL** button in the **System Control Group** until the **FADE** mode illuminates.



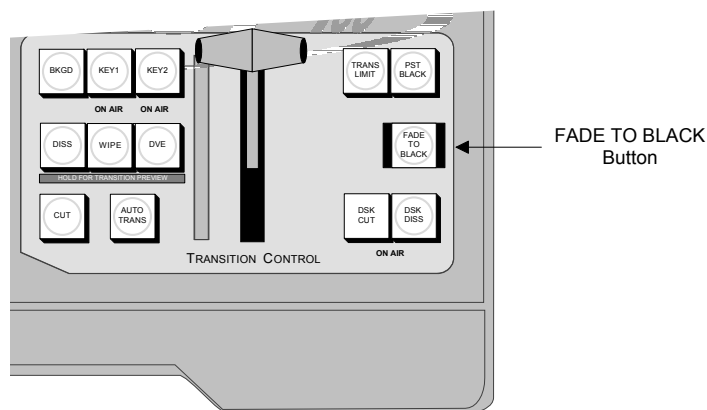
*Setting the Fade to Black Transition Rate*

2. Using the **100**, **10**, and **1** buttons, program the rate at which the fade is to take place.

This completes the procedure to change the Fade to Black rates.

## Using Fade to Black

The switcher's "Fade to Black" function allows you to fade (auto-transition) the *entire* switcher output to black, including the downstream key and all effects currently on air. It is the last effect that the switcher is capable of performing before the final video signal is passed to the output. The button labeled **Fade to Black** in the **Transition Control Group** controls the fade to black function.



*Fade to Black Button in the Transition Control Group*

Use the following procedure to cause the switcher to do a fade to black:

1. Press the **Fade to Black** button located in the **Transition Control Group** while observing the program monitor.
2. The fade will take place at the rate programmed in the section “**Changing Fade to Black Rates**” on page 4-8.
3. The LED on the **Fade to Black** button will be lit orange while fading to or fading from black. However, when the switcher is in a “Fade to Black” state, the LED will flash red.

### **Reverse Fade**

A reverse fade is accomplished by pressing the **Fade to Black** button again. This causes the switcher to do a fade from black to the previous scene. A reverse fade can take place during an active fade process. In a situation where a scene is being faded down, pressing the **Fade to Black** button a second time will cause the scene to automatically fade back up.

### **Notes on Using the Fade to Black Function**

Please note the following important points regarding the **Fade to Black** function:

- The Fade to Black transition is independent of all other switcher transitions.
- When the switcher has faded to black, keys can still be modified and cut off and on. Source selections can also be changed. This allows one to fade down to one scene and fade up to another.
- A Fade to Black transition cannot be previewed. The appropriate rate must be set by reference to the fade appearance on the program output.
- Once the switcher is in black, it *stays* in black until the **Fade to Black** button is pressed again.
- When the switcher is in black, the LED on the **Fade to Black** button continues to flash red as long as the switcher remains in full **Fade to Black** mode.
- If you are performing a long Fade to Black and you wish to change your mind, press **Fade to Black** *again* (during the fade transition) to reverse direction — and return to the starting point (full program).

---

## Aspect Ratio

The Synergy 100 switcher operates in *either* 4:3 or 16:9 mode. Setting the output aspect ratio to 4:3 automatically defines the aspect ratio of all the inputs as 4:3 and *greys out* the **Aspect** value on the **Inputs Menu**. Conversely, setting the output aspect ratio to 16:9 automatically defines all of the inputs as 16:9. This procedure of changing the internal aspect ratio ensures the circle wipe remains a perfect circle in either mode.



### Note

If you are operating in 16:9 mode and all inputs are 16:9 video sources, you must have your outputs feeding 16:9 monitors in order to view the video without distortion. By the same token, if you are operating in 4:3 mode with 4:3 video sources feeding your inputs, ensure that you have 4:3 monitors with which to view your output.

Use the following procedure to set the output aspect ratio:

1. Navigate to the **Outputs Menu** as follows:
  - Press **MENU** to display the **Main Menu** on the **Preview Overlay**.
  - Press **2. Outputs** to display the **Outputs Menu**.

Outputs				
0. Aspect	4:3			
1. Ref Dly	300			
2. Clean	BeforeKeys			
3. Ancillary data				
4. Rem Aux	Off			
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Outputs Menu*

2. Set the output aspect ratio as follows:
  - Press **0. Aspect**.
  - Toggle the **0. Aspect** button to select a mode. You can choose between the following:
    - ~ **4:3** — Setting the output aspect ratio to 4:3 automatically defines the aspect ratio of all the inputs as 4:3
    - ~ **16:9** — Setting the output aspect ratio to 16:9 automatically defines all of the inputs as 16:9.



### Note

Dual aspect ratio production is not available in this software release. However, future releases which incorporate Ross Video's **Dual Aspectizer** will offer full dual aspect ratio production capabilities.

- Press the right **SEL** button to accept the new settings.
3. Press **MENU** to display the **Installation Change Screen**.

4. Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the changes.
- Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure to set the output aspect ratio.



# Transitions

---

## In This Chapter

Transitions are the most frequently used switcher operations. The simplest transition is a direct selection of the next picture on the **PGM** (Program) bus, performed by pressing another crosspoint. This simple “cut” provides an instantaneous change but does *not* allow you to preview the next picture.

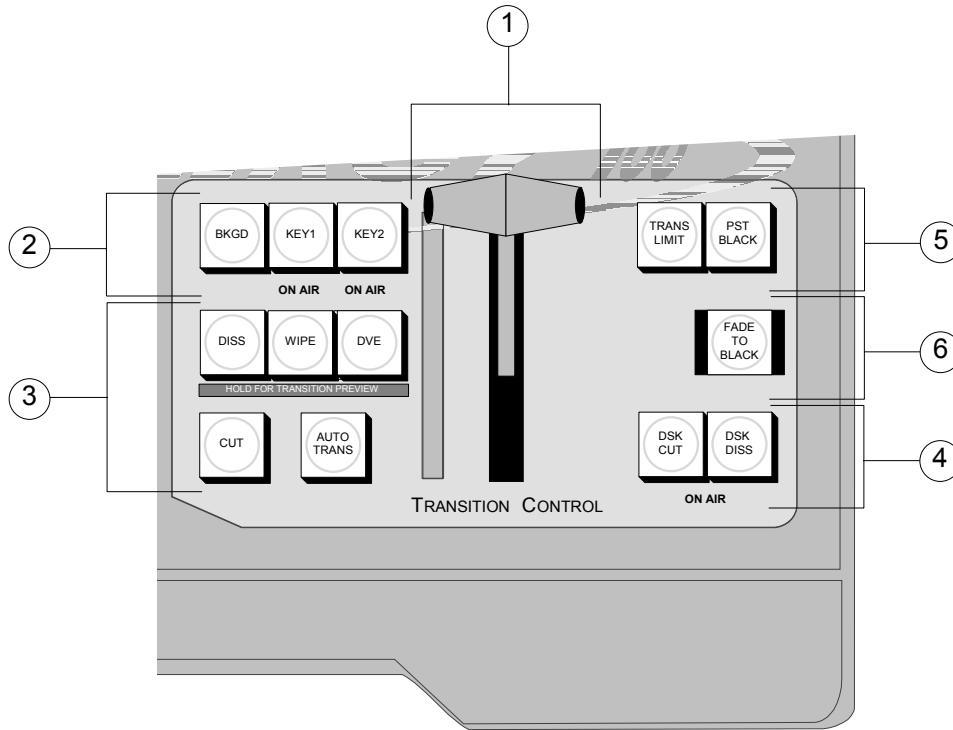
Other types of transitions involve the **PST** (Preset) bus and the controls in the **Transition Control** group. Here, using cuts, dissolves, wipes, as well as DVE transitions, you have a full preview of the upcoming picture.

The following topics are discussed in this chapter:

- Transition Control Group
- Working with Next Transitions
- Eight Steps to Flawless Transitions
- Auto Transitions
- Changing Auto Transition Rates
- Using Manual Transitions
- Using Cuts
- Using Dissolves
- Transition Limit
- Transition Preview
- Preset Black

# Transition Control Group

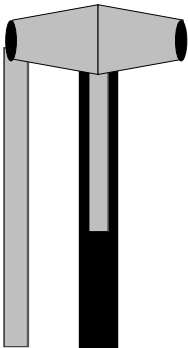
The following figure illustrates the **Transition Control** group.



*Transition Control Group*

1) Fader Section	3) Transition Type Section	5) Transition Parameter Section
2) Next Transition Section	4) DSK Transition Section	6) Fade To Black Button

Following are descriptions of each section.



## 1. Fader Section

The **Fader** handle is used to perform manual transitions. The “type” of transition is based on the transition button that is selected in the **Transition Type Section** — be it a Dissolve, a Wipe or a DVE transition. The **Fader** performs one complete transition when it is moved from one limit to the other. Due to the switcher’s flip-flop architecture, it does not matter at which limit the transition begins. The **PGM** bus *always* remains the program output.

The **Transition Progress Bar** located to the left of the **Fader** indicates the direction of **Fader** travel during a transition. As the transition progresses, the LED segments of the bar will illuminate. For full or *partial* transitions (when the **Fader** is paused part-way through), the unlit portion of the bar indicates the direction that the **Fader** must be moved in order to complete the transition.

Please note that the **Transition Progress Bar** will also illuminate when the **AUTO TRANS** button is used to perform the transition.



## 2. Next Transition Section

The **Next Transition Section** includes three buttons that allow you to select the combination of actions that will be included in the *next transition*. When pressed, all buttons remain lit until another combination of button(s) is selected — they can be enabled in any combination. When pressed, the program video is not affected — only the actions in the *next transition* are affected.



ON AIR



ON AIR

- Enable **BKGD** to include a transition between the **PGM** and **PST** buses. When a manual or auto-transition is performed, the video selected on **PST** transitions to **PGM**.
- Enable **KEY1** to perform a transition of the Effects Keyers' first key.
  - ~ If the keyer is currently off, the transition brings on the key and the **ON AIR** LED below the button lights red.
  - ~ If the keyer is currently on, the transition removes the key and the **ON AIR** LED below the button turns off.
- Enable **KEY2** to perform a transition of the Effects Keyers' second key.
  - ~ If the keyer is currently off, the transition brings on the key and the **ON AIR** LED below the button lights red.
  - ~ If the keyer is currently on, the transition removes the key and the **ON AIR** LED below the button turns off.

Remember that *any combination* of actions can be selected. Refer to the section “**Working with Next Transitions**” on page 5-5 for more information on the three **Next Transition** buttons and the **ON AIR** LEDs.

## 3. Transition Type Section

The buttons in the **Transition Type Section** allow you to choose the *type* of transition and initiate the transition itself.



- The **DISS** button selects a dissolve as the transition type. When a dissolve is performed, the video on the **PST** bus gradually mixes into the video on **PGM**. At the end of the transition, **PST** video completely replaces **PGM** video and the buses flip-flop.

The **DISS** button is mutually exclusive with the **WIPE** and **DVE** buttons. Refer to the section “**Using Dissolves**” on page 5-9 for instructions.



- The **WIPE** button selects a wipe as the transition. When performed, the video on the **PST** bus gradually replaces the **PGM** video using a wipe pattern chosen from the **Effects Control** group. At the transition's end, **PST** video completely replaces **PGM** and the buses flip-flop.

The **WIPE** button is mutually exclusive with the **DISS** and **DVE** buttons. Refer to the “**Using Wipes**” section in Chapter 6 for instructions.



- The **DVE** button selects a 2-D or 3-D DVE effect as the transition. When performed, the video on the **PST** bus gradually replaces the **PGM** video using a 2-D or 3-D DVE effect pattern chosen from the **Effects Control** group. At the transition's end, **PST** video completely replaces **PGM** and the buses flip-flop.

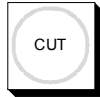
The **DVE** button is mutually exclusive with the **WIPE** button. Refer to the section “**Using Wipes**” on page 6-12 for instructions.



### Note

As an alternative, the **DVE** and **WIPE** buttons can be pressed simultaneously to select a DVE effect as the transition type.

The optional **Squeeze & Tease 2D Board** or **Squeeze & Tease WARP Board** must be installed to enable DVE transitions.



- The **CUT** button performs an instantaneous “cut” between the **PST** and **PGM** bus sources. The buses flip-flop after the cut is performed. The button itself is *momentary* — it does not stay lit.



- For dissolves, wipes and DVE transitions, **AUTO TRANS** performs an automatic transition between **PST** and **PGM**. The button is *momentary* and stays lit only *during* the transition. Rates are entered in the **System Control** group.



### Note

Although we have used **BKGD** transitions between the **PGM** and **PST** buses as examples, remember that all types of transitions operate in the same manner, regardless of the **Next Transition** buttons selected.

## 4. DSK Transition Section

The two buttons in the **DSK Transition Section** are used to initiate a transition of the Downstream key.



- The **DSK CUT** button performs an instantaneous “cut”, either bringing on the downstream key or removing it, depending on your current setup. The button itself is *momentary* — it does not stay lit.



- The **DSK DISS** button performs an automatic transition, initiating a dissolve to either bring on the downstream key or remove it, depending on your current setup. The button is *momentary* and stays lit only *during* the transition. Rates are entered in the **System Control** group.



### Note

If the keyer is currently off, the transition brings on the key and the **ON AIR** LED below the buttons lights red. Similarly, if the keyer is currently on, the transition removes the key and the **ON AIR** LED below the buttons turns off.

## 5. Transition Parameter Section

The buttons in the **Transition Parameter Section** allow you to choose various transition attributes, if desired.



- The **TRANS LIMIT** button allows you to stop a transition at a preset position – in between the two absolute **Fader** limits. Refer to the section “**Transition Limit**” on page 5-10 for details.



- The **PST BLACK** button is a special two-stage transition that takes the switcher to black (or any other desired source) and then proceeds to the next transition previously indicated. Refer to the section “**Preset Black**” on page 5-12 for details.

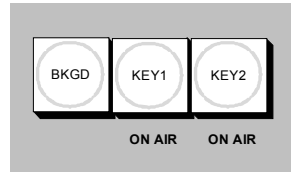
## 6. Fade To Black Button



- Press **Fade To Black** to initiate an “on air” fade-to-black (or fade up from black if pressed during a fade down) at the rate set for **Fade To Black** in the **Auto Transition Rate Group**.

## Working with Next Transitions

The **Next Transition Section** includes three buttons that allow you to select the combination of actions that will be included in the *next transition*. The section also includes two **ON AIR** LEDs that indicate the state of the Effects keys.



*Next Transition Section of the Transition Control Group*

Please note the following important points:

- The three buttons define what you want to change on your program output. Any combination of the background and keys can be changed. You can change up to three elements as desired — simply by pressing the appropriate combination of buttons.
- If a button is lit, that element will change when the transition is performed, either manually (with the **Fader**) or automatically (with the **AUTO TRANS** or **CUT** button). When the transition has completed, buttons that are lit will *stay lit* — until you change them.
- A “lit” *key* button should not be confused with the fact that you want a key to appear on air. Instead, it means that you want to change the *state* of the key. If a key button is lit, the key will change state. If a key’s state is on, the **ON AIR** LED will be lit red.
- The **ON AIR** LEDs have two states:
  - ~ When the LED is **Off**, the Effects key is turned off. It is *not* contributing to the output of the switcher.
  - ~ When the LED is lit **Red**, the key is turned on. It is contributing to the program output of the switcher.



### Operating Tip

Always check your preview monitor! The preview monitor output will *always* show you the next scene. For example, if a key’s state is currently *on* and the desired key button is lit, the preview monitor will show the key *off*.

## ***Eight Steps to Flawless Transitions***

Following are several easy steps for using the three “next transition” buttons to get the images you want on air — flawlessly.

1. Ensure that you have a **Preview** monitor connected.
2. Look at your **Program** monitor and determine what video elements you want to change — the background, Effects keys, or a *combination* of the elements.
3. Press the desired “next transition” button(s).
4. Look at your **Preview** monitor and confirm that the monitor shows the desired video elements in the desired states (e.g., keys on, keys off, proper background video selected).
5. If one of the key elements is in the wrong state, press its associated “next transition” button and re-confirm the new composite image on **Preview**.

6. If you are bringing on a *new key*, ensure that the correct key source is selected and that it appears properly on **Preview**. If required, adjust the key source accordingly.
7. If the background image is wrong, select the correct image on the **PST** bus — or alternately, change the state of the **BKGD** button.
8. Once you have confirmed that the next image is correct on **Preview**, perform the transition — either manually with the **Fader** or automatically using **CUT** or **AUTO TRANS**. Remember that the “next transition” buttons stay lit after the transition is complete.

## Auto Transitions

The **AUTO TRANS** button is used to start an automatic (smooth) transition between the selected **Preview** and **Program** monitor outputs. Note the following important rules:

- To “escape” from an auto transition in progress, you can either press **CUT** during the transition or manually pull the **Fader** in the proper direction. The “cut” action instantly completes the transition.
- You can *not* initiate an auto transition or a cut in the **Transition Control Group** if the **Fader** is off its upper or lower limit.
- If you disable the **Audio Cut** mode in the **Personality Menu**, by selecting the **Off** option, the audio transition will reflect the type of transition selected. If you press the **AUTO TRANS** button, the audio transition will be performed at the same rate as the video transition.

## Changing Auto Transition Rates

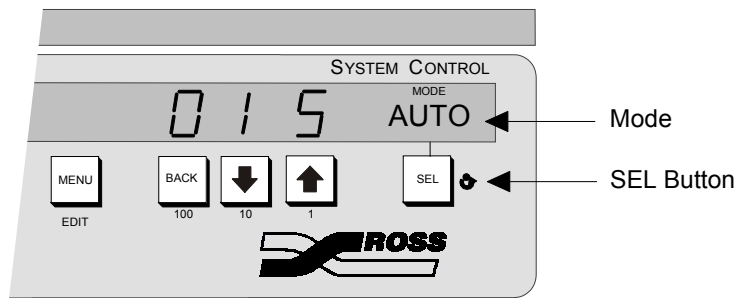
The **System Control Group** is used to set and display the three separate auto transition rates in television frames. A frame is 1/30 (NTSC) or 1/25 (PAL) of a second, depending on the television standard in use. NTSC has 525 lines of video, while PAL has 625 lines of video. The three rates shown on the control panel are:

- **AUTO** — initiated by the **AUTO TRANS** button located in the **Transition Control Group**.
- **DSK** — initiated by the **DSK DISS** button located in the **Transition Control Group**.
- **FADE** — initiated by the **Fade To Black** button found in the **Transition Control Group**.

The **SEL** button is used to select which of the three rates is shown on the display. Repeated pressing of this button cycles through the three selections listed above. The transition rate shown corresponds to the selection appearing in the display. Therefore, three different transition rates can be stored, one for each function, and these rates will apply to the auto transitions activated by the appropriate buttons.

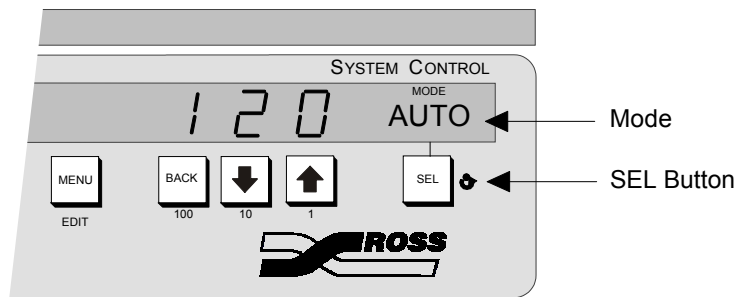
This section provides instructions for changing auto transition rates.

1. In the **System Control Group**, note the current transition rate in the display.



*System Control Group*

2. Press the **SEL** button until the “Mode” for the desired function appears.
3. Using the **100**, **10**, and **1** buttons, scroll to the desired rate in frames — from **1** to **999**. The new rate is automatically updated and appears in the display as you scroll.



*System Control Group*

Please note:

- Since the transition rate updates automatically as you scroll, there is no means of canceling the procedure. If you wish to “clear” the new rate, simply scroll to the original transition rate, as instructed above.
- If you scroll past the rate desired, use the **100**, **10**, and **1** buttons to scroll forwards until the desired value again appears in the display.
- You can reset the values in the hundreds and tens columns to 0 simply by holding down the **100** and **10** buttons. The value in the ones column will default to 1 frame by holding down the **1** button.
- You cannot program a transition rate of 0 frames as this is the same as a cut.

## Using Manual Transitions

Use the following procedure to perform a manual transition:



### Note

The manual transition will be applied to audio transitions when the **Audio Cut** feature is Off. Refer to the section “**Audio Cut Mode Setup**” in the *Synergy 100 Installation Guide* for information on this feature.

1. Ensure that your **PGM** bus, **PST** bus, and keys are set up as desired.
2. In the **Next Transition Section**, select **BKGD**, **KEY1**, or **KEY2**, or any combination thereof as the next transition.
3. In the **Transition Type Section**, select the desired transition type — dissolve, wipe, or DVE effect.
4. Move the **Fader** from its current limit to the opposite limit. The speed at which you move the **Fader** determines the manual transition rate.
  - Remember that during a transition, the **Transition Progress Bar** LED segments illuminate as the **Fader** travels, with the unlit portion signifying the direction the **Fader** must be moved in order to complete the transition.



### Note

When the fader is off a limit, all buttons in the **Transition Control** group are disabled.

This completes the procedure to perform a manual transition.

## Using Cuts

A “background cut” is an instant switch between the **PGM** and **PST** buses.



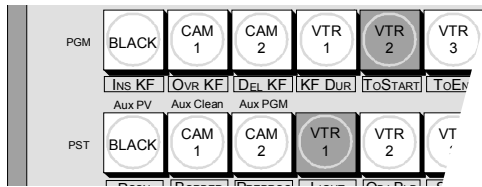
### Note

You can also perform a background cut simply by switching inputs on the **PGM** bus itself. This type of cut does *not* allow you to preview the next picture.

Although we have used **BKGD** transitions between the **PGM** and **PST** buses as examples, remember that all types of transitions operate in the same manner, regardless of the **Next Transition** buttons selected.

Use the following procedure to perform a cut:

1. Select an input on the **PGM** bus.
2. Select a different input on the **PST** bus.
3. In the **Next Transition Section**, select **BKGD** as the next transition. The figure below illustrates a *sample* setup and the associated monitor outputs — before the cut.



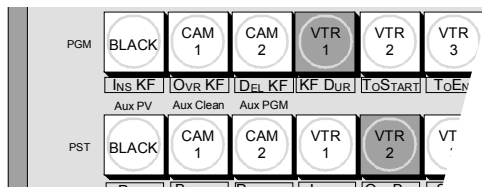
Preview Monitor



Program Monitor

Sample Setup – Before a Cut

4. Press **CUT**. The inputs selected on the **PGM** and **PST** buses instantly exchange and the buses flip-flop. The figure below illustrates the MLE and monitor setup *after* the cut.



Preview Monitor



Program Monitor

Sample Setup – After a Cut

5. Press **CUT** again to repeat the process and restore the original background.

This completes the procedure to perform a cut.

## Using Dissolves

In a “background dissolve” transition, the **PGM** bus video and **PST** bus video signals are gradually mixed together, until the **PST** bus video completely replaces the **PGM** bus video.

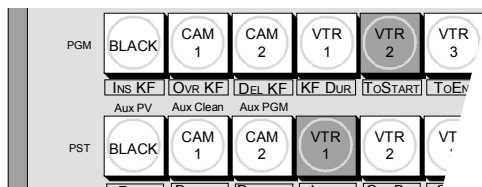


### Note

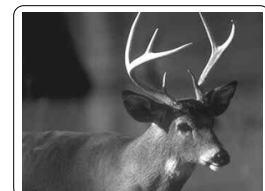
Although we have used **BKGD** transitions between the **PGM** and **PST** buses as examples, remember that all types of transitions operate in the same manner, regardless of the **Next Transition** buttons selected.

Use the following procedure to perform a dissolve:

1. Select an input on the **PGM** bus.
2. Select a different input on the **PST** bus.
3. In the **Next Transition Section**, select **BKGD** as the next transition. The figure below illustrates a *sample* setup and the associated monitor outputs — before the dissolve.



Preview Monitor



Program Monitor

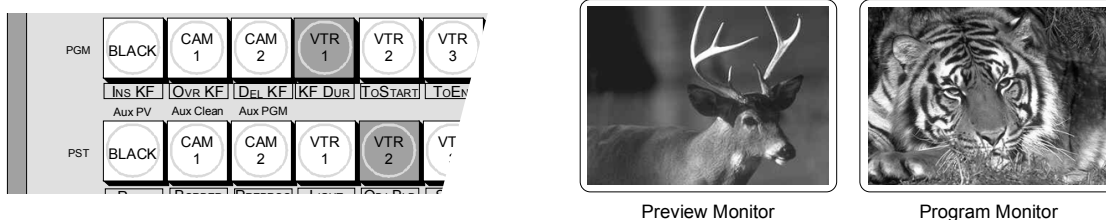
Sample Setup – Before the Dissolve

- In the **Transition Type Section**, press **DISS**.
- To perform a manual transition, move the **Fader** from limit to limit. To perform an auto transition, press the **AUTO TRANS** button. During either transition, the **PST** bus video signal gradually mixes into the **PGM** signal, as shown below.



#### Sample Setup – Performing a Transition

At the end of the transition, the **PST** video completely replaces the **PGM** video and the buses flip-flop. The figure below illustrates the MLE and monitor setup *after* the dissolve.



#### Sample Setup – After the Dissolve



#### Note

If a *very short* auto transition rate is selected (typically five frames or less), this may appear the same as a cut. This type of transition is often called a “soft cut”.

Refer to the section “**Using Wipes**” on page 6-12 for complete instructions on performing wipe transitions.

This completes the procedure to perform a dissolve.

## Transition Limit

The **TRANS LIMIT** button in the **Transition Control** group allows you to stop a transition at a preset position — in between the two absolute **Fader** limits.



#### Note

Trans Limit will be applied to audio transitions when the **Audio Cut** feature is Off. Refer to the section “**Audio Cut Mode Setup**” in the *Synergy 100 Installation Guide* for information on this feature.

Use the following procedure to perform a transition limit effect:

- Ensure the **Fader** is at an upper or lower limit and note the limit that you choose. The **Fader** must be returned to this limit in a subsequent step.
- Select a dissolve or a wipe as your next transition.



3. Move the **Fader** and *manually* set the transition to the desired position.
  - In the case of a dissolve, visually set the desired mix (superimposition) between Program and Preset.
  - In the case of a wipe, visually set the desired *split screen* position between Program and Preset.
4. Leave the **Fader** at its preset position and press **TRANS LIMIT**. The button lights *momentarily* and the fader position is stored.
5. Move the **Fader** back to the limit selected in step 1.
6. Press **TRANS LIMIT** to turn on the **Transition Limit** function. A single LED in the **Transition Progress Bar** illuminates, corresponding to the manually set position in step 3.
7. Use the **AUTO TRANS** button to perform the transition. The transition moves to the limit that you selected in step 3 and stops.
8. There are two ways to continue the transition:
  - Leave the **TRANS LIMIT** button turned on. When you use the **AUTO TRANS** button again, the transition reverses — and returns to its starting point.
  - Turn off the **TRANS LIMIT** button. When you use the **Fader** or **AUTO TRANS** again, the transition continues to its end.

This completes the procedure to perform a transition limit effect.

## Transition Preview

The “transition preview mode” allows you to rehearse a complete preset-to-background transition without affecting the program output. When in this mode, the full transition occurs on **Preview**, leaving the **Program** output signal undisturbed. You can create, rehearse and preview any transition. With the transition preview mode engaged, the **Fader** is effectively *disconnected* from program.

Use the following procedure to utilize the **Transition Preview** function:

1. Select the desired **Next Transition** button or buttons, depending on which video elements you want to change.
2. Press and hold the desired **Transition Type** button – **DISS** or **WIPE**.



### Note

A **DVE** transition cannot be previewed.

3. Use the **Fader** or **AUTO TRANS** to preview the current effect. Make any modifications desired.
4. Once you are satisfied with the effect, release the **Transition Type** button. The preview monitor reverts back to its look-ahead preview mode.
5. Perform the transition on air. The program output shows the exact effect as previewed previously on the preview monitor using “transition preview mode.”



### Note

If there is a transition in progress when the **Transition Type** button is released, the preview monitor output will not return to its look-ahead preview mode until the transition is complete.

This completes the procedure to utilize the **Transition Preview** function.

Please note the following important points:

- Transition preview mode is highly recommended for previewing complete effects.
- If you are unable to perform a transition preview as per the instructions above, please refer to Chapter 8, “**Additional Installation Setups**” in the *Synergy 100 Installation Guide*.

## Preset Black

The **Preset Black** function is a special two-stage transition that allows you to take the switcher to black (or any other desired source) with the first transition, and then proceed to the next transition previously indicated. This function is quite useful for dipping the switcher quickly to black or transitioning to a commercial.

Pressing **PST BLACK** causes the **BLACK** crosspoint to be selected on the **PST** bus, replacing the currently selected **PST** source. The buttons in the **Next Transition Section** *may change*, depending on what is currently on air.

There are two stages to the transition:

- When you press **PST BLACK**, the switcher presets a dissolve to black. An alternate transition type can be selected, if desired. If a key or a combination of keys are on, but their “next transition” buttons are *not* lit, the switcher automatically lights the button for you.  
  
The **first transition** dissolves the switcher to black and dissolves off all keys. The buttons in the **Next Transition Section** then change, presetting the switcher with the original preview scene. This scene now appears on the **Preview** monitor.
- The **second transition** brings the switcher back up from black to the scene previously shown on **Preview** — regardless of the combination of background and key sources selected.

Use the following procedure to perform a **Preset Black** transition:

1. Press **PST BLACK**. The preview monitor will now show a black picture.
2. Perform a transition with the **Fader**, **AUTO TRANS** or **CUT**. The program transitions to black. Note that when black is reached, the switcher presets the previous scene (from step 1) which also appears on **Preview**.
3. Perform a second transition using the **Fader**, **AUTO TRANS** or **CUT**. The switcher transitions to the previous scene, at the end of which the **PST BLACK** light turns off.



### Operating Tip

After Step 1, a *different source* other than black can be selected on **PST**. This would allow you to dip to **COLOR BKGD** (white, for example), for a creative “flash-frame” transition. In addition, **BLACK** can be *permanently* overridden by holding down the **PST BLACK** button while selecting the desired source on the **PST** bus. This override can be stored to disk or USB key in the **Personality** register.

This completes the procedure to perform a **Preset Black** transition.

# Pattern and Effects Control

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## In This Chapter

This chapter provides information and instructions for using your switcher's **Effects Control** groups. The following topics will be discussed:

- Effects Control Groups
- Effects Control Modes
- Effects Menu Functions
- Wipes Overview
- Using Wipes
- Selecting Wipes
- Mattes Group

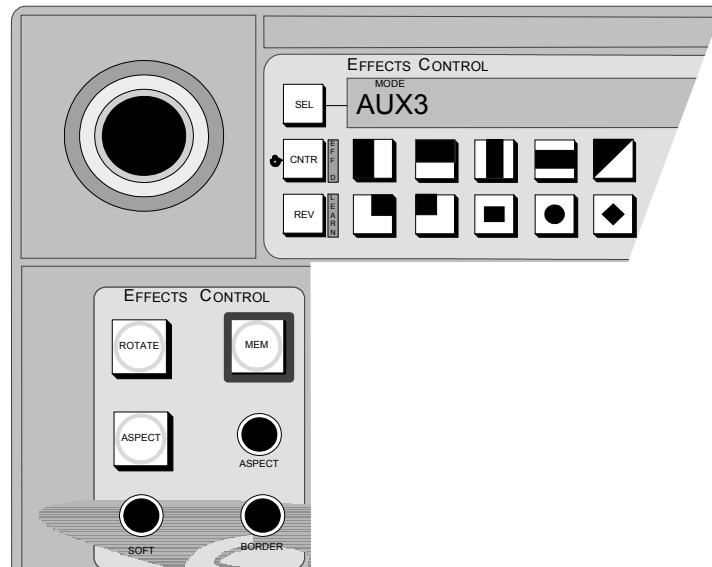
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## Effects Control Groups

The two **Effects Control** groups are *assignable* groups of controls that allow you to choose wipe patterns, and adjust wipe parameters and key modifiers. For example, by pressing **WIPE** or **FLY KEY**, the groups are assigned to that specific function.

The top **Effects Control Group** includes a four-character display labeled “**MODE**”, and its associated **SEL** button. This display identifies which area or button on the switcher has control of the **Effects Control** groups. In addition, the button of the controlling feature (i.e., **WIPE** or **FLY KEY**) will illuminate green, instead of yellow.

The following figure illustrates the **Effects Control** groups on the **Synergy 100** control panel:



*Effects Control Groups*

### Effects Control Modes



- The **SEL** button in the **Effects Control Group** allows you to cycle through several “modes”, depending on the area or button which currently has control of the **Effects Control** groups. The modes displayed are linked to the area or button selected, as outlined in the table on the following page.

In addition, by holding down the **SEL** button and pressing one of the buttons listed in the following table, you can change the button that has control without having to toggle it on and off.

Effects Control Mode Table

Mode	Button Selected	Features Controlled
FLY1	<b>FLY KEY</b> in Effects Keyer, Key 1 (*1) (*3)	Size, aspect ratio, and position of flown key in Keyer 1
FLY2	<b>FLY KEY</b> in Effects Keyer, Key 2 (*1) (*3)	Size, aspect ratio, and position of flown key in Keyer 2
CRP1	<b>MASK</b> when a Squeeze & Tease Box is active in Effects Keyer, Key 1	Cropping all edges of the video in a Squeeze & Tease Box on Key 1
CRP2	<b>MASK</b> when a Squeeze & Tease Box is active in Effects Keyer, Key 2	Cropping all edges of the video in a Squeeze & Tease Box on Key 2
MSK1	<b>MASK</b> in the Effects Keyer, Key 1 (*2)	Masking areas of a Self, Auto Select, or Chroma key on Key 1
MSK2	<b>MASK</b> in the Effects Keyer, Key 2 (*2)	Masking areas of a Self, Auto Select, or Chroma key on Key 2
MSKd	<b>MASK</b> in the Downstream Keyer Group	Masking areas of a Self or Auto Select key in the Downstream Keyer
MEM“#”	<b>MEM</b> in the Effects Control Group	Access to the Memory Store and Recall features
WIPE	<b>WIPE</b> in the Transition Control Group	All Wipe controls, including pattern selection and modifiers
PP1	<b>PST PATT</b> (with <b>FLY KEY</b> off) in Effects Keyer, Key 1	All modifiers for the Preset Pattern key type on Key 1
PP2	<b>PST PATT</b> (with <b>FLY KEY</b> off) in Effects Keyer, Key 2	All modifiers for the Preset Pattern key type on Key 2
DVE	<b>DVE</b> in the Transition Control Group	Pattern selection and wipe direction for the Squeeze & Tease wipes
BORD	<b>BORD</b> , <b>SHDW</b> , or <b>OUTL</b> in the Downstream Keyer Group	All modifiers (softness, size, etc.) for the optional border generator on the DSK
ACK1	<b>CHROMA KEY</b> in Effects Keyer, Key 1	The Auto Chroma Key feature when setting up a Chroma Key or Ultimatte Key on Key 1
ACK2	<b>CHROMA KEY</b> in Effects Keyer, Key 2	The Auto Chroma Key feature when setting up a Chroma Key or Ultimatte Key on Key 2
NONE	*see next column	If any of the above features have control, turning them off will set the mode to NONE.
HIDE and SHOW	<b>SEL</b> to the left of the “Mode” display toggles between the two modes. (*4) (*5)	When in any 3D menu, sections of the menu can be hidden. If the mode is set to “HIDE”, only the currently selected item, and its corresponding data values will remain displayed. “SHOW” displays the entire S&T 3D menu and all data values.

Notes:

(\*1) Selecting PST PATT in the keyer automatically turns on the **FLY KEY**.

(\*2) Except when the key type is a Squeeze & Tease Box.

(\*3) If you have the Squeeze & Tease WARP option installed, the key can also be rotated.

(\*4) Only valid when in the **S&T 3D Menu**.

(\*5) Refer to the *Synergy 100 Squeeze & Tease 3D/WARP Owner’s Guide* for full details.

---

## Effects Menu Functions

There are several options in the **Effects Menu** that allow you to enable editors and GPIs and place displays on top of the selected preview output. Please note the following important points:

- When in the **Effects Menu**, each press of the **SEL** button or corresponding option number in the **Effects Control Group** toggles a specific effect function on and off.
- All functions are *independent*. They can be enabled or disabled in any combination desired.

The following topics are discussed in this section:

- Center Overlay
- Safe Title Overlay

Each of these functions is described below.

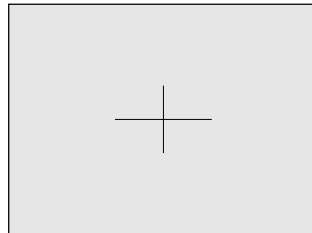


### Note

Enabling the Editor feature using the Effects Menu is discussed in the section the section “**Editor Interface**” on page 9-5.  
For information on enabling the **GPIs** interface feature, refer to the section “**GPIs**” on page 9-2.  
Refer to the section “**Menu Background**” on page 3-5 for information on enabling the **Menu Background** feature.

## Center Overlay

The **Center Overlay** feature places cross hairs on the preview monitor to indicate the center of the picture, as shown below. Once enabled, the **Center Overlay** feature can be used to align text and other information, both horizontally and vertically.



*Preview Monitor — Center Overlay*

Use the following procedure to enable the **Center Overlay** feature:

1. Ensure that your preview monitor is properly connected.
2. Navigate to the **Effects Menu** as follows:
  - Press **MENU** to display the **Main Menu**.
  - Press to display the **Effects Menu**.

Effects				
0. Editor				On
1. GPIs				Off
2. Center				Off
3. SafeTitle				Off
4. Menu Bkgd				On
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

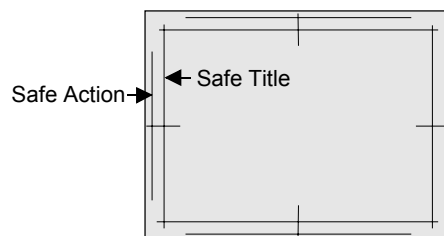
*Effects Menu*

3. Enable the **Center Overlay** feature as follows:
  - Press **2. Center**.
  - Toggle the **2. Center** button between **On** and **Off** as follows:
    - ~ **On** — Use this option to enable the Center Overlay feature. This will place cross hairs on the preview monitor to indicate the center of the picture.
    - ~ **Off** — Use this option to disable the Center Overlay feature. This is the default setting.
  - Press the right **SEL** button to accept the new settings.
4. Press **MENU** to display the **Installation Change Screen**.
5. Accept or cancel these changes as follows:
  - Press **0. Confirm** to accept the changes.
  - Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure to enable the **Center Overlay** feature.

## Safe Title Overlay

The **Safe Title Overlay** feature places a SMPTE standard safe title and safe action grid on the preview monitor, as shown below:



*Preview Monitor - Safe Title Overlay*

Please note the following points about the **Safe Title Overlay**:

- The “**Safe Title**” box (inner box) outlines the area within which the vast majority of home television sets will be able to read text.

- The “**Safe Action**” box (outer box) outlines the region within which viewers should be able to follow action on their television screen.



**Note**

To suppress the above two overlay elements of the **Effects Menu**, ensure that the overlays are toggled to the **Off** position.

Use the following procedure to enable the **Safe Title Overlay** feature:

1. Navigate to the **Effects Menu** as follows:
  - Press **MENU** to display the **Main Menu**.
  - Press to display the **Effects Menu**.

Effects				
0. Editor		On		
1. GPIs		Off		
2. Center		Off		
3. SafeTitle		Off		
4. Menu Bkgd		On		
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Effects Menu*

2. Enable the **Safe Title Overlay** feature as follows:
  - Press **3. Safe Title**.
  - Toggle **3. Safe Title** between **On** and **Off** as follows:
    - ~ **On** — Use this option to enable the Safe Title Overlay feature. A grid will be displayed on the preview monitor.
    - ~ **Off** — Use this option to disable the Safe Title Overlay feature. This is the default setting.
  - Press the right **SEL** button to accept the new settings.
3. Press **MENU** to display the **Installation Change Screen**.
4. Accept or cancel these changes as follows:
  - Press **0. Confirm** to accept the changes.
  - Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure to enable the **Safe Title Overlay** feature.



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# Wipes Overview

The **Effects Control** groups also include *two* pattern generators:

- **Pattern Generator 1** is shared by the **Wipe Generator** and the **Preset Pattern Generator** for the **Effects Keyers' KEY1**. This pattern generator is *full-featured* — all wipe patterns are available.
- **Pattern Generator 2** is used by the **Preset Pattern Generator** for the **Effects Keyers' KEY2**. This generator is restricted to the Classic wipe patterns, *minus* the circle. Rotary and Matrix wipes are *not* available.



## Note

Because **Pattern Generator 1** is shared, you cannot select a **WIPE** transition if **PST PATT** is selected on **Keyer 1**. Similarly, if **WIPE** is enabled and you select a **PST PATT** key type in **Keyer 1**, the **WIPE** button turns off and the transition type reverts to **DISS**.

To select a wipe, press **WIPE** in the **Transition Control Group** and select the desired pattern button. Once selected, the pattern can be modified and used on air. A single press of a button will illuminate its LED, and select the wipe as pictured. If you double-press the button, the LED will flash, indicating “user wipe mode”, and you will be able to choose any of the more than sixty wipes available. Refer to the section “**Using Wipes**” on page 6-12 for more information on selecting and using wipes.

## Effects Control Group Sections

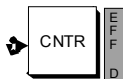
The top **Effects Control Group** includes 10 buttons which display 10 “classic” wipes. In addition, each button provides access to any of the more than 60 “user” wipes available.

- If you have the **Squeeze & Tease 2D** option installed, an additional 40 *two-dimensional* DVE effects are available.
- If you have the **Squeeze & Tease WARP** option installed, there are several *three-dimensional* DVE effects to choose from.

Also included in the top **Effects Control Group** are the following two buttons:



- The **REV/LEARN** button controls the *direction* of the wipe. Three choices of wipe directions are available:
  - ~ The default state of the **REV/LEARN** button is off. The wipe will proceed in the normal fashion, with the new picture being revealed from the black area (as shown on the pattern button) to the white area. The button’s LED will not be lit.
  - ~ Press **REV/LEARN** to set the direction of the wipe to reverse. The new picture is revealed from the white area to the black area. The button’s LED will be on.
  - ~ Double-press **REV/LEARN** to set the direction of the wipe to “flip-flop”. Wipe direction is normal for the first transition, reverse for the second, then normal for the third, etc. The button’s LED will be flashing.



- The **CNTR/EFF D** button is used to return a border, wipe positions, masks, and cropping features to their default state or position. In addition, it is used to default flown keys, including **Squeeze & Tease 2D** and **Squeeze & Tease WARP** boxes, to full screen. When recalling memories, this button enables you to perform an “effects dissolve” between two switcher setups.

The lower **Effects Control Group** provides two buttons and three “end-stop” knobs that modify the selected pattern.



- The **BORDER** knob allows you to adjust pattern borders, from no border to full-screen borders on all wipe patterns, with the exception of pattern number 111, which does not accept a border. (Refer to the section “**Selecting Wipes**” on page 6-13 for information on how to access additional patterns.)

- ~ Turning the knob clockwise increases border width.
- ~ Turning the knob counter-clockwise decreases border width.



- The **SOFT** knob allows you to adjust pattern edge softness from hard-edge to full soft-edge on all patterns, with the exception of pattern number 111, which does not allow edge softness. (Refer to the section “**Selecting Wipes**” on page 6-13 for information on how to access additional patterns.)

- ~ Turning the knob clockwise increases edge softness.
- ~ Turning the knob counter-clockwise decreases edge softness.



- When the **ASPECT** button is lit, the adjacent knob can be used to adjust the aspect ratio of selected patterns.

- ~ Turning the knob clockwise increases the pattern’s vertical aspect ratio, and, at the same time, reduces the horizontal aspect ratio.
- ~ Turning the knob counter-clockwise increases the pattern’s horizontal aspect ratio, and, at the same time, reduces the vertical aspect ratio.



### Important

As an overall reminder about the knobs in the **Effects Control Group**, please note the following important point regarding end-stop knobs:

Because an **End-stop Knob**’s electrical position can be *overwritten* by recalling a memory register, the electrical knob position *may not match* the knob’s current physical position. In this case, the knob can still be adjusted but you may not have the full adjustment range available.



### Operating Tip

To fully re-synchronize an **End-stop Knob**’s physical-to-electrical position, turn the knob fully clockwise, then fully counter-clockwise. Full-range adjustments can now be made.



- The **ASPECT** button enables the use of the adjacent knob.
  - ~ When the button is on, patterns with both horizontal and vertical angles to their edges can have their aspect ratios adjusted. Circles can be adjusted into ovals, squares into rectangles, etc.
  - ~ When the button is off, all aspect ratio adjustment is removed and the pattern returns to its default shape.

### Notes on using the Aspect Button

Note the following points regarding the **ASPECT** button:

- If you adjust the aspect ratio of one pattern, then select another pattern that can *not* have its aspect adjusted, the **ASPECT** light will stay on until it is turned off manually by pressing the button.



- The **ROTATE** button enables the use of the positioner as a wipe pattern modifier.
  - ~ When the button is on, wipe patterns 00 and 07 (horizontal wipes) and 10 and 17 (vertical wipes) can be rotated a full 360 degrees. Only these four patterns can be rotated.
  - ~ When the button is off, all rotation is removed and the pattern returns to its default position.



**Note**

If you have the **Squeeze & Tease WARP option** installed, the **ROTATE** button has further functionality. Refer to the *Synergy 100 Squeeze & Tease 3D/WARP Owner's Guide* for details.

## Classes of Wipes

The switcher's **WIPE** feature allows you to select from over 60 wipes, including those that are normally hidden from view on the panel. If your switcher has the optional **Squeeze & Tease 2D Board** installed, another 40 DVE effects, such as pushes and tumbles, are available. If you have the **Squeeze & Tease WARP** option installed, there are several *3-dimensional* DVE effects to choose from.

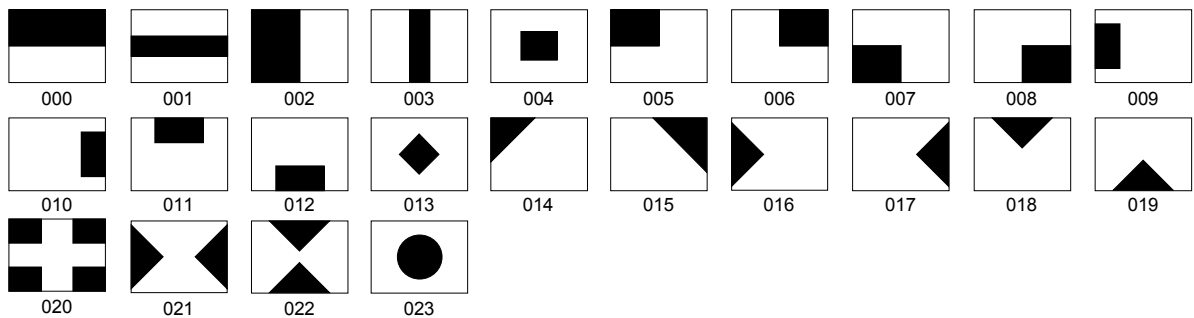
The classes of wipes are as follows:

0. classic wipes
1. rotary wipes
2. matrix wipes
3. special wipe

Each class of wipe is illustrated in the following sections.

### Classic Wipes

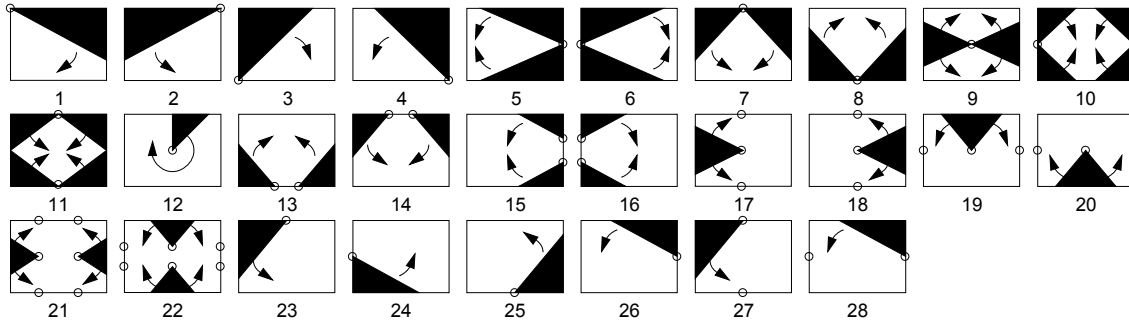
The following figure illustrates the available “Classic” Wipes – Class 0.



*Classic Wipes – Class 0*

## Rotary Wipes

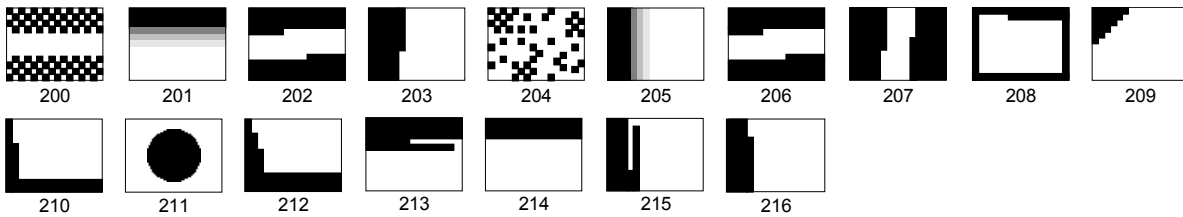
The following figure illustrates the available “Rotary” Wipes – Class 1.



Rotary Wipes – Class 1

## Matrix Wipes

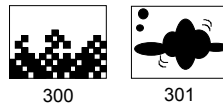
The following figure illustrates the available “Matrix” Wipes – Class 2.



Matrix Wipes – Class 2

## Special Wipes

The following figure illustrates the available “Special” Wipes – Class 3.

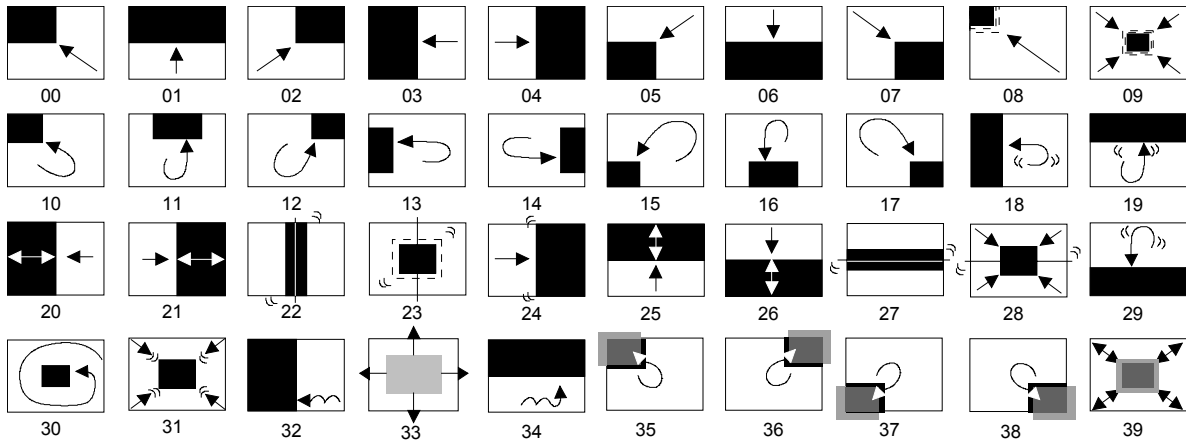


Wipe number 300 is the special animated “fire” wipe, and wipe number 301 is a “plasma” wipe — give them a try!

This completes the procedure to select a **Wipe**.

## Optional Squeeze & Tease 2D Wipes

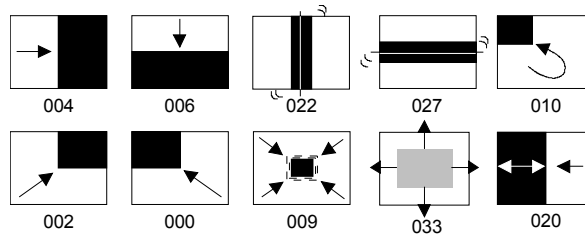
If your Synergy 100 switcher has the optional **Squeeze & Tease 2D Board** installed, you have access to 40 DVE wipe effects, such as push-offs, pull-ons and other similar DVE transitions.



Optional Squeeze & Tease 2D Wipes

## DVE Wipe Effects

The 10 pattern buttons in the **Effects Control Group** represent 10 DVE wipe effects, as represented in the following figure in order of buttons.



Effects Control Group – 10 DVE Wipe Effects



### Note

The numbers under the wipe patterns indicate the *pattern number* as selected using the **System Control Group**.

The graphical representations of the wipes **do not** correspond with the patterns on the actual keys in the **Pattern Control Group**.

# Using Wipes

In a “background wipe” transition, the **PGM** bus video is gradually replaced with the **PST** bus video according to a wipe pattern pre-selected in the **Effects Control Group**.

The following topics are discussed in this section:

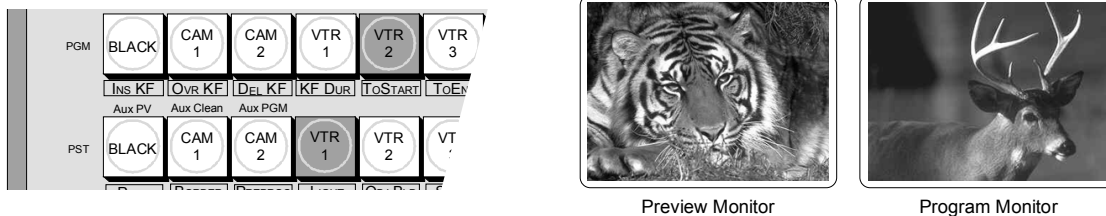
- Performing a Wipe
- Selecting Wipes

## Performing a Wipe

Use the following procedure to perform a wipe:

1. Select an input on the **PGM** bus.
2. Select a different input on the **PST** bus.
3. In the **Transition Control Group**, select **BKGD** as the next transition.

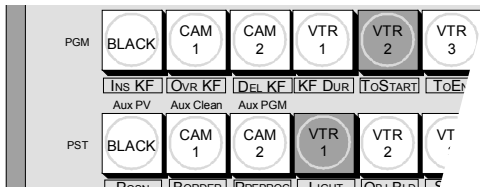
The following figure illustrates a *sample* setup and the associated monitor outputs — before the wipe.



MLE and Monitor Setup – Before the Wipe

4. Press **WIPE**. This action causes the lamp on the **WIPE** button to illuminate green and automatically assigns the **Effects Control** groups to the transition.
5. Press the pattern button for the desired wipe.
6. Choose the direction for the wipe. Select between normal, reverse, or flip-flop by pressing or double-pressing the **REV/LEARN** button.
7. Turn the **BORDER** knob fully clockwise, then fully counterclockwise. For this first exercise, this ensures that there is *no border*.
8. Perform a transition using one of the following methods:
  - To perform a manual transition, move the **Fader** from limit to limit.
  - To perform an auto transition, press the **AUTO TRANS** button.

During the transition, the **PST** bus video signal gradually replaces the **PGM** signal using the selected wipe, as the following figure illustrates.



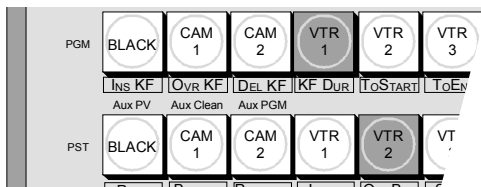
Preview Monitor



Program Monitor

### MLE and Monitor Setup – Performing a Transition

At the end of the transition, the **PST** video completely replaces the **PGM** video and the buses flip-flop. The following figure illustrates the MLE and monitor setup *after* the wipe.



Preview Monitor



Program Monitor

### MLE and Monitor Setup – After the Wipe



#### Note

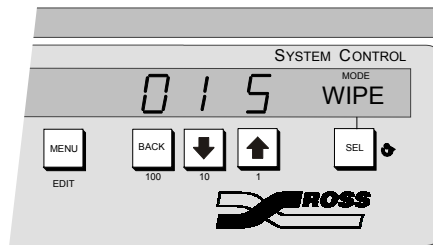
Wipe borders can be modified to be any matte color. Refer to the section “**Mattes Group**” on page 6-16 for details.

This completes the procedure to perform a wipe.

## Selecting Wipes

Use the following procedure to select a **Wipe**:

1. Press **WIPE** in the **Transition Control Group**. The lamp on the button will illuminate green.
2. To choose one of the 10 patterns as shown in the **Effects Control Group**, simply press the desired button.
3. To access the additional user wipe patterns, double press any of the pattern buttons. The selected LED will flash, and the current “extended wipe” pattern number will be displayed in the **System Control Group**.
4. You will now have control of the **System Control Group**, and can use the **100**, **10**, and **1** buttons to scroll through the patterns as desired. Refer to the following figure:



System Control Group

The first (hundreds) digit in the display represents the “class” of wipe. The classes of wipes are as follows:

- 0. classic wipes
  - 1. rotary wipes
  - 2. matrix wipes
  - 3. special wipe
5. Use the **100** button below the display to scroll through the classes. The **10** and **1** buttons are used to scroll through the wipe pattern numbers, represented by the last two (tens and units) digits in the display.
  6. Once you have selected the desired pattern, you can perform your transition in the usual manner.

This completes the procedure to select a **Wipe**.

## Selecting a DVE Wipe Effect

Use the following procedure to select a **DVE** wipe effect:

1. Press **DVE** in the **Transition Control Group**. The **DVE** button illuminates green indicating that the transition is active.



### Operating Tip

As an alternative, the **DVE** and **WIPE** buttons can be pressed simultaneously to select a DVE effect as the transition type. Both the **DVE** and **WIPE** buttons illuminate green indicating that the transition is active.

2. Select a DVE Wipe effect by pressing the one of the 10 pattern buttons in the **Effects Control Group** represent 10 DVE wipe effects.



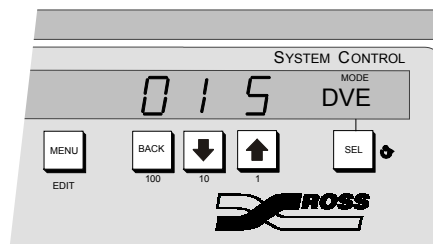
### Note

The numbers under the wipe patterns indicate the *pattern number* as selected using the **System Control Group**.  
The graphical representations of the wipes **do not** correspond with the patterns on the actual keys in the **Pattern Control Group**.

3. To gain access to all 40 DVE wipe patterns, double press any of the pattern buttons in the **Effects Control Group**. The selected LED will flash, and the DVE function will have control of the **System Control Group**.



- Use the **10** and **1** buttons to scroll through the patterns as desired. Refer to the following figure.



System Control Group

- Use the **10** and **1** buttons to scroll through the Squeeze & Tease 2D Wipes numbers, represented by the last two digits in the display.
- Once you have selected the desired pattern, you can perform your transition in the usual manner.

This completes the procedure to select a **DVE** wipe effect.

### Notes on Selecting a Squeeze & Tease Wipe

Please note:

- When enabled, the **Squeeze & Tease Wipe** mode selects a free channel or two free channels as required. If channels are not available, you can not select a **Squeeze & Tease** wipe.
- You can perform a **Squeeze & Tease** wipe on the background or an individual key, by pressing either the **BKGD**, **KEY1**, or the **KEY2** button in the **Transition Control Group**. However, you can not select more than one at a time.
- Background (**BKGD**) and key (**KEY1** or **KEY2**) transitions only require one **Squeeze & Tease** channel to perform a **Squeeze & Tease** wipe. However, wipes involving **Auto Select** keys require two channels.
- If you want to perform a **Squeeze & Tease** wipe on the key, for example, and the **Effects Keyers Group** is *already* performing a Squeeze & Tease 2D box, the Squeeze & Tease wipe is allowed. If the keyer is *not* performing a Squeeze & Tease box, the system temporarily borrows a single Squeeze & Tease channel (or two channels if you are performing the wipe on an **Auto Select** key).



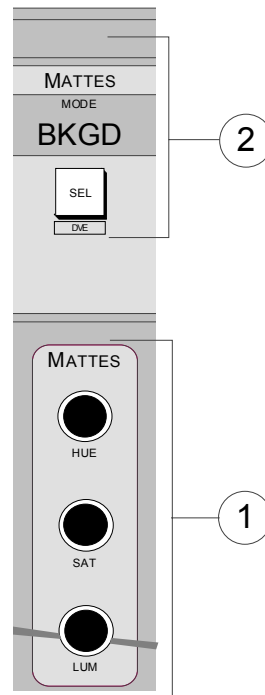
#### Note

If your **Synergy 100** switcher has the optional **Squeeze & Tease WARP Board** installed, you have access to 100 pre-programmed 2-dimensional and 3-dimensional DVE wipe effects. Refer to the *Squeeze & Tease 3D/WARP Owner's Guide* for full details.

# Mattes Group

The **Mattes Group** provides a set of *assignable* controls that allow you to select specific matte generators and adjust colors for wipe patterns, borders, the color background, and matte fills. The **Mattes Group** is assigned to a specific function by pressing a **PST PATT**, **WIPE**, **COLOR BKGD**, **BORD** or **MATTE FILL** button.

The following figure illustrates the **Mattes Group**:



*Mattes Group*

1) Matte Color Knobs	2) Matte Destination Section
----------------------	------------------------------

## 1. Matte Color Knobs

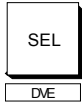
The three **Matte Color Knobs** allow you to adjust the color of the selected matte generator. Each knob is an “end-stop” knob. Refer to the section “**Knobs**” on page 4-7 for additional information on end-stop knobs.



- Hue is the characteristic of a color signal that determines whether the color is red, yellow, green, blue, etc. Adjust the **HUE** knob to change the color of the selected matte generator. A full 360 degrees of hue adjustment is provided.
- Saturation is the intensity of the color. Adjust the **SAT** knob to change the color saturation of the selected matte generator. Saturation can be adjusted from 0 (monochrome or no saturation) to 100 percent — full color saturation.
- Luminance is the component of the signal that represents the brightness in a video picture. Adjust the **LUM** knob to change the luminance of the selected matte generator. Luminance can be adjusted from 0 (minimum brightness, or black) to 100 percent (maximum brightness, or white).

## 2. Matte Destination Section

The **SEL** button in the **Matte Destination Section** allows you to select one of five standard and two optional matte generators. Each generator is capable of generating *one* color. The generators are selected automatically (as outlined below) or they can be selected manually.



- Press **SEL** in the **Mattes Group** and scroll through the seven options until **BKGD** appears in the display. This matte generator is automatically selected when the **COLOR BKGD** buttons on the bus rows are pressed.

When **BKGD** is selected, you can adjust the selected **COLOR BKGD** color using the three **Matte Color** knobs.



**Note**

The default **COLOR BKGD** color is blue.

- Press **SEL** in the **Mattes Group** and scroll through the seven options until **WIPE** appears in the display. This matte generator is automatically selected when the **WIPE** button in the **Transition Control Group** is pressed.

When **WIPE** is selected, you can adjust the selected wipe border color using the three **Matte Color** knobs.

- Press **SEL** in the **Mattes Group** and scroll through the seven options until **DSK** appears in the display. This matte generator is used by the **Downstream Keyer's** matte fill and optional border and shadow generator. It is automatically selected when the following buttons are pressed:

~ Any of the buttons in the **Downstream Keyer Group**.

When **DSK** is selected, you can adjust the downstream key's matte fill color and, if you have the **Border Generator** option installed, the downstream key's border color using the three **Matte Color** knobs. Refer to the section "**Bordering Keys**" on page 7-25 for more information.

- Press **SEL** in the **Mattes Group** and scroll through the seven options until **KEY1** appears in the display. This matte generator is used by the **Effects Keyers Key 1's** matte fill. It is automatically selected when the following buttons are pressed:

~ Any of the buttons relating to Key 1 in the **Effects Keyer Group** except **PST PATT**.

When **KEY1** is selected, you can adjust the matte fill color of the Effects Key 1, using the three **Matte Color** knobs.



**Note**

If **PST PATT** is selected in the **Effects Keyers Group**, you can not select **MATTE FILL**.

- Press **SEL** in the **Mattes Group** and scroll through the seven options until **KEY2** appears in the display. This matte generator is used by the matte fill of the **Effects Keyers Key 2**. It is automatically selected when the following buttons are pressed:

~ Any of the buttons relating to Key 2 in the **Effects Keyer Group** except **PST PATT**.

When **KEY2** is selected, you can adjust the matte fill color of Effects Key 2 using the three **Matte Color** knobs.

- Press **SEL** in the **Mattes Group** and scroll through the seven options until **S&T1** appears in the display. This matte generator is used by the optional **Squeeze & Tease 2D Board** and **Squeeze & Tease WARP Board** for adjusting the color of the border around a Squeeze & Tease box. It is automatically selected when the **PST PATT** button for Keyer 1 in the **Effects Keyers Group** is pressed.

When **S&T1** is selected, you can adjust the Effects Key 1 **Squeeze & Tease** box's border color using the three **Matte Color** knobs.

- Press **SEL** in the **Mattes Group** and scroll through the seven options until **S&T2** appears in the display. This matte generator is used by the optional **Squeeze & Tease 2D Board** and **Squeeze & Tease WARP Board** for adjusting the color of the border around a Squeeze & Tease box. It is automatically selected when the **PST PATT** button for Keyer 2 in the **Effects Keyers Group** is pressed.

When **S&T2** is selected, you can adjust the Effects Key 2 **Squeeze & Tease** box's border color using the three **Matte Color** knobs.

# Keying

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## In This Chapter

This chapter provides instructions for using the switcher keys of your **Synergy 100 SD**. The following topics are discussed:

- Introduction to Keying
- Effects Keyers Group
- Downstream Keyer Group
- A Word About Clean Feed
- Performing a Self Key
- Performing an Auto Select Key
- Performing a Chroma Key
- Chroma Key Lighting Tips
- Performing a Preset Pattern Key
- Performing Squeeze & Tease Boxes
- Split Keys
- Programming a Favorite CG
- Using Auto Transitions
- Using Key Modifiers
- Filling a Key with Matte
- Masking Keys
- Inverting Keys
- Bordering Keys
- Flying Keys
- Positioner

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## Introduction to Keying

The “**Keying**” function allows you to insert (or electronically “cut”) portions of one scene into another or to place titles over background images. Two signals are essentially required for a key:

- The “key” signal (also known as an *alpha* signal) is used to electronically *cut* a hole in the background video.
- The “fill” signal (also known as the *key foreground*) is used to electronically fill the key signal’s hole with video.

Visually, keys appear as *layers* that can be built up to create the desired composite image. The MLE can generate three individual keys that appear downstream of the background images.

Refer to the section “**Video Flow through the Switcher**” on page 2-6 for additional information on basic video flow, MLE priority and layering.

### Key Group Basics

The **Synergy 100** panel includes *two* **Key** groups — the **Effects Keyers Group** and the **Downstream Keyer Group**. Please note the following *basic* rules regarding the two key groups:

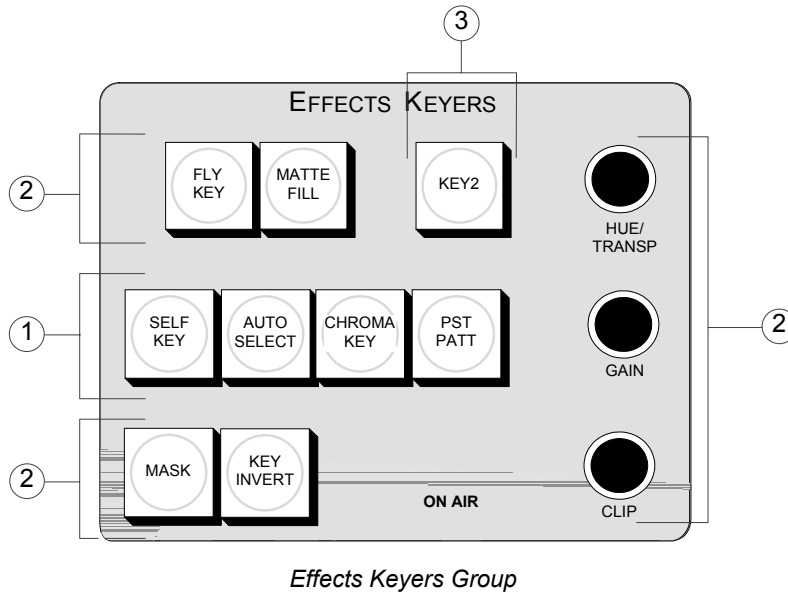
- For all key types (except **Preset Patterns**) the **Key Bus** is used to select key alpha and fill sources. Even though the *buttons* on the **Key Bus** are shared between the three Keyers, three sets of independent keying electronics allow *each keyer* to have its own key and fill selections. For Preset Pattern keys, the alpha signal is chosen by selecting a wipe pattern in the **Effects Control Group**.
- Functionally, the range of patterns available for a Preset Pattern key on Key 2 of the **Effects Keyers Group** is restricted to the classic patterns, minus the circle. On the other hand, the **Wipe Generator**, that is also used for a Preset Pattern key on Key 1 of the **Effects Keyers Group**, is *full-featured* — all wipe patterns are available.

### Effects Keyers Group

The controls in the **Effects Keyers Group** allow you to choose Key types and a variety of key modifiers. The following topics are discussed in this section:

- Key Type Section
- Key Modifier Section
- Key Assignment Section

The figure on page 7-3 illustrates the **Effects Keyer Group**.



1) Key Type Section	2) Key Modifier Section	3) Key Assignment Section
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### 1. Key Type Section

The **Key Type Section** provides four buttons that select the *type* of key that will be inserted over background video.



- Press **SELF KEY** to select a “Self” key type, also known as a *luminance* key. With a Self Key, the luminance (or brightness) values of the key source itself (as selected on the **Key Bus**) are used to cut the hole.

The key hole is filled with the *same video signal* as the key cutter. The key hole can also be filled with color matte. Self Keys are often used to key images from tape as there is no separate alpha available.



- Press **AUTO SELECT** to choose an “Auto Select” key type, also known as a *linear* key.

With Auto Select keys, two signals are used to cut and fill the hole — a key (alpha) signal and a fill (video) signal. These signals originate from devices such as character generators, still stores, DVEs, and graphics systems.

When you choose an Auto Select key and press a key source (on the **Key Bus**), the switcher *automatically* selects both the alpha and fill signals. These signals were *linked* together during the installation procedure. Refer to the section, “**Setting Up BNC Inputs**” in Chapter 6 of the *Synergy 100 Installation Guide* for details.



- Press **CHROMA KEY** to select a “Chroma” key type. With a Chroma Key, the hole is cut based on a selected color value (hue), rather than on a luminance value or an alpha signal. The color is then electronically removed and replaced with background video from another image.

Similar to Self Keys, the Chroma Key hole is filled from the *same video source* as the key cutter, except that the fill is composed of all colors that remain *after* the selected chroma key color is removed. The hole can also be filled with color matte. Chroma Keys are typically used to key the weathercaster over a weather map.

If your switcher has the optional **Ultimatte™ Insider** installed, refer to Chapter 10 “**Ultimatte Insider**” on page 10-1 for complete operational instructions.



### Note

Unlike analog switchers that require separate RGB signals to perform a Chroma Key, with the Synergy 100 Switcher, you can Chroma Key on *any source* that you select on the **Key Bus**.



### Operating Tip

Pressing the button that is currently *lit* in the **Key Type Section** is a quick way to simply *activate* a keyer for adjustment, when both keyers are in use.



- Press **PST PATT** to select a “Preset Pattern” key type. If you have installed the optional **Squeeze & Tease 2D Board** or **Squeeze & Tease WARP Board**, this action will automatically turn on the **FLY KEY** button (in the Key Modifier Section), and apply a 2-D or 3-D box effect to the key.

Refer to the section “**Performing Squeeze & Tease Boxes**” on page 7-17 for information on Squeeze & Tease 2D. For information on Squeeze & Tease WARP, refer to the *Squeeze & Tease 3D/WARP Owner’s Guide*.

For a standard Preset Pattern key, the hole is cut based on a pattern that you select in the **Effects Control Group**. The pattern (which acts just like the *auto select* key’s alpha signal) is filled with video from the **Key Bus**.

## 2. Key Modifier Section

The buttons and knobs in the Key Modifier Section allow you to modify the key that is currently selected.



- Press **KEY INVERT** to invert the polarity of the selected key signal. For example, if a Self Key source has white letters on a black background, the white letters normally cut the hole. When **KEY INVERT** is pressed, the polarity of the signal is reversed and the *black background* cuts the hole. This function is often used to key black text that is printed on a white background.

Note that all key types can be inverted, except the optional **Squeeze & Tease** boxes.



- Press **MASK** to activate the **Mask** controls. These controls allow you to selectively eliminate unwanted portions of a key signal, similar to the “crop” function found on many DVEs. Using an adjustable box pattern, you can size and position the mask to hide the top, bottom, left or right edges of the key.

In addition, the **REV/LEARN** button in the **Effects Control Group** can be used to invert the mask. All key types *except* Preset Pattern keys and **Squeeze & Tease** boxes can be masked. Refer to the section “**Masking Keys**” on page 7-24 for information and instructions.



- Press **FLY KEY** to enable or disable the **Squeeze & Tease 2D** or **Squeeze & Tease WARP** function, allowing you to apply 2-D or 3-D DVE effects to any of the four key types. The button illuminates automatically when **PST PATT** is pressed, but must be pressed manually to fly a **CHROMA KEY**, **AUTO SELECT** or **SELF KEY**.

Once enabled, you can control the flying image’s size, horizontal and vertical position and much more. The **FLY KEY** button will not illuminate if one of the options is not installed. Refer to the section “**Flying Keys**” on page 7-27 for instructions. If you have the **Squeeze & Tease WARP** option installed, refer to the *Squeeze & Tease 3D/WARP Owner’s Guide* for instructions.





- Press **MATTE FILL** to fill the selected key hole with a matte color — *instead* of the key foreground video from the **Key Bus**. All key types *except* Preset Pattern keys can be filled with matte color. Use the controls in the **Mattes** signal's to choose the matte's hue, luminance, and saturation. Refer to the section "**Mattes Group**" on page 6-16 for matte fill instructions.



- The **HUE/TRANSP** knob has two functions.
  - ~ With a Chroma key, it is used to select the color that you want to key out – essentially, the color to be *replaced* by the background video. The knob rotates through the full 360-degree color spectrum.
  - ~ If you setting up a Self Key or Auto Select Key, the **HUE/TRANSP** knob is used to adjust the key's transparency.



- Rotate **CLIP** to adjust the key's luminance or *threshold* level. Only the areas of the source video that are *higher* than the setting of the threshold will cut a hole in the background video.



- Rotate **GAIN** to adjust the key's gain. The control acts on all keys (except the optional **Squeeze & Tease** boxes) and *softens* the key edge, allowing you to adjust the way that the key blends into the background.

### 3. Key Assignment Section

The button in the **Key Assignment Section** allows you to toggle control of all key modifiers between the two keys in the Effects Keyers Group.



- Press **KEY2** to assign control of all the key modifier buttons and knobs to the **Effects Keyers'** second key. This action will cause the button to illuminate.
- To return control of all modifiers to the **Effects Keyers'** Key 1, simply press the **KEY2** button again to turn it off.

This completes the discussion on the **Effects Keyers Group**.

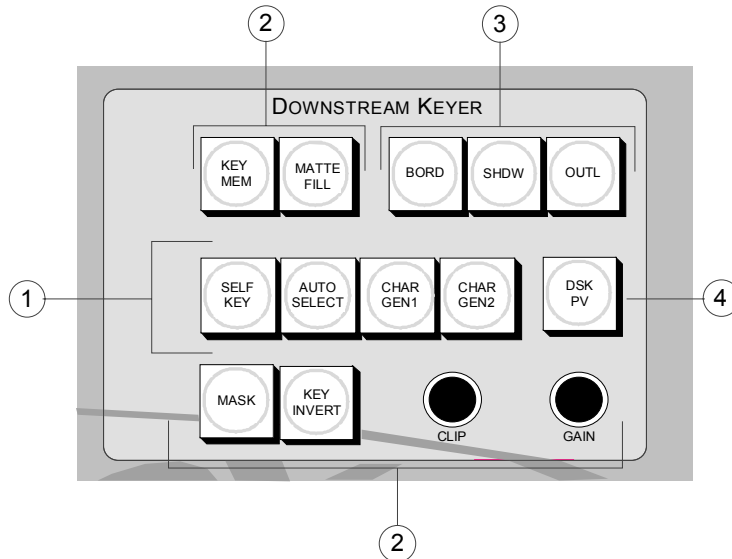
## Downstream Keyer Group

This section outlines the areas of the Downstream Keyer Group.

The following topics are discussed:

- Key Type Section
- Key Modifier Section
- Border Controls
- DSK PV Button

The figure on on page 7-6 illustrates the **Downstream Keyer Group**.



Synergy 100 Downstream Keyer Group

1) Key Type Section	3) Border Controls
2) Key Modifier Section	4) DSK PV Button

### 1. Key Type Section

The **Key Type Section** provides two buttons that select the *type* of key that will be inserted over background video.



- Press **SELF KEY** to select a “Self” key type, also known as a *luminance* key. With a Self Key, the luminance (or brightness) values of the key source itself (as selected on the **Key Bus**) are used to cut the hole.

The key hole is filled with the *same video signal* as the key cutter or the hole can also be filled with color matte. Self Keys are often used to key images from tape.



- Press **AUTO SELECT** to choose an “Auto Select” key type, also known as a *linear* key.

With Auto Select keys, two signals are used to cut and fill the hole — a key (alpha) signal and a fill (video) signal. These signals originate from devices such as character generators, still stores, DVEs, and graphics systems.

When you choose an Auto Select key and press a key source (on the **Key Bus**), the switcher *automatically* selects both the alpha and fill signals. These signals were *linked* together during the installation procedure. Refer to the section “**Setting Up BNC Inputs**” in Chapter 6 of the *Synergy 100 Installation Guide* for details.

In addition to these buttons, there are two buttons used as hotkeys for your “favorite” auto select keys originating from character generators, still stores, DVEs, etc.



- Press **CHAR GEN1** to select your most frequently used “favorite” auto select key, without having to hunt for it on the **Key Bus**. When pressed, the key type and key source are automatically selected, **KEY MEM** is turned on and key modifiers are turned off to provide a *clean* CG key. Refer to the section “**Programming a Favorite CG**” on page 7-20 for instructions.



- Press **CHAR GEN2** to choose an alternate frequently used “favorite” auto select key. This button works in the exact same manner as **CHAR GEN1**, and is also programmed as per the section “**Programming a Favorite CG**” on page 7-20.

## 2. Key Modifier Section

The buttons and knobs in the **Key Modifier Section** allow you to modify the key that is currently selected.



- Press **KEY INVERT** to invert the polarity of the selected key signal. For example, if a Self Key source has white letters on a black background, the white letters normally cut the hole. When **KEY INVERT** is pressed, the signal's polarity is reversed and the *black background* cuts the hole. This function is often used to key black text that is printed on a white background. Note that all key types can be inverted.



- The **KEY MEM** (memory) function applies to Auto Select Keys only. This function allows you to store and recall *one set* of clip and gain settings *per crosspoint*.

The **KEY MEM** button turns on *automatically* when you press **AUTO SELECT** and choose an Auto Select key source on the **Key Bus**. This function recalls the key's settings from memory. With the button lit, clip and gain settings are locked. If you press **KEY MEM** to turn *off* the light, you *unlock* clip and gain, allowing you to make temporary adjustments to the linear key's settings. Turning the button back *on again* restores the key source's default settings from memory.

Although the default clip and gain settings were set during the switcher installation process, you can also use the **KEY MEM** button to store *new* default values for the selected linear key source. Refer to the section "**Performing an Auto Select Key**" on page 7-11 for details.



- Press **MASK** to activate the **Mask** controls. These controls allow you to selectively eliminate unwanted portions of a key signal, similar to the "crop" function found on many DVEs. Using an adjustable box pattern, you can size and position the mask to hide the top, bottom, left or right edges of the key.

In addition, the **REV/LEARN** button in the **Effects Control Group** can be used to invert the mask. Both key types can be masked. Refer to the section "**Masking Keys**" on page 7-24 for information and instructions.



- Press **MATTE FILL** to fill the selected key hole with a matte color — *instead* of the key foreground video from the **Key Bus**. Both key types can be filled with matte color. Use the controls in the **Mattes Groups** to choose the matte's hue, luminance, and saturation. Refer to the section "**Mattes Group**" on page 6-16 for matte fill instructions.



- Rotate **CLIP** to adjust the key's luminance or *threshold* level. Only the areas of the source video that are *higher* than the setting of the threshold will cut a hole in the background video.



- Rotate **GAIN** to adjust the key's gain. This control *softens* the key edge, allowing you to adjust the way that the key blends into the background. For Auto Select (linear) keys, the adjustment ensures the correct key transparency.

### 3. Border Controls



#### Note

The **Floating Border Generator** option must be installed to enable border control operation.

Borders are available in all keyers. Refer to the section “**Bordering Keys**” on page 7-25, for details.



- Press **BORD** to add a border behind the selected key type. The border can appear as a simple *surrounding* border or as a detached shadow. Width, softness, color, and transparency are adjustable using the appropriate knobs in the Effects Control and Mattes Groups. Refer to the section “**Bordering Keys**” on page 7-25 for instructions.



- Press **SHDW** to add a drop shadow behind the selected key type, with variable width, softness, color, and transparency. Refer to the section “**Bordering Keys**” on page 7-25 for instructions.



- Press **OUTL** to add an outline around the selected key type, with variable width, softness, color, and transparency. With **OUTL** selected, the key fill is completely transparent. Refer to the section “**Bordering Keys**” on page 7-25 for instructions.

### 4. DSK PV Button



- Press and hold **DSK PV** to set up and adjust your downstream keyer effect by watching the preview monitor. If the DSK is not currently on air, the preview monitor will show the downstream keyer effect superimposed on top of the Program output. If the DSK is currently on air, the preview monitor will display the Program output without the DSK.



#### Important

The **DSK PV** function is not available when Key 1 or Key 2 have a border applied, and are on air.



#### Note

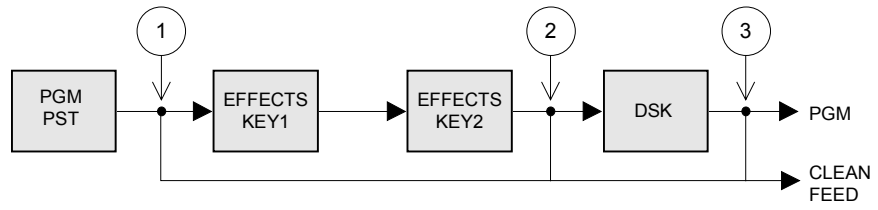
The **DSK PV** button is active only as long as the button is held down. When released, the preview monitor once again displays the Preview output (based on the “**Next Transition**” buttons selected) and the button’s LED turns off.

This completes the discussion on the Downstream Keyer Group.

## A Word About Clean Feed

If you have the **Clean Feed Option** installed, your program output may be set up in a special mode using the **Outputs Menu**. Please consult with your facility engineer to determine how your switcher is configured.

The **Clean Feed** output can be generated from different locations in the video path. The Clean Feed alpha output can be derived from any key type on Key 1. Refer to the “**Setting Up Outputs**” section in Chapter 8 of the *Synergy 100 Installation Guide* for full details. The point from which the feed is derived is software-configurable. Refer to the diagram on page 7-9.



*Clean Feed Modes*

1. At point **1** above, the clean feed output is pulled after the Program/Preset Bus, but *before* the three keys are added.
2. At point **2** above, the clean feed output is pulled downstream of the two Effects Keyers, but upstream of the DSK.
3. At point **3** above, the clean feed output is pulled downstream of the three Keyers and effectively mirrors the program output.

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## Using Keys

This section includes detailed instructions for using keys. Prior to proceeding, ensure that you have read the section “**Introduction to Keying**” on page 7-2 thoroughly.

### Performing a Self Key

A **Self Key** is one in which the luminance (or brightness) values of the key source itself are used to cut the hole.

Use the following procedure to perform a Self Key in Key 1:



#### Note

This procedure will show you how to perform a **Self Key** in **Key 1**, the same procedure can be used to perform a **Self Key** in **Key 2** or **DSK**.

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **KEY1** in the **Transition Control Group** to preview the key. This step will also server to assign the **Key** bus and **Effects Keyers Group** to **Key 1**.
3. Select a key source on the **Key 1** bus.
4. Press **SELF KEY** in the **Effects Keyers Group**.
5. Adjust the Clip and Gain of the key as follows:



#### Note

If you select a different **Self Key** source, you will need to re-adjust the Clip and Gain of the source. However, each crosspoint will remember its own individual clip and gain setting.

- Use the **CLIP** knob in the **Effects Keyers Group** to adjust the luminance level of the key. The lower the threshold setting, the more the key is visible.
  - Use the **GAIN** knob in the **Effects Keyers Group** to adjust softness of the edges of the key.
6. Select any additional key modifiers you want to use. You can select between the following:
    - **MATTE FILL** — Select this button to fill the hole cut by the clip and gain of the source with a matte color.
    - **KEY INVERT** — Select this button to invert the key polarity of the hole cut by the clip and gain of the source.
    - **MASK** — Select this button to activate the mask feature and mask out a rectangular part of the source video.
    - **Border Effects** — Select these effects to add borders, shadows and outlines to your key.
  7. Perform a **CUT**, **AUTO TRANS**, or move the fader from one limit to the other to take your **Self Key** on-air.

This completes the procedure to perform a Self Key in Key 1.

## Performing an Auto Select Key

An **Auto Select** (or “linear”) **Key** is one in which two signals are used to cut and fill the hole — a key (alpha) signal and a fill (video) signal. These signals originate from devices such as character generators, still stores, DVEs, and graphics systems.

Use the following procedure to perform an Auto Select Key in Key 2:

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **KEY2** in the **Transition Control Group** to preview the key. This step will also serve to assign the Key bus and the **Effects Keyer Group** to **Key 2**.
3. Select a key source on the **Key 2** bus.
4. Press **AUTO SELECT** in the **Effects Keyers Group**.



### Operating Tip

If you are setting up an **Auto Select Key** in the **Effects Keyer Group**, you can adjust the **Clip** and **Gain** as needed. In the **Downstream Keyer Group** you will have to toggle the **KEY MEM** button **Off** before you will be able to adjust the **Clip** and **Gain** as needed.

5. Select any additional key modifiers you want to use. You can select between the following:
  - **MATTE FILL** — Select this button to fill the hole cut by the clip and gain of the source with a matte color.
  - **KEY INVERT** — Select this button to invert the key polarity of the hole cut by the clip and gain of the source.
  - **MASK** — Select this button to activate the mask feature and mask out a rectangular part of the source video.
  - **Border Effects** — Select these effects to add borders, shadows and outlines to your key.
6. Perform a **CUT**, **AUTO TRANS**, or move the fader from one limit to the other to take your **Auto Select Key** on-air.

This completes the procedure for performing an Auto Select Key in Key 2.

## Storing New Clip and Gain Settings

If the **KEY MEM** button is off, you can adjust the clip and gain settings of the key on a temporary basis. In this mode, if you want to permanently store the new clip and gain settings, use the following procedure. This procedure re-locks the clip and gain values, and stores the new settings in memory.



### Important

There is no undo function. If you re-store clip and gain, you cannot recall previous values unless you recall settings from memory. Refer to the section “**Storing Memory Registers**” on page 8-3 for information.

1. Ensure that the **KEY MEM** button is toggled **Off**.
2. Adjust clip and gain for the desired appearance.
3. Press and hold the **AUTO SELECT** button.
4. Press **KEY MEM**.
5. Release both buttons.

## Performing a Chroma Key

A **Chroma Key** is one in which the hole is cut based on a color value (hue), rather than on a luminance value or an alpha signal. The color is electronically removed and replaced with background video from another image. You can Chroma Key on *any source* selected on the **Key Bus**.

Use the following procedure to perform a Chroma Key in Key 1:

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **KEY1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyers Group** to **Key 1**.
3. Select the key source on the **Key 1 Bus**.
4. Press **CHROMA KEY** in the **Effects Keyers Group**. This action causes the following to occur:
  - The auto chroma key function is activated and crosshairs appear on the preview output.
  - The switcher presets a transition to the source selected on the key bus. If a key is on but its “next transition” button is not lit, the switcher automatically illuminates the button for you.
5. Use the positioner to place the crosshairs on top of the color you want to key out.
  - You will notice that the right-most four-character mode display in the **System Control Group** reveals the text “**Grab**”.
6. Press the associated **SEL** button.
7. Adjust the clip, gain, and hue as follows:
  - Use the **CLIP** knob in the **Effects Keyers Group** to adjust the clip threshold. The lower the threshold setting, the more key is visible.
  - Use the **GAIN** knob in the **Effects Keyers Group** to adjust the softness of the edges of the key.
  - Use the **HUE/TRANSP** knob in the **Effects Keyers Group** to select the color (hue) that you want to remove.
8. Adjust the Chroma suppression and rejection as follows:
  - Press and hold **CHROMA KEY** and rotate the **SAT** knob in the **Mattes Group** to adjust chroma suppression.
  - Press and hold **CHROMA KEY** and rotate the **HUE** knob in the **Mattes Group** to adjust the chroma rejection (hue selectivity).

Refer to the section “**Chroma Key Tips**” on page 7-13 for a basic sequence of steps for clipping Chroma Keys.



### Note

If there are flaws and blemishes in the Chroma Key set's background, they will appear as shadows. Normally, a superb set with careful lighting is required for natural Chroma Key shadows. Refer to the section “**Chroma Key Lighting Tips**” on page 7-14 for tips on lighting Chroma Key sets.

9. Select any additional key modifiers you want to use. You can select between the following:



- **MATTE FILL** — Select this button to fill the hole cut by the clip and gain of the source with a matte color.
  - **KEY INVERT** — Select this button to invert the key polarity of the hole cut by the clip and gain of the source.
  - **MASK** — Select this button to activate the mask feature and mask out a rectangular part of the source video.
10. Perform a **CUT, AUTO TRANS**, or move the fader from one limit to the other to take your **Chroma Key** on-air.

This completes the procedure for performing a Chroma Key in Key 1. The same procedure is applied to performing a Chroma Key in Key 2.

### **Chroma Key Tips**

Adjusting a Chroma Key is an iterative process. To achieve the best looking key, you must adjust a set of parameters and then *return* to those parameters for subsequent adjustment — after other values have been set.

Use the following procedure to modify your Chroma Key in Key 1:

1. Press **CHROMA KEY**.
2. Press **KEY1** in the **Transition Control Group**.
3. Select a Key source on the **Key 1 Bus**.
4. Ensure **KEY INVERT** is turned off.
5. Turn **GAIN** to zero by rotating the **GAIN** knob all the way to the right (clockwise), and then all the way to the left (counter clockwise).
6. Set the **CLIP** very low to a point where you see a prominent change on screen, even if only *portions* of the background are clipped out — and even if those portions are the incorrect color.
7. Rotate the **HUE/TRANSP** knob until you begin to see the proper color *key out* (typically blue or green).
  - Note that position and continue turning until you move *beyond* that hue to another color.
  - Rotate the **HUE/TRANSP** knob back and position the knob in the *center* of this range — finding the spot where the maximum amount of the proper color is keyed out.



#### **Operating Tip**

Select **MATTE FILL** and fill the key with white. This will make clip and gain setup errors visible.

8. Re-adjust **CLIP** to the maximum value possible — without bringing in shadows and other defects in the chroma key set.
9. Adjust **GAIN** to the maximum value possible — without making the key transparent and without bringing in the background. Getting the highest possible gain is essential for obtaining clean, smooth edges.



#### **Operating Tip**

If you cannot get the edges smooth without bringing in the background, try reducing the clip slightly — and then increasing the gain slightly.

10. Turn off **MATTE FILL** if you turned it on, and select the desired background for your key on the **Preset** bus.
11. Perform a **CUT, AUTO TRANS**, or move the fader from one limit to the other to take your **Chroma Key** on-air.

This completes the procedure to modify a Chroma Key in Key 1. The same procedure is applied to modifying a Chroma Key in Key 2.

## **Chroma Key Memory**

Unlike Self keys, Chroma keys do not retain the clip and gain values with each crosspoint. Instead, there is only one set of values associated with the entire switcher at a given time. Therefore, each time you change the source of the Chroma Key, you will have to re-clip the key as outlined above.

## **Chroma Key Lighting Tips**

Achieving a good, clean chroma key is often considered one of the most challenging exercises in a studio. There are several elements that contribute to an effective chroma key including, lighting, distance of the talent from the background, type of background used, and the type of camera used. However, lighting is often considered the most important. Here are a few lighting hints which you may find helpful when setting up your chroma key.

### **Lighting the Background**

- There are several different kinds of lights typically used to light chroma key backgrounds. The most common are, cyclorama lights, soft lights, scoops, florescent lights, HMIs, and umbrella lights.  
  
For the most part, the one thing that they all have in common is the fact that they are “fill” type lights, as opposed to “key” lights. These lights provide an even, diffused, flat light, which is critical in lighting chroma key backgrounds.
- For best results, lights are usually hung in an even pattern from a grid above the background but space requirements may dictate the lights be positioned on stands beside the background. If side lighting is used, ensure the lights are positioned at equal distances from the background being lit, in order to achieve balance.
- The number of lights used to light a background is directly related to the size of the background surface. Therefore, a larger, longer surface requires more lights than a smaller one. But whatever size of surface you are lighting, the most important point to remember is the background should be lit as evenly as possible to avoid “hot spots” in the chroma key.
- When lighting the background, experienced lighting directors will first of all eyeball the background for hot spots, adjusting and readjusting the lights, but then check their work using either a waveform monitor or a photographer’s light meter. Waveform monitors are most useful since they display a graphical representation of the video level and any small variation in light level is immediately apparent. On the other hand, a light meter in the hands of an experienced professional can achieve the same results.
- Generally speaking, the best chroma key results are achieved with an even level of light on the background in the area of 60 – 75 IRE on a waveform monitor. However, conditions specific to your application may dictate a value outside of that range.
- If you only have access to key type lights, you can simulate the effect of fill lights by bouncing a key light off of a reflector and then on to the chroma key background.

Alternatively, you can use diffused glass, gels, or scrims to soften the light from a key light. If you use any of these methods it's important to note that you will lose a significant amount of the original light intensity. Therefore, it takes more lights to reach the optimum IRE level required for a good chroma key.

### ***Lighting the Foreground (Talent)***

- You can maximize the quality of your chroma key if you separate the foreground (talent) from the background by 6 – 8 feet. This enables you to light the foreground and the background separately, thus reducing or avoiding “spill” and/or shadows.

Separation also allows you more flexibility in how you light your talent. You may still choose to use a flat lighting technique, but with separation, the option exists to light your talent using a more dramatic 3-light, “Rembrandt style of lighting”, typically used in other lighting applications. This style is characterized by 3 lights – a key, a fill, and a back light.

- If spill does occur between the background and the foreground, a blue “halo” or “matte line” appears around the talent’s shoulders and hair. This can be reduced or eliminated by using a yellow, straw, or amber colored light for the talent’s back light. It will wash out or neutralize the blue reflection from the background on the back of the talent. (Note: this technique is not applicable to Ultimatte, as Ultimatte has circuitry designed to remove blue spill.)
- As a general rule, it is good practice to light the foreground and the background to approximately the same IRE levels but this is often varied when dramatic lighting effects are required for the talent.
- And finally, be careful not to mix lights with different color temperatures on the same set (either foreground or background). The human eye and brain are able to deal with the subtle differences in color temperatures but cameras aren’t nearly that smart. If you must use lights with different color temperatures, make sure you use colored gels to compensate for the differences. Otherwise, you may experience holes in your chroma key that will be very difficult to remove.

### ***Additional Chroma Key Tips and Considerations***

Along with lighting, there are a number of other studio elements that should be taken into account when setting up your chroma keys. They include, the background material itself, the camera and its setup, keying from a prerecorded signal on VTR, and using compressed video sources.

- Green and blue are the two most common colors used for chroma keying backgrounds and are equally effective. Blue was initially chosen because it is the complimentary color to flesh tone and, therefore, the easiest to key out (we don’t want to key out the faces, do we ...). Given today’s technology, almost any color can be used but blue and green are still the most widely used.
- There are a number of different materials commonly used as chroma key backgrounds and each has its benefits. The most common are paper, fabric, and paint. Paper is not as durable but can be more cost effective and more easily set up than the other two. Paint takes time and must be applied in several coats to ensure a deep, complete covering, while fabric also takes time and must be mounted and hung properly. Contact your television set and lighting distributor for details on the material that best meets your budget and application.
- If you are creating your chroma key on a studio set, it is generally accepted that the quality of your chroma key is directly related to the quality of the camera shooting the scene. The background video can come from any number of sources and may be quite

acceptable but the foreground video is what is being keyed and where your attention is most focused. Therefore, the camera must be as high a resolution and low in noise as your budget will allow. In the end, low cost cameras may never produce “acceptable” chroma key results no matter how well the lighting has been configured.

- Always use the SDI or component output of your camera as your chroma key source. Composite outputs are considered monitoring, not broadcast, outputs and lack sufficient color and luminance information to achieve an acceptable chroma key.
- As well, *never* shoot a chroma key with the detail turned on in your camera. Detail adds noise to the video signal and makes it much more difficult for the chroma key circuits to process the video. Turning on the camera detail is not the solution to a low light level – more lights are!
- And finally, a few other points for your consideration. Avoid using foreground chroma key sources from 4:1:1 formats, highly compressed material (more than 4 to 1), or composite analog recordings. The technical nature of their formats and storage algorithms defeat the chroma key circuits and will seldom deliver acceptable results.

## Performing a Preset Pattern Key

A **Preset Pattern** key is one in which the hole is cut based on a wipe pattern that you select in the **Effects Control Group**. The pattern (which acts just like the alpha signal used with an *auto select* key) is filled with video from the **Key Bus**.



### Important

If you perform a Preset Pattern key on Effects Keyer 2, the pattern generator is restricted to all the classic wipe patterns (minus the circle).



### Note

This section of the *Synergy 100 Operation Guide* explains Preset Pattern keys *without* the flying key mode enabled. For instructions on the flying key mode, refer to the section “**Performing Squeeze & Tease Boxes**” on page 7-17 or the *Squeeze & Tease 3D/WARP Owner’s Guide*, as required.

Use the following procedure to perform a Preset Pattern Key in Key 1:

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **KEY1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyers Group** to **Key 1**.
3. Select the key source on the **Key 1 Bus**.
4. Press **PST PATT** in the **Effects Keyers Group**.
5. Select the desired wipe pattern in the **Effects Control Group**.



### Operating Tip

You can adjust the Clip and Gain as needed by using the **CLIP** and **GAIN** knobs in the **Effects Keyer Group**. You can also adjust the size and location of the pattern using the Positioner.

6. Press the **FLY KEY** button to turn it off.
7. Press **KEY1** in the **Transition Control Group** to preview the Key.

- Adjust wipe parameters such as **ASPECT** and **BORDER** in the **Effects Control Group**.



### Operating Tip

The **SOFT** knob has the same function as **GAIN** in the **Effects Keyer Group**.

- Select any additional key modifiers you want to use. You can select between the following:
  - MATTE FILL** — You *cannot* Matte Fill a **Preset Pattern Key**.
  - KEY INVERT** — Select this button to invert the polarity of the key.
  - MASK** — Select this button to activate the mask feature and mask out a rectangular part of the source video (both alpha and fill).
- Perform a **CUT**, **AUTO TRANS**, or move the fader from one limit to the other to take your **Preset Pattern Key** on-air.

This completes the procedure for performing a Preset Pattern Key in Key 1. The same procedure is applied to performing a Preset Pattern Key in Key 2.

## Performing Squeeze & Tease Boxes

The **flying PST PATT Key** (also known as a **Squeeze & Tease Box**) function allows you to apply a 2-D box effect to the **PST PATT Key** type, with the ability to control the size, horizontal position, and vertical position of the Key.

The information in this section is applicable when using the **Squeeze & Tease 2D** card. If you have the **Squeeze & Tease WARP** option installed, please refer to the *Squeeze & Tease 3D/WARP Owner's Guide*.

Use the following procedure to perform a Squeeze & Tease Box Key in Key 1:

- Ensure that the **Squeeze & Tease 2D Option** is installed. Refer to the section “**Options Menu**” on page 3-7 for instructions on how to verify the status of your installed hardware options.
- Select a background source on the **PGM** bus. This provides the background over which the key will appear.
- Press the **KEY1** in the **Transition Control Group** to preview the key.
- Select a key source on the **Key 1 Bus**.
- Press **PST PATT** in the **Effects Keyers Group**. This action automatically turns on the **FLY KEY** button and assigns the **Effects Control Group** to the key.



### Note

**Preset Pattern** modifiers (for example, clip, gain, soft) do not affect a Squeeze & Tease Box.

- Adjust the size, and position of the key as follows:
  - Size** — Twist the Z-axis of the positioner to adjust the size of the key.
  - Position** — Move the positioner **Up/Down** or **Left/Right** to change the position of the key on screen.



### Operating Tip

For additional information about using the **Positioner** of the Synergy Switcher, refer to the section “**Positioner**” on page 7-29.

7. Press the **MASK** button to activate the cropping feature. Crop the key as follows:
  - Moving the Positioner *up* and *down* will crop the image from the top edge.
  - Moving the Positioner *left* and *right* will crop the image from the left edge.
8. Press the **REV/LEARN** button in conjunction with the **MASK** button for additional cropping capabilities.
  - Moving the Positioner *up* and *down* will crop the image from the bottom edge.
  - Moving the Positioner *left* and *right* will crop the image from the right edge.



### Important

As you crop the right edge, the right edge moves towards the left. However, as you crop the left edge, the right edge *once again* appears to move towards the left. This occurs because all fly key manipulations are registered (locked) to the upper left edge of the image. This feature gives you a constant and accurate frame of reference when manipulating fly key images.

9. Press the **MASK** button to turn off the cropping feature and assign the **Effects Control Group** *back* to the **FLY KEY** button.
10. Adjust the border on the key as follows:
  - Use the **BORDER** knob to adjust the size of the border on the key.
  - Use the **SOFT** knob to adjust the softness of the border on the key.
11. Adjust the color of the **Squeeze & Tease** box border as follows:
  - Press **PST PATT** in the **Effects Keyer Group** to assign control of the **Mattes Group**, as indicated by **S&T1** or **S&T2** appearing in the **Mattes Group** display.



### Note

If a **Squeeze & Tease** box is enabled, pressing **SELF KEY, AUTO SELECT**, or **CHROMA KEY** automatically turns the **Squeeze & Tease** mode off and changes to the selected keying mode.

- Make your color selections, as desired.
12. Press the **ASPECT** button and rotate the associated knob to change the aspect ratio of the key.



### Operating Tip

If you wish to default all of the **Squeeze & Tease** modifiers, simply press the **CNTR/EFF D** button in the **Effects Control Group**. The **Squeeze & Tease** box keys clear to the upper left corner.

13. Perform a **CUT, AUTO TRANS**, or move the fader from one limit to the other to take your **Squeeze & Tease Box Key** on-air.

This completes the procedure for performing a Squeeze & Tease Box Key in Key 1.

## Split Keys

A **Split Key** is one in which you assign a different *fill source* for a key. This is a key source that is different than the *default* key/fill associations that are set up during installation and different from those that are set up *automatically* for the various key types. Split keys are typically used for creative montages and for keying moving video *inside* key shapes.

There are two different split key functions:

- **Split Key** — A Split Key allows you to hold (retain) the alpha signal of the key and assign a new video source to fill the hole. A typical application is when you fill your character generator alpha signal with the live output from a VTR or camera.
- **Split Video** — A Split Video allows you to hold a (non-alpha) key cutter and select a new video source to fill the hole. A typical application is when you fill your title camera's luminance key signal with the live output from a VTR.

In both cases, a new *fill source* is assigned while the hole cutter is *held*. The following methods allow you to perform split keys *quickly*— without having to return to the **Inputs Menu** and change your key/fill associations..



### Important

When a flying **SELF KEY** is Split, the flying is turned off. If you press **SELF KEY** on a **Split Key** a message stating: “You cannot fly a Split Self Key.” will be displayed on the preview monitor.

## Performing a Split Key

The **Split Key** function allows you to hold the alpha signal of a key and assign a new video source to fill the hole. A split key can be formed in both of the Effects Keyers, and the DSK.

Use the following procedure to perform a split key in Key 1:

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **Key1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyer Group** to **Key 1**.
3. Select a key source on the **Key 1** bus.
4. Press **AUTO SELECT** in the **Effects Keyers Group**.
5. Press and *hold* **AUTO SELECT**.
6. Select the new fill source on the **Key 1** bus.
7. Release both buttons.



### Operating Tip

Both buttons will now be lit on the **Key 1** bus. The selected key alpha video source will still be lit, and the new split fill video signal will be flashing.

8. Adjust the Clip and Gain of the key as needed. Refer to the section “**Performing an Auto Select Key**” on page 7-11 for instructions.



### Note

The **Split Key** function is a *temporary* assignment. If, after setting up the split, you press *any button* on the **Key Bus**, the split is released and you must set up the split again. Pressing **AUTO SELECT** again *does not* re-establish the split.

This completes the procedure for performing a split key in Key 1. The same procedure is applied to performing a split key in Key 2.

## Performing a Split Video

The **Split Video** function allows you to hold a luminance key cutter and assign a new video source to fill the hole.

Use the following procedure to perform a split video in Key 1:

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **Key1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyer Group** to **Key 1**.
3. Select a key source on the **Key 1** bus.
4. Press **SELF KEY** in the **Effects Keyers Group**.
5. Press and *hold* the **SELF KEY** button.
6. Select the new fill source on the **Key 1** bus.
7. Release both buttons.



### Operating Tip

Both buttons will now be lit on the **Key 1** bus. The selected key alpha video source will still be lit, and the new split fill video source will be flashing.

8. Adjust the Clip and Gain of the key as needed. Refer to the section “**Performing a Self Key**” on page 7-10 for more information.



### Note

The **Split Key** function is a *temporary* assignment. If, after setting up the split, you press *any button* on the **Key Bus**, the split is released and you must set up the split again. Pressing **SELF KEY** again *does not* re-establish the split.

This completes the procedure for performing a split video in Key 1. The same procedure is applied to performing a split video in Key 2.

## Programming a Favorite CG

This procedure allows you to select a “favorite” CG that you can place on the **CHAR GEN1** or **CHAR GEN2** buttons in the **Downstream Keyer Group**. The feature is designed so that you can quickly select a “clean” CG in the **Auto Select** mode, with no key modifiers enabled.

Use the following procedure to program the **CHAR GEN1** button:

1. Press and *hold* **CHAR GEN1** in the **Downstream Keyer Group**.



### Note

If you have a simple or complex key type already set up, when you press **CHAR GEN1** or **CHAR GEN2**, the entire Keyer is cleared. In addition to the favorite CG, the system will automatically select **AUTO SELECT** and **KEY MEM** (provided the Auto Select Key with the appropriate Key Memory values has been set up in the installation).



2. Select the favorite CG source on the **Key Bus**.
3. Release both buttons.

This completes the procedure for assigning a source to the **CHAR GEN1** button. The same procedure is applied to assigning a video source to the **CHAR GEN2** button. The selected CG will be stored in memory and will be recalled each time **CHAR GEN1** is pressed.

## Using Auto Transitions

The **AUTO TRANS** button in the **Transition Control Group** is used to start an automatic (smooth) transition that brings the selected key on or off-air. Refer to the section “**Auto Transitions**” on page 5-6 for more information on performing an Auto Transition.

- Two *different* auto-transition rates can be used to dissolve or wipe a key:
  - ~ **Auto Rate** — If the **AUTO TRANS** button in the **Transition Control Group** is used in conjunction with the “next transition” buttons, the rate is controlled by the **AUTO** rate in the **System Control Group**.
  - ~ **DSK Rate** — If the **DSK DISS** button in the **Transition Control Group** is used, that rate is controlled by the **DSK** rate in the **System Control Group**.

Each auto transition button has its own unique rate. This important feature allows you to perform background transitions and downstream key transitions at different rates.

For example, with an **AUTO** rate of 20 frames and a DSK rate of 15 frames, you could fade in a key at 20 frames (using the **AUTO TRANS** button in the **Transition Control Group**) and fade out the downstream key at 15 frames using the **DSK DISS** button in the **Transition Control Group**.

Refer to the section “**Changing Auto Transition Rates**” on page 5-6 for complete instructions on changing the Auto Transition rates.

### Key Auto Transition Notes

Please note the following important points regarding key auto transitions:

- There are two ways to quickly finish an Auto Transition that is already in progress:
  - ~ Press **CUT** during the transition immediately.
  - ~ Move the **Fader** from one limit to the other.



#### Important

Once you move the **Fader** off-limit, the transition will stop. If you continue to move the Fader until the **AUTO TRANS** button goes out, the transition control has been passed to the Fader. If you move the Fader back to the original limit, you can continue the transition by pressing the **AUTO TRANS** button again or by pressing the **CUT** button.

- You *cannot* perform an Auto Transition if the **Fader** is off its upper or lower limit.
- The **DSK** can only be transitioned using the **DSK DISS** or **DSK CUT** buttons. The position of the Fader or the next transition selections does not affect a Downstream Keyer transition.
- Wipes can only be performed on the **Effects Keyer** transition or **Background** transitions.

## ***Key Cut Notes***

Downstream Key transitions using the **DSK CUT** button in the **Transition Control Group** can be performed when the fader is off its upper or lower limit. This is due to the Downstream Key Transition buttons being totally independent of the rest of the **Transition Control Group**. Therefore, the position of the fader has no bearing at all on the DSK transition.

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## Using Key Modifiers

This section provides basic instructions for using key modifiers. The following topics are discussed:

- Filling a Key with Matte
- Masking Keys
- Inverting Keys
- Bordering Keys
- Flying Keys

### Filling a Key with Matte

Use the following procedure to fill a key with matte color in Key 1:



#### Note

You cannot apply **MATTE FILL** to a **PST PATT** key. **Matte Fill** can be applied to all other key types.

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **Key1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyers Group** to **Key 1**.
3. Select a key source on the **Key 1** bus.
4. Select either **SELF KEY**, **AUTO SELECT**, or **CHROMA KEY** in the **Effects Keyers Group**.
5. Press **MATTE FILL** in the **Effects Keyers Group**. The key fill will now be replaced with the current color from the matte generator.
6. Adjust the color of the matte as follows:
  - **HUE** — Use the **HUE** knob in the **Mattes Group** to adjust the color of the matte generator.
  - **SAT** — Use the **SAT** knob in the **Mattes Group** to adjust the color saturation. The color saturation can be adjusted from monochrome, or no saturation, to full color saturation.
  - **LUM** — Use the **LUM** knob in the **Mattes Group** to adjust the luminance of the color. The luminance can be adjusted from minimum brightness to maximum brightness.



#### Operating Tip

Refer to the section “**Mattes Group**” on page 6-16 for more detailed color instructions.

7. Add additional key modifiers as required.
8. Perform a **CUT**, **AUTO TRANS**, or move the fader from one limit to the other to take your key on-air.

This concludes the procedure for filling a key with matte color in Key 1.

## Masking Keys

Use the following procedure to mask a key in Key 1:



### Note

You cannot mask a **PST PTT** key or a Squeeze & Tease box key. A **mask** can be applied to all other key types.

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **Key1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyers Group** to **Key 1**.
3. Select a key source on the **Key 1** bus.
4. Select either **SELF KEY**, **AUTO SELECT**, or **CHROMA KEY** in the **Effects Keyers Group**.
5. Press **MASK** in the **Effects Keyers Group**. The current settings of the mask generator will be applied to the key.
6. Adjust the size, position, and aspect of the mask as follows:



### Operating Tip

You can return the mask to its default size, position, and aspect by pressing the **CNTR/EFF D** in the **Effects Keyers Group**.

- **Size** — Twist the positioner to increase or decrease the size of the mask.
  - **Position** — Move the positioner **Up/Down** or **Left/Right** to place the mask where you want it.
  - **Aspect** — Use the **ASPECT** knob in the **Effects Keyers Group** to adjust the aspect ratio of the mask.
7. Invert the mask as follows:
    - Press the **REV** button in the **Effects Keyers Group** to invert the mask.
  8. Add additional key modifiers as required.
  9. Perform a **CUT**, **AUTO TRANS**, or move the fader from one limit to the other to take your key on-air.

This concludes the procedure to mask a key in Key 1.

## Inverting Keys

Use the following procedure to invert a key in Key 1:



### Note

You cannot invert Squeeze & Tease boxes. Invert can be applied to all other key types.

1. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
2. Press **Key1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyers Group** to **Key 1**.
3. Select a key source on the **Key 1** bus.

4. Select either **SELF KEY**, **AUTO SELECT**, **CHROMA KEY**, or **PST PATT** in the **Effects Keyers Group**.
5. Press **KEY INVERT** in the **Effects Keyers Group**. The polarity of the selected key is now reversed.
6. Adjust the Clip and Gain of the key as follows:
  - Use the **CLIP** knob in the **Effects Keyers Group** to adjust the luminance of the key. The lower the threshold setting, the more the key is visible.
  - Use the **GAIN** knob in the **Effects Keyers Group** to adjust the softness of the edges of the key.
7. Add additional key modifiers as required.
8. Perform a **CUT**, **AUTO TRANS**, or move the fader from one limit to the other to take your key on-air.

This concludes the procedure to invert a key in Key 1.

## Bordering Keys

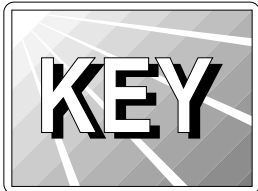


### Note

The border defaults to **DSK**.

The **Key Border** function allows you to place borders, shadows, and outlines around keys in any one of the keyers. The **Border Generator** option must be installed. The border buttons will not illuminate if the option is not installed.

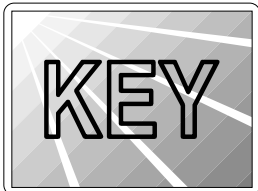
The following figures display examples of the three types of borders that can be created by the **Border Generator**:



- Press **BORD** to add a border behind the selected key type. The border can *surround* the key or it can appear as a detached shadow that can be offset to any distance and direction. Border width, softness, color, and transparency are all adjustable.



- Press **SHDW** to add a drop shadow behind the selected key type. The shadow is *connected* to the key signal, instead of being detached. Shadow width, softness, color, and transparency are all adjustable.



- Press **OUTL** to add an outline around the selected key type, with variable width, softness, color, and transparency. With **OUTL** selected, the key fill is completely transparent.

## Assigning a Border to a Key



### Note

You can *only* assign a border to *one* key (**Key 1**, **Key 2**, or **DSK**) at a time.

Use the following procedure to assign and modify a border to a key in Key 1:

1. Ensure that the **Floating Border Generator** option is installed. Refer to the section “**Options Menu**” on page 3-7 for instructions on verifying the status of your installed hardware options.
2. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
3. Press **Key1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyers Group** to **Key 1**.
4. Select a key source on the **Key 1** bus.
5. Select either **SELF KEY**, **AUTO SELECT**, or **CHROMA KEY** in the **Effects Keyers Group**.
6. Assign a border generator to the key as follows:
  - Press and *hold* the currently selected key type button.
  - Select a border type while continuing to press the selected key type button. You can choose from the following:
    - ~ **BORD** — Double press this button to add a border behind the selected key type.
    - ~ **SHDW** — Double press this button to add a drop shadow behind the selected key type.
    - ~ **OUTL** — Double press this button to add an outline around the selected key type, with variable width, softness, color, and transparency.



### Note

When **BORD**, **SHDW**, or **OUTL** is selected, **DSK** is automatically selected in the **Mattes Group**. Refer to the section “**Bordering Keys**” on page 7-25 for more information on the three types of borders.

7. Adjust the size, position, glow, and transparency of the border as follows:



### Note

Press **CNTR/EFF D** in the **Effects Control Group** to reset the vertical and horizontal positioning parameters of the border to their default values.

- **Size** — Twist the positioner to adjust the border width.
- **Position** — Move the positioner **Up/Down** or **Left/Right** to adjust the border position.
- **Glow** — Use the **SOFT** knob in the **Effects Control Group** to adjust the glow applied to the border.
- **Transparency** — Use the **BORDER** knob in the **Effects Control Group** to adjust the transparency applied to the border.



### Operating Tip

To create the widest possible border, set both the positioner and **SOFT** controls to their maximum settings.

8. Adjust the color of the border as follows:
  - **HUE** — Use the **HUE** knob in the **Mattes Group** to adjust the color of the border generator.
  - **SAT** — Use the **SAT** knob in the **Mattes Group** to adjust the color saturation. The color saturation can be adjusted from monochrome, or no saturation, to full color saturation.
  - **LUM** — Use the **LUM** knob in the **Mattes Group** to adjust the luminance of the color. The luminance can be adjusted from minimum brightness to maximum brightness.
9. Perform a **CUT, AUTO TRANS**, or move the fader from one limit to the other to take your key on-air.

This concludes the procedure to assign and modify a border to a key in Key 1. This procedure applies to assigning a border to a key in Key 2.

## Flying Keys

The **Fly Key** function allows you to apply 2D effects to any key type, with the ability to control the size, rotation, horizontal position and vertical position of the key.



### Note

All key types can be flown, but applying the fly key function to a Preset Pattern key creates a Squeeze & Tease Box. Refer to the section “**Performing Squeeze & Tease Boxes**” on page 7-17.

For information on using 3D DVE effects, refer to the *Squeeze & Tease 3D/WARP Owner’s Guide*.

Use the following procedure to fly a key in Key 1:

1. Ensure that the **Squeeze & Tease 2D Option** or **Squeeze & Tease WARP Option** is installed. The **FLY KEY** button will not illuminate if the option is not installed.  
Refer to the section “**Options Menu**” on page 3-7, for instructions on how to verify the status of your installed hardware options.
2. Select a background source on the **PGM** bus. This provides the background over which the key will appear.
3. Press **Key1** in the **Transition Control Group** to preview the key. This step will also serve to assign the **Key** bus and **Effects Keyers Group** to **Key 1**.
4. Select a key source on the **Key 1** bus.
5. Select either **SELF KEY, AUTO SELECT**, or **CHROMA KEY** in the **Effects Keyers Group**.
6. Press **FLY KEY** in the **Effects Control Group**. The key is now re-routed through the *internal* DVE, and you can now adjust its size and position.
7. Adjust the Clip and Gain of the key as follows:
  - Use the **CLIP** knob in the **Effects Keyers Group** to adjust the luminance of the key. The lower the threshold setting, the more the key is visible.
  - Use the **GAIN** knob in the **Effects Keyers Group** to adjust the softness of the edges of the key.

- Adjust the size, position and aspect of the key as follows:

**Note**

Press the **CNTR/EFF D** button in the **Effects Control Group** to clear the aspect ratio, size, and position back to default values.

- Size** — Twist the positioner *clockwise* and *counter-clockwise* to increase or decrease the size of the key.
  - Position** — Move the positioner **Up/Down** or **Left/Right** to control the position of the key on screen.
  - Aspect** — Press the **ASPECT** button in the **Effects Control Group** and use the **ASPECT** knob to adjust the aspect ratio of the key.
- Add additional key modifiers as required.

This concludes the procedure to fly a key in Key 1.

### ***Fly Key Notes***

Note the following important points regarding the **Fly Key** function:

- You can only fly *one* **AUTO SELECT** key at a time. If one Keyer is already flying an **AUTO SELECT** key, you cannot enable the **FLY KEY** button in the other Keyer.
- You can fly *any combination* of **Preset Pattern Keys (Squeeze & Tease Boxes)**, **CHROMA KEYS** or **SELF KEYS** – one in Keyer 1 and the other in Keyer 2. You can fly any two 3D Preset Pattern Keys in Keyer 1.
- When a flying **SELF KEY** that is **Split**, the flying is turned off.
- If a key is processed using **Fly Key** but its *size* is not reduced, the image can be repositioned without *any picture degradation*.
- You can program a flying Key to *move* from position to position, using an effects dissolve. Refer to the section “**Effects Dissolve**” on page 8-7 for details.
- If you are flying *both Effects keys* and you need to adjust the one that is *not currently active*, simply press the **KEY2** button to select the alternate Keyer, and then the Key type button to activate its “fly key” functionality.

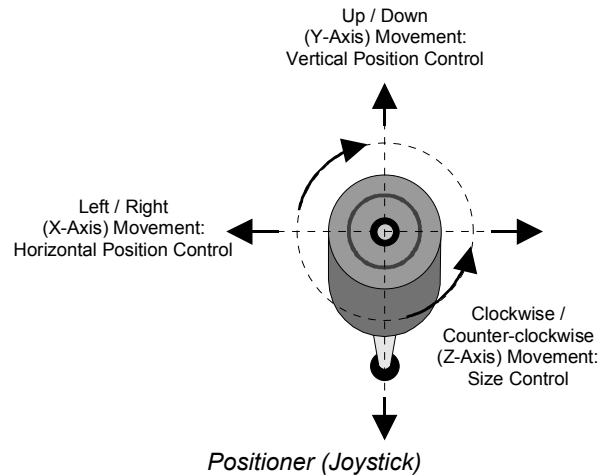


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## Positioner

The **Positioner** is an *assignable* module that allows you to manipulate the size and position of wipe patterns, flying keys, borders, mask and crop edges, **PST PATT** keys, and **Squeeze & Tease** box keys — depending upon the selected mode.

The control of the 3-axis **Positioner** (also known as a *joystick*) is illustrated below:



- Moving the **Positioner** *left* and *right* controls the horizontal position of the wipe pattern, flying keys, mask, **Squeeze & Tease** box or border. It also controls the left and right edges of the **Squeeze & Tease** box in cropping mode and the horizontal rotation of a flown key when the **Squeeze & Tease WARP** option is installed.
- Moving the **Positioner** *up* and *down* controls the vertical position of the wipe pattern, flying keys, mask, **Squeeze & Tease** box or border. It also controls the upper and lower edges of the **Squeeze & Tease** box in cropping mode and the vertical rotation of a flown key when the **Squeeze & Tease WARP** option is installed.
- Twisting the **Positioner** clockwise and counter-clockwise controls the size of the wipe pattern, flying keys, mask, **Squeeze & Tease** box, and border. It also provides a means of rotating the vertical and horizontal wipes when the **ROTATE** button is active and the planar (or Z-axis) rotation of a flown key when the **Squeeze & Tease WARP** option is installed.



# Memory Functions and More

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## In This Chapter

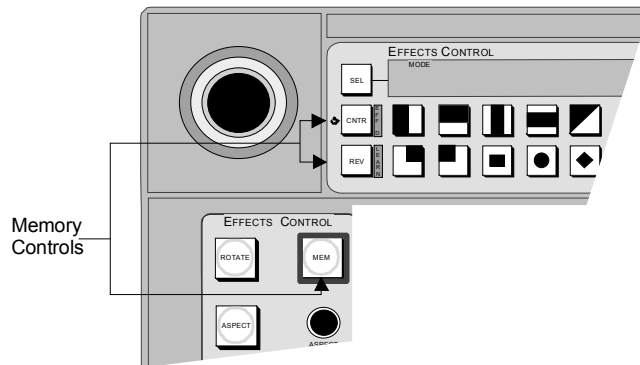
This chapter provides instructions for using your switcher's **Memory System**, plus additional features such as **Effects Functions** and **Aux Buses**. The following topics are discussed:

- Memory Functions
- Storing Memory Registers
- Recalling Memory Registers
- Effects Dissolve
- Copy and Swap Functions
- Synergy Slots

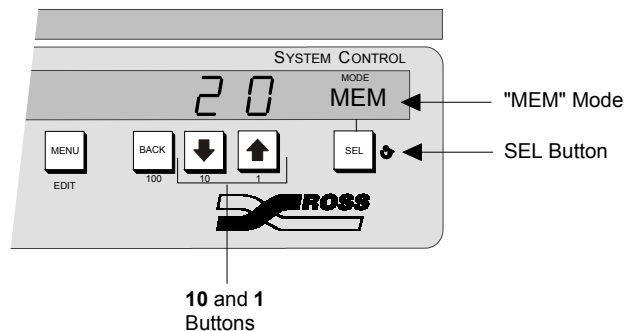
# Memory Functions

The Synergy memory system stores and recalls complete switcher set-ups including key source and fill information, wipe pattern selection, masking, transition rates, borders, key attributes, and color matte levels — all the control panel settings that comprise a typical built-up scene.

The memory controls consist of the **MEM** button, the **CNTR/EFF D** button, and the **REV/LEARN** button located in the **Effects Control** groups. These buttons are used in conjunction with the **System Control Group** and the **Effects Control** pattern buttons. Please refer to the following diagrams:



*MEM, CNTR/EFF D, and REV/LEARN Buttons*



*System Control Group*

A memory register is a “snapshot” of the switcher — and up to 100 registers, numbered 00 to 99, can be stored and recalled. The digit in the tens column represents the memory *bank* number. Ten banks of 10 registers each are provided, laid out in the following fashion:

- Bank 0 (registers 00 to 09)
- Bank 1 (registers 10 to 19)
- Bank 2 (registers 20 to 29) etc.

The digit in the ones column represents the memory register within the selected bank.

When the **MEM** button in the **Effects Control Group** is selected, the numbers 0 through 9 under the pattern buttons identify memory locations, not pattern numbers. With these buttons, you can store and recall 10 complete switcher set-ups directly. To access different memory banks, use the **10** (down arrow) button in the **System Control Group**. One bank is active at any given time.

# Storing Memory Registers

This section provides instructions for storing memory registers.

Remember that when you store a panel setup, you store *everything*, including all *underlying data*. For example, if you store a register that includes one or more keys, not only is the key data stored for the current on air keys, but data (e.g., clip and gain) is also stored for keys that are *not* currently on air.

There are two ways to store a scene - a **quick store**, and an **advanced store**. The only difference between the two is the ability to gain access to other than the currently selected memory bank. Both methods are discussed in this section.

## Quick Store

Use the following procedure to perform a *quick* store:

1. Set up the switcher to create some desired scene.

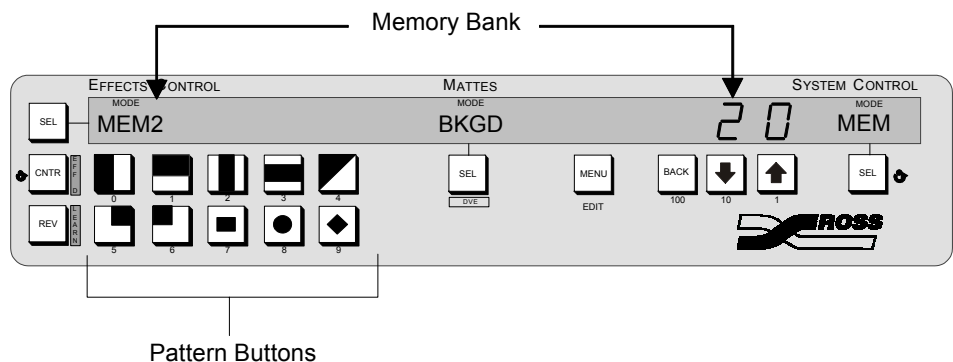


### Note

If you wish to use the **AutoRecall** feature, as detailed in Chapter 7 of the *Synergy 100 Installation Guide*, you must toggle on the **Effects Dissolve** button (**CNTR/EFF D**) prior to storing.

2. Press the **MEM** button to assign the **Effects Control** buttons and **System Control Group** controls to memory stores and recalls. The **MEM** button lights green.

Note the bank number in the tens column of the **System Control Group** display as you will need it to recall the correct memory. The memory *bank* is also displayed following the text **MEM** in the left-most four-character mode display of the **Effects Control Group**.



*Effects Control and System Control Groups*

3. Press the **REV/LEARN** button to enter memory store mode.
4. Press one of pattern buttons **0** through **9** (now being used as storage locations).

The switcher setup has been stored and the LED on the **REV/LEARN** button turns off.



### Note

A store operation can be canceled only if a memory location has not already been selected (by pressing a pattern button). Press **MEM** or **REV/LEARN** to abort the store operation.

This completes the procedure to perform a *quick* store.

## Advanced Store

Use the following procedure to perform an *advanced* store:

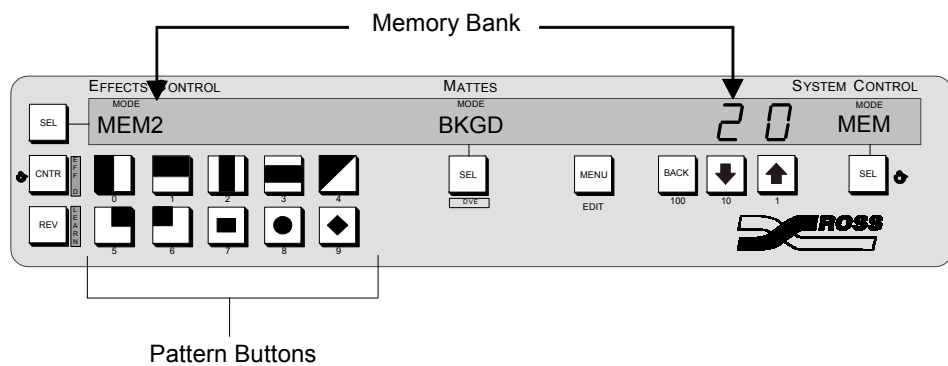
1. Set up the switcher to create some desired scene.



### Note

If you wish to use the **AutoRecall** feature, as detailed in Chapter 7 of the *Synergy 100 Installation Guide*, you must turn on the **Effects Dissolve** button (**CNTR/EFF D**) prior to storing.

2. Press the **MEM** button to assign the **Effects Control** buttons and **System Control Group** controls to memory stores and recalls. The **MEM** button lights green.
3. Press the **REV/LEARN** button to enter “store” mode.
4. Press the **10** (down arrow) button in the **System Control Group** to scroll to the desired bank.



*Effects Control and System Control Groups*

5. Press the **1** (up arrow) button to select the memory register.

If you prefer, after selecting the desired memory bank with the **10** button, you can simply press one of buttons 0 through 9 in the **Effects Control Group** to choose the register number. The switcher setup stores to memory and the **MEM** and **REV/LEARN** buttons automatically turn off.



### Important

The store operation can be aborted any time prior to pressing the **SEL** button.  
Storing a setup in a specific register overwrites any previous information that may have been contained in that register.  
A store operation cannot be undone.

6. Press **SEL** in the **System Control Group** to store the scene to memory.

This completes the procedure to perform an *advanced* store.

# Recalling Memory Registers

This section provides instructions for recalling memory registers.

There are two ways to recall a scene - a *quick* recall, and an *advanced* recall. The only difference between the two is the ability to gain access to other than the currently selected memory bank. Both methods are discussed in this section.

## Quick Recall

Use the following procedure to perform a *quick* recall:

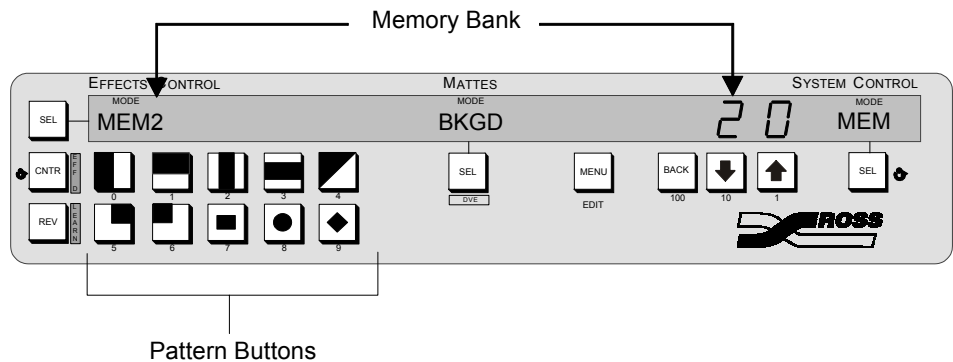
1. Press the **MEM** button. The button will illuminate green.
2. Press one of pattern buttons **0** through **9** (now being used as storage locations). The switcher setup is recalled.



### Note

If this memory was stored with the **Effects Dissolve** feature activated, and the **AutoRecall** option is set to **On**, (refer to Chapter 7 of the *Synergy 100 Installation Guide*), the **CNTR/EFF D** button will illuminate, and the current switcher setting will “slew” to the new recalled setting.

This method of recalling memories can only be done within a specific bank. If you need to change banks, you will need to perform an *advanced* recall.



Effects Control and System Control Groups

This completes the procedure to perform a *quick* recall.

## Advanced Recall

Use the following procedure to perform an *advanced* recall:



### Important

A recall operation cannot be undone.

1. Press the **MEM** button. The button will illuminate green.
2. Press the **10** button in the **System Control Group** to scroll to the desired bank.
3. Press the **1** button to scroll to the desired memory register.

4. Press **SEL** to recall the previously stored scene.

If you prefer, after selecting the desired memory bank with the **10** button, you can simply press one of buttons 0 through 9 in the **Effects Control Group** to choose the register number. The switcher setup is automatically recalled.



#### Note

If this memory was stored with the **Effects Dissolve** feature activated, and the **AutoRecall** option is set to **On**, (see Chapter 7 of the *Synergy 100 Installation Guide*), the **CNTR/EFF D** button will illuminate, and the current switcher setting will “slew” to the new recalled setting.

This completes the procedure to perform an *advanced* recall.

After a recall, the panel responds to the recalled values and not to the current position of the knobs. This may result in the control knob reaching its mechanical stop before the full value is reached. If this happens, it will be necessary to rotate the knob away from the mechanical stop to a point where some change is again observed. At this point, the knob is totally returned to operator control and it will respond in a normal fashion. This makes it possible to make adjustments on the program output without observing any jump as the control knob is re-synchronized.

## Recall Register Notes

Please note the following important points regarding memory register recalls:

- When a register is recalled that includes an off-limit **Fader**, the system brings the effect back as a *temporary* “wipe limit.” You can use the **AUTO TRANS** button in the normal way to complete the transition.
- It is possible to recall a memory while retaining a current video crosspoint. This is accomplished by holding down the crosspoint of the video that you want to keep, and then recalling the desired memory. This feature applies to both key buses and DSK bus, as well as the background and preset buses.
- It is possible to trigger a memory recall using a frame GPI input. Refer to the “**Setting Up Frame GPIs**” section in Chapter 8 of the *Synergy 100 Installation Guide* for details.



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## Effects Dissolve



### Note

The **Effects Dissolve** feature can be stored and automatically recalled with the memory. Refer to Chapter 7 of the *Synergy 100 Installation Guide* for details.

The **CNTR/EFF D** button in the **Effects Control Group** enables you to “slew” a switcher setup from its current setting to a new recalled setting. In DVE terms, an **Effects Dissolve** is a two-keyframe effect whereby the switcher interpolates between two different settings (a source effect and a destination effect) at a given rate. Please note:

- Only *analog* functions (such as border color, clip levels and pattern positions) slew between a current setting and a new recalled setting. However, when the **CNTR/EFF D** button is armed and the recall function is performed, the Synergy 100 *first* recalls all non-dissolving values *prior* to beginning the effects dissolve itself.

This means that everything that is *not* an analog value (e.g., key priorities, crosspoints, patterns, next transition data) is recalled in the first frame of the effects dissolve, followed by all *analog* values in the second frame. By *presetting* the switcher with the correct backgrounds and priorities (immediately prior to performing the effects dissolve), this feature guarantees the correct ending position for your effects.

- If the **CNTR/EFF D** button is off, recalled effects *cut* between registers.
- The **Effects Dissolve** function is valid for *recall* operations only. Storage operations are not affected.
- The duration of the **Effects Dissolve** is governed by the transition rate that is programmed into the *destination* register. For example:
  - ~ Effect #1 is a box wipe that is positioned in the upper left of the screen. It is stored in register 1 with a transition rate of 10 frames.
  - ~ Effect #2 is a box wipe that is positioned in the upper right of the screen. It is stored in register 2 with a transition rate of 45 frames.

If you cut to register 1 and then recall register 2 with an **Effects Dissolve**, the box wipe moves from the upper left to the upper right at a 45 frame duration.

- The **Effects Dissolve** function will *not* transform a circle wipe into a box wipe. For example:
  - ~ Effect #3 is a circle wipe that is positioned in the center of the screen. It is stored in register 3 with a transition rate of 30 frames.
- If you cut to register 1 and then recall register 3 with an **Effects Dissolve**, the system cuts to the circle wipe and then moves it from the upper left to the center at a 30 frame duration.
- You can slew as many functions within the MLE as desired.

## Performing an Effects Dissolve

Use the following procedure to perform an **Effects Dissolve**:

1. Program an effect with the intention of performing an **Effects Dissolve** — that is, a *change* between two different analog settings (e.g., a wipe in two positions, a border with two unique colors, two different “fly key” positions).

2. Enter the desired transition rate. Refer to the section “**Changing Auto Transition Rates**” on page 5-6 for instructions.
3. Store the effect in the desired memory register. Refer to the section “**Storing Memory Registers**” on page 8-3 for instructions. Remember that the transition rate determines the duration of the **Effects Dissolve** — how long it takes to *slew to this setup*.
4. Repeat steps 1 through 3 for the second effect (remember that two setups are required to perform an effects dissolve — essentially, a *source* effect and a *destination* effect).
5. Recall the first setup from memory. Refer to the section “**Recalling Memory Registers**” on page 8-5 for details.
6. To perform the **Effects Dissolve**, press **CNTR/EFF D** and recall the second setup from memory. The system *first* recalls all non-dissolving values (with a cut) and then slews all analog values.
7. Repeat step 6 if you want to slew back to the *first setup* or to any additional registers that have been properly stored in preparation for the **Effects Dissolve** function.
  - You can slew or cut between as many setups as desired, simply governed by the **CNTR/EFF D** button and the way that the effect was programmed.

This completes the procedure to perform an **Effects Dissolve**.

---

# Copy and Swap Functions

The following copy and swap functions are available:

- **Copy Key** — allows you to copy the contents of one keyer to the other key location within the **Effects Keyers Group**.
- **Key Swap** — allows you to swap the entire contents of one keyer with the contents of the other key location within the **Effects Keyer Group**.

Please note that there are no copy/swap functions available for the **Downstream Keyer**.

## Copy Key

The **Copy Key** function allows you to copy the entire contents of one keyer to the other keyer in the **Effects Keyers Group**.

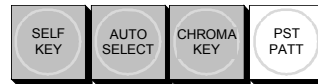


### Note

When you copy a keyer to another keyer, the entire contents (except matte fill color) of the source keyer are copied to the destination — including the selected key crosspoint.

Use the following procedure as a *basic* key copy method:

1. In the **Effects Keyers Group**, ensure that the key you wish to copy has control of all key modifier buttons and knobs. That is, the key type and all modifiers of your *source* key *must* be displayed.
2. Press and *hold* the **Key Type** of the key you wish to copy.



*Effects Keyer – Key Types*

3. Press the **KEY2** button in the **Effects Keyers Group**.
4. Release both buttons.

This completes the procedure to copy a key.

## Key Swap

The **Key Swap** function allows you to swap the entire contents of one keyer with the contents of the other keyer in the **Effects Keyers Group**.

Use the following procedure to swap the Keyers:

1. Press and *hold* the **KEY2** button in the **Effects Keyers Group**.
2. Press **KEY1** in the **Transition Group**.



### Operating Tip

The procedure can also be performed in the reverse order — pressing **KEY1** first, followed by the **KEY2** button

3. Release both buttons. The keyers swap their contents, as indicated by a pop-up message that appears on the preview monitor.

This completes the procedure to swap the Keyers.

---

## Synergy Slots

The Synergy 100 incorporates a special mode in which pseudo-random information is statistically measured on a cumulative basis. This function is accessed as follows:

- Press and hold the **SEL** buttons in the **System Control** and **Mattes** groups.
- Press **KEY2** in the **Effects Keyers Group**.

This action causes all button LEDs to turn off, with only the display area in the upper section of the panel and the fader remaining active. The seven segment displays in the System Control group shows 100, which represents the starting number of credits.

The fader serves as a “slot machine arm”. Moving it first to the upper limit and then to the lower limit, will cause the 3 four-character **MODE** displays to cycle for several seconds, and then settle on various pay line symbols.

When a winning combination of pay line symbols occurs, the panel reacts as follows:

- the button LEDs on the lower area of the control panel flash randomly
- the number of credits won flashes alternately with the new total number of credits
- the winning pay line symbol (or symbols) flashes.

Winning pay line symbol combinations award credits as per the payout table below. The average payoff rate is approximately 239.4 percent.

*Pay Line Payout Table*

<b>Pay Line Symbols</b>	<b>Panel Display</b>	<b>Credit Payout</b>
3 “S100”s	S100	1000
3 “Lucky 7”s	=7=	250
3 Oranges	Orng	30
3 Lemons	Lemn	25
3 Apples	Appl	20
3 Cherries	Chry	20
3 Bells	Bell	15
3 Bars	Bar	15
3 Stars	Star	10
3 Plums	Plum	10
2 “S100”s	S100	10
1 “S100”	S100	3

The amount of credits won on any one pull of the arm will determine the number of flashing buttons on the panel. There are three “levels” of a “win”. Refer to the following table for detailed information.

*LED Illumination Levels Table*

<b>Level</b>	<b>% of LEDs Illuminated</b>	<b>Credits Won</b>
1	6.25%	< 10
2	12.5%	10 to 100
3	25%	> 100

The highest number of credits you can accumulate is 9999, and the lowest is 0.

When you wish to exit the Synergy Slots, press any button in the upper pattern area. You are now ready to switch your next show.



# Peripheral Device Control and More

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## In This Chapter

This chapter provides instructions for using your switcher's **Memory System**, plus additional features such as **Effects Functions** and **Aux Buses**. The following topics are discussed:

- GPIs
- Serial Tally Protocol Interface
- Remote Audio Mixer Control Interface
- Editor Interface
- Aux Bus Control
- Remote Aux Panels

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# GPIs

The Synergy 100 switcher's GPI function provides 12 input ports, each of which can be programmed for specific functions. A GPI input pulse can be associated with a specific area and button on the switcher, which triggers when that pulse is received from an external device.

In order for the GPIs to function, the **GPIs** option in the **Effects Menu** must be set to **On**.

Use the following procedure to enable the GPIs feature:

1. Ensure that your GPIs are connected and properly configured to communicate with your Synergy 100 Switcher. Refer to Chapter 7, “**Communications Setup**” in the *Synergy 100 Installation Guide*, for full instructions on configuring your GPIs.
2. Navigate to the **Effects Menu** as follows:
  - Press **MENU** to display the **Main Menu**.
  - Press to display the **Effects Menu**.

Effects				
0. Editor				On
1. GPIs				Off
2. Center				Off
3. SafeTitle				Off
4. Menu Bkgd				On
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Effects Menu*

3. Enable the **GPI feature** as follows:
  - Press **1. GPIs**.
  - Toggle the **1. GPIs** button between **On** and **Off** as follows:
    - ~ **On** — Use this option to enable GPIs.
    - ~ **Off** — Use this option to disable the GPIs feature.
  - Press the right **SEL** button to accept the new settings.
4. Press **MENU** to display the **Installation Change Screen**.
5. Accept or cancel these changes as follows:
  - Press **0. Confirm** to accept the changes.
  - Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure to enable the **GPIs feature**.



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## Serial Tally Protocol Interface

The **Serial Tally Protocol** option provides a means of communication between the Synergy 100 switcher and tally system interface equipment using industry standard protocol. The standard parallel tally interface will continue to operate normally when this option is enabled. Note that the **Serial Tally Interface** software option must be enabled.



### Note

Refer to the section titled “**Options Menu**” in Chapter 2 of the *Synergy 100 Installation Guide* to ensure that the **Serial Tally Protocol** option is installed. If not, please contact Ross Video Technical Support for details.

Software Options - S/N:F422342234				
0. Add	A6F8			
1. Editor	On			
2. DVE	Off			
3. Audio	On			
4. Ser Tal	On			
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Software Options Menu — Serial Tally Option Installed*

Refer to Chapter 7, “**Communication Setup**” of the *Synergy 100 Installation Guide* for full instructions on configuring your peripheral ports for the Serial Tally Interface.

### Look Ahead Serial Tally

The **Look Ahead Serial Tally** (L.A.S.T.) protocol enables you to inform external devices of a key crosspoint change before the crosspoint change is performed on any bus of the Synergy 100 switcher. When a key source changes, the L.A.S.T. protocol informs the device while delaying the crosspoint change for the duration you set in the **Communication Menus**. Once set up, the L.A.S.T. protocol will continually transmit the information about every Synergy 100 switcher bus.

The **Look Ahead Serial Tally** protocol has extra options that *must* be setup to properly communicate with a serial tally interface device. Refer to the section, “**Serial Tally Protocol Setup**” in Chapter 7 of the *Synergy 100 Installation Guide* for setup information.

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## Remote Audio Mixer Control Interface

The **Audio Mixer Interface** option provides audio-follow-video capability to the Synergy 100 switcher. The option offers audio channel grouping and individual channel level adjustments. Note that the **Audio** software option must be enabled.



### Note

Refer to the section titled “**Options Menu**” in Chapter 2 of the *Synergy 100 Installation Guide* to ensure that the **Audio** option is installed. If not, please contact Ross Video for details.

Software Options - S/N:F422342234				
0. Add	A6F8			
1. Editor	On			
2. DVE	Off			
3. Audio	On			
4. Ser Tal	On			
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Software Options Menu — Audio Option Installed*

Refer to the section, “**Setting Up Audio Inputs**” of the *Synergy 100 Installation Guide* for full instructions on configuring your audio inputs. For full instructions on configuring your Peripheral 2 port and Audio Cut setup, refer to the section, “**Remote Audio Mixer Communications Setup**” of the *Synergy 100 Installation Guide* .

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## Editor Interface

The **Editor** option in the **Effects Menu** allows the switcher to be controlled by an editing system using GVG 100, GVG 200, or GVG 4000 protocol. The **Editor** software option must be enabled.



### Note

Refer to Chapter 2 of the *Synergy 100 Installation Guide* to verify that the **Editor option** is installed. If not, please contact Ross Video Technical Support for details. For more information on setting up communications with your device and the Synergy 100 Switcher, refer to Chapter 7, “**Communication Setup**” of the *Synergy 100 Installation Guide*.

Use the following procedure to enable the **Editor** option from the Synergy menu system:

1. Ensure that one of your edit controller’s serial ports is properly connected to the **EDITOR** connector on the rear of the Synergy 1 chassis and properly assigned to switcher control from within your editing system.

Refer to your edit controller’s installation and operating manuals for details on the capabilities of your system’s remote switcher interface.

2. Navigate to the **Effects Menu** as follows:
  - Press **MENU** to display the **Main Menu**.
  - Press **0. Effects** to display the **Effects Menu**.

Effects				
0. Editor				On
1. GPs				Off
2. Center				Off
3. SafeTitle				Off
4. Menu Bkgd				On
MENU	100	10	1	SEL
Exit	Previous	Down	Up	Accept

*Effects Menu*

3. Toggle the **0. Editor** button to toggle remote control from an external edit controller as follows:
  - **On** — Use this option to enable remote control from an external edit controller. Local operations can still be performed.
  - **Off** — Use this option to disable remote control from an external edit controller. The Synergy 100 switcher is entirely “local.”



### Note

The **Editor** option can also be enabled by pressing (or double pressing) the **MENU** button in the **System Control** group. Refer to Chapter 8 of the *Synergy 100 Installation Guide* for configuration instructions.

4. Press the right **SEL** button to accept the new settings.
5. Press **MENU** to display the **Installation Change Screen**.

6. Accept or cancel these changes as follows:
  - Press **0. Confirm** to accept the changes.
  - Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

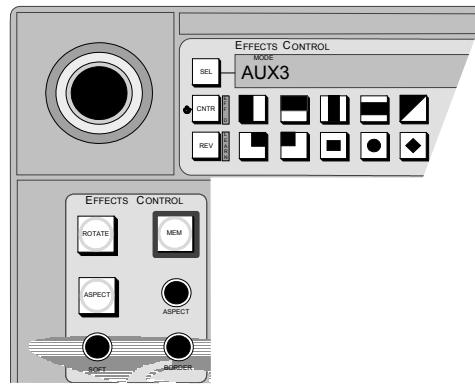
This completes the procedure to enable the **Editor** option from the Synergy menu system.

# Aux Bus Control

The Synergy 1 frame provides 8 **Aux Buses**, each of which can be used to route video to monitors, DVEs, still stores, VTRs, etc. The video sources for these Aux Buses are selected using the **Key Bus** and special **Preset Bus** crosspoints on the Synergy 100 control panel.

Use the following procedure to use the Aux Bus Control feature:

1. Press and hold the **SEL** button in the **Effects Control** group until the **AUX"#"** mode appears in the four-character display. If you prefer, you can also cycle through the modes by repeatedly pressing the **SEL** button.



*Effects Control Groups*



**Note**

The “#” sign in the **Effects Control** Mode display represents the number of the Aux Bus (3-10) that you are controlling, with Aux Bus 10 being displayed as AUX0. Aux Buses 1 and 2 are not available for this function.

2. The pattern buttons in the **Effects Control** group are used to select the Aux Bus that you wish to route video to. Select the desired Aux Bus by pressing the corresponding pattern button. Refer to the following table:

*Pattern Buttons for Aux Bus Control*

Pattern Button	Aux Bus Controlled
0	Aux 1 (Available for Preview Overlay only)
1	Aux 2 (Available for Preview Overlay only)
2	Aux 3
3	Aux 4
4	Aux 5
5	Aux 6
6	Aux 7
7	Aux 8
8	Aux 9
9	Aux 10

3. When **AUX“#”** is displayed in the **Effects Control Group**, the Key Bus crosspoints (and special Preset Bus crosspoints) function as Aux Bus crosspoints. The button for the input source that is currently feeding the selected Aux Bus will flash.

**Note**

If one of the 16 input sources on the Key Bus is feeding the Aux Bus, the selected crosspoint will flash orange. If you choose one of the three outputs on the Preset Bus to feed the Aux Bus, the corresponding crosspoint on the *Key Bus* will flash red.

4. Select the source to feed to the Aux Bus as follows:
  - To route one of the 16 input sources to the Aux Bus, press the button for the desired source on the Key Bus crosspoint row. This includes shifted crosspoints.
  - To route the **MLE Preview** output to the assigned Aux Bus destination, simultaneously press the **SHIFT** button on the Key Bus and the first button on the Preset Bus. Please note the **AUX PV** label above this button.
  - To route the **Clean Feed** output to the assigned Aux Bus destination, simultaneously press the **SHIFT** button on the Key Bus and the second button on the Preset Bus. Please note the **AUX CLEAN** label above this button.
  - To route the **Program** output to the assigned Aux Bus destination, simultaneously press the **SHIFT** button on the Key Bus and the third button on the Preset Bus. Please note the **AUX PGM** label above this button.

**Note**

Preview Overlay can be switched to use **AUX 1** and **AUX 2**. For details on the procedure, refer to Chapter 2 “**Installation**” of the *Synergy 100 Installation Guide*.

This completes the procedure for controlling the Aux Buses from the Synergy 100 control panel.

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## Remote Aux Panels

**Remote Aux Panels** are one-piece panels that provide remote control (or monitoring) capability of one (or more) of the switcher frame’s Aux Buses. These panels are typically mounted close to the destination devices to which they route their sources. Video does not flow through the panels — the actual Aux Bus outputs originate from the frame using separate wiring paths to the destination devices.

There are two types of **Remote Aux Panels** available:

- A **Dedicated Remote Aux Panel** controls one Aux Bus output. It allows you to route sources to *one destination only*.
- An **Assignable Remote Aux Panel** controls all 8 Aux Bus outputs, allowing you to route sources to *eight different destinations*.

Both types of **Remote Aux Panels** are discussed below.

### Using a Dedicated Remote Aux Panel

A **Dedicated Remote Aux Panel** controls one **Aux Bus** output only.



*Dedicated Remote Aux Panel*

Use the following method to use a **Dedicated Remote Aux Panel**:

- Using the **Aux Bus Crosspoint Row** or the group of **Special Aux Bus Crosspoints**, press the button for the desired source.



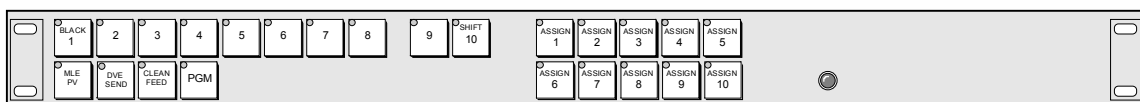
#### Note

To have access to **BLACK** on a **Remote Aux Panel**, you must feed the “601 REF IN” BNC on the rear of the chassis with a stable black signal that is low in jitter and that originates from a reliable digital source.

This completes the discussion on using a **Dedicated Remote Aux Panel**.

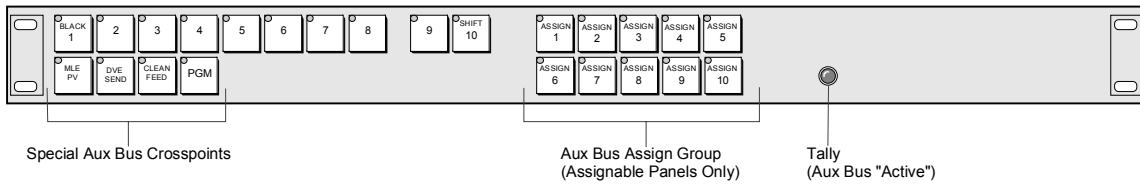
### Using an Assignable Remote Aux Panel

An **Assignable Remote Aux Panel** controls or monitors all 8 Aux Bus outputs. Assignable panels also include an **Aux Bus Assign** group that is used to select which Aux Bus the panel is controlling. All panel types include a bright “on-air” or “active” LED that indicates (when lit) that the Aux Bus controls a signal that forms a part of the program output.



*Assignable Remote Aux Panel*

In addition to crosspoints, the panels include dedicated “special” crosspoint buttons for MLE PV, DVE Send (not implemented), Clean Feed, and Program.



### Assignable Remote Aux Panel – Special Crosspoints

Refer to Chapter 7 of the *Synergy 100 Installation Guide*, for instructions on assigning “rights” to your Remote Aux Panel.

Use the following procedure to use an **Assignable Remote Aux Panel**:

1. Select the **Aux Bus** that you want to control (or monitor) using the **Aux Bus Assign Group**.



#### Note

Although selecting Assign 1 or Assign 2 is possible, changing the crosspoints routed to these Aux Buses is not. The default setting of these two unimplemented Aux Buses is **BLACK**.

2. Using the **Aux Bus Crosspoint Row** or the group of **Special Aux Bus Crosspoints**, press the button for the desired source.

This completes the procedure to use an **Assignable Remote Aux Panel**.

## Remote Aux Panel Notes

Please note the following important points regarding Remote Aux Panel operation:

- As the DVE Send feature is not implemented, selecting the **DVE SEND** crosspoint on a remote Aux panel will route the Program output to the Aux Bus.
- Selecting **BKGD Color** (Shifted button 1) on a remote Aux panel will route the Program output to the Aux Bus.
- When the Synergy 100 control panel is tracking sources being routed by a remote Aux panel, the **MLE PV**, **CLEAN FEED**, and **PGM** crosspoints on the remote Aux panel correspond to the first, second, and third Preview Bus crosspoint, respectively.



# Ultimatte Insider

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## In This Chapter

This chapter provides an overview and instructions for operating the optional **Ultimatte Insider™** chroma keyer function. The following topics are discussed:

- Ultimatte Insider Option Overview
- Ultimatte Setup
- Ultimatte Insider Operations

In Appendix B of the *Synergy 100 Installation Guide*, refer to the “**Ultimatte Insider Installation**” section for details on installing the Ultimatte board in the frame.

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## Ultimatte Insider Option Overview

**Ultimatte Insider** is a hardware option that adds true Ultimatte capability — directly *inside* the **Synergy 100** switcher. The option comprises a hardware board designed by Ultimatte, the Oscar™-winning industry leader in compositing technology.

Please note the following important points:

- The **Ultimatte Insider** board is allocated to only *one* of the MLE's two keyers. The **Ultimatte** will *automatically* be associated with the first keyer in which a **Chroma Key** key type is selected.
- The **Ultimatte Insider** board creates two signals from a selected video source – a processed fill and a processed alpha signal.
- Even though the **Ultimatte Insider** board is allocated to only one of the keyers, any of the 16 inputs can be used as an **Ultimatte** key source.

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## Ultimatte Setup

Once the **Ultimatte Insider** board is physically installed into the Synergy 1 frame, there is no set-up required.

During switcher operations, when you select one of the inputs on the **Key Bus** and select **CHROMA KEY** as the “type”, the **Ultimatte Insider** pop-up help will automatically appear on the preview output. However, the **Ultimatte Insider** will only be associated with the *first* Chroma Key you set up. If you select Chroma Key as the key type on the *other* Effects Keyer as well, it will be a standard Chroma Key.



### Important

The source that you select on the **Key Bus** activates the Ultimatte and internally calls up the Ultimatte’s processed alpha and fill signals. The selected source’s panel button on the **Background** and **Preset** buses remains the original *unprocessed* video signal.

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# Ultimatte Insider Operations

Use the following procedure to operate the **Ultimatte Insider** option:

1. In the **Transition Control** group, select the appropriate **KEY** button (**KEY1** or **KEY2**) to preview the key.
2. Select the desired key source on the **Key Bus**.
3. In the **Effects Keyer** group, press **CHROMA KEY**. This action automatically selects the output of the Ultimatte board, and causes the following to occur:
  - The auto chroma key function is activated and crosshairs appear on the preview output.
  - A pop-up help message, saying “Ultimatte Insider Activated”, is temporarily displayed on the preview output.
  - The switcher sets a temporary background transition (in the **Transition Control Group**) and changes the source on the PST bus to the source selected on the key bus.
4. Use the positioner to place the crosshairs on top of the color you want to key out.
5. You will notice that the right-most, four-character mode display in the **System Control Group** reveals the text “**Grab**”. Press the associated **SEL** button to obtain the best *automatic* chroma key. This action causes the following to occur:
  - The bus returns to the previously selected crosspoint.
  - The “**Next Transition**” buttons in the **Transition Control Group** return to the state that they were in prior to the auto chroma key function being activated.
6. Typically, no adjustment is required. However, if you feel adjustment is necessary, the following parameters can be modified:
  - Rotate the **CLIP** knob in the **Effects Keyers Group** to control the level of **Matte Density** (opacity). This important step determines the level of separation that corresponds to the point at which the foreground is opaque. The default setting is one in which neutral colored foreground objects are opaque, but any color which is a shade of the background color is partially transparent. Increasing the **Matte Density** level permits foreground objects that are the same shade as the background color to be made opaque in the composite image.

For best results, lower the level until some portion of the foreground subject starts to become gray in the matte signal. Then increase the level until any area which should be opaque, has just become black in the matte signal. Do not increase the level too much, as it can cause hard dark edges around your foreground subjects.
  - Rotate the **GAIN** knob in the **Effects Keyers Group** to control the **Black Gloss** level of foreground objects or surfaces that may be reflecting color from the background. The control introduces a negative offset which helps interpret the object as a foreground object. Adjust the **Black Gloss (GAIN)** level while viewing the matte signal on the monitor. Increase the level only enough to make the black glossy area of the foreground subject appear solid black in the matte signal.

Note that adjusting the **Black Gloss (GAIN)** level *may* permit the **Matte Density** level to be lowered. Readjust **Matte Density (CLIP)** after adjusting **Black Gloss** level to ensure that both levels are set *as low as possible*, without permitting print-through in the foreground. Do not advance the level too far, as it can cause hard, dark edges around your foreground subjects.

- Rotate the **HUE/TRANSP** knob in the **Effects Keyers Group** to adjust the **Matte Gain** level from the white end. The control can lower the **Matte Gain** output gain to 0%, or push it into the legal ceiling.

Note that the **Matte Gain (HUE/TRANSP)** control is a gain adjustment that affects only the processed matte output signal. This control does not have any effect on the matte signal used internally in the **Ultimate Insider**.

7. Three additional parameters are adjustable by holding down the **CHROMA KEY** button and using the following knobs:

- Rotate the **LUM** knob in the **Mattes Group** to adjust the **Grey Balance**, making mid-range foreground colors warmer or cooler with minimal effects on lighter and darker colors. In addition to controlling flare suppression at mid-level values, the **Grey Balance** control also provides you with an added degree of flexibility in suppressing flare and contamination from the background spill onto the foreground subject.

Note that flare suppression may alter certain foreground colors. In most cases, this adjustment makes the foreground appear as if it is placed in front of a neutral (black) background and not a colored one, and overall, makes the composite more realistic (free of any influence from the background color).

Because alteration of foreground colors may not be acceptable using flare suppression, two selective color gates are provided, **Flare Gate 1** and **Flare Gate 2**. These “**Gate**” adjustments let you override the suppression so that “problem” colors can be used in the foreground. Problematic colors can be reproduced (with the addition of some flare on certain colors), while maintaining full suppression on the rest.

- Rotate the **HUE** knob in the **Mattes Group** to adjust **Flare Gate 1**.
- Rotate the **SAT** knob in the **Mattes Group** to adjust **Flare Gate 2**.

The effect of the **Flare Gate** controls vary depending on the background color. The tables on the following pages illustrate the benefits and trade-offs of each **Flare Gate** adjustment. Columns 1 and 2 list the two **Flare Gate** controls, and the varying degree of adjustment.

## Background Color: Blue

Flare Gate Adjustment Table — Background Color: Blue

Flare Gate 1 (HUE)	Flare Gate 2 (SAT)	Benefits	Trade-Offs
0%	0%	<ul style="list-style-type: none"> <li>Removes Blue Spill while permitting some shades of blue to be reproduced in the foreground.</li> <li>Allows BLUE to exceed GREEN by the amount GREEN exceeds RED.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to reproduce Magenta in foreground (or any shade of pink in which the Blue should exceed Green.) Magenta will be reproduced as Red.</li> <li>Unable to remove blue spill from green foreground objects.</li> </ul>
100%	0%	<ul style="list-style-type: none"> <li>Removes Blue Spill from Green foreground objects as well as all other foreground colors.</li> <li>Limits BLUE to the LOWER of RED or GREEN.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to reproduce Cyan or Magenta in foreground.</li> <li>Cyan will be reproduced as Green.</li> <li>Magenta will be reproduced as Red.</li> </ul>
0%	100%	<ul style="list-style-type: none"> <li>Permits reproduction of Magenta in the foreground (and any shade of Pink in which Blue exceeds Green).</li> <li>Allows BLUE to exceed GREEN by the amount RED exceeds GREEN (or by the amount GREEN exceeds RED when RED is lower than GREEN).</li> </ul>	<ul style="list-style-type: none"> <li>Will not remove Blue Spill from shades of Red in the foreground.</li> <li>Will not completely remove Blue Spill from shades of Green in the foreground.</li> </ul>
100%	100%	<ul style="list-style-type: none"> <li>Removes Blue Spill from shades of Green in the foreground.</li> <li>Permits reproduction of Magenta in foreground.</li> <li>BLUE is limited to the level of RED regardless of the level of GREEN.</li> </ul>	<ul style="list-style-type: none"> <li>Cannot reproduce shades of Blue in the foreground.</li> <li>Cyan will become Green.</li> <li>Cannot remove Blue Spill from Red or Yellow. (Blue spill will desaturate Yellows.)</li> </ul>

## Background Color: Green

Flare Gate Adjustment Table — Background Color: Green

Flare Gate 1 (HUE)	Flare Gate 2 (SAT)	Benefits	Trade-Offs
0%	0%	<ul style="list-style-type: none"> <li>Removes Green Spill while permitting some shades of Green to be reproduced in the foreground.</li> <li>Allows GREEN to exceed BLUE by the amount BLUE exceeds RED.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to reproduce Yellow in foreground (or any shade of Brown in which the Green should exceed Blue.) Yellow will be reproduced as Red.</li> <li>Unable to remove Green Spill from Blue foreground objects.</li> </ul>
100%	0%	<ul style="list-style-type: none"> <li>Removes Green Spill from Blue foreground objects as well as all other foreground colors.</li> <li>Limits GREEN to the LOWER of RED or BLUE.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to reproduce Cyan or Yellow in foreground.</li> <li>Cyan will be reproduced as Blue.</li> <li>Yellow will be reproduced as Red.</li> </ul>
0%	100%	<ul style="list-style-type: none"> <li>Permits reproduction of Yellow in foreground (and any shade of Brown which Green exceeds Blue).</li> <li>Allows GREEN to exceed BLUE by the amount RED exceeds BLUE (or by the amount BLUE exceeds RED when RED is lower than BLUE).</li> </ul>	<ul style="list-style-type: none"> <li>Will not remove Green Spill from shades of Red in the foreground.</li> <li>Will not completely remove Green Spill from shades of Purple in the foreground.</li> </ul>
100%	100%	<ul style="list-style-type: none"> <li>Removes Green Spill from shades of Blue in the foreground.</li> <li>Permits reproduction of Yellow in foreground.</li> <li>GREEN is limited to the level of RED regardless of the level of BLUE.</li> </ul>	<ul style="list-style-type: none"> <li>Cannot reproduce shades of Green in the foreground.</li> <li>Cyan will become Blue.</li> <li>Cannot remove Green Spill from Magenta or Red. (Green Spill will desaturate Magentas.)</li> </ul>

## Background Color: Red

Flare Gate Adjustment Table — Background Color: Red

Flare Gate 1 (HUE)	Flare Gate 2 (SAT)	Benefits	Trade-Offs
0%	0%	<ul style="list-style-type: none"> <li>Removes Red Spill while permitting some shades of Red to be reproduced in the foreground.</li> <li>Allows RED to exceed GREEN by the amount GREEN exceeds BLUE.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to reproduce Magenta in foreground (or any shade of pink in which the Red should exceed Green.) Magenta will be reproduced as Blue.</li> <li>Unable to remove Red spill from Green foreground objects.</li> </ul>
100%	0%	<ul style="list-style-type: none"> <li>Removes Red Spill from Green foreground objects as well as all other foreground colors.</li> <li>Limits RED to the LOWER of BLUE or GREEN.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to reproduce Magenta or Yellow in foreground.</li> <li>Magenta will be reproduced as Blue.</li> <li>Yellow will be reproduced as Green.</li> </ul>
0%	100%	<ul style="list-style-type: none"> <li>Permits reproduction of Magenta in foreground (and any shade of Pink in which Red exceeds Green).</li> <li>Allows RED to exceed GREEN by the amount BLUE exceeds GREEN (or by the amount GREEN exceeds BLUE when BLUE is lower than GREEN).</li> </ul>	<ul style="list-style-type: none"> <li>Will not remove Red Spill from shades of Blue in the foreground.</li> <li>Will not completely remove Red Spill from shades of Green in the foreground.</li> </ul>
100%	100%	<ul style="list-style-type: none"> <li>Removes Red Spill from shades of Green in the foreground.</li> <li>Permits reproduction of Magenta in foreground.</li> <li>RED is limited to the level of BLUE regardless of the level of GREEN.</li> </ul>	<ul style="list-style-type: none"> <li>Cannot reproduce shades of Red in the foreground.</li> <li>Yellow will become Green.</li> <li>Cannot remove Red Spill from Blue or Cyan. (Red Spill will desaturate Cyans.)</li> </ul>



# Appendix A. Menu Trees

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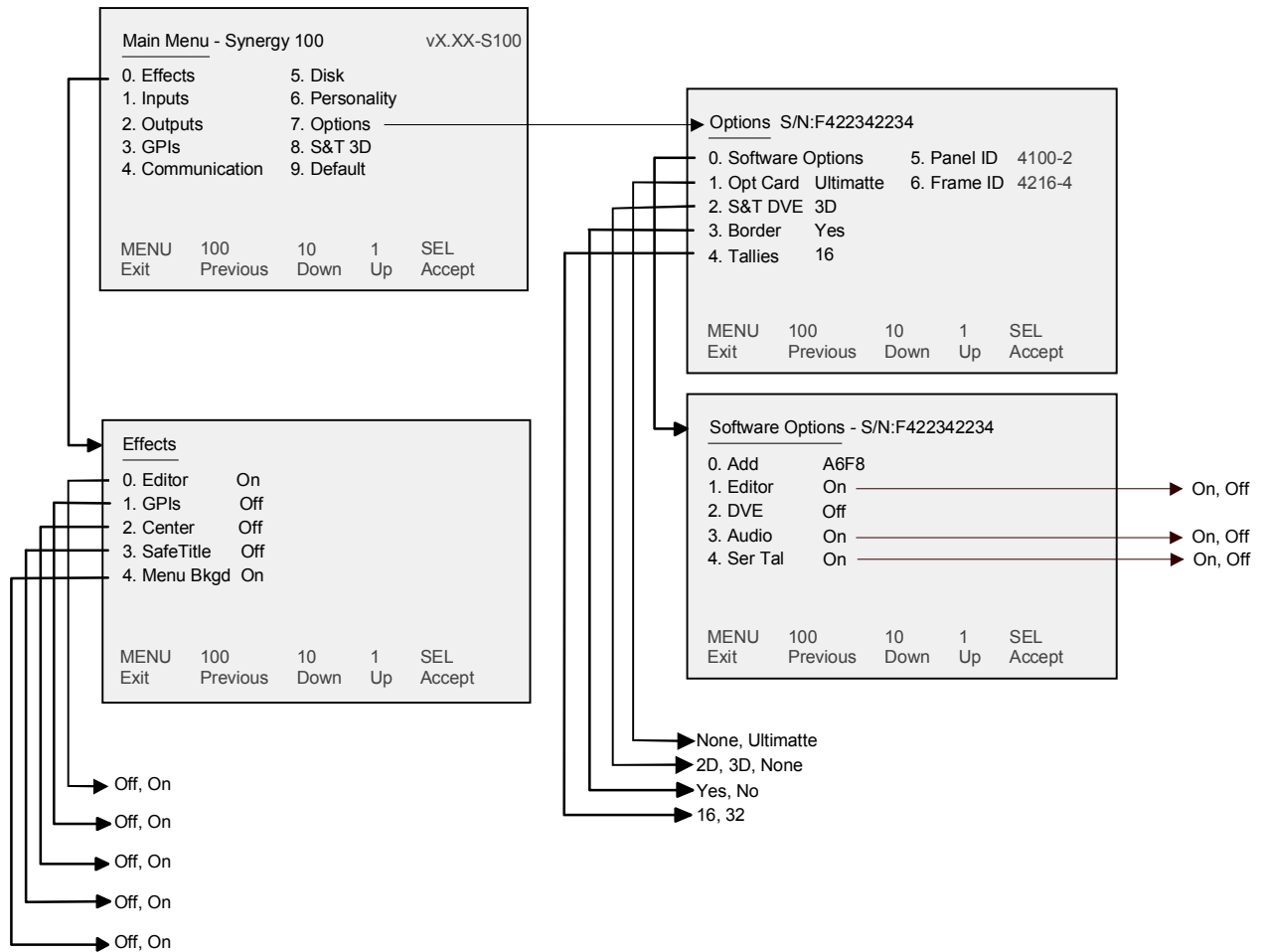
## In This Appendix

For your reference, this appendix lists the various menu trees that are used to set up the configurable areas of your **Synergy 100 SD** switcher. The following topics are discussed:

- Effects and Options Menu Trees
- BNC Configuration Menu Tree
- Additional Installation Setup Menu Tree
- GPI Setup Menu Tree
- Editor Communication Menu Tree
- Monitor Communication Menu Tree
- Audio Communication Menu Tree
- Serial Tally Communication Menu Tree
- Disk Menu Tree
- Squeeze & Tease 3D Menu Tree
- Default Menu Tree

# Effects and Options Menu Trees

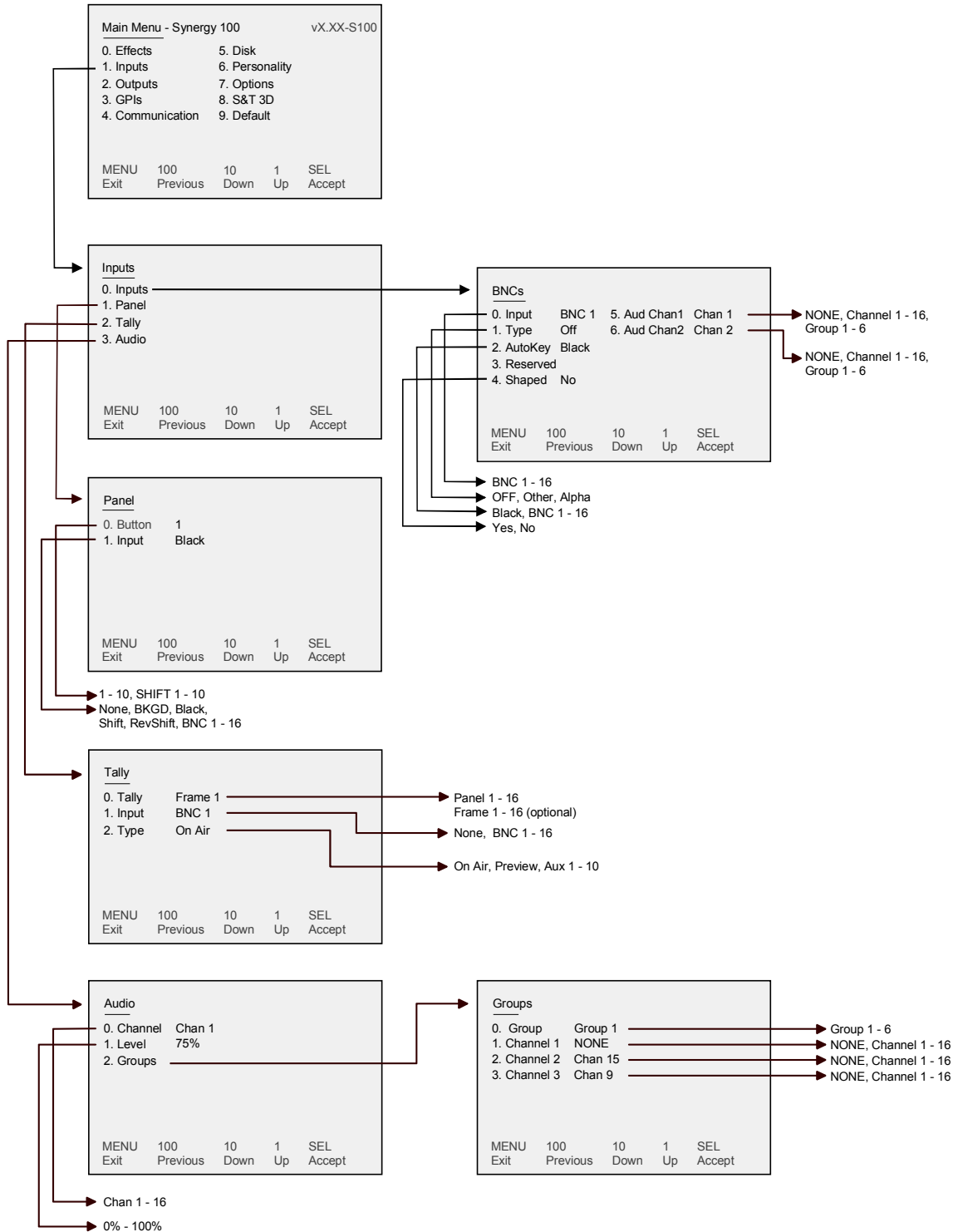
The following figure illustrates *portions* of the menu that are used to turn on various options and user preferences and to identify both the software and hardware options that have been installed in your system.



Effects and Options Menu Trees

# BNC Configuration Menu Tree

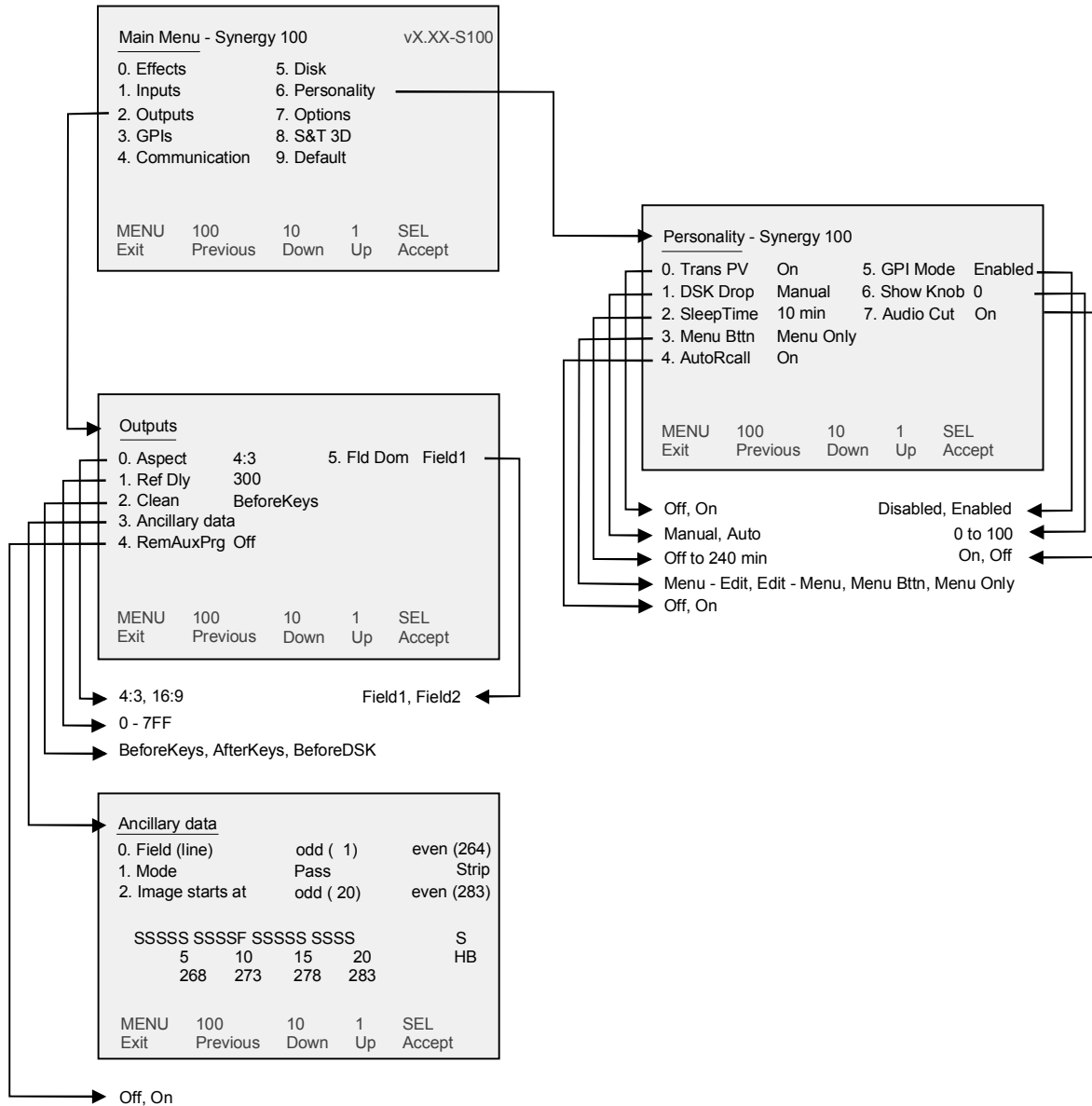
The following figure illustrates the *portion* of the menu tree that is used to configure your BNC inputs.



BNC Configuration Setup Menu Tree

# Additional Installation Setup Menu Tree

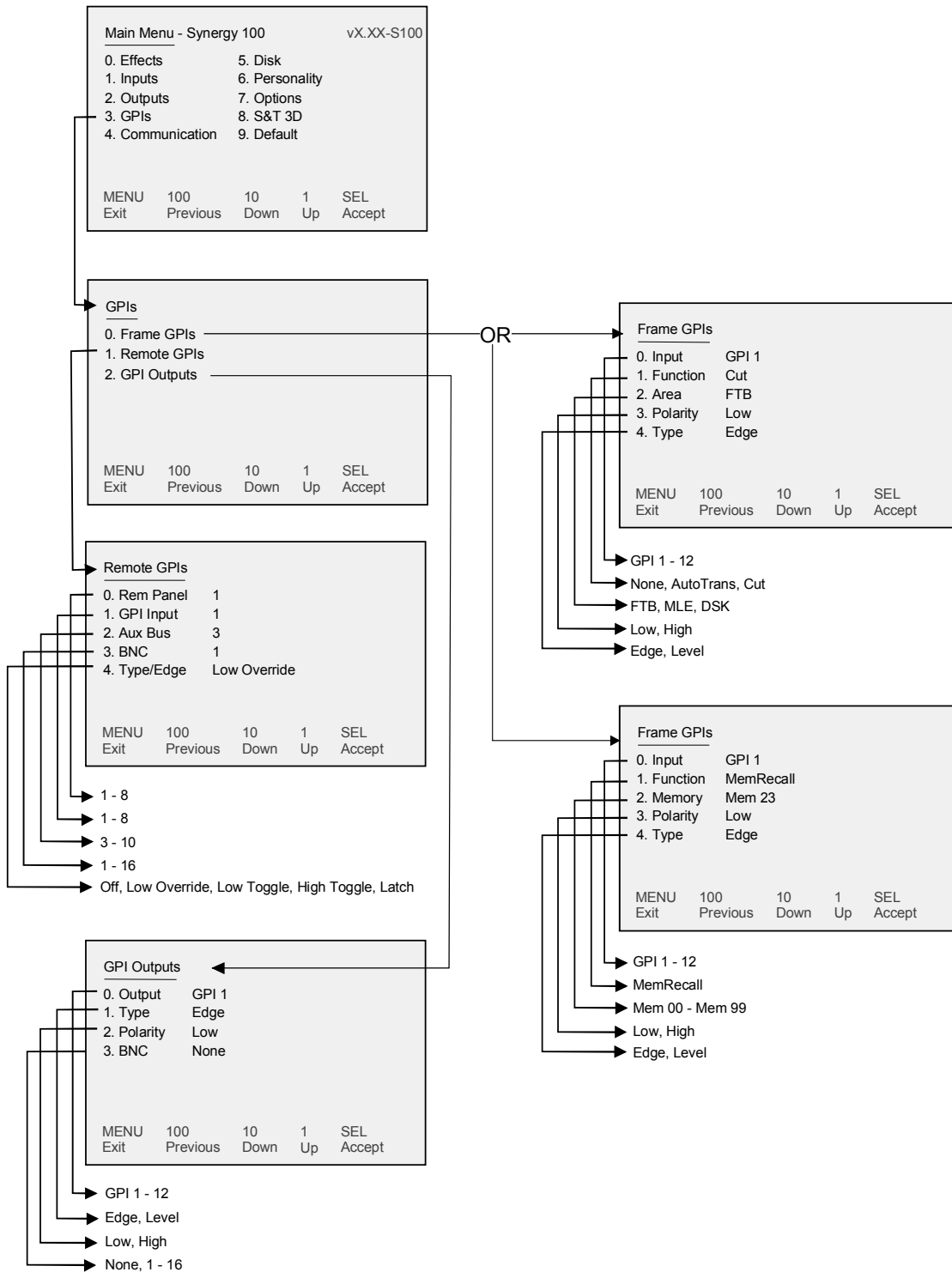
The following figure illustrates the *portion* of the menu tree that is used for additional installation setup procedures.



Additional Installation Setup Menu Tree

# GPI Setup Menu Tree

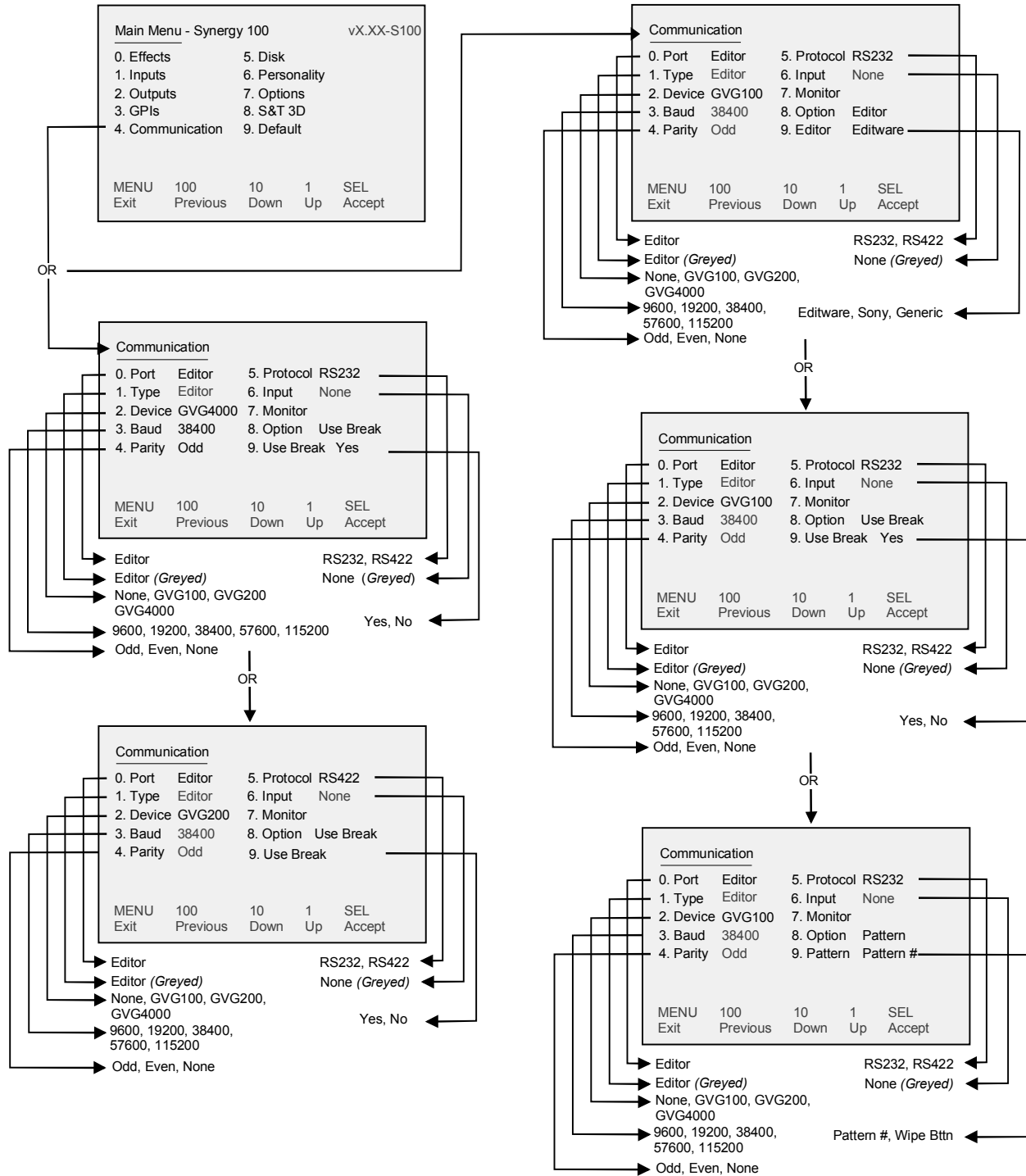
The following figure illustrates the *portion* of the menu tree that is used for GPI setup procedures.



GPI Setup Menu Tree

# Editor Communication Menu Tree

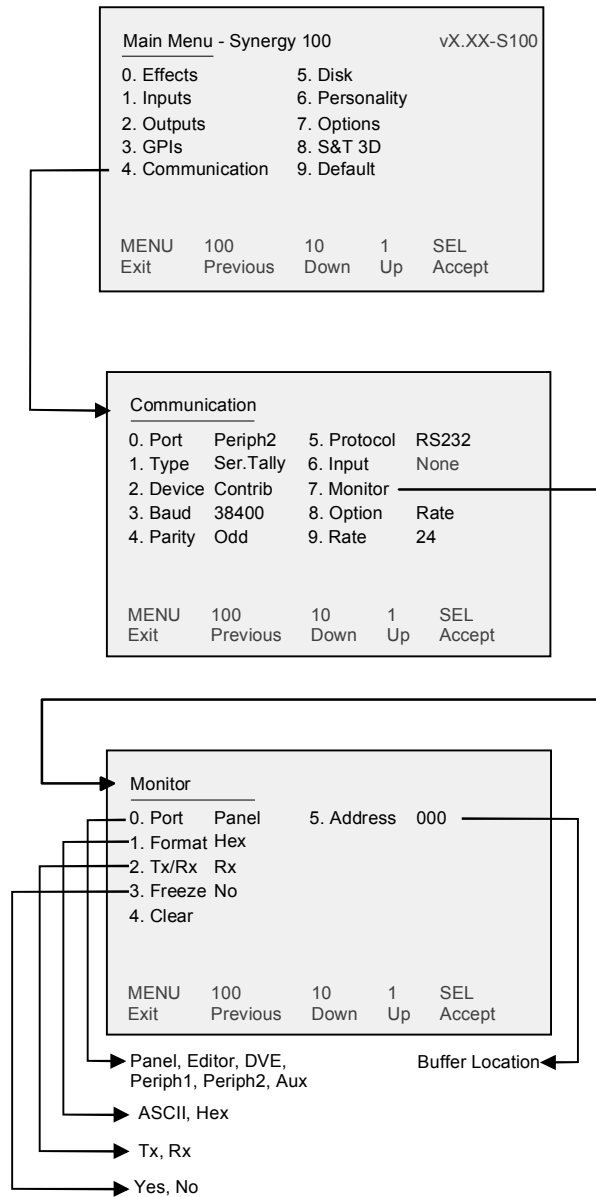
The following figure illustrates the *portion* of the menu tree that is used for setting up communication with external editors.



Communications Menu Tree – Editor Setup

# Monitor Communication Menu Tree

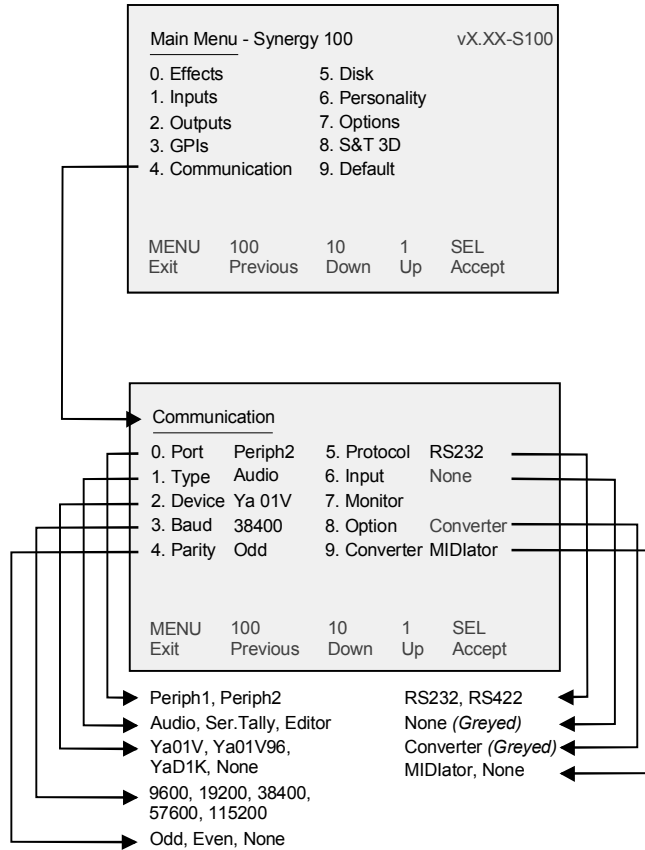
The following figure illustrates the *portion* of the menu tree that is used for monitoring the data transmitted and received through various communication ports.



Communication Menu Tree – Monitor Setup

# Audio Communication Menu Tree

The following figure illustrates the *portion* of the menu tree that is used for setting up communication with audio mixers.

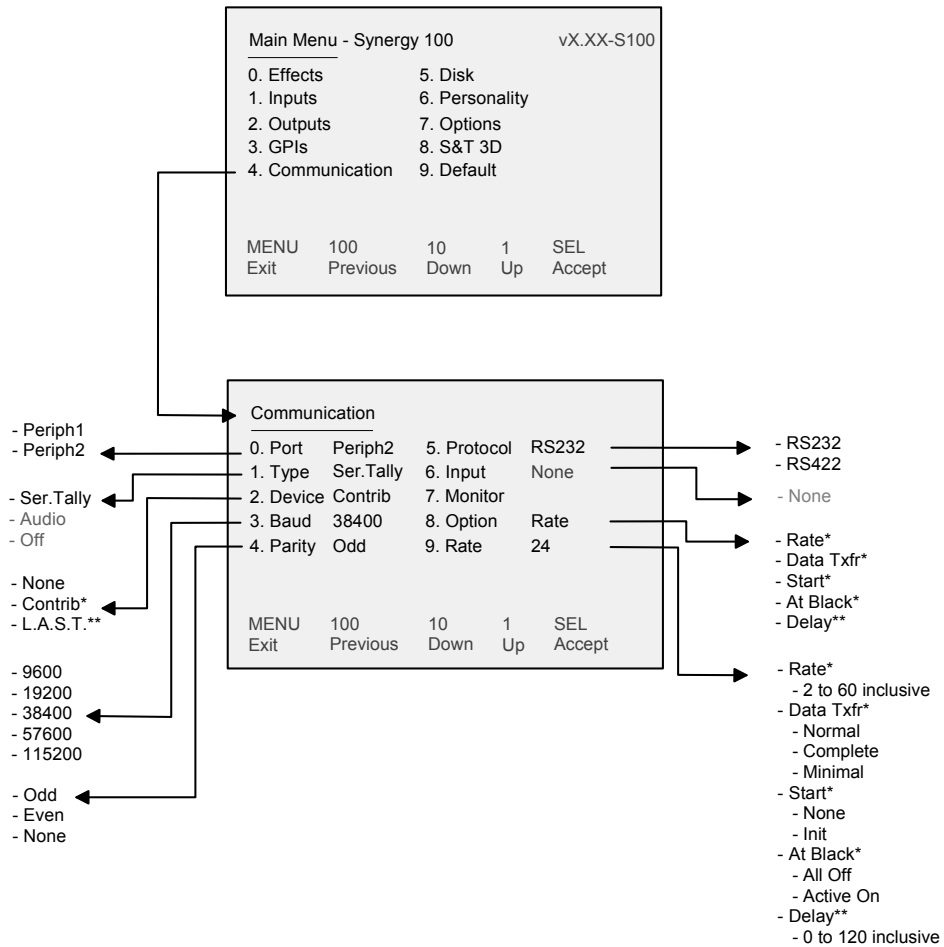


Audio Communication Setup Menu Tree



# Serial Tally Communication Menu Tree

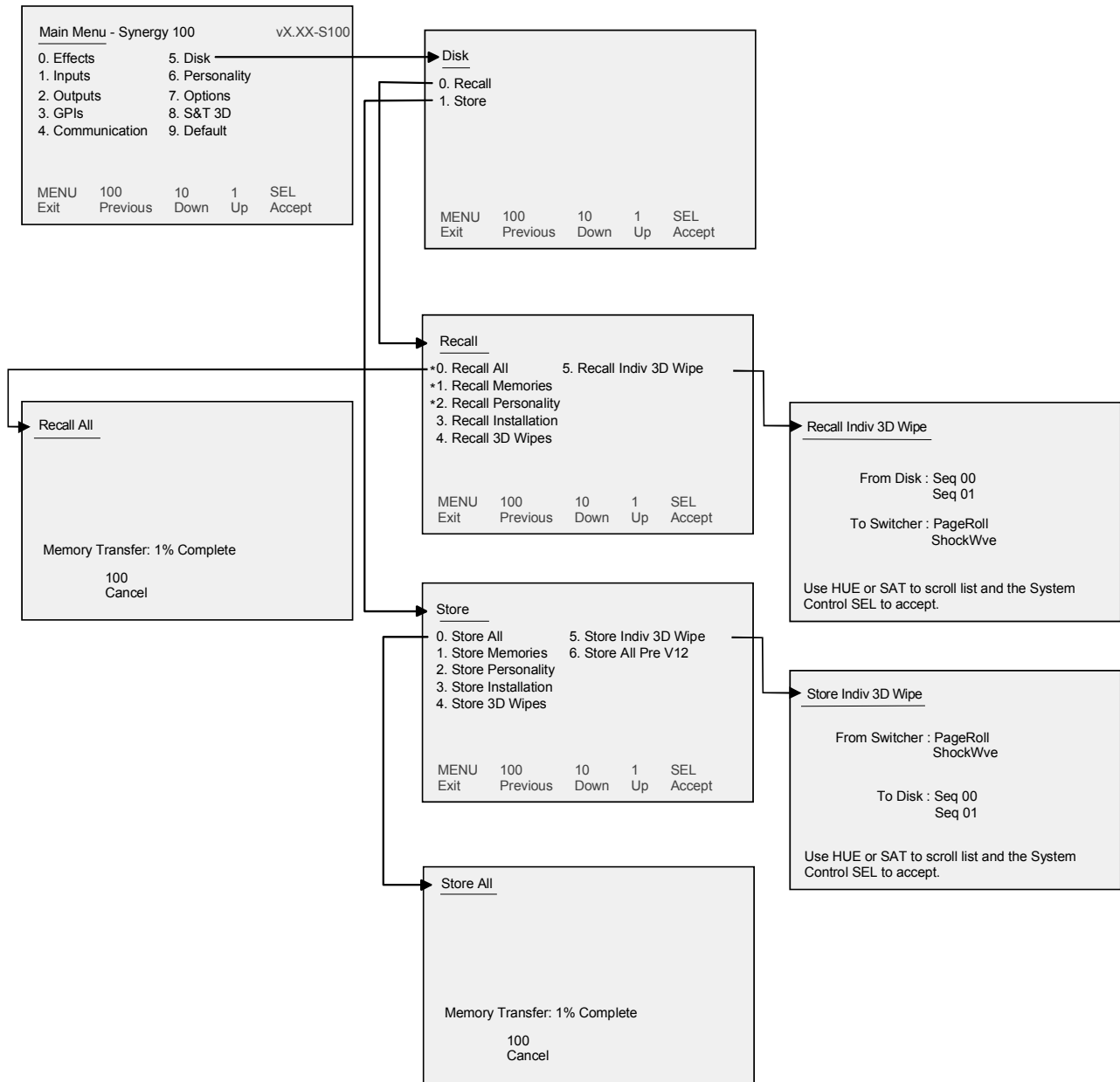
The following figure illustrates the *portion* of the menu tree that is used for setting up serial tally communication parameters.



Serial Tally Communication Setup Menu Tree

# Disk Menu Tree

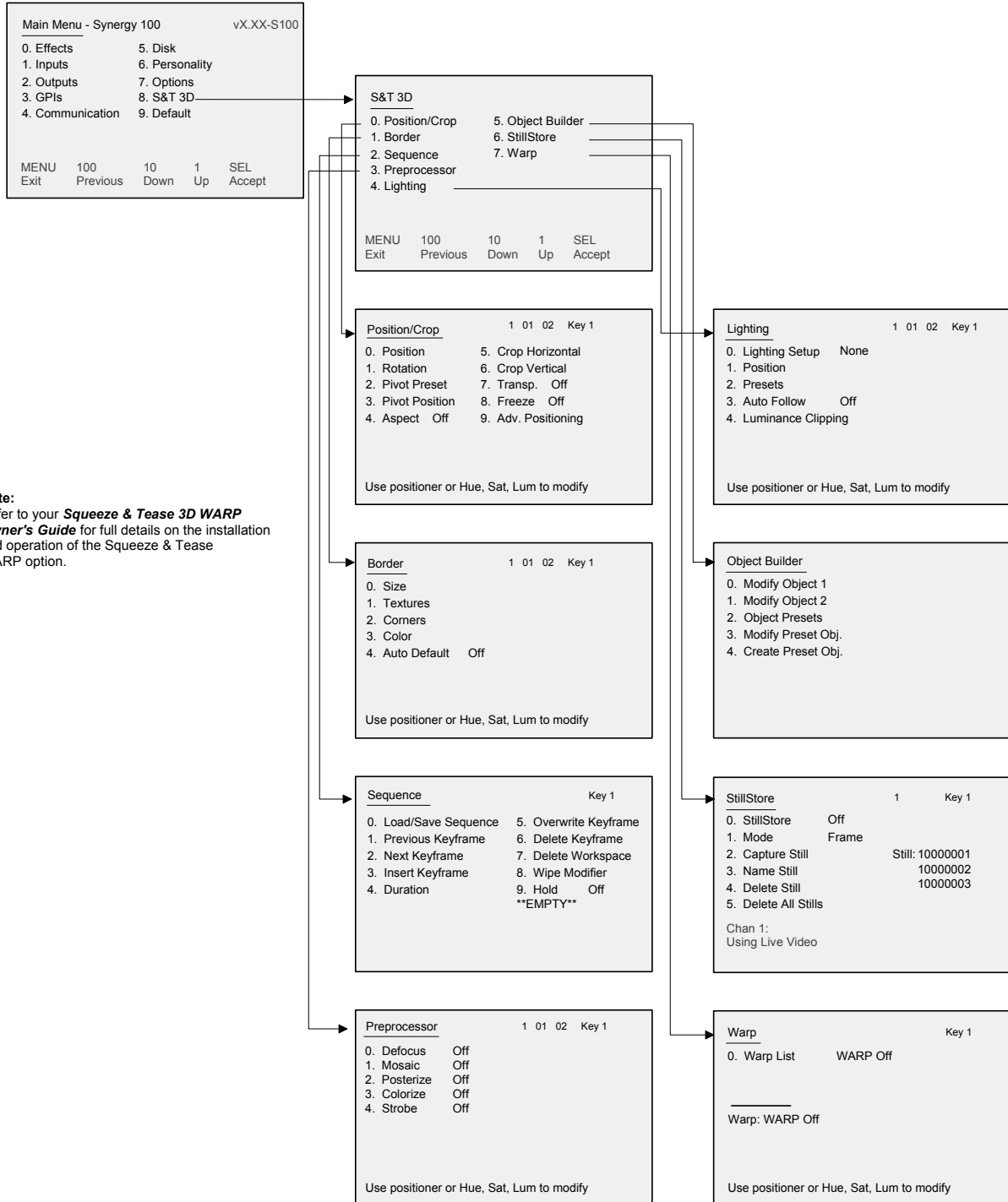
The following figure illustrates the *portion* of the menu tree that is used for storing and recalling your switcher installation setup, memories, personality, and 3D wipes to and from a floppy disk or USB key.



Disk Setup Menu Tree

# Squeeze & Tease 3D Menu Tree

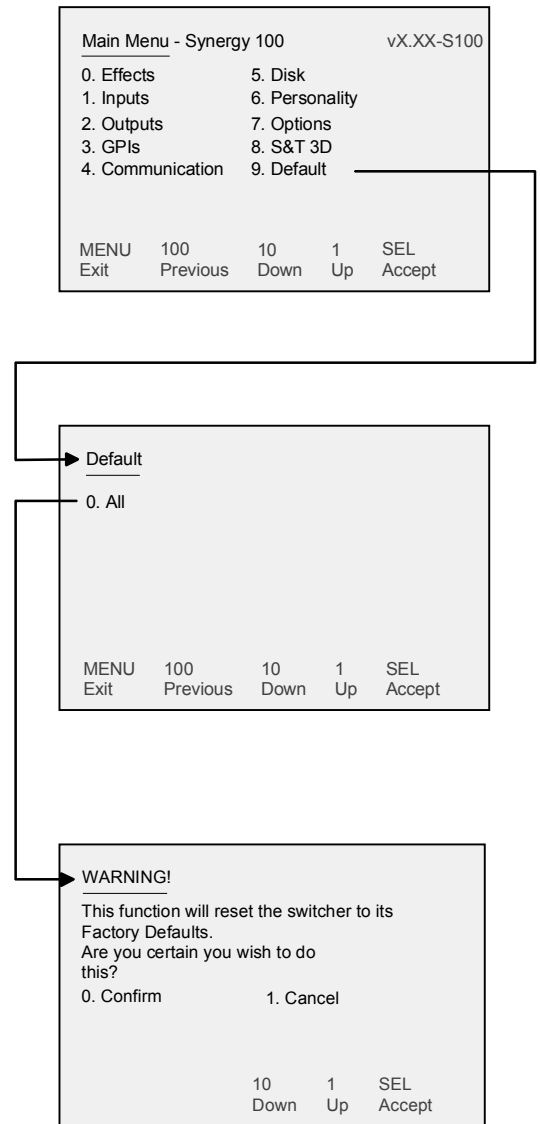
The following figure illustrates the *portion* of the menu tree that is used for configuring your Squeeze & Tease 3D effects.



Squeeze & Tease 3D Setup Menu Tree

# Default Menu Tree

The following figure illustrates the *portion* of the menu tree that is used to default your switcher settings.



*Default Menu Tree*

# Glossary of Terms

**Active Video Lines** — All video lines not occurring in the vertical blanking interval; the portion of the video signal that contains picture information.

**Aspect Ratio** — The numerical ratio of picture width to height, for example, 4:3 or 16:9.

**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.

**Border** — Effects created around the edges of a pattern or on a keyer. If an optional dual border generator card is installed, several border, shadow, and outline effects are available on that keyer as well.

**Border Generator** — Circuitry which generates various border effects on keys created by the switcher.

**Chroma Key** — An effect in which video from one source replaces video of a specific hue in a second video source. The blue and green hues are most commonly used for chroma keying.

**Chrominance** — The “depth” or saturation of a color. The three characteristics of a TV color signal are chrominance, luminance and hue.

**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 term “mix” is often used interchangeably with “dissolve”.

**Downstream Keyer (DSK)** — A keyer that places a key “downstream” of the MLE effects system output. This “top level” effect usually consists of a character generator title.

**External Key** — A video input (non-primary video) used to produce a key effect. Examples of external key sources are character generators and cameras.

**Fade-to-Black** — A controlled change of the on-air picture signal level down to black level.

**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”).

**Field Frequency** — The rate at which one complete field is scanned, approximately 50 times per second in 625 video or 60 times per second in 525 video.

**Frame** — One complete picture consisting of two fields of interlaced scanning lines.

**GPI** — An abbreviation for General Purpose Interface, a device which typically allows remote control of the switcher's automatic transition functions.

**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.

**Internal Key** — The use of a primary input to produce a key effect.

**Key** — An effect produced by “cutting a hole” in background video, then filling the hole with video or matte from another source. Key source video cuts the hole, key fill video fills the hole. The video signal used for cut and fill can come from the same or separate sources.

**Key Fill** — A video input which is timed to “fill the hole” provided by the key source video. An example of key fill is the video output of a character generator.

**Key Invert** — An effect which 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. The **KEY INV** push-button selects this effect.

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

**Key Video** — See Key Source.

**Linear Keys** — 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 signal (also known as the “hole cutter” or “alpha channel”) that is associated with the key fill. A keyer capable of a linear key converts the key signal voltage directly to the transparency effect on the screen. Our switcher's **KEY MEM** button allows the user to store the CLIP and GAIN settings required to match the incoming key signal to the keyer's requirements.

**Line Frequency** — The number of horizontal scans per second. For 525 line 60 Hz systems, this is approximately 15734 scans per second.

**Luminance Key** — An effect in which video from one source is replaced by video that exceeds a set level in a second video source.

**Mask** — See Key Mask.

**Matte** — A solid color signal which is generated by the switcher and can be adjusted for hue, saturation, and luminance levels.

**Matte Key** — A key effect in which the fill video is matte, provided by one of the switcher's matte generators.

**Memory** — The memory feature provides storage and recall of complete switcher setups.

**MIX** — See Dissolve.

**MLE** — An abbreviation for multi-level effects.

**PGM Output** — The on-air video output of the system.

**Primary Input** — Video sources selected by the control panel push-buttons for the crosspoint buses. These buses are normally labeled “KEY”, “PGM” or “BKGD”, and “PST”.

**PV Output** — A switcher output which shows the scene that will go on-air when the next automatic or manual transition takes place.

**Self Key** — A key effect in which the same video signal serves as both the key signal and key fill.

**Soft Edge** — A pattern edge effect produced by mixing key source and key fill signals in such a way that the edge of the pattern is not sharp.

**Split Screen** — An effect in which a wipe pattern provides the key source signal. This is known as a “preset pattern” key.

**Tally** — An indicator which illuminates when the associated push-button or control is selected or is on-air.

**Termination** — A means of closing a circuit by connecting a resistive load to it. In video systems, a termination is typically a 75 ohm resistive load.

**Transition** — A controlled change from one video input to another video input or black. The change can occur through a wipe, cut, dissolve or “DVE Send” effect.

**Transition Preview** — A transition seen only on the preview monitor. It may be observed and adjusted without disturbing the program or “on-air” output.

**Video** — The electrical signal produced by a television camera, character generator or other image source. The signal amplitude varies in relation to the tonal scale from black to white presented at the source. White produces the highest amplitude; black produces the lowest signal amplitude.

**Wipe** — A transition from one video signal to another, in which the change proceeds according to the shape of a specific pattern. A moving transition line separates the two picture signals.





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