Ross Video Limited

Synergy 1 and Synergy 100
Maintenance Guide

Software Version: 16-S1

ROSS

Cool Practical Technology™

Synergy 1 and Synergy 100 • Maintenance Guide

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Notice

Trademarks

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

⏚	**Protective Earth**	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.
⚠	**Warning**	The symbol with the word **"Warning"** within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury
⚠	**Caution**	The symbol with the word "**Caution**" 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.
⚠	**Notice**	The symbol with the word "**Notice**" 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.
⚡	**Warning Hazardous Voltages**	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.
▲	**ESD Susceptibility**	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.

⚠ **Warning** 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.

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^2** 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 appariel numerique 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.

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.

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.

Company Address

Ross Video Limited

8 John Street
Iroquois, Ontario, K0E 1K0
Canada

Ross Video Incorporated

P.O. Box 880
Ogdensburg, New York
USA 13669-0880

General Business Office:	(+1) 613 • 652 • 4886
Fax:	(+1) 613 • 652 • 4425
Technical Support:	(+1) 613 • 652 • 4886
After hours emergency:	(+1) 613 • 349 • 0006
E-mail (Technical Support):	techsupport@rossvideo.com
E-mail (General Information):	solutions@rossvideo.com
Website:	http://www.rossvideo.com

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Introduction

In This Chapter

As a useful tool for the field engineer, the guide takes you through the block diagram of the Synergy switchers, the main boards and components, and the steps required to install various options in the frame and control panel.

About This Guide

This guide provides information regarding the technical theory and maintenance of the following Synergy switchers:

- **Synergy 1**
- **Synergy 100**

The following chapters are included:

- Chapter 1 — "**Introduction**" summarizes the guide and lists important terms, conventions and abbreviations.

- Chapter 2 — "**System Architecture**" describes the switcher's block diagram, and explains how video flows through the unit.

- Chapter 3 — "**Software Upgrades**" provides instructions for performing software upgrades.

- Chapter 4 — "**Option Boards**" provides basic information about the optional boards: Serializers and Deserializers for timing Aux Buses, the Dual/Floating Border Generator, the Squeeze & Tease Boards, the Ultimatte Insider Board, the Dual Aspectizer Board, and the Frame Tally Board.

- Chapter 5 — "**Frame Processor (CPU) Board**" provides details on the Frame CPU Board. The Serializer and Deserializer Boards and their installation are also discussed.

- Chapter 6 — "**Working with Installed Options**" discusses the system menus that enable you to verify the installed options on your Synergy switcher, and install serial numbers and software options.

- Chapter 7 — "**DVE Send Option**" outlines the procedures required to install and test the DVE Send Option on the Synergy 1 switcher.

- Chapter 8 — "**Power Supplies**" provides information about redundant power, and procedures for changing control panel and frame power supplies in the field.

- Chapter 9 — "**Calibration and Diagnostics**" provides information about calibrating the Synergy 1 and Synergy 100 switchers, and running a variety of diagnostic tests.

- Chapter 10 — "**Control Panel Boards**" provides details about each "switch" board in the control panel for the Synergy 1 and Synergy 100 switchers, plus the Control Panel CPU Board layout for each.

- Chapter 11 — "**Synergy 1 Panel Maintenance**" provides detailed instructions for basic Synergy 1 control panel maintenance procedures, such as changing lamps and buttons.

- Chapter 12 — "**Synergy 1 Control Panel Options**" provides instructions for installing a variety of control panel options, including VTR Remote Control, Video Server Control and Audio Server Control.

- Chapter 13 — "**Miscellaneous Options**" provides instructions for installing the Editor Interface Option and the Synergy 1 USB Controller.

- An **Index** is also provided for your reference.

If, at any time, you have a question pertaining to your Synergy 1 or Synergy 100 switcher, please contact us at the numbers listed in the front of this guide. Our technical staff are always available for consultation, training, or service.

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 integral display panel are indicated in bold-faced upper and lower case text. For example:

  The **Aux Bus Setup Menu** allows you to ...

- Softkey labels on the integral display are indicated in bold-faced upper and lower case letters, using a sans-serif font. They are *not* indicated by the function key below the display that you press. For example:

  Press **Accept New Name** to register ...

Documentation Terms

The following terms are used throughout this guide:

- A "**1+0 DVE**" has a video connection *only* going from the Synergy 1 to the DVE. Both key and fill signals are connected from the DVE to the Synergy 1.

- A "**1+1 DVE**" has both a video (fill) and an key (alpha) connection going from the Synergy 1 to the DVE. Both key and fill signals are connected from the DVE to the Synergy 1.

- "**Crosspoint**" is synonymous with "**Button**". Both refer to the switcher crosspoint or buttons on the Synergy control panel.

- "**Frame**" and "**Electronics Frame**" both refer to the Synergy 1 or 100 switcher's 2 RU electronics chassis.

- "**Input #**" refers to the "**BNC Input #**" on the rear of the Synergy frame.

- "**Operator**" and "**User**" refer to the person who uses the Synergy production switcher.

- "**Panel**" and "**Control Panel**" both refer to the multi-button control panel of the Synergy 1 or Synergy 100 switchers.

- "**Primary DVE**" refers to the *one* DVE (either single or multi-channel) that is connected to a Synergy 1 switcher via RS-422 serial control. This type of connection allows you to run the DVE using *custom control* buttons. You can also load DVE effects from the panel using the **Recall DVE** button in the **Global Memory System Group**.

- "**SDI**" refers to Serial Digital Interface, a digital video signal that is distributed via a single coaxial cable with BNC connectors.

- "**Secondary DVE**" refers to any number of DVEs that are connected to the Synergy 1 switcher using video and key connections only — with *no* RS-422 control. A secondary DVE *must* be controlled from its own local control panel, or via GPI output pulses from the Synergy 1 switcher.

- "**System**" refers to the entire Synergy 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 system is included.

Abbreviations

The following abbreviations are used throughout the text:

Abbreviation	Definition
A-D	Analog-to-Digital
AUX	Auxiliary
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

Related Publications

For a complete installation and operational overview of the Synergy 1/Synergy 100 product line, refer to the following publications:

- *Synergy 1 Installation Guide* (**4216D-002**)
- *Synergy 1 Operation Guide* (**4216D-003**)
- *Synergy Series Squeeze & Tease 3D/WARP Owner's Guide* (**4000D-148**)
- *Synergy 100 Installation Guide* (**4100D-002**)
- *Synergy 100 Operation Guide* (**4100D-003**)
- *Synergy 100 Squeeze & Tease 3D/WARP Owner's Guide* (**4100D-148**)

A Word About Static Discharge

Throughout the many procedures in this *Maintenance Guide*, please observe all static discharge precautions.

Caution   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.

System Architecture

In This Chapter

This chapter describes the boards for the Synergy 1 frame, the overall system block diagram, and provides an explanation of how video flows through the unit. The Synergy 1 frame is used with the Synergy 1 and Synergy 100 control panels.

The following topics are discussed:

- • Block Diagram
- • Primary System Boards
- • Buses and Video Routing
- • CPU Structure
- • Power-Up Sequence
- • Board Labeling

Refer to the "**Equipment Overview**" sections of the *Synergy 1 Installation Guide* and *Synergy 100 Installation Guide* for detailed discussions of the Synergy frame front panel, back panel connectors, internal board layout, and control panel connectors.

Block Diagram

Use the block diagram below for reference throughout this chapter.

Legend:

| 10-Bit Parallel Digital | _ _ _ _ _ _ |
| Serial Digital | _____ |
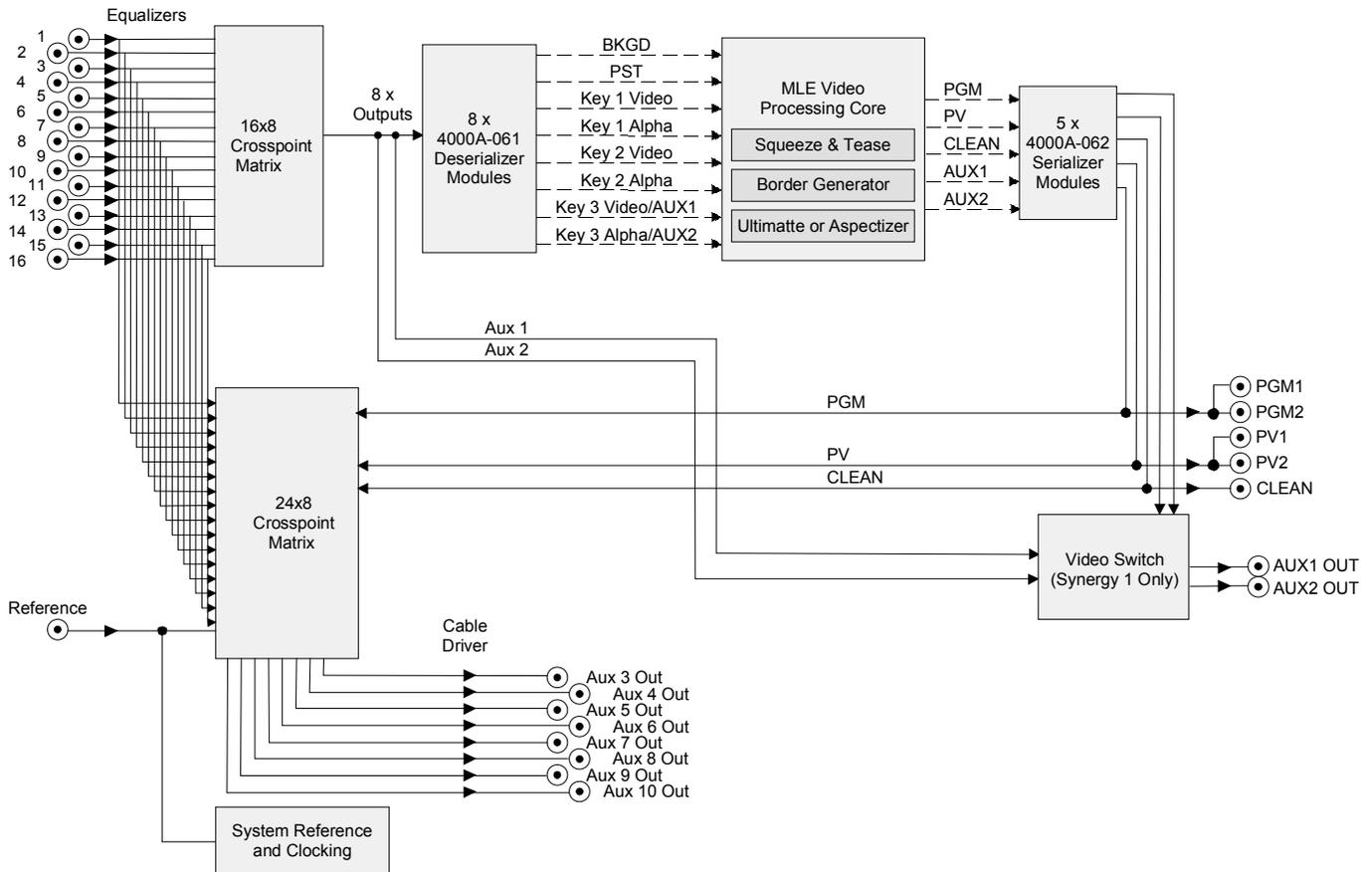
Synergy 1 Frame Block Diagram

Note the following important points regarding the block diagram "**Synergy 1 Frame Block Diagram**" on page 2–2:

- 16 external inputs are routed into the 16x8 crosspoint matrix.

- PGM, PV, and Clean Feed are fed into the 24x8 crosspoint matrix , which then routes the signal to Aux Buses 3 to 10.

- The crosspoint matrices provide 16 outputs:

    ~ Background

    ~ Preset

    ~ Key 1 Video

    ~ Key 2 Video

    ~ Key 3 Video/Aux 1

    ~ Key 1 Alpha

    ~ Key 2 Alpha

    ~ Key 3 Alpha/Aux 2

    ~ 8 x Aux (Aux Buses 3-10)

- Each output, with the exception of the 8 untimed Aux Buses, is routed through a **Deserializer Module** (4000A-061) from which the signals feed the MLE.

- Aux Buses 1 and 2 may be routed through **Deserializer Modules**, through blanking circuitry (not shown), re-serialized in **Serializer Modules** (4000A-062), and out through BNC connectors.

- The MLE is self-contained, with provisions for several optional modules: **Dual Border Generator** (4000A-049), **Squeeze & Tease 2D** (4000A-048), **Squeeze & Tease 3D** (4000A-148), **Dual Aspectizer** (4000A-050), and the **Ultimatte Insider™**. The MLE outputs the following signals:

    ~ Program

    ~ Preview

    ~ Aux 1 (optionally timed)

    ~ Aux 2 (optionally timed)

    ~ Clean Feed (optional)

Note The following two sections provide diagrams of the front and rear frame of the Synergy 1 and Synergy 100 switchers.

Synergy 1 Frame – Front View

The figure below illustrates the front of the frame, with the door removed. The layout is identical for the Synergy 1 and Synergy 100 switchers.
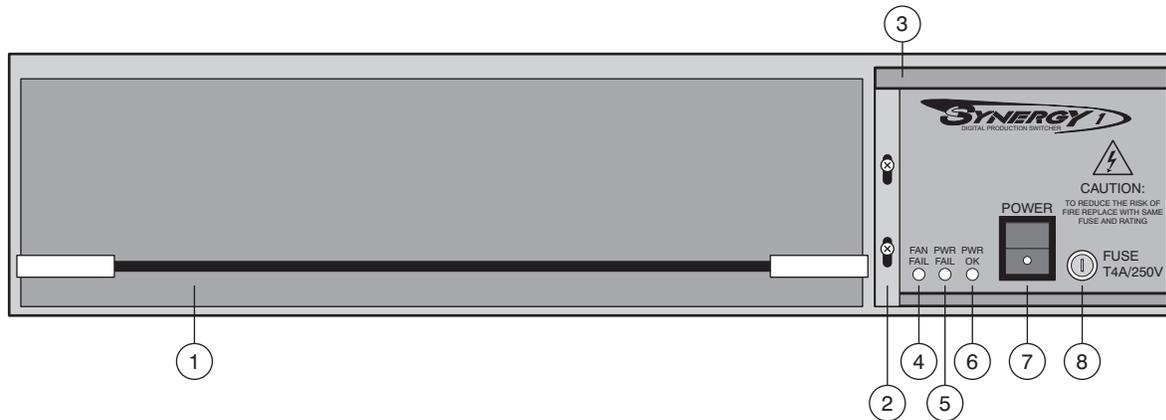
Synergy 1 Frame — Front View

1) Frame CPU Board	4) Fan Fail LED	7) Power Switch
2) Power Supply Lock Down Plate	5) Power Fail LED	8) Fuse
3) Power Supply Handle	6) Power On LED	

The following are descriptions of each front component.

1. Frame CPU Board

The **Frame CPU Board** provides all the electronics required for the Synergy switcher. The board also houses several "daughter" boards for options such as **Squeeze & Tease 2D** or **WARP**, **Ultimatte Insider**, **Aspectizer**, or the **Dual Border Generator**.

2. Power Supply Lock Down Plate

The power supply is held in place with a single lock-down plate that is secured with two screws. These screws must be loosened and the lock-down plate moved up in order to be able to remote the power supply.

3. Power Supply Handle

A small handle is provided to assist in removing and inserting the power supply. The tray houses the power supply and frame fan. For frame cooling, note that air flows in from the sides of the frame, across the circuit boards and out the rear exhaust port.

**Warning
Hazardous
Voltages**

When the power supply is inserted into the frame, it mates with male power pins that carry *live voltage* if the frame is plugged in. All power *must* be disconnected before servicing.

Caution — do *not* insert your fingers into the power supply slot when the unit is plugged in!

4. **FAN FAIL LED**

    When lit, the **FAN FAIL** LED indicates that the fan is drawing too much current or has stopped turning.

5. **POWER FAIL LED**

    When lit, the **POWER FAIL** LED indicates that the power supply has failed or is not connected properly.

6. **POWER ON LED**

    During normal operations, the **POWER ON** LED should be lit *green*. 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.

7. **POWER Switch**

    Use the **POWER** Switch to turn on the power supply.

    Note that two important **POWER FAIL** indicator LEDs on the Control Panel mirror the condition of the frame LEDs and the panel's power supply:
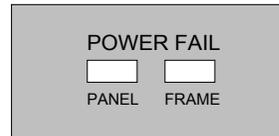
    - **PANEL** — when lit, indicates that there is a fault with the control panel's primary or secondary power supply.
    - **FRAME** — when lit, indicates that there is a fault with the frame supply or fan.

8. **FUSE**

    A fuse is provided for the power supply. The fuse is rated at 250V, 4A.

Synergy 1 Frame – Rear View

The figure below illustrates the rear connector panel of the Synergy 1 frame. The connector layout is identical for the Synergy 1 and Synergy 100 switchers.
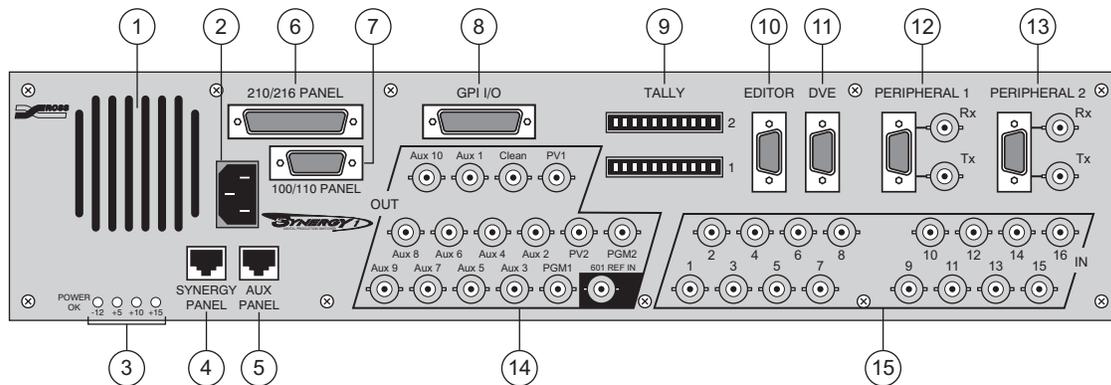
Synergy 1 Frame — Rear View

1) Fan Exhaust Vent	6) RVS 210/216 Panel Port	11) DVE Port
2) Power Connector	7) GVG 100/110 Panel Port	12) Peripheral 1 Port
3) Power Supply LEDs	8) GPI I/O Port	13) Peripheral 2 Port
4) Synergy Panel Port	9) Tally Ports	14) Output Section
5) Aux Panel Port	10) Editor Port	15) Input Section

The following section includes descriptions of each rear panel connector.

1. Fan Exhaust Vent

A grill is provided for **FAN EXHAUST**, behind the power supply. To prevent the frame from overheating, do not block the exhaust vent with cables or other equipment.

2. Power Connector

One AC **POWER** connector is provided for frame power.

3. Power Supply LEDs

Four **POWER SUPPLY LEDs** are provided to indicate the condition of the power supply (-12, +5, +10 and +15V). Under normal operating conditions, each should be lit green.

4. Synergy Panel Port

One 8-pin shielded Telco port labeled **SYNERGY PANEL** is provided for communications between the frame and the Synergy control panel.

Important

The cable for connecting the Synergy control panel to the Synergy 1 SD frame is not wired as a standard CAT5 ethernet cable. If you need a cable of a specific length, contact your Ross Video Representative for ordering information.

5. **Aux Panel Port**

   One 6-pin shielded telco port labeled **AUX PANEL** is provided for communications between the frame and remote Aux panels.

6. **RVS 210/216 Panel Port**

   One 50-pin port labeled **210/216 PANEL** is provided for communications between the frame and the RVS 210 or RVS 216 control panel.

7. **GVG 100/110 Panel Port**

   One 15-pin D-Type port labeled **100/110 PANEL** is provided for communications between the frame and the GVG-100 or GVG-110 control panel.

8. **GPI Input/Output Port**

   One 25-pin, D-Type port labeled **GPI I/O** is provided for GPI input and output ports. Please note:

   • As standard, the connector provides one common ground, 12 GPI outputs and 12 GPI inputs.

9. **Tally Ports**

   Two 12-pin ports labeled **TALLY** are provided for a total of 16 optional tally relays.

10. **Editor Port**

    One 9-pin, D-Type, RS-422 port labeled **EDITOR** is provided for connection to a external edit controller. The connection allows the Synergy 1 to be controlled by the editor using RS-422 commands.

    • The port can be configured as RS-422 or RS-232 through the menu system.

11. **DVE Port**

    One 9-pin, D-Type, RS-422 port labeled **DVE** is provided for connection to the primary external DVE. The connection is designed for control purposes. Please note:

    • The port can also be used to connect to the *first channel* of a DVE that requires one serial port per channel.

    • The port can be configured for additional serial control purposes through the menu system.

12. **Peripheral 1 Ports**

    The **PERIPHERAL 1** group includes three ports:

    • One 9-pin, D-Type, RS-422 port is provided for connection to a primary peripheral device. The connection is for control purposes. The port can be configured for additional serial control purposes through the menu system.

    • Two BNCs labeled **Rx** and **Tx** are provided for communications with peripheral devices such as the CDK-111A-M.

Note
The two **Peripheral 1** BNCs share the same internal circuitry as the 9-pin D-Type **Peripheral 1** connector. Only *one* of the two sets of connectors can be used at a time.

13. **Peripheral 2 Ports**

   The **PERIPHERAL 2** group includes three ports:

   • One 9-pin, D-Type RS-422/RS-232 port is provided for connection to a primary peripheral device. The connection is for control purposes. The port can be configured for additional serial control purposes through the menu system.

   • Two BNCs labeled **Rx** and **Tx** are provided for communications with peripheral devices such as the CDK-111A-M.

   Note   The two **Peripheral 2** BNCs share the same internal circuitry as the 9-pin, D-Type, **Peripheral 2** connector. Only *one* of the two sets of connectors can be used at a time.

14. **Output Section**

   Fifteen BNCs are provided as the switcher outputs, plus the digital reference input, as follows:

   • Two program outputs (**PGM1** and **PGM2**).

   • Two preview outputs (**PV1** and **PV2**). Both outputs display the overlay as controlled from the menu system.

   • Ten Aux Bus outputs (**Aux1** through **Aux10**). Aux outputs 1 and 2 can be *timed* or *untimed*, depending upon the number of **Timed Aux Bus** options installed. Aux outputs 3 through 10 are untimed.

   Note   Since the Synergy 1 SD 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, with the exception of Aux Bus 1 and 2.

   Any of the 10 Aux Bus outputs can be used for the *primary* DVE, the DVE that can be controlled using RS-422 serial control from the Synergy 1 control panel *only*. Refer to the section "**Output Connection**" in the *Synergy 1 Installation Guide* for additional information.

   This feature is not available for the Synergy 100 control panel.

   • One optional clean feed output (**CLEAN**).

   • One digital reference input (**601 REF IN**).

   If DAs are required to provide additional outputs for a particular signal, contact Ross Video or your Ross Video dealer for details.

15. **Input Section**

   Sixteen BNCs are provided for the digital inputs of the switcher.

Primary System Boards

The following primary system boards are referred to throughout this chapter:

- **Frame Motherboard (4216A-002)**

  Also called the backplane, this non-removable board provides the interconnects between the Frame Processor board, power supply and external connections. The board has no active components.

- **Frame Processor (CPU) (4216A-001)**

  The **Frame Processor** resides in the slot of the Synergy 1 frame. It contains the main system microprocessor which handles high-level control functions and all of the remote serial communication for the Synergy 1 frame. It also provides connectors for mounting of all of the optional daughter boards.

Buses and Video Routing

The Synergy 1 switcher's full crosspoint matrix is 24 x 16 as follows:

- 16 external inputs

- 4 internal inputs

- 4 spare inputs (The spare inputs are currently not used.)

The 16 buses (crosspoint outputs) are as follows:

- Background

- Preset

- Key 1 Video

- Key 1 Alpha

- Key 2 Video

- Key 2 Alpha

- Key 3 Video/Aux 1/DVE Video

- Key 3 Alpha/Aux 2/DVE Alpha

- 8 x Untimed Aux (Aux Buses 3-10)

MLE Outputs

Looking closer at the MLE, it receives eight dedicated buses:
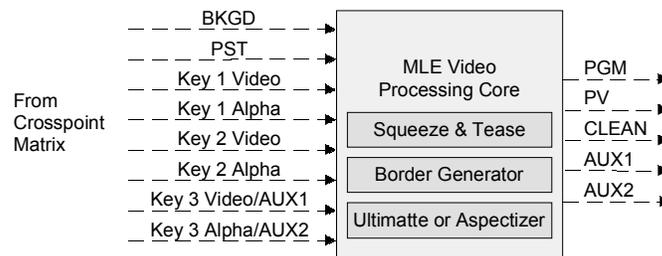
MLE Outputs — Dedicated Buses

These dedicated buses are as follows:

- 1 x Background

- 1 x Preset

- 1 x Key 1 Video

- 1 x Key 1 Alpha

- 1 x Key 2 Video

- 1 x Key 2 Alpha

- 1 x Key 3 Video/Aux 1/DVE Video

- 1 x Key 3 Alpha/Aux 2/DVE Alpha

The MLE includes the following outputs:

- **Program** — This output is routed to a rear-frame BNC output connector, to the Preview Matrix, and also back into the crosspoint matrix.

- **Preview** — This output is routed to a rear-frame BNC output connector and to the Preview Matrix.

- **Clean Feed** — This output is routed to a rear-frame BNC output connector and also back into the crosspoint matrix.

- **Aux 1** *(Synergy 1 only)* — This output is routed to a rear-frame BNC output connector through the video switch.

- **Aux 2** *(Synergy 1 only)* — This output is routed to a rear-frame BNC output connector through the video switch.

Serializer Modules

Program, **Preview**, **Clean Feed, Aux 1,** and **Aux 2** video each come out of the MLE as parallel 10-bit data. These signals are then routed through small **Serializer Modules** (4000A-062) as shown below.

Serializer Module

Serializer Modules convert the parallel digital video data into the serial format, which can then be routed via coax cables through your facility, or used internally in the Synergy's crosspoint matrix. The crosspoint matrix requires that everything must be in the serial format. Thus any signal that is routed to the crosspoint matrix must go through a **Serializer Module**, from any given output.

Note The **Clean Feed** has a dedicated BNC output, just like **Program** and **Preview**, but **DVE Send** is *only* available to the outside world by routing it into the video switch, and then out via an Aux Bus.

There is no **DVE Send** BNC output.

Synergy 1 Aux Buses

The routing for Aux Buses on the Synergy 1 is described in this section. Refer to the illustrations on on page 2–12.

Aux Buses 1 and 2

Aux Buses 1 and 2 can be configured for either "timed" or "untimed" operation.

- For **untimed** Aux Bus operation, the lower circuit is used — going directly from the crosspoint matrix to the video switch, and then to the output BNC connector. No other processing is required.
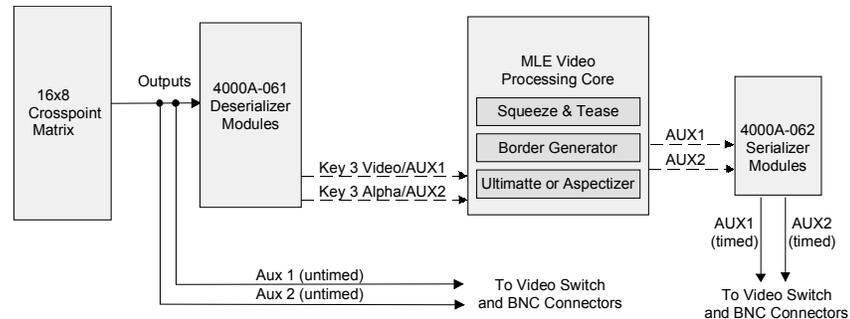
Aux Buses 1 and 2 Routing

- For timed **Aux Bus** operation, the upper circuit is used — going first through a **Deserializer Module** (4000A-061).
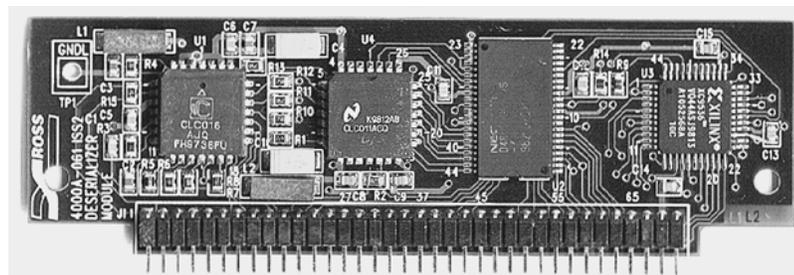
Deserializer Module

The **Deserializer Module** converts the signal from serial data to 10-bit parallel data, but it also handles the timing of the inputs by auto-timing the signal to reference.

The signal is then routed into the MLE video processing core, through circuitry that performs blanking insertion, signal clean-up, and synchronization to system reference. Note that the blanking does not affect the imbedded ancillary data in the vertical interval.

- As the last step, the signal is routed through a **Serializer Module**, converted from parallel to serial, then through a driver (video switch) to the output BNC connector.

Aux Buses 3 to 10

Aux Buses 3 to 8 inclusive are untimed, and are switched directly on the crosspoint matrix. Refer to the figure on on page 2–13.

Regarding timing, there is very little delay on the untimed Aux Bus outputs. The timed Aux Bus outputs, however, are delayed such that they are timed to match the PGM output of the switcher.
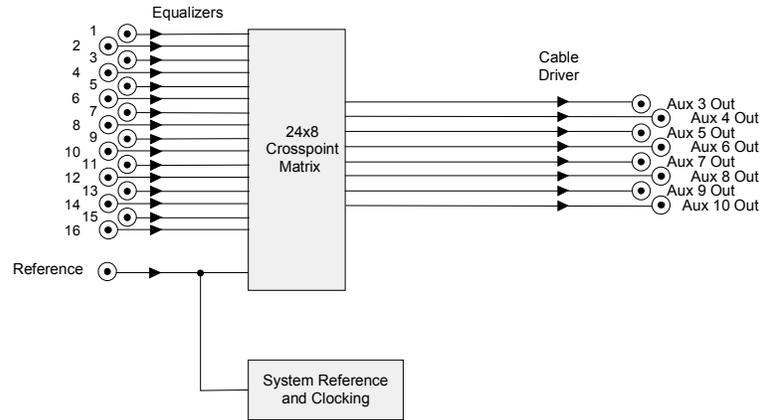
Aux Buses 3 to 10 Routing

Phase Lock Loop and Sync Pulse Generator

The Phase Lock Loop (**PLL**) and Sync Pulse Generator (**SPG**) circuitry takes the reference video signal from the **REF IN** BNC (in serial form) and creates a clean clock — plus various other sync pulses for the system.
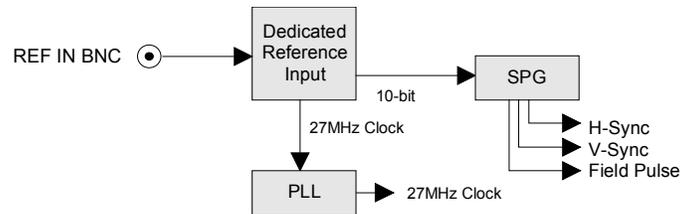
PLL and SPG Circuitry

Within the PLL and SPG circuitry, there are two modes in which the **Deserializer Module** (4000A-061) can work:

- for reference
- as a 27 MHz clock

Both modes are discussed in the following sections.

Reference

The simplest mode is when the Deserializer is used for the reference. The microprocessor tells the module to add a delay of [n] clocks. The signal comes in — it is then delayed and fed out.

- On all other buses (e.g., MLE, Aux Buses) system software requests a delay of [n] clocks from the reference. The reference sends a sync pulse, then the module looks at incoming video and adjusts the delay dynamically — delaying video by [n] from the reference signal.

System delay on the Synergy 1 is adjusted using the **Reference Menu**. Refer to the section, "**Reference Delay Adjustment**" in the *Synergy 1 Installation Guide* for more information.

```
Reference                                            (200)
                                                  Ref Delay
Additional Delay:       18.94 microsec ( 512 clocks)

MLE1 Delay:             24.35 microsec ( 658 clocks)
Timed Aux Delay:        39.05 microsec (1055 clocks)
Preview Overlay Delay:  42.31 microsec (1143 clocks)
```

Synergy 1 Reference Menu

System delay on the Synergy 100 is adjusted using the **Outputs Menu**. Refer to the section, "**Outputs Menu**" in the *Synergy 100 Installation Guide* for more information.

```
Outputs
_____

0. Aspect      4:3        5. Fld Dom   Field1
1. Ref Dly     300
2. Clean       BeforeKeys
3. Ancillary data
4. RemAuxPrg  Off



MENU      100        10      1      SEL
Exit      Previous   Down    Up     Accept
```

Synergy 100 Reference Menu

The output of the **Deserializer Module** is routed to the SPG, that in turn generates Horizontal Sync, Vertical Sync and Field Pulse.

27 MHz Clock

Another output from the **Deserializer Module** is a 27 MHz clock, which is routed to the Phase Lock Loop (**PLL**). Within the **PLL** is a stable oscillator that regenerates the 27 MHz clock, filtering out all jitter and generating the stable (clean) 27 MHz signal that clocks the *entire* system. The net result is that if you have a jittery reference signal, the output of the Synergy switcher will not be adversely affected on its outputs.

> **Note** | The **PLL** loop bandwidth is 300 Hz. Therefore, low frequency jitter below 300 Hz will not be filtered out by the PLL

If the reference is not present (or is lost), the **PLL** and **SPG** still continue to run. In this condition however, the switcher can default to 625-line mode and the clock rate is not guaranteed. Furthermore, the switcher may lose lock with the video.

System Timing and Non-Sync Detectors

Non-sync detection is based in the **Deserializer Module** (4000A-061). As discussed above, a simple delay can be used, or the module can look at the reference signal and then determine an offset.

The only information that the **Deserializer Module** has about the reference is **Horizontal Sync**. The module itself guarantees that the video will be locked horizontally — after video passes through it.

Additionally, the module's vertical sync output is examined, and compared to that of the reference. If the two signals do not match vertically, the system considers the video to be non-synchronous — and the **N/S** (Non-Sync) LED lights on the panel (on the bus on which the source was chosen). In this non-sync situation, the selected video *may* be stable, but it will be shifted vertically.

If you have an input signal that is out of the timing window (too far out of time horizontally), the signal may lock to the next (or to the previous) **Horizontal Sync** pulse. This situation, however, can introduce a one-line offset, either up or down — and the **N/S** light will again come on.

The Synergy 1 switcher "auto-times" around the reference — on the inputs. Synergy 1 specifications allow a ¼ line tolerance with regard to timing. If your input is ¼ line early or ¼ line late, relative to the reference, the system can time it properly and make it lock exactly. If the signal is greater than the allowed tolerance, the system can not guarantee that it will lock to the correct "H." It may possibly lock to the previous H, or to the next H.

Notes on System Timing and Non-Sync Detectors

Please note:

- In order for the Synergy 1 switcher to properly auto-time late signals (with respect to the reference), the switcher's reference delay must be set to *at least* the amount of time that the incoming signal is late.

  For example, if a video source arrives 1 microsecond later than the reference, the reference delay must be set to at least 1 microsecond for the Synergy 1 switcher to properly auto-time the source. Refer to the section, "**Reference Delay Adjustment**" in the *Synergy 1 Installation Guide* for details on setting the reference delay for your Synergy 1 switcher. If you are setting up a Synergy 100 system, refer to the section, "**Outputs Menu**" in the *Synergy 100 Installation Guide*.

- The Synergy 1 switcher has *one* non-sync detector per bus (including the Aux Buses).

- The non-sync detection circuitry itself resides on the Frame Processor board. However, the detection circuitry uses the V Sync pulse from the **Deserializer Module** to determine sync status.

- The **N/S** LED lights *only* when a non-synchronous input is selected on a given bus. Thus if three non-sync sources are chosen on **PGM**, **KEY** and **PST**, each **N/S** LED will light on the respective buses.

- There are no non-sync detectors on untimed Aux Buses.

CPU Structure

This section describes the CPU structure of the Synergy 1 switcher, in terms of which areas are controlled by which specific microprocessors. Effectively, the CPU structure of the Synergy 1 switcher functions as a master/slave duo-processor system, where the master processor controls high level functionality, and delegates other tasks to slave processors.

In a Synergy 1 switcher, you have two microprocessors in the frame, plus one in the control panel. Each microprocessor is a 50 MHz floating point DSP (TMS-320-C32, manufactured by Texas Instruments), and each is identical — running at the same clock rate.

Processor Distribution and Functionality

Processor distribution and functionality is as follows:

- One "**Frame Processor**" on the **Frame Processor Board** is responsible for performing high level functions, and issuing commands to the MLE processor. This processor manages all serial channels to and from the frame, and manages communications with all other peripheral devices connected to the frame. In addition, it manages communications with the control panel, and in the case of the **Synergy 100 Control Panel**, communicates to the **Control Panel Processor** which LEDs to turn on and off and which text to write in the various displays on the panel.

  The **Frame Processor** also controls the Ultimatte™ Insider Board, the Dual Aspectizer® Board and non-MLE functions, including all **Aux Bus** functions, and all crosspoint switching.

- One "**MLE Processor**" on the **Frame Processor Board** processes high-level information that pertains to the current state and specific commands issued on the MLE.

  This high level information includes which functions are enabled or disabled, and what configurations have been set up by the user on the control panel. The **MLE Processor** translates that information, and sets the required bits in the hardware to complete the command request.

  Following are several examples:

  ~ If you press **WIPE** in the MLE and select the circle wipe in the **Pattern Control Group**, that information goes to the **Frame Processor** — which in turn tells the **MLE Processor** that a circle wipe has been requested. The **MLE Processor** then draws the proper tables required to make the image.

  ~ If you pull the **Fader** from Program to Preset, the **Frame Processor** receives that information and analyses how it affects the high level structures within the switcher — e.g., which buses are moving, what type of effect has been requested (Dissolve, Wipe, DVE, etc.). The **Frame Processor** then passes the current state of a particular field to the MLE Processor, which then writes the effect's specific values to the video processing circuitry.

  ~ If you press the **AUTO TRANS** button, that command goes from the control panel to the Frame Processor, which in turn keeps track of which state the transition is in. Commands are then issued to the **MLE Processor** to perform the transition at (for example) 4% in one field, 8% in the next field — until complete. The MLE Processor in turn *does not* process the video itself, but rather issues commands to the hardware on the **Frame Processor Board** to set the mixer to the requested ratio and manipulate the pixels accordingly.

The MLE Processor also controls the MLE options, such as **Squeeze & Tease**, **Squeeze & Tease 3D**, and the **Dual Border Generator** option. Each option lives as a daughter board on the **Frame Processor Board** itself.

- One "**Control Panel Processor**" within the **Synergy 1 Control Panel** itself oversees both the large User Display and the small MLE display, and also translates button presses into serial protocol that is sent to the frame — indicating which buttons have been selected. The processor also tracks which functions have been selected in the MLE, and at a very high level, provides the frame with specific information that removes the need for the frame to know precisely what the panel looks like.

  For example, the panel does not say that button 32 has been pressed, rather, it says that there is a request to select a circle wipe on pattern generator 2. The frame processes the command and sets the new state of the MLE and pattern generator. In the case of a knob or the positioner, the panel alerts the frame that the control is increasing or decreasing in value. Floppy disk and USB key storage and recall information is also handled by the panel processor, but the data ends up in the frame.

  The "**Control Panel Processor**" within the **Synergy 100 Control Panel** simply turns LEDs on and off, and writes to the various displays on the panel. However, the **Frame Processor** instructs the **Control Panel Processor** *which* LEDs to activate and *which* text to display.

Note

> For system efficiency, the data on the floppy disk or USB key (such as that contained in software upgrades and memory registers), is written in a proprietary binary compressed format. Compressed data is sent to the frame where it is decompressed and processed. Customers cannot read the files on disk or USB key.

A Note About CPU Architecture

Virtually all of the lookup tables and all of the bits that are used to configure the hardware and map the crosspoints are set *every single field*. The system is in effect performing a complete memory recall operation every single field, always guaranteeing that the control panel is set properly. In terms of the architecture, there is no difference between a *requested* memory recall operation and the way that the switcher updates the panel normally — every field.

In addition to increasing the system's reliability tremendously, this functionality also allows you to return to the *exact* state of the panel, should a power failure occur.

Power-Up Sequence

In a **Power-Up** sequence on the control panel, the system first accesses the control panel EPROM, and determines if a software upgrade has been requested.

- If an upgrade has been requested, the system enters the software upgrade mode.

- If the contents of the control panel's flash memory fail a checksum test, the system goes into upgrade mode.

- If an upgrade has not been requested, the system goes to flash memory and copies the contents of the CPU program from flash to RAM. Within the flash memory are located FPGA files, which are uploaded into the control panel's FPGAs.

The control panel next goes to RAM, executes the operating program from RAM, and waits for commands from the frame. If the panel receives *no information* from the frame, the Synergy 1 panel waits in the "**Synergy 1 Logo**" mode as show below.

Synergy 1 Logo

In addition, if communication is lost to the Synergy frame, the panel drops into Diagnostic mode, and the panel itself goes dark.

⚠	**Important**	You may receive a "**USB Upgrade Failed**" error message when the Synergy 1 control panel is powered on if you have the **USB Removable Media Drive Option** installed. Should you receive this error message, contact Ross Video Technical Support for instructions on how to correct the error.

In the case of the Synergy 100 control panel, the panel will remain unlit, with the exception of the Ross™ logo, until it receives commands from the frame. If communication with the Synergy frame is lost, the message, "**FRME COMM LOST**" appears across the four-character displays. Refer to the section, "**Using a USB Key**" on page 3–22 for information on USB error messages when power is restored to the Synergy 100 control panel.

Software Upgrades

When power is applied to the Synergy frame, the **Frame Processor** also goes to the EPROM and determines whether or not a software upgrade has been requested — based on the position of DIP Switch 4, **SW8**, the **Software Upgrade Switch**.

Note | Both the frame and panel EPROMs contain a small amount of code that is sufficient to boot the system or handle a request for a software upgrade.

- If an upgrade has been requested, the frame sends that information to the control panel in the form of a break character. The frame then waits for upgrade data to come from the panel.

- If the contents of the frame's flash memory fail a checksum test, the system goes into upgrade mode.

Refer to the section "**Synergy 1 Software Upgrades**" on page 3–9 for the procedure to upgrade the software for your Synergy 1 switcher. For instructions on upgrading your Synergy 100 software, refer to section "**Synergy 100 Software Upgrade**" on page 3–19.

- If an upgrade has not been requested, the frame goes to flash, and loads up its RAM with code for the Frame CPU. The Frame CPU then performs the following functions:

  ~ Uploads its FPGA with the necessary configuration file.

  ~ Loads CPU code to the MLE CPU and its FPGA (because the MLE CPU only has RAM — not flash).

  ~ Loads all option cards that may be present on the MLE, and all of the option cards' FPGAs.

Once everything has been uploaded, there is a controlled system "start." During the controlled start, the system looks at non-volatile RAM, which contains a record of any possible system *state* — prior to the power down. The system then determines if the power up was due to a power failure, shutting power off normally, or a hard system reset.

- If a hard reset was the cause, the system state is cleared, data is sent to the control panel and the system begins operating.

- If there was a power down or a power failure, the contents of non-volatile memory are checked. If they are in error, a reset is performed. If they are correct, it uses that data as the current system *state* for the boot configuration, informs the control panel, and boots the system in the same state (as prior to the power down).

Note | During power up, the system also checks for new option boards that may have been installed. All option boards have "version and level" read-back circuitry installed, which is read by the frame. This allows the Synergy frame to load the appropriate code and software into a newly-installed board.

The following situations cause a software upgrade:

- If the frame is powered on with the Software Upgrade Switch in the **UP** position.

- During the power up sequence, the system performs a check sum on the Flash. If the check sum is invalid, the system alerts you on the display, and gives you the option to boot or upgrade.

A Note About Memory Registers

Switcher memory registers are stored in the frame's flash memories, along with the FPGA configuration files and the microprocessor code files. Memory registers are recalled directly from flash. The non-volatile memory registers only record the current system state in them. They are low power RAMs which are battery backed (the battery rating is 5 to 10 years).

A Note About the Software Upgrade Process

If a software upgrade has been requested, the control panel reads the upgrade file from a floppy disk or USB key, and then searches for the "boot loader" file. This special file controls the steps required in the upgrade. The boot loader reads the control panel file off the floppy disk or USB key, decompresses it and upgrades the flash. It also loads the frame upgrade file off the floppy disk or USB key, sends it via serial communications to the frame microprocessor — where it is decompressed and uploaded to the frame's flash.

	Note	If the software upgrade process is interrupted, the flash is unaffected. Flash is not uploaded until all upgrade information has been transferred.

Once the entire process is complete, you can then power down the Synergy frame and panel, and place the Software Upgrade Switch (**DIP Switch 4, SW8**) back to the **DOWN** position.

Notes on Using a USB Key

You may receive a "**USB Upgrade Failed**" error message when the Synergy control panel is powered on. Should you receive this error message, contact Ross Video Technical Support for instructions on how to correct the error.

Board Labeling

The figure below illustrates a typical circuit board label:

Circuit Board Labeling Scheme

For all system circuit boards, the following data is listed:

- Ross Video logo

- Board name

- Board number

- Board revision (**ISS** = Issue)

Where a white square is present in the label string, letters *may* be written within the square to indicate a minor variation on the board itself.

Software Upgrades

In This Chapter

This chapter provides instructions for upgrading the Synergy switcher software from a storage device.

The following topics are discussed:

- Synergy 1 Jumpers and Switches
- Synergy 1 Software Upgrades
- Synergy 100 Jumpers and Switches
- Synergy 100 Software Upgrade

Synergy 1 Jumpers and Switches

This section provides important information about system jumpers and switches. The following topics are discussed:

- Jumper Positions

- Synergy 1 Control Panel Jumpers and Switches

- Frame Jumpers and Switches

	Caution	All product servicing should be carried out by qualified service personnel. To gain access to the control panel jumpers, as outlined in the section, "**Synergy 1 Control Panel Jumpers and Switches**"on page 3-3, it will be necessary to remove the safety barrier from the inside of the Control Panel's tub. The equipment still presents a safety hazard with the power switches in the **OFF** position. To avoid electrical shock, disconnect all A/C power cords from the rear of the panel before removal of this barrier. 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.

Jumper Positions

The following legend indicates the jumper positions used in the following two sections.

Jumper Positions

- **Up**: Jumper is away from the front of the board

- **Down**: Jumper is towards the front of the board

Synergy 1 Control Panel Jumpers and Switches

The following diagram illustrates the location of jumpers and switches on the front edge of the **Control Panel CPU Board**:
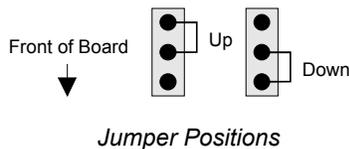
⚠️ **Caution**	All product servicing should be carried out by qualified service personnel. To gain access to the control panel jumpers, as outlined in the section, "**Synergy 1 Control Panel Jumpers and Switches**"on page 3-3, it will be necessary to remove the safety barrier from the inside of the Control Panel's tub. The equipment still presents a safety hazard with the power switches in the **OFF** position. To avoid electrical shock, disconnect all A/C power cords from the rear of the panel before removal of this barrier. 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.

Control Panel Jumpers and Switches

1) JP2, Panel Type	5) JP6, Reserved	9) DIP Switch 1, Reserved
2) JP3, Panel Type	6) JP7, Reserved	10) DIP Switch 2, Reserved
3) JP4, Panel Type	7) JP8, Reserved	11) Reset Button
4) JP5, Reserved	8) JP9, Panel Redundant Power	

1. **JP2, Panel Type**

   Jumper **JP2** works with **JP3** and **JP4** to set the control panel type. Please leave it in the default **Down** position.

2. **JP3, Panel Type**

   Jumper **JP3** works with **JP2** and **JP4** to set the control panel type. Refer to the following table for details.

3. **JP4, Panel Type**

   Jumper **JP4** works with **JP2** and **JP3** to set the control panel type. Refer to the following table for details.

   Setting the Control Panel by Jumper Type

Jumper	Synergy 1
JP2	Down
JP3	Down
JP4	Down

4. **JP5, Reserved**

   Jumper **JP5** is reserved for future use. Please leave it in the default **Down** position.

5. **JP6, Reserved**

   Jumper **JP6** is reserved for future use. Please leave it in the default **Down** position.

6. **JP7, Reserved**

   Jumper **JP7** is reserved for future use. Please leave it in the default **Down** position.

7. **JP8, Reserved**

   Jumper **JP8** is reserved for future use. Please leave it in the default **Down** position.

8. **JP9, Panel Redundant Power**

   Jumper **JP9** indicates whether or not redundant power has been installed in the control panel.

   • **Up** — Redundant power is installed. The red **POWER FAIL** indicator on the control panel will light in the event of a power supply failure in the panel.

   • **Down** — Redundant power is not installed. The red **POWER FAIL** indicator will not light.

9. **DIP Switch 1**

   This 8-position DIP switch is reserved for future use. Please leave all switches in the default **Down** position as labeled on the switch.

10. **DIP Switch 2**

    This 8-position DIP switch is reserved for future use. Please leave all switches in the default **Down** position as labeled on the switch.

11. **Reset Button**

    Press the control panel's **RESET** button to initiate a *full panel* reset. When the reset is initiated from the control panel, the frame's reset is initiated using a software message that is passed along the RS-422 control cable. In the unlikely event that the frame has crashed, it may be necessary to *manually* reset the frame. Refer to the section "**System Reset Notes**"on page 3-7 for additional important information about the system reset function.

Frame Jumpers and Switches

The following diagram illustrates the location of jumpers and switches on the front edge of the **Frame CPU Board**:

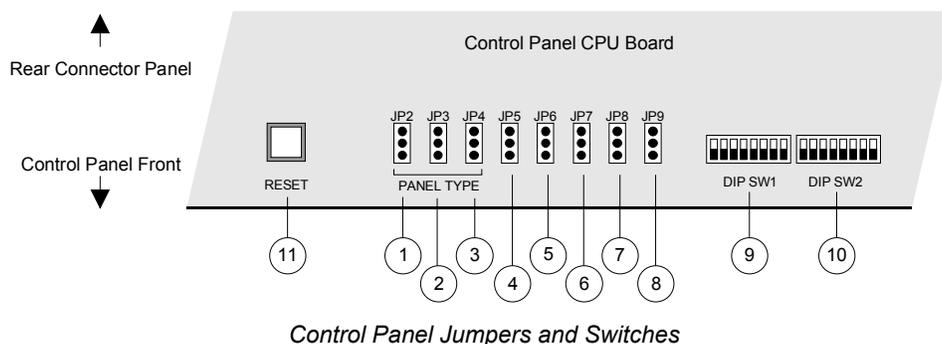|	Caution	Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling the switcher circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Touch the frame to dissipate static charge before removing boards from the frame and exercise proper grounding precautions when working on circuit boards.

Frame Jumpers and Switches
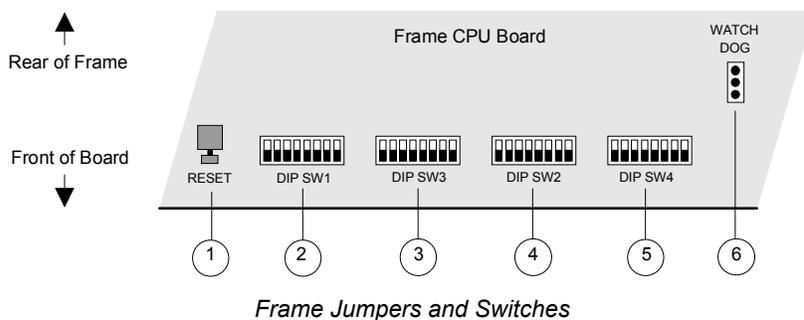
1) Reset Button	3) DIP Switch 3, S&T 3D Upgrade	5) DIP Switch 4, Active
2) DIP Switch 1, Reserved	4) DIP Switch 2, Reserved	6) Watch Dog Jumper

1. Reset Button

Press the red **RESET** button on the frame to initiate a *full system* reset. When the reset is initiated from the frame, the control panel's reset is initiated using a software message that is passed along the RS-422 control cable. In the unlikely event that the control panel has crashed, it may be necessary to *manually* reset the control panel. Refer to the section "**System Reset Notes**"on page 3-7 for additional information.

2. DIP Switch 1

This 8-position DIP switch is reserved for future use. Please leave all switches in the default **Down** position, as labeled on the switch. (Early issue boards may find this switch unpopulated).

3. DIP Switch 3

This 8-position DIP switch is adjusted only when upgrading Squeeze & Tease 3D/WARP software on the Synergy 1 panel and frame. In that case, set SW8 in the **Up** position to enable Squeeze & Tease 3D/WARP software upgrades from a floppy disk or USB key. Refer to Chapter 2, "**Installation and Setup**" of your *Squeeze & Tease 3D/WARP Owner's Guide* for detailed switch setup instructions.

If no Squeeze & Tease 3D/WARP software upgrades are being performed, please leave all switches in the default **Down** position, as labeled on the switch.

4. DIP Switch 2

This 8-position DIP switch is reserved for future use. Please leave all switches in the default **Down** position, as labeled on the switch.

5. **DIP Switch 4**

   This 8-position DIP switch has the following system assignments (from left to right):

   • **SW1** — **Reserved**. Leave in the default **Down** position.

   • **SW2** — **Reserved**. Leave in the default **Down** position.

   • **SW3** — **Panel Type**. Works with **SW4, SW5** and **SW6**. Refer to the table on page 3-6 for details.

   • **SW4** — **Panel Type**. Works with **SW3, SW5** and **SW6**. Refer to the table below for details.

   • **SW5** — **Panel Type**. Works with **SW3, SW4** and **SW6**. Refer to the table below for details.

   • **SW6** — **Panel Type**. Works with **SW3, SW4** and **SW5**. Refer to the table below for details.

DIP Switch 4 Switch Positions

DIP Switch 4	Synergy 1 Position
SW3	Down
SW4	Down
SW5	Down
SW6	Down

   • **SW7** — **Installation Enable**. This switch determines the installation status of the switcher:

   ~ **Up**: Access to installation features is restricted. When you enter the **Installation Menu**, a message alerts you that "**Installation Settings are Locked**." However, you *are* permitted to view the menus as usual. Upon exiting the installation menus, the "**Installation Settings are Locked**" menu once again alerts you that any changes will be *ignored* upon exiting the installation tree.

   In this position, the installation **Load/Save to Disk** menus do not appear in the menu tree.

   ~ **Down**: Installation settings can be changed without restriction. However, upon exiting the menus, an "**Installation Warning**" alerts you that settings are about to be changed:

```
You are about to change the switcher's installation settings.
Press 'Confirm' to save the new settings, or 'Cancel' to revert
to the old settings.




   Confirm      Cancel
```

Installation Change Confirmation Menu

✎ **Note** Place the switch in the **Up** position when you want to restrict access to installation menus. For certain facilities, this setting is recommended once installation is complete.

- **SW8** — **Software Upgrade**. This switch controls the ability to upgrade software from a storage device, such as floppy disk or USB key:

  ~ **Up** — Software can be upgraded from a storage device. Refer to the section, "**Software Upgrade**"on page 3-11 for instructions.

  ~ **Down** — Software can not be upgraded from a storage device. This is the default position.

6. **Watch Dog Jumper**

   Leave the **Watch Dog Jumper** in the default **DIS** (disabled) position.

System Reset Notes

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

- Turning power on and off in either the control panel or the frame causes *that device* to reset — but *not* the other device. This feature ensures that the program video will not be adversely affected if the control panel loses power.

- If *only* the frame is turned off, the panel indicates a frame power failure on the **POWER FAIL** indicator LEDs. In addition, the control panel menu displays the Splash Screen.

- When frame power is restored, the power failure status indicator clears, and the panel returns to the main menu with all control panel settings in the state they were in before the frame power fail occurred — even though the panel was not physically reset.

Note | The rack frame stores all installation, personality, custom control macros, memories and the current video state. The control panel keeps track of the current menu and the settings of all buttons. Resetting the frame changes the current video state. Turning the control panel on and off will *not* reset the video state, because a frame reset has not been initiated.

Power Fail Indicators

Note that two important **POWER FAIL** indicator LEDs on the control panel mirror the condition of the four frame "Power" LEDs and the panel's power supply.
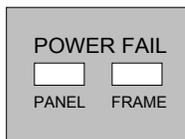
POWER FAIL

PANEL   FRAME

- **PANEL** — when lit, indicates that there is a fault with the control panel's primary or secondary power supply.

- **FRAME** — when lit, indicates that there is a fault with the frame primary supply, secondary supply, or fans.

Power Failure Recovery

The power failure recovery feature of the Synergy 1 SD switcher protects the *entire panel setup* in situations where power is lost. When power is restored after a failure, all setups return *exactly* as they were, immediately before the power failure.

Please note:

- A loss of control panel power *only* has no effect on the frame, because the frame stores the current video state. When control panel power is restored, your setups will return to their previous state. Similarly, resetting the control panel *only* has no effect on the frame.

  Remember that resetting the frame *does* change the current video state, returning the frame and control panel to the default "reset" state.

Synergy 1 Software Upgrades

This section provides step-by-step instructions for upgrading the Synergy switcher software from a storage device. You can obtain copies of all previous software upgrade instructions by navigating the Ross Video website at **http://www.rossvideo.com**.

Use the following procedures to perform a software upgrade from a storage device:

- Hardware Confirmation

- System Backup

- Software Upgrade

- Restoring Registers to the Synergy 1 Switcher

Hardware Confirmation

⚛ **Important** | If you are upgrading your Synergy switcher to a software version of **16-S1**, or higher, you must ensure that your Control Panel CPU Board is of **Issue 5** or higher.

Use the following procedure to verify the version of the CPU Board in your Synergy control panel:

1. Navigate to the **Installed Options Menu** as follows:

   - Press **HOME** (to display the **Main Menu 1-2**).

   - **MORE** (to display the **Main Menu 2-2**).

   - **Setup** (to display the **Setup Menu**).

   - **Installed Options** (to display the **Installed Options Menu 1-2**).

2. Press **Panel Boards** to display the **Panel Boards Menu**.

```
Installed Options (1-2)
Frame Serial Number:0000000

Board                    Rev  FPGA Rev
4216-033 Panel CPU        5   4000x033.bit 1998/12/01 09:49:35     Use Knob 2
4216-030 Xpt Switch       X                                        to scroll
4216-034 Key Switch       2                                        list.
4216-035 Trans Switch     1
4216-036 Pattern Switch   Xa
4216-037 Function Switch

    Software      Panel        Frame       Option    Enter Serial
    Options       Boards       Boards      Boards       Number
```

Installed Options — Panel Boards Menu

3. Locate the **4216-033 Panel CPU** in the **Board** column.

4. Confirm that the **Rev** number is **5** or higher.

⚛ **Important** | If the **Panel CPU** is of a Revision lower than **5** you will NOT be able to upgrade to version **16-S1**, or higher, without upgrading your control panel.

If your hardware meets the requirements of the software upgrade, proceed to with the next step and backup your system.

System Backup

	Important	Because the software upgrade process *automatically* returns the switcher to *default* values, it is important that you back up all switcher elements to a storage device at this point.

Use the following procedure to save your setup configurations to a storage device:

1. Navigate to the **Disk Menu** as follows:

    • Press **HOME** (to display the **Main Menu 1-2**).

    • **DISK** (to display the **Disk Menu**).

2. Insert a storage device as follows:

    • Insert a pre-formatted 1.44 MB high-density floppy disk into the floppy disk drive of the Synergy switcher.

	Note	If the floppy disk is not formatted (or if you wish to completely erase all data from the disk), press **Format**. Follow the instructions on the display to format the disk.

   OR

    • Insert a USB key into the USB port of the Synergy switcher. You must wait 5 seconds after inserting the USB key into the USB port before you can save to it.

	Note	You must have the **USB Removable Media Drive** option installed in order to use a USB key for saving and recalling setup configurations.

3. Press **Store** to display the **Disk Store Menu**.

4. Press **All** to store *all categories* of registers to your storage device.

	Caution	Do NOT remove the floppy disk or USB key from the switcher before the LED on the disk drive or USB port goes out. Doing so may destroy the data on your floppy disk or USB key, as well as the data on the next one you insert into the switcher.

5. Eject the storage device from the switcher.

6. Label the storage device and store it in a safe place. It is recommended that you place the following information on the label:

    • Synergy 1 SD Switcher

    • Software Version [**vXX.xx**] Backup

    • Today's Date

This completes the procedure for saving your setups to a storage device. Please continue with the "**Software Upgrade**" procedure.

Software Upgrade

This section outlines how to initiate the software upgrade using either floppy disks or a USB key.

⚠️	**Important**	The procedures outlined here apply generically to *all* software upgrade requirements. You can obtain copies of all previous software upgrade instructions by logging on to our website at http://www.rossvideo.com.
		For specific instructions on upgrading the software for a purchased option, refer to the appropriate section in this guide.

Using Floppy Disks

Use the following procedure to initiate the software upgrade from a floppy disk:

1. Ensure that you backup switcher by saving your setups to a floppy disk. Refer to the section, "**System Backup**"on page 3-10 for more information.

⚠️	**Caution**	Observe all static discharge precautions throughout the procedure.

2. Power off the frame.

3. Power off the control panel.

4. Move the **Software Upgrade** DIP switch (**DIP Switch 4**, **SW8** on the **Frame CPU Board**) to the **Up** position. Use the diagram below for reference.
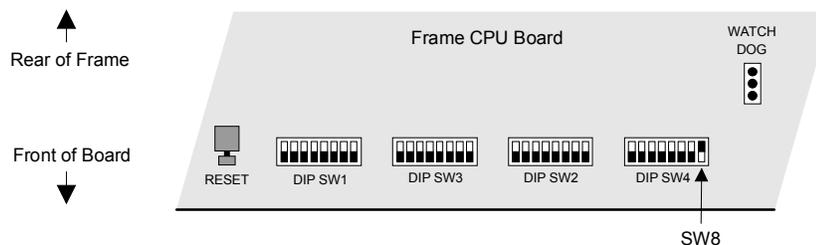
DIP Switch Setting for Software Upgrade

5. Power on the frame first.

6. Power on the control panel second.

7. Insert the **S1 Software Upgrade Disk #1** into the floppy drive.

✏️	**Note**	If you receive an error message informing you that you must have CPU issue **5** or high, you will have abort the software upgrade. This will require you to power off the frame and set the DIP switch back to the **DOWN** position and power on the frame and control panel without the disk in the disk drive.

8. When prompted, remove **Disk #1**, insert **Disk #2**, press **Continue**, and wait for the upgrade process to complete. The completion is clearly indicated when the menu buttons flash in "marquee" fashion.

9. Power off the frame.

10. Power off the control panel.

11. Move **DIP Switch 4**, **SW8** (on the **Frame CPU Board**) to the **Down** position.

---

12. Power on the frame and the control panel — in any order desired.

This completes the procedure for upgrading system software. Please continue with the "**Restoring Disk Registers**" procedure.

Using a USB Key

Use the following procedure to initiate the software upgrade from a USB key:
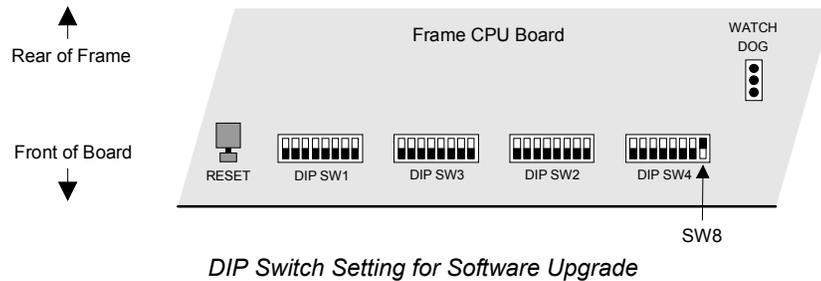
1. Ensure that you have saved your setups to a USB key. Refer to the section "**System Backup**"on page 3-10 for more information.

Caution | Observe all static discharge precautions throughout the procedure.

2. Power off the frame.

3. Power off the control panel.

4. Move the **Software Upgrade** DIP switch (**DIP Switch 4**, **SW8** on the **Frame CPU Board**) to the **Up** position. Use the diagram on page 3-11 for reference.

Rear of Frame

Front of Board

Frame CPU Board

WATCH DOG

RESET DIP SW1 DIP SW3 DIP SW2 DIP SW4

SW8

DIP Switch Setting for Software Upgrade

5. Power on the frame first.

6. Power on the control panel second.

Important | After restoring power to the control panel, you may receive the error message "**USB Upgrade Failed**". Contact Ross Video Technical Support for more information on correcting the error.

7. Insert the **USB key** with the upgrade system software into the USB port of the Synergy switcher.

Note | If you receive an error message informing you that you must have CPU issue **5** or high, you will have abort the software upgrade. This will require you to power off the frame and set the DIP switch back to the **DOWN** position and power on the frame and control panel without the USB key in the USB port.

The completion is clearly indicated when the menu buttons flash in "marquee" fashion.

8. Power off the frame.

9. Power off the control panel.

10. Move **DIP Switch 4**, **SW8** (on the **Frame CPU Board**) to the **Down** position.

11. Power on the frame and the control panel — in any order desired.

⚠	**Important**	After restoring power to the control panel, you may receive the error message "**USB Upgrade Failed**". Contact Ross Video Technical Support for more information on correcting the error.

This completes the procedure for upgrading system software. Please continue with the "**Restoring Disk Registers**" procedure.

Notes on Using a USB Key

The **USB Removable Media Drive Option** replaces the floppy disk drive on the control panel, and supports industry standard USB keys. Once the option is installed, you can store and recall complete switcher setups including memory functions, switcher personalities, installation registers, and more, to a USB key.

⚠	**Important**	A decrease in performance will result from storing more than one set of Synergy files on your USB key.

Consider the following notes when using a USB key:

- Write protect should be disabled on any USB key.

- All Synergy files must be stored in the Root directory of the USB key.

- Only DOS or Windows™ partitions in the USB key directory are supported.

- You must wait 5 seconds after inserting the USB key into the USB port before you can save or recall files.

- A delay can be expected when saving files to a USB key with more than half of the available memory allocated.

- You may receive a "**USB Upgrade Failed**" error message when the Synergy 1 control panel is powered on. Should you receive this error message, contact Ross Video Technical Support for instructions on how to correct the error.

Restoring Registers to the Synergy 1 Switcher

Use the following procedure to restore your registers to on-line memory:

1. Ensure that the new Synergy software version is properly installed. If not, refer to the section "**Software Upgrade**"on page 3-11.

2. Locate the "backup" storage device that you made in the section "**System Backup**"on page 3-10.

3. Read the entire contents of the storage device into switcher memory as follows:

   - Press **HOME** to display the **Main Menu 1-2**.

   - Press **DISK** to display the **Disk Menu**.

   - Insert the backup storage device into its drive or port of the switcher.

✓	**Operating Tip**	You must wait 5 seconds after inserting the USB key into the USB port before you can read its contents.

   - Press **Recall** to display the **Disk Recall Menu**.

- Press **All** to recall *all categories* of registers from the storage device.

⚠️ **Caution** | Do NOT remove the floppy disk or USB key from the switcher before the LED on the disk drive or USB port goes out. Doing so may destroy the data on your floppy disk or USB key, as well as the data on the next one you insert into the switcher.

4. Eject the storage device from the switcher.

This completes the procedure for restoring your disk registers.

Synergy 100 Jumpers and Switches

This section provides important information about the Synergy 100 system jumpers and switches. The following topics are discussed:

- Jumper Positions
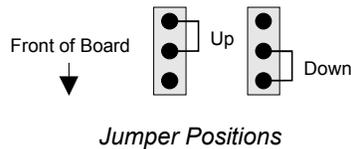- Frame Jumpers and Switches
- System Reset Notes

⚠️ **Caution** | All product servicing should be carried out by qualified service personnel.

The equipment still presents a safety hazard with the power switches in the **OFF** position.

Jumper Positions

The following legend indicates the jumper positions used in the following section.

Jumper Positions

- **Up** — Jumper is away from the front of the board.
- **Down** — Jumper is towards the front of the board.

Frame Jumpers and Switches

The following figure illustrates the location of jumpers and switches on the front edge of the **Frame CPU Board**:

	Caution	Static discharge can cause serious damage to sensitive semiconductor devices. Touch the frame to dissipate static charge before removing boards from the frame and exercise proper grounding precautions when working on circuit boards.

Frame Jumpers and Switches
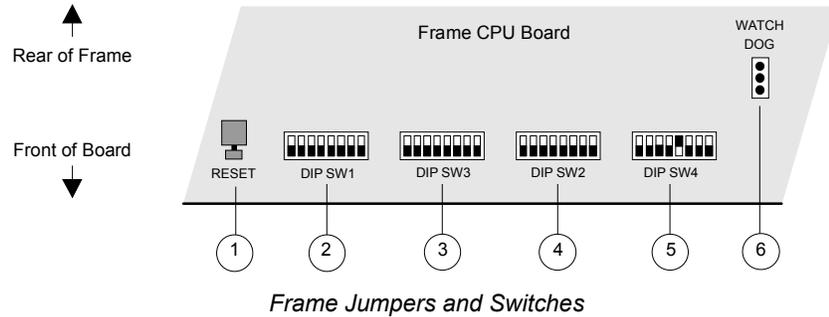
1) Reset Switch	3) DIP Switch 3	5) DIP Switch 4
2) DIP Switch 1, Reserved	4) DIP Switch 2	6) Watch Dog Jumper

1. Reset Switch

Press the red **RESET** switch on the frame to initiate a *full system* reset. When the reset is initiated from the frame, the control panel's reset is initiated via a software message that is passed along the RS-422 control cable. In the unlikely event that the control panel has crashed, it may be necessary to *manually* reset the control panel. Refer to the section, "**System Reset Notes**"on page 3-18 for additional information.

2. DIP Switch 1

This 8-position DIP switch is reserved for future use. Please leave all switches in the default **Down** position, as labeled on the switch. (Early issue boards may find this switch unpopulated).

3. DIP Switch 3

This 8- position DIP switch has the following system assignments (from left to right):

- **SW1 to SW7** — These assignments are **Reserved** and must be left in their default **Down** positions.

- **SW8** — This switch controls the ability to upgrade the **Squeeze & Tease 3D** software from a storage device as follows:

  ~ **Up** — Software can be upgraded from a storage device, such as a floppy disk or USB key. Refer to Chapter 2 "**Installation and Setup**" in your *Synergy 100 Squeeze & Tease 3D/WARP Owner's Guide* for instructions.

  ~ **Down** — Software can not be upgraded from a storage device. This is the default position.

4. DIP Switch 2

This 8-position DIP switch has the following system assignments (from left to right):

- **SW1** to **SW7** – These assignments are **Reserved** and must be left in their default **Down** positions.
- **SW8** – **Preview Overlay**. This switch controls the ability to remove the Preview Overlay from the Preview outputs as follows:
  - ~ **Up** — Preview Overlay is removed from the Preview output and is displayed on Aux 1 and Aux 2 outputs.
  - ~ **Down** — Preview Overlay displays on PV1 and PV2 outputs. This is the default position.

5. **DIP Switch 4**

   This 8-position DIP switch has the following system assignments (from left to right):
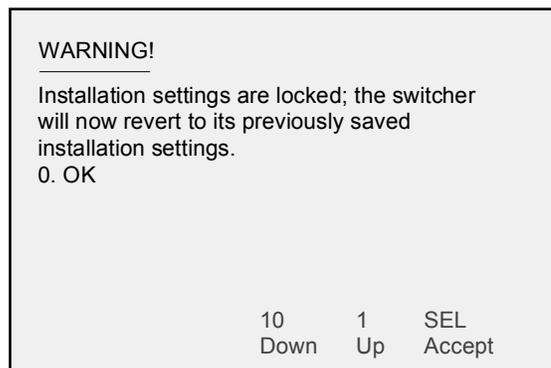
   - **SW1** — This switch is **Reserved**. Leave in the default **Down** position.
   - **SW2** — This switch is **Reserved**. Leave in the default **Down** position.
   - **SW3** — **Panel Type**. Works with **SW4, SW5** and **SW6**.
   - **SW4** — **Panel Type**. Works with **SW3, SW5** and **SW6**.
   - **SW5** — **Panel Type**. Works with **SW3, SW4** and **SW6**.
   - **SW6** — **Panel Type**. Works with **SW3, SW4** and **SW5**.

   Refer to the table below for details.

   DIP Switch 4 Positions

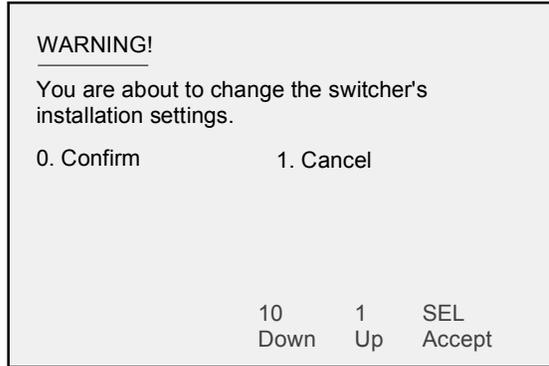 | DIP Switch 4 | Synergy 100 | Synergy 1 | GVG 100/110 | Ross 210A/D | Ross 216A/D |
   |:---:|:---:|:---:|:---:|:---:|:---:|
   | **SW3** | Down | Down | Down | Down | Up |
   | **SW4** | Down | Down | Down | Up | Up |
   | **SW5** | Up | Down | Up | Up | Up |
   | **SW6** | Down | Down | Up | Up | Up |

   - **SW7** — **Installation Enable**. This switch determines the installation status of the switcher:
     - ~ **Up** — Access to installation features is restricted. However, you *are* permitted to view the menus on the preview overlay. A message is displayed, directly above the navigation help, that reads "**Warning: Installation settings are locked**." If the user has attempted to change the installation in any way, the following message appears:

WARNING!
___

Installation settings are locked; the switcher
will now revert to its previously saved
installation settings.
0. OK

| 10 | 1 | SEL |
| Down | Up | Accept |

Warning Message – Locked Installation Settings

In addition, the **Recall Installation** option on the **Disk Recall Menu** will be greyed out, and selecting **Recall All** will recall everything *except* the installation.

~ **Down** — Installation settings can be changed without restriction. However, upon exiting the menus, an "**Installation Warning**" alerts you that settings are about to be changed:

```
WARNING!
─────────

You are about to change the switcher's
installation settings.

0. Confirm          1. Cancel




                    10      1     SEL
                    Down    Up    Accept
```

Installation Change Confirmation Menu

Note
> Place the switch in the **Up** position when you want to restrict access to installation menus. For certain facilities, this setting is recommended once installation is complete.

- **SW8 — Software Upgrade**. This switch controls the ability to upgrade software from a storage device as follows:

  ~ **Up** — Software can be upgraded from a storage device, such as a floppy disk or USB key. Refer to "**Synergy 100 Software Upgrade**"on page 3-19 for instructions.

  ~ **Down** — Software can not be upgraded from a storage device. This is the default position.

6. **Watch Dog Jumper**

Leave the **Watch Dog Jumper** in the default **DIS** (disabled or **Up**) position.

System Reset Notes

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

Important
> The rack frame stores all installation, personality, memories, and the current video state. The control panel keeps track of the current menu and the settings of all buttons. Resetting the frame changes the current video state. Simply turning the frame off, or loosing power to the control panel, will *not* reset the video state, because a frame reset has not been initiated.

Synergy 100 Software Upgrade

This section provides step-by-step instructions for upgrading your **Synergy 100 system** software from a storage device, such as a floppy disk or a USB key. You can obtain copies of all previous software upgrade instructions by logging on to our web site at **http://www.rossvideo.com**.

The following topics are discussed:

- System Backup
- Software Upgrade
- Restoring Registers to the Synergy 100 Switcher

System Backup

| **Important** | Because the software upgrade process *automatically* returns the switcher to *default* values, it is important that you back up all switcher elements to a storage device, such as a floppy disk or USB key, at this point. |

Use the following procedure to save your setup configurations to a storage device:

1. Navigate to the **Disk Menu** as follows:

    - Press **MENU** (to display the **Main Menu**).
    - Press **5. Disk** in the **Effects Control** group (to display the **Disk Menu**).

2. Press button **1. Store** in the **Effects Control** group to display the **Store Menu**.

3. Insert a storage device as follows:

    - Insert a pre-formatted 1.44 MB high-density floppy disk into the floppy disk drive of the Synergy 100 Switcher.

| **Note** | If the floppy disk is not formatted (or if you wish to completely erase all data from the disk), press **Format**. Follow the instructions on the display to format the floppy disk. |

    OR

    - Insert a USB key into the USB port of the Synergy 100 Switcher. You must wait 5 seconds after inserting the USB key into the USB port before you can save setup configurations to it.

| **Note** | You must have the **USB Removable Media Drive** option installed in order to use a USB key for saving and recalling setup configurations. |

4. Press **0. Store All** in the **Effects Control Group**.

| **Caution** | Do NOT remove the floppy disk or USB key from the switcher before the LED on the floppy drive or USB port goes out. Doing so may destroy the data on your floppy disk or USB key, as well as the data on the next one you insert into the switcher |

5. Eject the storage device from the switcher.

6. Label the storage device and store it in a safe place.

   It is recommended that you place the following information on the label:

   • Synergy 100 SD Switcher

   • Software Version [**vXX.xx**] Backup

   • Today's Date

This completes the procedure for saving your setups to a storage device. Please continue with the "**Software Upgrade**" procedure.

Software Upgrade

This section outlines how to initiate the software upgrade using either floppy disks or a USB key.

	Note	If you have received a Synergy 100 system with version 16 software already loaded on it, you will *not* be able to load pre-version 16 software onto it regardless of whether you have a USB port or floppy disk drive.

Using Floppy Disks

Use the following procedure to initiate the software upgrade from floppy disk:

1. Power off the frame.

	Caution	Observe all static discharge precautions throughout the procedure.

2. Move the **Software Upgrade** jumper (**DIP Switch 4**, **SW8** on the **Frame CPU Board**) to the **Up** position. Refer to the figure below.

Software Upgrade Jumper
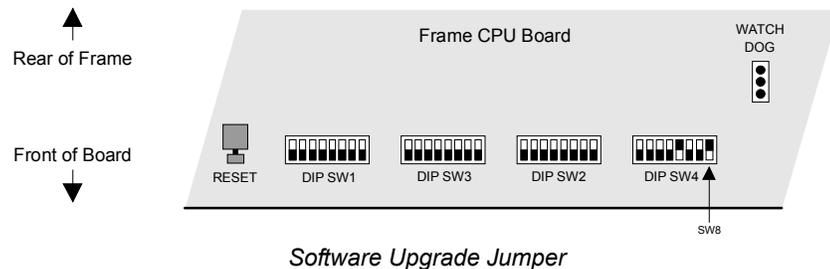
3. Power on the Synergy frame.

4. At this time, a message will appear in the four-character displays, asking you if you have saved your memories to disk.

   • If you have not, press the **1** (UP arrow) button to display the word "**Quit**" and press **SEL**. This will cause the frame to boot without upgrading the software, and give you a chance to save your setups to disk. Refer to the section, "**System Backup**"on page 3-19 for instructions.

   • If you have saved your setups to disk, press **SEL** under the "**Cont**" prompt and continue with the upgrade.

5. Insert the **Synergy Software Upgrade Disk** in the drive.

6. Follow the instructions on the control panel's display and wait for the upgrade process to complete.

7. Power off the Synergy frame.

8. Move **DIP Switch 4**, **SW8** (on the **Frame CPU Board**) to the **Down** position.

9. Power on the frame.

This completes the procedure for upgrading system software. Please continue to "**Restoring Registers to the Synergy 100 Switcher**"on page 3-23.

Upgrading Synergy 100 Software with a USB Key

The **USB Removable Media Drive** option replaces the floppy disk drive on the control panel, and supports industry standard USB keys. Once the option is installed, you can store and recall complete switcher setups including memory functions, switcher personalities, installation registers, and more, to a USB key.

⬡✳ **Important** | A decrease in performance will result from storing more than one set of Synergy files on your USB key.

Please note the following when upgrading your Synergy 100 switcher software from a USB Key:

- Synergy 100 systems released *before* version 16 are able to load version 16 or later software, and revert back to earlier versions.

- If you have received a Synergy 100 system with version 16 software already loaded on it, you will *not* be able to load pre-version 16 software onto it regardless of whether you have a USB port or floppy disk drive.

- The following messages may be displayed on the Synergy 100 control panel during the software upgrade process:

  ~ **WAIT USB** — This message informs you that the Synergy 100 control panel is trying to communicate with the USB port and read the USB key. Once the control panel detects the USB key, the message is no longer displayed.

  ~ **USB UPGD** — This message informs you that the Synergy 100 switcher is in the process of a software upgrade and will be displayed until the process is complete.

  ~ **USB UPGD FAIL** — This message informs you that the Synergy 100 control panel has failed to upgrade. Contact Ross Video Technical Support for more information.

- Write protect should be disabled on any USB key.

- All Synergy files must be stored in the Root directory of the USB key.

- Only DOS or Windows™ partitions in the USB key directory are supported.

- You must wait 5 seconds after inserting the USB key into the USB port before you can save or recall files.

- A delay can be expected when saving files to a USB key with more than half of the available memory allocated.

Using a USB Key

Use the following procedure to initiate the software upgrade from a USB key:

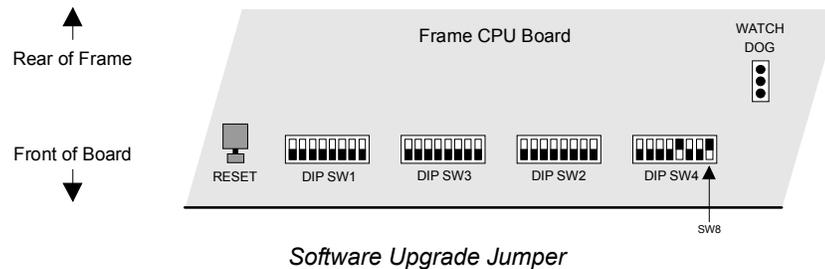| Note	You must have the **USB Removable Media Drive** option installed in order to use a USB key for software upgrades.

1. Power off the frame.

Caution	Observe all static discharge precautions throughout the procedure.

2. Move the **Software Upgrade** jumper (**DIP Switch 4**, **SW8** on the **Frame CPU Board**) to the **Up** position.

Software Upgrade Jumper

3. Power on the frame.

4. At this time, a message will appear in the four-character displays, asking you if you have saved your memories.

   • If you have not, press the **1** (UP arrow) button to display the word "**Quit**" and press **SEL**.This will cause the frame to boot without upgrading the software, and give you a chance to save your setups to a USB key. Refer to "**System Backup**"on page 3-19 for instructions.

   • If you have saved your setups to a USB key, press **SEL** under the "**Cont**" prompt and continue with the upgrade.

5. Insert the USB key containing the Synergy 100 software into the USB port of the Synergy 100 switcher. You must wait 5 seconds after inserting the USB key into the USB port before you can proceed to the next step.

6. Follow the instructions on the control panel's display and wait for the upgrade process to complete.

7. Turn off the frame.

8. Move **DIP Switch 4**, **SW8** (on the **Frame CPU Board**) to the **Down** position.

9. Power on the frame.

This completes the procedure for upgrading system software. Please continue with the "**Restoring Registers**" procedure.

Notes on Upgrading Software with a USB Key

Please note:

   • Synergy 100 systems released *before* version 16 are able to load version 16 or later software, and revert back to earlier versions.

- If you have received a Synergy 100 system with version 16 software already loaded on it, you will *not* be able to load pre-version 16 software onto it regardless of whether you have a USB port or floppy disk drive.

- The following messages may be displayed on the Synergy 100 control panel during the software upgrade process:

  ~ **WAIT USB** — This message informs you that the Synergy 100 control panel is trying to communicate with the USB port and read the USB key. Once the control panel detects the USB key, the message is no longer displayed.

  ~ **USB UPGD** — This message informs you that the Synergy 100 switcher is in the process of a software upgrade and will be displayed until the process is complete.

  ~ **USB UPGD FAIL** — This message informs you that the Synergy 100 control panel has failed to upgrade. Contact Ross Video Technical Support for more information.

Restoring Registers to the Synergy 100 Switcher

Use the following procedure to restore your registers to on-line memory:

1. Ensure that new Synergy software version is properly installed. If not, refer to "**Software Upgrade**"on page 3-20.

2. Locate the "backup" storage device that you made in "**System Backup**"on page 3-19.

3. Read the entire contents of the storage device into switcher memory as follows:

   - Navigate to the **Recall Menu** as follows:
     ~ Press **MENU** to display the **Main Menu**.
     ~ Press **5. Disk** to display the **Disk Menu** .
     ~ Press button **0. Recall** to display the **Recall Menu**.

   - Insert the backup storage device into the Synergy 100 switcher.
   - Press **0. Recall All**.
   - Press **SEL**.

⚠ **Caution**

> Do NOT remove the floppy disk or USB key from the switcher before the LED on the floppy drive or USB port goes out. Doing so may destroy the data on your floppy disk or USB key, as well as the data on the next one you insert into the switcher

4. Eject the storage device from the switcher.

This completes the procedure for restoring your registers.

Option Boards

In This Chapter

This chapter provides basic information about the optional boards (and other hardware options) that install on the **Frame Processor Board**.

The following topics are discussed:

- Optional Boards
- Timed Aux Bus – Synergy 1
- Installing a Timed Aux Bus
- Removing a Timed Aux Bus
- Squeeze & Tease 2D Board
- Removing or Installing the Squeeze & Tease 2D Board
- Squeeze & Tease 2D Board Jumpers
- Squeeze & Tease 3D/WARP Board
- Removing or Installing the Squeeze & Tease 3D Board
- Dual (Floating) Border Generator
- Removing or Installing the Dual Border Generator
- Ultimatte Insider™ Board
- Installing the Ultimatte Insider Board
- Dual Aspectizer Board Installation – Synergy 1
- Frame Tally Board Installation

Optional Boards

Several optional boards install on top of the **Frame Processor Board**:

- Timed Aux Buses *(Synergy 1 only)*

- Squeeze & Tease 2D Board

- Squeeze & Tease 3D Board

- Dual Border Generator (Floating Border Generator for the Synergy 100)

- Ultimatte Insider™ Board

- Dual Aspectizer Board *(Synergy 1 only)*

- Frame Tally Board

Each option board is discussed in detail in the following sections.

Timed Aux Bus – Synergy 1

The following topics are discussed in this section:

- Installing a Timed Aux Bus
- Removing a Timed Aux Bus
- Aux Bus Socket Labeling

Note

Aux Buses 1 and/or 2 can be timed.

Installing a Timed Aux Bus

You will require a **Timed Aux Bus** kit that includes the following components:

- One **De-serializer Module** (4000A-061). This module installs in a socket on the *left* (input) side of the **Frame Processor Board**.
- One **Serializer Module** (4000A-062). This module installs in the corresponding socket on the *right* (output) side of the board.

Use the following procedure to install a timed Aux Bus.

Caution

Observe all static discharge precautions throughout the procedure.

1. Power down the Synergy 1 frame.

2. Carefully remove the **Frame Processor Board** assembly from the frame, and set it on a clean, flat, static free surface.

3. If you have Revision 4 of the **Frame Processor Board**, you will need to remove the **SIMM Stabilizer Brackets** (refer to the following drawing) as follows:

   - Loosen and remove the four screws that attach the stabilizer brackets to the frame processor board.
   - Remove the brackets and set aside with the screws in a safe place for later re-installation.

4. Read the Aux Bus slot labels closely.

5. Locate the "**IN**" slot (on the left side of the board) for the Aux Bus that you want to "time." The figure on page 4–4 illustrates the location of the slots.

Serializer
Aux Bus Slots

Deserializer
Aux Bus Slots

Location of SIMM
Stabalizer Brackets
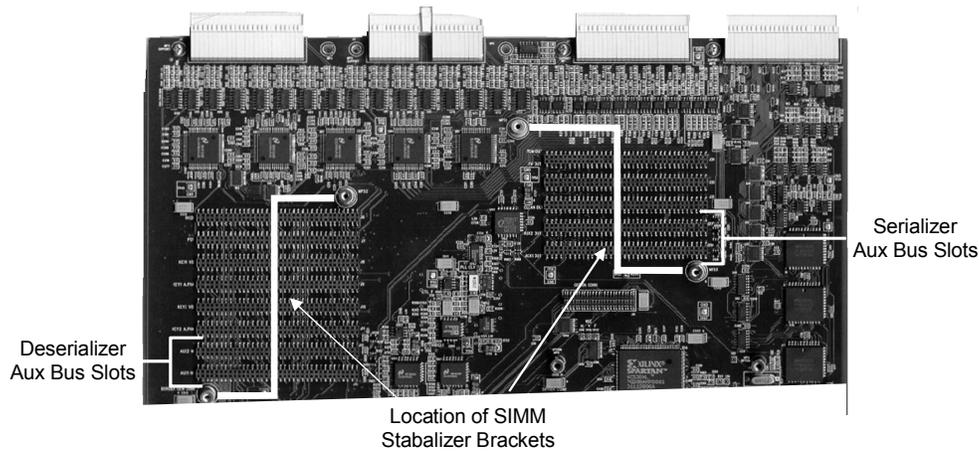
SIMM Stabilizer Brackets and Aux Bus Slot Locations — Frame Processor Board

6. Install the **De-serializer Module** as follows:

   • Carefully align the module over the socket.

   • Ensure that the board's components are facing to the rear.

   • Use your fingers to "feel" for the proper pin-to-socket alignment.

   • While applying downward pressure, slowly rock the module horizontally (side to side), until the module is fully seated. Avoid flexing the board — so as not to bend the pins.

   • After installation, "sight" down the board at the connector level, to make sure that there are no exposed pins.

⚠ **Caution**

Failure to install a module with a precise 1:1 pin-to-socket orientation will damage the Frame Processor Board, the selected module — or both! Double check your work!

7. Locate the corresponding "**OUT**" slot (on the right side) for the Aux Bus that you want to "time." For example, **AUX1 OUT**.

8. Install the **Serializer Module** as follows:

   • Carefully align the module over the socket.

   • Ensure that the board's components are facing to the rear.

   • Use your fingers to "feel" for the proper pin-to-socket alignment.

   • While applying downward pressure, slowly rock the module horizontally (side to side), until the module is fully seated. Avoid flexing the board — so as not to bend the pins.

   • After installation, "sight" down the board at the connector level, to make sure that there are no exposed pins.

⚠ **Caution**

Failure to install a module with a precise 1:1 pin-to-socket orientation will damage the **Frame Processor Board**, the selected module — or both! Double check your work!

9. If desired, repeat steps 5 through 8 to time the other available Aux Bus.

10. (*Revision 4 board only*) Re-install the **SIMM Stabilizer Brackets** as follows:

    • Carefully positioning the **SIMM Stabilizer Brackets** on top of the SIMMs as per the diagram on on page 4–4.

    • Installing and tightening the four mounting screws. Do not *over-tighten* to avoid damage to the board.

11. Replace the **Frame Processor Board** assembly in the Synergy frame, ensuring it is firmly seated.

12. Power on the Synergy 1 frame.

This completes the installation procedure. Note that there is no software installation required for this option.

Testing the Aux Bus Output

You can now test the Aux Bus output in several ways:

    • Route the selected Aux Bus output to a monitor, and switch between two signals on the Aux Bus or Remote Aux Panel — for example, a primary input and program signal that you know may *not* be perfectly timed. The signals should now switch seamlessly.

    • Route the selected Aux Bus output to the input of a DVE, and switch between two or more signals. While monitoring the output of the DVE, there should be no green flashes on the monitor (flashes that are typically associated with untimed sources).

Removing a Timed Aux Bus

This procedure is typically required if you need to replace a faulty **Serializer** or **De-serializer** module on another Aux Bus circuit — or you simply want to move a timed Aux Bus from one Aux Bus output to another.

Use the following procedure to remove a timed Aux Bus:

⚠️ **Caution** | Observe all static discharge precautions throughout the procedure.

1. Power down the Synergy 1 frame.

2. Carefully remove the **Frame Processor Board** assembly from the Synergy frame, and set it on a clean, flat, static free surface.

3. If you have Revision 4 of the **Frame Processor Board**, you will need to remove the **SIMM Stabilizer Brackets** (refer to the figure on page 4–6) as follows:

    • Loosen and remove the four screws that attach the stabilizer brackets to the frame processor board.

   • Remove the brackets and set aside with the screws in a safe place for later re-installation.

Deserializer
Aux Bus Slots

Serializer
Aux Bus Slots

Location of SIMM
Stabalizer Brackets
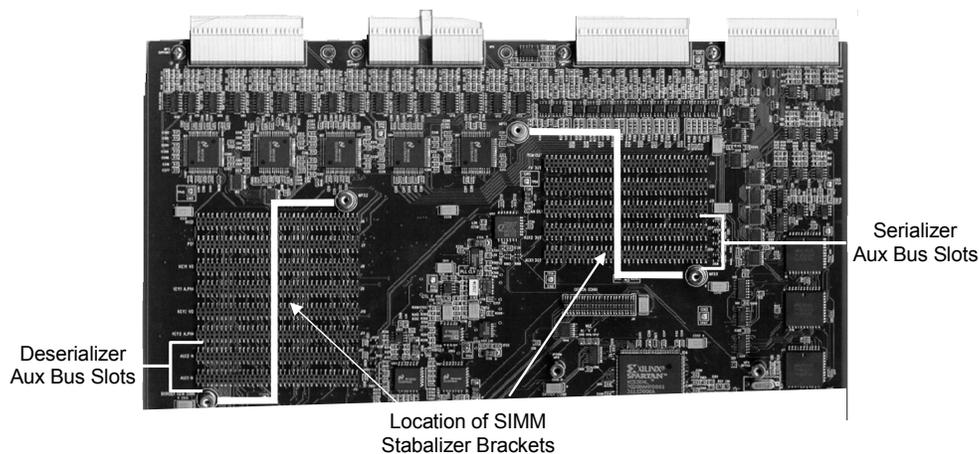
SIMM Stabilizer Brackets and Aux Bus Slot Locations — Frame Processor Board

4. Read the Aux Bus slot labels closely.

5. Locate the "**IN**" slot (on the left side of the board) for the Aux Bus that you want to remove. For example, **AUX2 IN**.

6. Remove a **De-serializer Module** as follows:

   • Hold the module firmly.

   • While applying upward pressure, *slowly* rock the module vertically (from top to bottom), until the module pulls out of the socket. Avoid pulling the board out too quickly — so as not to bend the pins.

7. Store the module in an anti-static bag for later use, or for re-installation in another slot as required.

8. Locate the corresponding "**OUT**" slot (on the right side) for the Aux Bus that you want to remove. For example, **AUX2 OUT**.

9. Remove the **Serializer Module**, as follows:

   • Hold the module firmly.

   • While applying upward pressure, *slowly* rock the module vertically (from top to bottom), until the module pulls out of the socket. Avoid pulling the board out too quickly — so as not to bend the pins.

10. If desired, repeat steps 4 through 9 for the other timed Aux Bus.

11. (*Revision 4 board only*) Re-install the **SIMM Stabilizer Brackets** as follows:

    • Carefully positioning the **SIMM Stabilizer Brackets** on top of the SIMMs as per the diagram on page 4–4.

    • Install and tighten the four mounting screws. Do not *over-tighten* to avoid damage to the board.

12. Replace the **Frame Processor Board** assembly in the frame, ensuring it is firmly seated.

13. Power on the Synergy 1 frame.

This completes the procedure to remove a timed Aux Bus from the Synergy 1 frame.

Squeeze & Tease 2D Board

The figure below illustrates the **Squeeze & Tease 2D Board**.
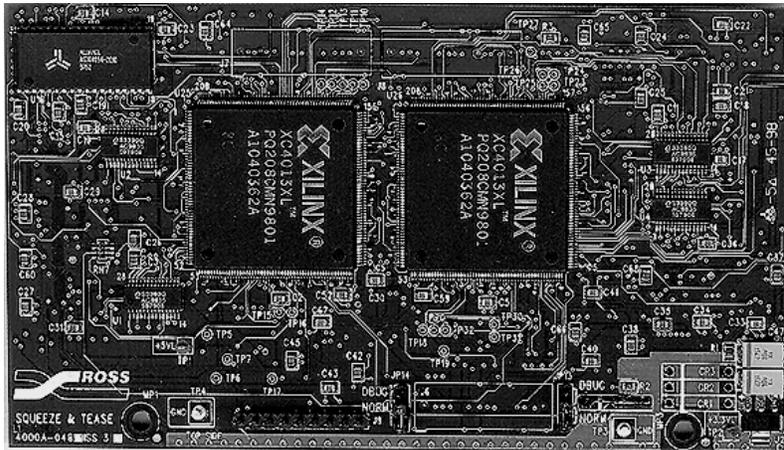
Squeeze & Tease 2D Board

The **Squeeze & Tease 2D Board** installs on the front center of the **Frame Processor Board**, as indicated in the figure below. The board mates with three connectors as shown, plus two mounting standoffs. The standoffs secure the **Squeeze & Tease 2D Board** to the **Frame Processor Board**.

Squeeze and Tease
Mounting Location
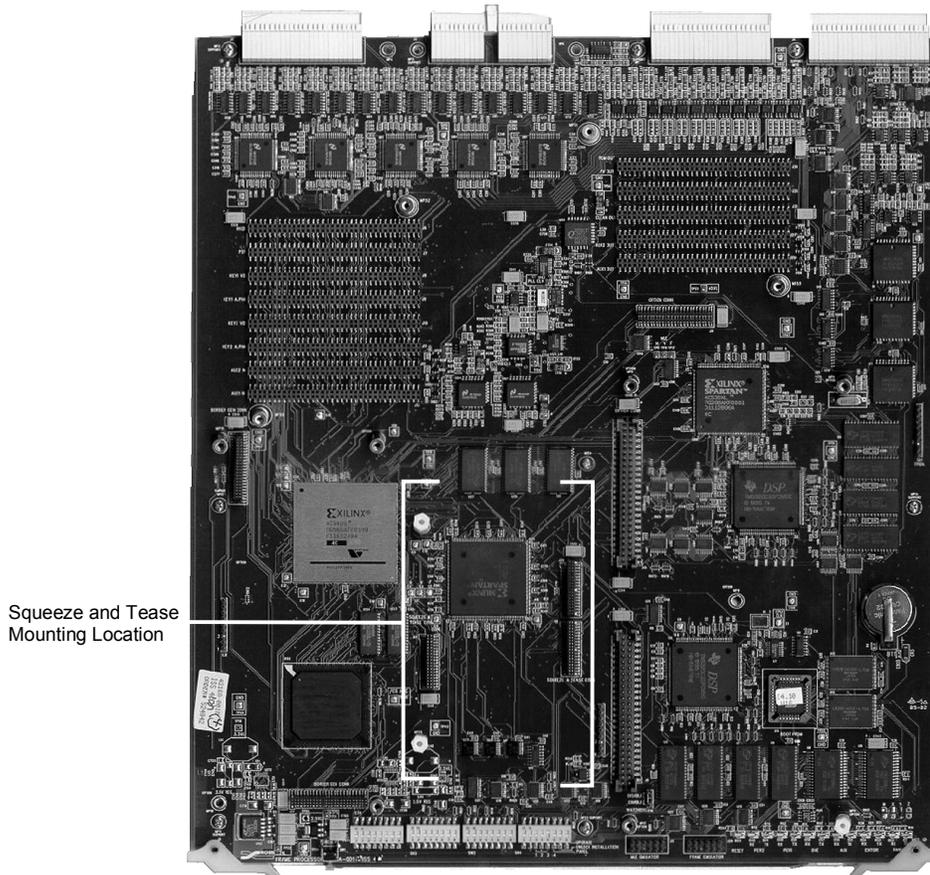
Squeeze & Tease 2D Board Mounting Location

Removing or Installing the Squeeze & Tease 2D Board

Use the following procedure to remove or install the optional **Squeeze & Tease 2D Board**:

	Caution	Observe all static discharge precautions throughout the procedure.

1. Power down the Synergy 1 frame.

2. Carefully remove the **Frame Processor Board** from the frame, and set it on a clean, flat, static free surface.

3. To remove the **Squeeze & Tease 2D Board**:

   • Locate the **Squeeze & Tease 2D Board**.

   • Loosen and remove the mounting screws from the holes and set them aside in a safe place.

   • While applying upward pressure, slowly rock each connector out of its socket, being careful to avoid flexing the board too much — so as not to bend the pins.

   • Set the board aside on a clean, flat, static free surface.

4. To install the **Squeeze & Tease 2D Board**:

   • If protective plastic shrouds are installed over the target connectors on the **Frame Processor Board**, remove and store them.

   • Carefully align the **Squeeze & Tease 2D Board** over the Squeeze & Tease connectors on the Frame Processor Board, ensuring you have the proper header-to-socket alignment. In addition, check that the standoffs align with the mounting holes.

   • Once aligned, push down on either side of each connector, until the board is fully seated.

   • Replace and tighten the mounting screws to secure the board. Do not over tighten the screws.

   • Double check the alignment of the **Squeeze & Tease 2D Board** by sighting down the connectors. No pins should be visible where the header meets the card.

This completes the procedure to remove or install the optional **Squeeze & Tease 2D Board**.

Squeeze & Tease 2D Board Jumpers

Two jumpers are located along the bottom edge of the **Squeeze & Tease 2D Board**, as shown below:

Squeeze and Tease Board

JP14   JP13
Norm / Debug   Norm / Debug
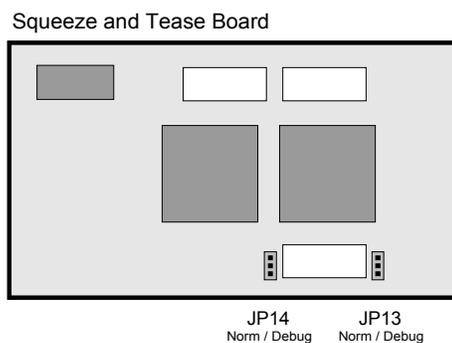
• **JP13** — leave the jumper in the **Norm** position.

• **JP14** — leave the jumper in the **Norm** position.

Squeeze & Tease 3D/WARP Board

The figure below illustrates the **Squeeze & Tease 3D/WARP Board** for the Synergy 1 and Synergy 100 Switchers.
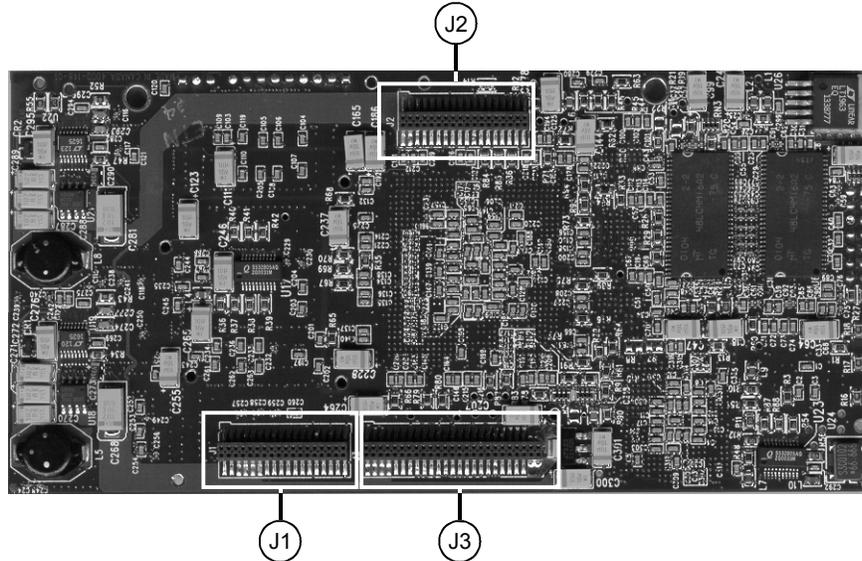
Squeeze & Tease 3D/WARP Board

The **Squeeze & Tease 3D/WARP Board** installs on the front center of the **Frame Processor Board**. The board mates with three connectors as shown, plus two mounting standoffs. The standoffs secure the **Squeeze & Tease 3D/WARP Board** to the **Frame Processor Board**.

Squeeze & Tease 3D / WARP Board Installation

This section provides instructions for installing the **Squeeze & Tease 3D / WARP** option on the Synergy 1 Frame board.

⚠	**Caution**	Make sure you have upgraded your switcher software to the same version as the Squeeze & Tease 3D / WARP software. The switcher software **must** be upgraded **before** attempting to install or upgrade **Squeeze & Tease 3D / WARP**. Refer to the section "**Synergy 1 Software Upgrades**" on page 3–9 for details on upgrading your Synergy 1 software. For information on upgrading software for your Synergy 100 panel, refer to the section "**Synergy 100 Software Upgrade**" on page 3–19.

The **Squeeze & Tease 3D / WARP** board installs on the left front center of the Synergy 1 **Frame Processor Board**, as indicated in the figure: "**Squeeze & Tease 3D/WARP Board Mounting Location**" on page 4–10. The **Squeeze & Tease 3D / WARP** board mates with three sockets (connectors) and two mounting standoffs, as shown.
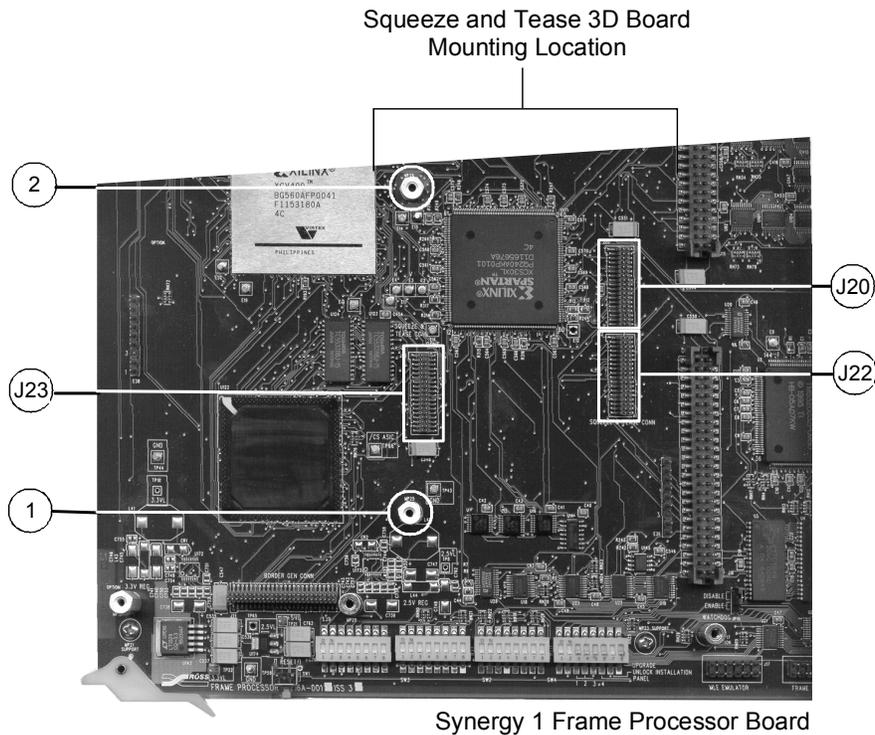
Squeeze and Tease 3D Board
Mounting Location

Synergy 1 Frame Processor Board

Squeeze & Tease 3D/WARP Board Mounting Location

Removing or Installing the Squeeze & Tease 3D Board

Use the following procedure to remove or install the optional **Squeeze & Tease 3D/WARP Board**:

	Caution	**Static discharge** can cause serious damage to sensitive semiconductor devices.
		Avoid handling the **Squeeze & Tease 3D / WARP Board** in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Touch the rack frame to dissipate static charge before removing boards from the frame and exercise proper grounding precautions when working on the **Squeeze & Tease 3D / WARP Board**.

1. Power down the Synergy 1 frame.

2. Carefully remove the **Frame Processor Board** from the frame, and set it on a clean, flat, static free surface.

3. To remove an existing **Squeeze & Tease 2D Board**:

    •   Locate the **Squeeze & Tease Board** that you wish to remove.

    •   Loosen and remove the mounting screws from the holes and set them aside in a safe place.

    •   While applying upward pressure, slowly rock each connector out of its socket, being careful to avoid flexing the board too much – so as not to bend the pins.

    •   Set the board aside on a clean, flat, static-free surface.

4.   To remove an existing **Squeeze & Tease 3D/WARP Board**:

⚠️ **Caution** | When handling the **Squeeze & Tease 3D / WARP Board**, **DO NOT** touch the heatsink, located in the middle of the board. Handle the board by the edges. Handling of the heatsink may cause serious damage to the heatsink and to the board.

Note that the heatsink will become **HOT** when the device is in operation and should be avoided.

- Locate the **Squeeze & Tease 3D/WARP Board**.
- Loosen and remove the mounting screws from the holes and set them aside in a safe place.
- While applying upward pressure, slowly rock each connector out of its socket, being careful to avoid flexing the board too much — so as not to bend the pins.
- Set the board aside on a clean, flat, static free surface.

5.   Unpack the **Squeeze & Tease 3D/WARP** kit, consisting of one **Squeeze & Tease 3D / WARP Board** (4000A-148).

6.   If protective plastic shrouds are installed over the target connectors on the **Frame Processor Board**, remove and store them.

7.   Install the **Squeeze & Tease 3D / WARP Board** as follows:

- Locate the three sockets labeled "**Squeeze & Tease Conn**" on the **Synergy 1 Frame Board**, near the middle, front of the board. The sockets are labeled **J20**, **J22**, and **J23**.
    - ~   The three **Synergy 1 Frame Board** sockets will mate with the three headers on the **S&T 3D / WARP** board.
    - ~   The **Squeeze & Tease 3D / WARP Board** headers are labeled **J1**, **J2**, and **J3**. Use the figure "**Squeeze & Tease 3D/WARP Board**" on page 4–9 for reference.
    - ~   The header-to-socket mating pattern is **J1 → J20**, **J2 → J23**, and **J3 → J22**.
- Carefully align the **Squeeze & Tease 3D/WARP Board** over the connectors.
- Ensure that the **Squeeze & Tease 3D/WARP** major components of the board are facing up. You will have the correct board orientation when you can read the *Ross Video* logo and *Squeeze & Tease 3D / WARP* silk screening identification on the top of the board.
- Use your fingers to "feel" for the proper header-to-socket alignment.
- While applying downward pressure, slowly rock the module until the module is fully seated. Avoid flexing the board — so as not to bend the pins.

✏️ **Note** | The **J3** header on the **Squeeze & Tease 3D/WARP Board** is a 50-pin connector. It mates with a 36-pin socket (**J22**) on the **Synergy 1/100 Frame Board**. Once the board is fully seated, there will be seven (7) pairs of pins on the **Squeeze & Tease 3D/WARP Board**'s **J3** connector that are *not* mated. This is the correct configuration.

⚠	**Caution**	Failure to install the **Squeeze & Tease 3D/WARP Board** with a precise 1:1 header-to-socket orientation (with the exception of the **J3** to **J22** connectors) will damage the **Synergy 1 Frame Board**, the selected module — or both! Double-check your work!

8. Replace and tighten the mounting screws to secure the board. Do not over tighten the screws.

9. When complete, carefully replace the **Synergy 1 Frame Board** into the frame, and secure with the outer latches on the board edges.

This completes the procedure to remove or install the optional **Squeeze & Tease 3D/WARP Board**.

Installing the 3D Fan Assembly

⚠	**Caution**	In order to provide adequate ventilation for the **Squeeze & Tease 3D/WARP** board, the following instructions **must** be followed.
		For all systems with a **Squeeze & Tease 3D/WARP** option installed, the ambient temperature maximum is 40° Celsius.
		The fan inlet filter must be kept clean and free of obstructions.
		If you are using a Synergy 1 switcher, the top and front panel covers must be in place when operating with the **Squeeze & Tease 3D/WARP** option installed.

✳	**Important**	The Fan used for WARP cards is the same as the fan used for 3D cards, therefore these instructions are used in both situations.

This fan provides adequate ventilation for the card and prevents damage caused by high ambient temperatures. It is recommended that you replace the fan every 5 years. If you need a replacement fan, please contact Ross Video Technical Support. This procedure should take approximately ten minutes to complete.

Tools Required

Only the cooling fan assembly and a Phillips screwdriver are required.

⚠	**Caution**	**Static discharge** can cause serious damage to sensitive semiconductor devices. Avoid handling the switcher circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Use of a grounding strap is strongly recommended. Touch the frame to dissipate static charge before removing boards from the frame and exercise proper grounding precautions when working on circuit boards.

Installing the Fan on a Frame

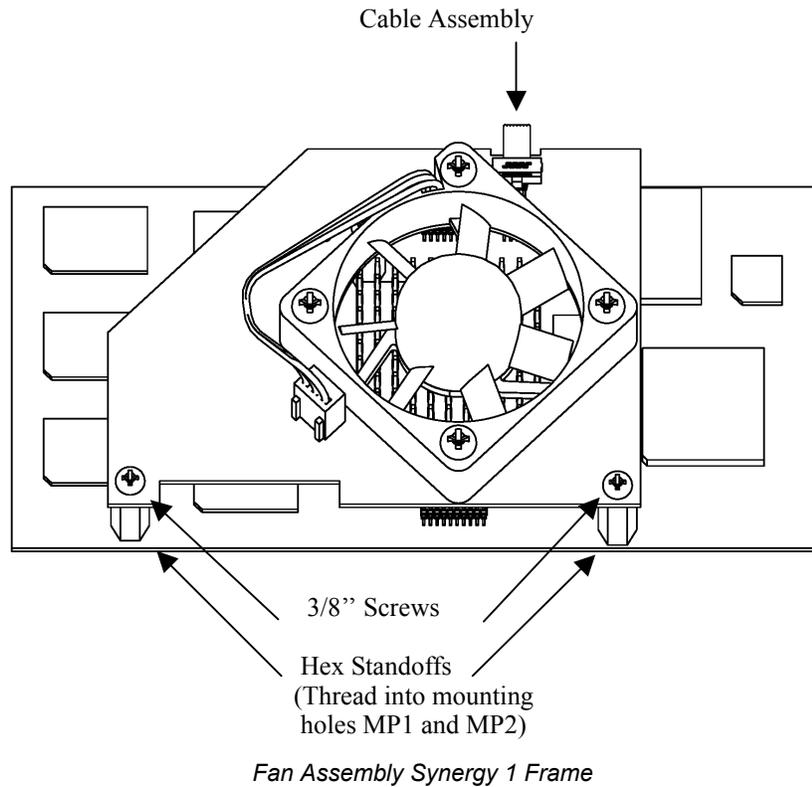Use the following procedure to install the **Squeeze & Tease 3D/WARP Fan Assembly**:

> **Caution** Observe all static discharge precautions throughout the procedure.

1. Turn off the power to the frame and carefully remove the **Synergy 1/100 Frame Processor Board** (4216A-001) from the frame. Set it on a clean, flat, static free surface, with the rear of the board to your left. This orientation allows for the easiest access to the **Squeeze & Tease 3D Board** (4000A-148).

2. Locate the **Squeeze & Tease 3D/WARP Board** that is located near the center right section of the **Frame Processor Board**.

3. Carefully unpack the **Squeeze & Tease 3D/WARP Fan Assembly** (4000A-248), consisting of the fan assembly itself, a 10-pin ribbon cable, 2 hex standoffs, and two 3/8" long screws.

4. Attach one end of the ribbon cable to the 8-pin connector (**J6**) near the top center of the **S&T 3D** card. Although the socket on the cable is 10-pin, it will always seat correctly, as it is restricted by the space between this connector and the 20-pin connector next to it.

5. Insert and tighten the threaded ends of the 2 standoffs to the front edge of the **Squeeze & Tease 3D/WARP** card, in the holes identified as **MP1** and **MP2**.

6. With the oblique angle on the upper left corner, attach the ribbon cable connector to the 10-pin connector at the top of the **Squeeze & Tease 3D/WARP Fan Assembly** card.

7. Position the fan assembly on top of the standoffs, with the standoffs aligned with their respective holes on the fan assembly card (**MP1** to **MP1** and **MP2** to **MP2**).

8. Insert and tighten the 2 screws, taking care not to over tighten them. Refer to the following diagram:

Cable Assembly

3/8'' Screws

Hex Standoffs
(Thread into mounting
holes MP1 and MP2)

Fan Assembly Synergy 1 Frame

9. When complete, carefully replace the **Synergy 1 Frame Processor Board** into the frame, and secure with the outer latches on the board edges.

This completes the procedure for installing the **Squeeze & Tease 3D/WARP Fan Assembly** on the **Squeeze & Tease 3D/WARP** card within the Synergy 1 frame. Please contact Ross Video Technical Support if any further assistance is required. Next you will upgrade the Squeeze & Tease software.

Squeeze & Tease Software Upgrade

	Important	If you have purchased the **Squeeze & Tease 3D/WARP** option, you must upgrade the software on the **Squeeze & Tease 3D/WARP Board** as well.

	Note	Remember to upgrade your switcher software to the same version as the **Squeeze & Tease 3D/WARP** software before you begin. The switcher software *must* be upgraded *before* attempting to upgrade **Squeeze & Tease 3D**.
		Version 11 software requires the 3D fan assembly be in place before you upgrade. Refer to the section "**Installing the 3D Fan Assembly**" on page 4–12 for details. If you do not have the **3D Fan Assembly**, please call Ross Video Technical Support.

The **Squeeze & Tease 3D/WARP** board has its own CPU and, therefore, requires its own software. The **Squeeze & Tease 3D/WARP** board will come preloaded with the latest version of software from

the factory, but from time to time, new versions will be released which add new features to the board's capability. When a new version is released, you can perform a software upgrade using floppy disks or a USB key. Both methods are described below.

| ✎ | **Note** | You must have the **USB Removable Media Drive** option installed in order to use a USB key to upgrade your Synergy software. |

Using Floppy Disks for a Software Upgrade

This procedure included in this section is applicable to both Synergy switchers.

Use the following procedure to perform a software upgrade using floppy disks:

| ⚠ | **Caution** | Observe all static discharge precautions throughout the procedure. |

1. Ensure that you have saved your switcher configuration, setups and registers. Refer to Chapter 2 in the *Synergy 1 Installation Guide* for instructions.

2. Power off the frame and the control panel.

3. Move the **3D / WARP Software Upgrade Switch** (**DIP Switch 3, SW8**), on the **Frame Processor (CPU) Board**, to its UP position as displayed in the following figure:

Frame Processor Board (4216A-001)
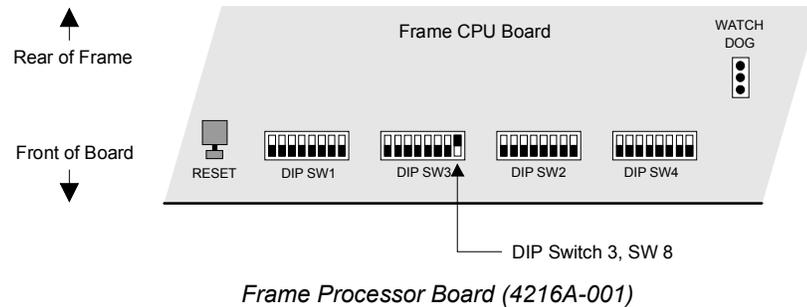
4. Verify that the 3D Fan Assembly is in place. Refer to the section "**Installing the 3D Fan Assembly**" on page 4–12 for details. If you do not have the 3D Fan Assembly, contact Ross Video Technical Support.

5. Insert the **S&T 3D / WARP Upgrade Disk 1** in the floppy drive.

| ✎ | **Note** | One floppy disk contains the Squeeze & Tease 3D/WARP Upgrade software for the Synergy 100 switcher. This disk is labeled as "**S&T 3D/WARP Upgrade Disk**". |

6. Power the frame on first.

7. Power the control panel on second.

8. Follow the instructions on the menu system of the control panel, including when to insert **S&T 3D / WARP Upgrade Disk 2** if you have a Synergy 1 switcher, and wait for the upgrade process to complete. The completion is clearly indicated.

| ⚠ | **Caution** | Do NOT remove the floppy disk from the switcher before the LED on the switcher goes out. Doing so may destroy the data on your floppy disk, as well as the data on the next disk you insert into the switcher. |

9. Remove the **S&T 3D / WARP Upgrade Disk** from the panel and turn the power off the frame and the panel in any order.

10. Return the **3D / WARP Software Upgrade Switch** to its normal **Down** position.

11. Power on the frame and control panel in any order desired.

This completes the procedure for performing an **S&T 3D / WARP** software upgrade for the Synergy 1 Switcher using floppy disks.

Using a USB Key for a Software Upgrade

This procedure included in this section is applicable to both Synergy switchers.

Use the following procedure to perform a software upgrade using a USB key:

Caution

Observe all static discharge precautions throughout the procedure.

1. Ensure that you have saved your switcher configuration, setups and registers. Refer to Chapter 2 in the *Installation Guide* for your switcher for instructions.

2. Power off the frame and the control panel.

3. Move the **3D / WARP Software Upgrade Switch** (**DIP Switch 3, SW8**), on the **Frame Processor (CPU) Board**, to its UP position as displayed in the following figure:

Frame Processor Board (4216A-001)
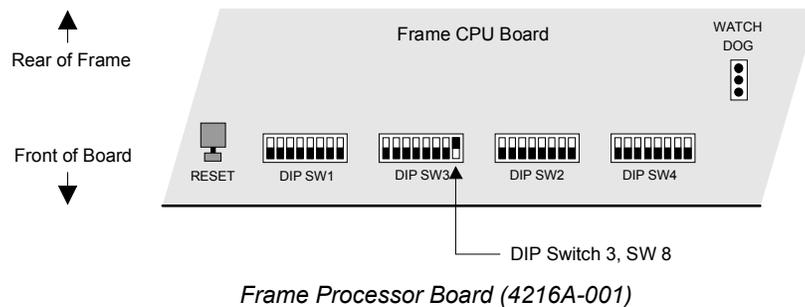
4. Verify that the 3D Fan Assembly is in place.

   Refer to the section "**Installing the 3D Fan Assembly**" on page 4–12 for details. If you do not have the 3D Fan Assembly, please call Ross Video Technical Support.

5. Insert the **USB key** that contains the S&T Software in the switcher.

6. Power the frame on first.

7. Power the control panel on second.

Important

After restoring power to the Synergy control panel, you may receive an error message, "**USB Upgrade Failed**" if you have a Synergy 1. If you have a Synergy 100 panel, the error message, "**USB UPGD FAIL**" may be displayed.

Contact Ross Video Technical Support for more information on correcting these errors.

8. Follow the instructions on the menu system of the control panel and wait for the upgrade process to complete.

⚠️ **Caution** | Do NOT remove the USB key from the switcher before the LED on the switcher goes out. Doing so may destroy the data on your USB key, as well as the data on the next USB key you insert into the switcher.

9. Remove the USB key from the switcher.

10. Power off the frame and the panel in any order.

11. Return the **3D / WARP Software Upgrade Switch** to its normal **Down** position.

12. Power on the frame and control panel in any order desired.

✳️ **Important** | After restoring power to the Synergy control panel, you may receive an error message, "**USB Upgrade Failed**" if you have a Synergy 1. If you have a Synergy 100 panel, the error message, "**USB UPGD FAIL**" may be displayed. Refer to the section "**Notes on Upgrading Software with a USB Key**" on page 3–22 should you receive other USB-related messages during the Synergy 100 upgrade.

Contact Ross Video Technical Support for more information on correcting these errors.

This concludes the procedure to perform a **Squeeze & Tease 3D / WARP** software upgrade for the Synergy 1 Switcher using a USB key.

Dual (Floating) Border Generator

The figure below illustrates the **Dual Border Generator** (or the **Floating Border Generator** for the Synergy 100 switcher).
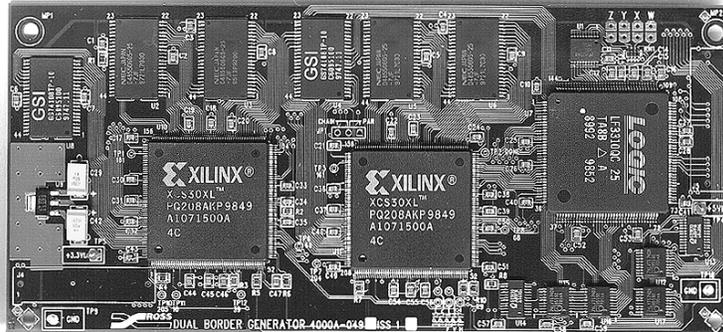
Dual Border Generator

Note	There are no jumpers on the **Dual Border Generator**.

The **Dual Border Generator** installs on the left side of the **Frame Processor Board**, as indicated in the figure below. The board mates with two connectors as shown, plus four mounting standoffs.

Border Generator
Mounting Location
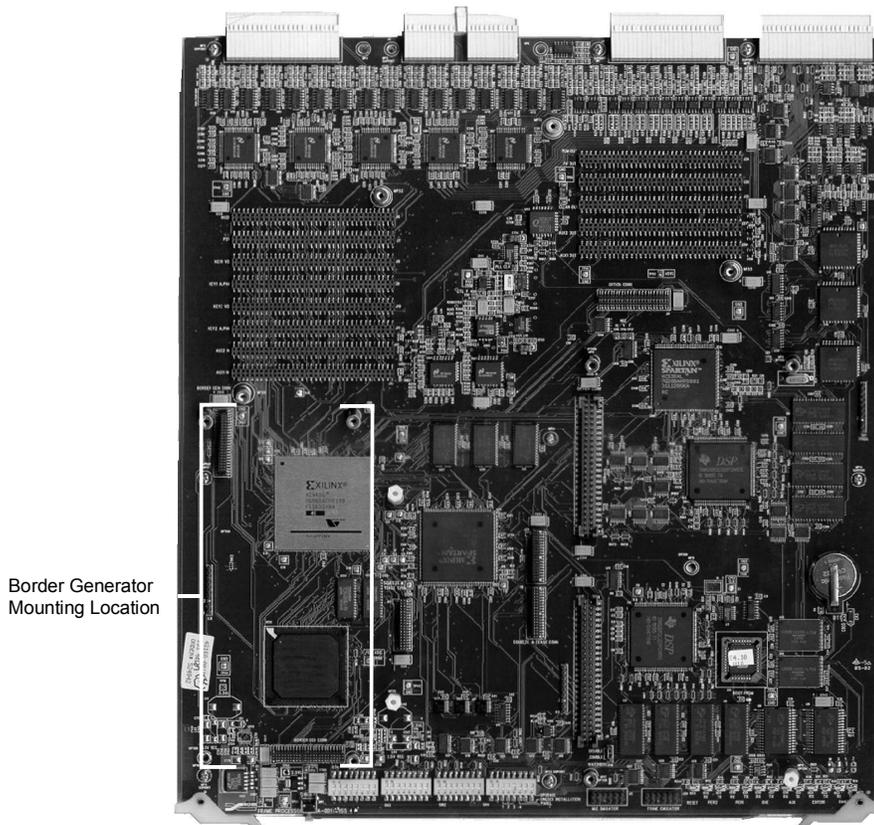
Dual Border Generator Location and Mounting

Removing or Installing the Dual Border Generator

Use the following procedure to remove or install the optional **Dual (Floating) Border Generator**:

Caution | Observe all static discharge precautions throughout the procedure.

1. Power down the Synergy frame.

2. Carefully remove the **Frame Processor Board** from the frame, and set it on a clean, flat, static free surface.

3. To remove the **Dual (Floating) Border Generator**:

   • Locate the **Dual (Floating) Border Generator**.

   • Loosen and remove the mounting screws from the holes and set them aside in a safe place.

   • While applying upward pressure, slowly rock each connector out of its socket, being careful to avoid flexing the board too much — so as not to bend the pins.

   • Set the board aside on a clean, flat, static free surface.

4. To install the **Dual (Floating) Border Generator**:

   • If protective plastic shrouds are installed over the target connectors on the **Frame Processor Board**, remove and store them.

   • If there are no standoffs installed in the **Frame Processor Board**, be sure to install all four in the holes provided.

   • Carefully align the **Dual (Floating) Border Generator** over the headers (**BORDER GEN CONN**) on the **Frame Processor Board**. Use your fingers to "feel" for the proper header-to-socket alignment. In addition, check that the standoffs align with the mounting holes.

   • Once aligned, push down on either side of each connector, until the board is fully seated.

   • Replace and tighten the mounting screws to secure the board. Do not over tighten the screws.

   • Double check the alignment of the **Dual (Floating) Border Generator** by sighting down the connectors. No pins should be visible where the header meets the card.

This completes the procedure to remove or install the **Dual (Floating) Border Generator**.

Ultimatte Insider™ Board

	Note	The following information is current as of **Revision 1.03** of the **Ultimatte Insider Board**.

The figure below illustrates the **Ultimatte Insider Board** — an option card for the Synergy 1 and Synergy 100 switchers that is manufactured by Ultimatte Corporation.
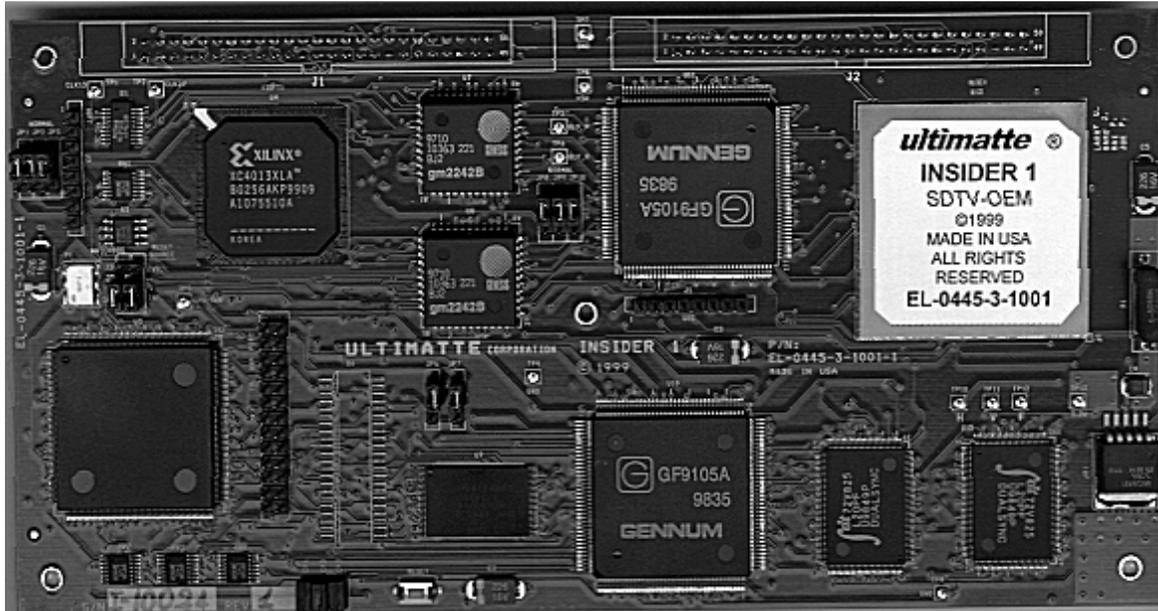
Ultimatte Insider Board

	Important	The Ultimatte™ option is mutually exclusive with the Aspectizer® option. Only one of the two can be installed at any time.

The **Ultimatte Insider Board** accepts a single video input, via the **Frame Processor Board**, and generates one processed video (foreground) and one alpha (or matte) output using the exclusive Ultimatte process. When installed and properly configured, the "Ultimatte Key" is assigned to a selected MLE keyer (on the Synergy 1 control panel) or Effects Keyer (on the Synergy 100 control panel), replacing the Synergy's standard chroma key.

- If you are using a Synergy 1 control panel, a complete array of user menus are fully integrated with the option.

- If you are using a Synergy 100 control panel, several parameters can be modified by using various knobs on the panel.

Refer to the *Synergy Operation Guide* for your panel type for operating instructions.

Using the matte signal of the Ultimatte in conjunction with a full linear mixer, the Synergy switcher can composite any background video source with the processed foreground.

	Note	There are no DIP switches on the **Ultimatte Insider Board**.

Installing the Ultimatte Insider Board

This section provides instructions for installing an **Ultimatte Insider Board** on the **Frame Processor Board**.

Use the following procedure to install the **Ultimatte Insider** option:

⚠	**Caution**	Observe all static discharge precautions throughout the procedure.

1. Power down the Synergy frame.

2. Carefully remove the **Synergy 1 Frame Processor Board** from the frame, and set it on a clean, flat, static free surface, with the rear of the board away from you.

3. Unpack the **Ultimatte Insider** kit, which consists of one **Ultimatte Module**.

4. Locate the two sockets labeled **Option Conn** on the **Synergy 1 Frame Processor Board**, near the right, front of the board. Refer to the diagram below.

MP16 Standoff

Ultimatte Insider
Mounting Location
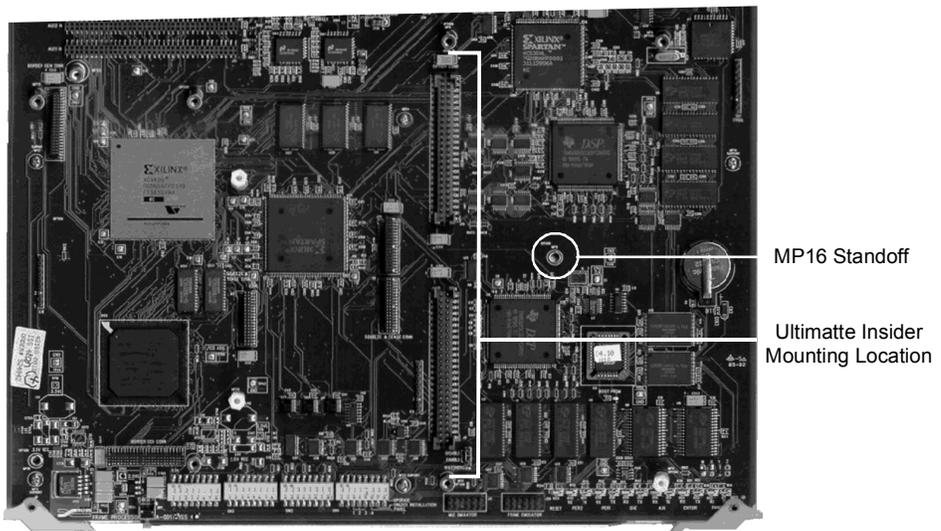
Synergy 1 Frame Processor Board

✎	**Note**	If you have an *Issue 2* or early *Issue 4* **Frame Processor Board**, you will need to removed the standoff at **MP16** as it inhibits proper installation of the **Ultimatte Insider Board**. Contact Ross Video Technical Support for details.

5. Install the **Ultimatte Module Board** as follows:

- Carefully align the module over the sockets.

- Ensure that the components of the **Ultimatte Module Board** are facing up.

- Use your fingers to "feel" for the proper pin-to-socket alignment.

- While applying downward pressure, slowly rock the module until the module is fully seated. Avoid flexing the board — so as not to bend the pins.

- After installation, "sight" down the board at the connector level, to make sure that there are no exposed pins. It is recommended that you rotate the board 360 degrees to check all planes.

⚠ **Caution** | Failure to reinstall a module with a precise 1:1 pin-to-socket orientation will damage the Synergy 1 **Frame Processor Board**, the selected module — or both! Double check your work!

6. When complete, carefully replace the **Synergy 1 Frame Processor Board** into the frame, and secure with the outer latches on the board edges.

This completes the installation for the **Ultimatte Insider** option. Refer to the *Synergy 1 Operation Guide* or the *Synergy 100 Operation Guide* for operating instructions.

Ultimatte Insider Board Jumpers

There are ten factory-preset jumpers on the **Ultimatte Insider Board**. Please leave the jumpers in their factory-preset, default positions.

Ultimatte Insider Board LEDs

There are three LEDs on the **Ultimatte Insider Board** — one red LED and two green LEDs. During boot up, the three LEDs indicate a particular status of the unit.

- The red LED should be off after the board boots up. If it is not, a problem exists with the unit.

- The center green LED is the communications status indicator. It lights when communication is taking place between the host and the board.

- The right green LED is the board's heartbeat. Whenever a video signal exists at the input of the board and the microprocessor is running, the LED toggles every 120 fields.

Dual Aspectizer Board Installation – Synergy 1

![*] **Important** | The **Aspectizer** option is mutually exclusive with the **Ultimatte Insider** option. Only one of the two can be installed at any time.

This section provides instructions for installing the **Dual Aspectizer** on the Synergy 1 **Frame Processor Board**. The following topics are discussed:

- Installing the Dual Aspectizer Board
- Upgrading the Dual Aspectizer

Installing the Dual Aspectizer Board

Use the following procedure to install the **Aspectizer** option:

![caution symbol] **Caution** | Observe all static discharge precautions throughout the procedure.

1. Power down the Synergy 1 frame.

2. Carefully remove the Synergy 1 **Frame Processor Board** (4216A-001B) from the frame, and set it on a clean, flat, static free surface, with the rear of the board away from you.

3. Unpack the **Aspectizer kit**, which consists of one **Aspectizer Module** (4000A-050).

4. Locate the *three* sockets labeled **Option Conn** on the **Synergy 1 Frame Processor Board**, near the right, front of the board. Refer to the diagram below.

MP16 Standoff

Dual Aspectizer Mounting Location
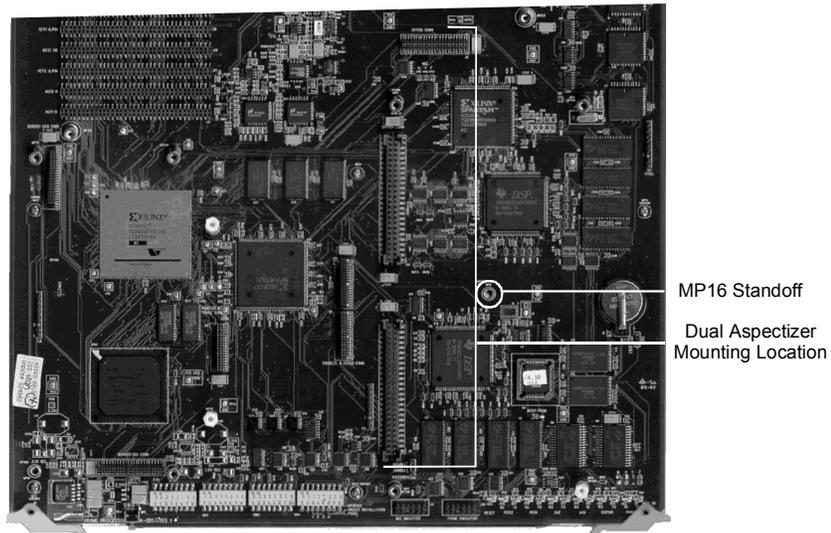
Synergy 1 Frame Processor Board

5. Install the **Aspectizer** option as follows:

   • Carefully align the **Aspectizer Module** over the sockets.

   • Ensure that the Aspectizer Module's connectors are facing down, and the Ross Video logo and board identification face up.

   • Use your fingers to "feel" for the proper pin-to-socket alignment.

   • While applying downward pressure, slowly rock the module until the module is fully seated. Avoid flexing the board — so as not to bend the pins.

   • After installation, "sight" down the board at the connector level, to make sure that there are no exposed pins. It is recommended that you rotate the board 360 degrees to check all planes.

⚠	**Caution**	Failure to reinstall a module with a precise 1:1 pin-to-socket orientation will damage the Synergy 1 Frame Processor Board, the selected module — or both! Double check your work!

6. If you have an *Issue 2* or early *Issue 4* **Frame Processor Board**, you will need to remove the standoff at **MP16** as it inhibits proper installation of the **Dual Aspectizer Board**. Contact Ross Video Technical Support for details.

7. When complete, carefully replace the **Synergy 1 Frame Processor Board** into the Synergy frame, and secure with the outer latches on the board edges.

This completes the installation for the **Dual Aspectizer** option. Next you will upgrade the software for the Dual Aspectizer Board.

Upgrading the Dual Aspectizer

⊛	**Important**	If you purchased a Dual Aspectizer Board containing a software version prior to version 2.10, you will need to upgrade your board in order to take advantage of our new "**Aspectizer** looks". Refer to the section "**Installed Options Menus – Synergy 1**" on page 6–2 for verification of the version of your **Aspectizer** board.

Use the following procedure to upgrade your **Dual Aspectizer Board**:

1. Ensure the **Dual Aspectizer** board is installed. Refer to the section "**Installing the Dual Aspectizer Board**" on page 4–23 for details.

2. Power on the frame and the control panel – in any order desired. If your **Aspectizer** contains a version of software prior to version 2.10, the following message will be displayed in the **Main Menu 1-2**:

```
Main Menu (1-2)

System information
Synergy 16.00-S1


        Please upgrade Aspectizer or contact Ross Technical
        Support.




   Custom                                      Preview
   Controls        Disk      Attributes  Help  Overlay        Effects
```
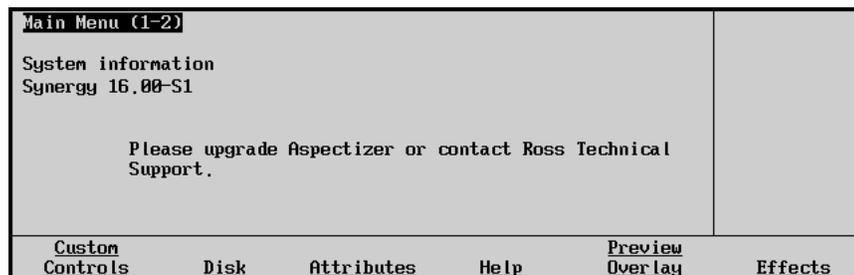
Main Menu 1-2

✎ **Note** As the upgrade process takes approximately ten minutes, you may choose to update at a later time. Press **HOME** to return to the main Synergy menu without performing the upgrade. However, the message displayed will remain on the Main Menu until the upgrade has been performed.

3. Access the Aspectizer Upgrade software as follows:

   • Insert the floppy disk containing the Aspectizer Upgrade software into the floppy disk drive of the Synergy switcher.

   OR

   • Insert the USB key containing the Aspectizer Upgrade software into the USB port of the Synergy switcher. You must wait 5 seconds after inserting the USB key into the USB port before you can access the Aspectizer upgrade software.

✎ **Note** You must have the **USB Removable Media Drive** option installed in order to upgrade the Aspectizer with a USB key.

4. Navigate to the **Option Cards Menu** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)

   • **MORE** (to display the **Main Menu 2-2**)

   • **Setup** (to display the **Setup Menu**)

   • **Installation** (to display the **Installation Menu 1-2**)

   • **MORE** (to display **Installation Menu 2-2**)

   • **Option Cards** (to display the **Option Cards Menu**)

```
Option Cards




                                                            Upgrade
    Ultimatte   Aspectizer                                 Aspectizers
```

Option Cards Menu

5. Press **Upgrade Aspectizers**. When the upgrade procedure is complete the **Option Cards Menu** is displayed.

This completes the procedure to upgrade your **Dual Aspectizer Board**. Refer to the section "**Dual Aspectizer Setup**" in the *Synergy 1 Installation Guide* to set up the Aspectizer for operation.

Frame Tally Board Installation

The Synergy 1 switcher includes 16 *configurable* frame tally relays, each of which can be assigned to any video input or to the program output. The **Frame Tally Board** (4216A-004) installs on the **Frame Motherboard** (4216A-002) at the rear of the Synergy 1 frame.

Installing the Frame Tally Board

Use the following procedure to install the **Frame Tally Board**:

Caution | Observe all static discharge precautions throughout the procedure.

1. Power down the Synergy 1 frame and its connected panel.

2. Remove the front panel cover of the frame, which is fastened with two sliding clips on each side of the cover.

3. Remove all of the screws (there should be 17) from the top panel of the frame and carefully lift the top off. This will expose the inside of the Synergy 1 frame.

4. Unpack the new **Frame Tally Board**. Note that it has two 32-pin dual row connectors (**J6**, **J7**). Note also that there are no jumpers, LEDs, or other adjustments present on the board.

5. Identify the two 32-pin headers (**J6**, **J7**) in the center of the **Frame Motherboard**.

6. Install the **Frame Tally Board** as follows:

   • Hold the **Frame Tally Board** with the Ross Video logo at the top and the components facing toward the **Frame Motherboard**.

   • Carefully align the **Frame Tally Board** so that its 32-pin connectors match the 32-pin headers on the **Motherboard**.

   • Use your fingers to "feel" for the proper pin-to-socket alignment.

Caution | Failure to install a board with a precise 1:1 pin-to-socket orientation will damage the **Frame Motherboard**, the **Frame Tally Board** — or both! Double check your work!

   • While applying gentle, forward pressure, slowly rock the board until it is fully seated. Avoid flexing the board so as not to bend the pins.

   • After installation, "sight" behind the board at the connector level, to make sure that there are no exposed pins.

   • Secure the **Frame Tally Board** onto the posts on the **Frame Motherboard**, with the two 4-40 machine screws (supplied).

7. When you have finished installing the **Frame Tally Board** on the **Frame Motherboard**, carefully replace the top panel of the frame by securing the 17 screws that were previously removed and replace the front cover.

8. Power on the Synergy 1 frame.

9. Power on the Synergy 1 control panel.

This completes the procedure to install the **Frame Tally Board**.

Frame Processor (CPU) Board

In This Chapter

This chapter provides details on the Frame CPU Board, and installing the Serializer and Deserializer modules.

The following topics are discussed in this chapter:

- Frame Processor (CPU) Board
- Frame Jumpers and Switches
- Deserializer Module
- Serializer Module
- Serializer/Deserializer Module Installation

Frame Processor (CPU) Board

The figure below shows the Synergy 1 **Frame Processor (CPU) Board** (4216A-001).
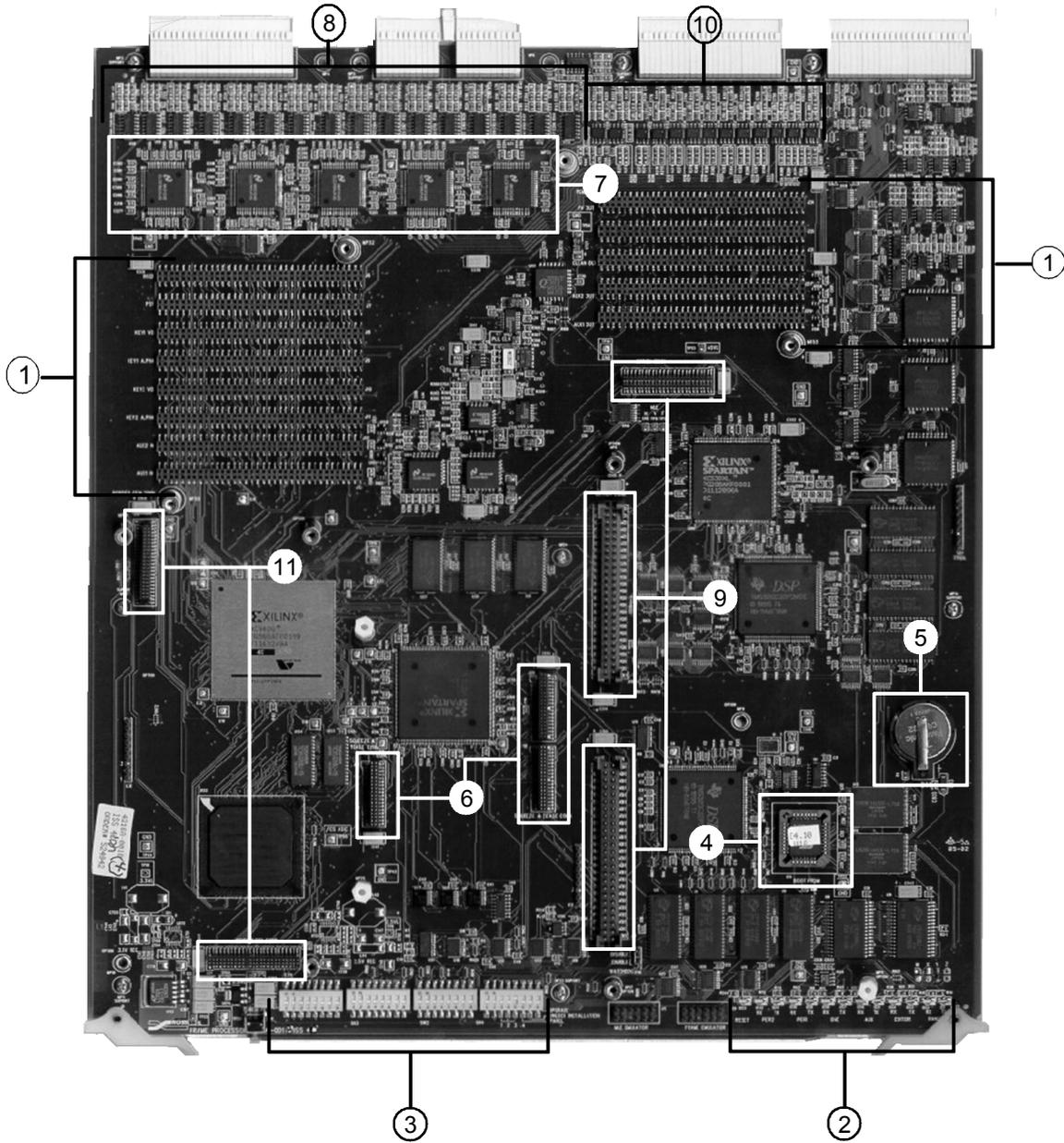
Frame CPU Board

1) Serializer/Deserializer Sections	5) Backup Battery for NV RAM	9) Option Sockets
2) LED Section	6) Squeeze & Tease Board Connectors	10) Output Drivers
3) Switch Section	7) Crosspoint Section	11) Dual Border Generator Board
4) Boot EPROM	8) Input Equalizer Section	Connectors

1. **Serializer/Deserializer Sections**

   The Serializer/Deserializer Sections include individual sockets for a group of **Deserializer Modules** (4000A-061) and **Serializer Modules** (4000A-062). Each slot is labeled as to the function for each module. Refer to the the section "**Deserializer Module**" on page 5–8 and the the section "**Serializer Module**" on page 5–9 for details on slot assignments and module functionality.

   • (standard) 1 slot on the left side of the board is provided for the **Background Deserializer Module**.

   • (standard) 1 slot on the left is provided for the **Preset Deserializer Module**.

   • (standard) 2 slots on the left are provided for **Key 1 Video** and **Key 1 Alpha Deserializer Modules**.

   • (standard) 2 slots on the left are provided for **Key 2 Video** and **Key 2 Alpha Deserializer Modules**.

   • *(optional)* 2 slots on the left are provided for **Timed Aux Bus Deserializer Modules**.

   ✎ **Note** | The two **Deserializer Modules** are standard on the Synergy 100, as they provide full functionality of the Downstream Keyer.

   • *(optional)* 2 slots on the right side of the board are provided for **Timed Aux Bus** Serializer modules.

   • (standard) 1 slot on the right is provided for the **Preview** output **Serializer Module**.

   • (standard) 1 slot on the right is provided for the **Program** output **Serializer Module**.

   • *(optional)* 1 slot on the right is provided for the **Clean** output **Serializer Module**.

2. **LED Section**

   Thirteen serial activity LEDs are provided to monitor system communications:

   • Yellow LED = **TX** (transmit)

   • Green LED = **RX** (receive)

3. **Switch Section**

   This section contains an array of switches — some of which are provided for customer use. Refer to the the section "**Frame Jumpers and Switches**" on page 5–5 for details.

   ✎ **Note** | The **Watchdog** jumper must be left in its current factory installed position.

4. **Boot EPROM**

   The Boot EPROM is socketed, in the event that an update of the EPROM is required.

5. **Backup Battery for NV RAM**

   The Backup Battery ensures that the contents in non-volatile RAM are not lost in the event of a power loss to the frame CPU board.

6. **Squeeze & Tease Board Connectors**

   Three connectors are provided for the optional **Squeeze & Tease 2D Board** (4000A-048) or **Squeeze & Tease 3D/WARP Board** (4000A-148).

7. **Crosspoint Section**

   The **Crosspoint Section** includes five chips that provide the 16 x 16 input/output matrix.

8. **Input Equalizer Section**

   The **Input Equalizer Section** includes equalizer circuits for each of the sixteen inputs of the Synergy switcher.

9. **Option Socket**

   The **Frame Processor Board** contains one **Option Socket**. This socket includes three connectors and associated standoffs, which mate with the option boards.

   The Option Socket accepts two different option boards that provide various video processing functions. These two boards are the Ultimatte™ Insider and the Dual Aspectizer (4000A-050). Refer to the section "**Ultimatte Insider™ Board**" on page 4–20 for details on the Ultimatte Insider Board. For information on the Dual Aspectizer, refer to the section "**Dual Aspectizer Board Installation – Synergy 1**" on page 4–23.

   | **Note** | Only two of the three connectors are used to mate with the **Ultimatte™ Insider Board**. |

10. **Output Drivers**

    There are a total of thirteen Output Driver chips installed. There is one for each of the ten Aux Buses, and one each for the Program, Preview, and Clean Feed.

11. **Dual Border Generator Board Connectors**

    Two connectors are provided for the optional **Dual Border Generator Board** (4000A-049). Refer to the section "**Dual (Floating) Border Generator**" on page 4–18 for details.

Frame Jumpers and Switches

The figure below illustrates the location of jumpers and switches on the front edge of the **Frame Processor Board**:

Frame Jumpers and Switches
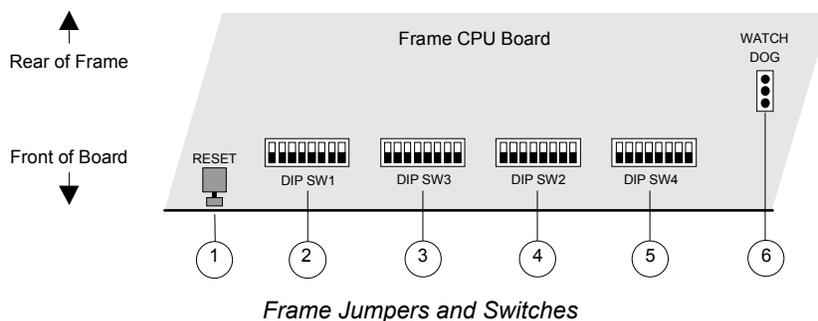
1) Reset	3) DIP Switch SW3	5) DIP Switch SW4
2) DIP Switch SW1, Reserved	4) DIP Switch SW2, Reserved	6) Watchdog Jumper

1. Reset Switch

Press the blue **RESET** switch on the Synergy frame to initiate a *full system* reset. When the reset is initiated from the frame, the control panel's reset is initiated via a software message that is passed along the RS-422 control cable. In the unlikely event that the control panel has crashed, it may be necessary to *manually* reset the control panel. Refer to the "**System Reset Notes**" section of either the *Synergy 1 Installation Guide* or the *Synergy 100 Installation Guide* for additional information.

> **Note** In the following descriptions, the switch position **Up** indicates the switch is *away* from the front of the board, while the **Down** position refers to the switch being *towards* the front of the board.

2. DIP Switch 1

This 8-position DIP switch is reserved for future use. Please leave all switches in the default **Down** position. (Early issue boards may find this switch unpopulated).

3. DIP Switch 3

This 8-position DIP switch has the following system assignments (from left to right):

- **SW1 to SW7** — *Reserved*. Leave in the default **Down** position.
- **SW8** — This is the **Squeeze & Tease 3D Software Upgrade** switch. This switch controls the ability to upgrade the **Squeeze & Tease 3D** software from a storage device:
  - ~ **Up** — Software can be upgraded from a storage device, such as a floppy disk or USB key. Refer to the section "**Squeeze & Tease 3D Software Upgrade**" in the *Squeeze & Tease 3D/WARP Owner's Guide* for instructions.
  - ~ **Down** — Software can not be upgraded from a floppy disk or USB key. This is the default position.

4. **DIP Switch 2**

    This 8-position DIP switch is reserved for future use. Please leave all switches in the default **Down** position.

5. **DIP Switch 4**

    This 8-position DIP switch has the following system assignments (from left to right):

    *   **SW1** — *Reserved*. Leave in the default **Down** position.
    *   **SW2** — *Reserved*. Leave in the default **Down** position.
    *   **SW3** — **Panel Type**. Works with **SW4, SW5** and **SW6**. Refer to the table below for details.
    *   **SW4** — **Panel Type**. Works with **SW3, SW5** and **SW6**. Refer to the table below for details.
    *   **SW5** — **Panel Type**. Works with **SW3, SW4** and **SW6**. Refer to the table below for details.
    *   **SW6** — **Panel Type**. Works with **SW3, SW4** and **SW5**. Refer to the table below for details.

DIP Switch Positions

DIP Switch 4	Synergy 100	Synergy 1	GVG 100/110	Ross 210A/D	Ross 216A/D
SW3	Down	Down	Down	Down	Up
SW4	Down	Down	Down	Up	Up
SW5	Up	Down	Up	Up	Up
SW6	Down	Down	Up	Up	Up

*   **SW7** — **Installation Enable**. This switch determines the installation status of the switcher:

    ~   **Up** — Access to installation features is restricted. However, you *are* permitted to view the menus on the LCD display or preview overlay.

    ~   **Down** — Installation settings can be changed without restriction. However, upon exiting the menus, a "**Warning**" alerts you that settings are about to be changed:

```
You are about to change the switcher's installation settings.
Press 'Confirm' to save the new settings, or 'Cancel' to revert
to the old settings.




    Confirm     Cancel
```

Synergy 1 — Installation Warning

```
┌─────────────────────────────────────────┐
│                                         │
│  WARNING!                               │
│  ─────────                              │
│  You are about to change the switcher's │
│  installation settings.                 │
│                                         │
│  0. Confirm              1. Cancel      │
│                                         │
│                                         │
│                                         │
│                     10     1    SEL     │
│                     Down   Up   Accept  │
│                                         │
└─────────────────────────────────────────┘
```
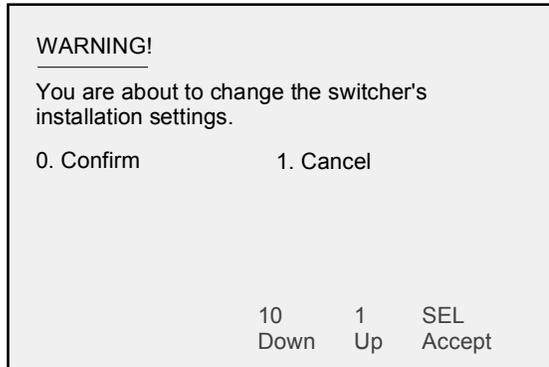
Synergy 100 — Installation Warning

✎	**Note**	Place the switch in the **Up** position when you want to restrict access to installation menus. For certain facilities, this setting is recommended once installation is complete.

- • **SW8** — **Software Upgrade**. This switch controls the ability to upgrade software from a storage device:

  ~ **Up** — Software can be upgraded from a floppy disk or USB key. Refer to the section "**Synergy 1 Software Upgrades**" on page 3–9 for upgrade instructions for your Synergy 1 control panel. For information on upgrading the software for your Synergy 100 control panel, refer to the section "**Synergy 100 Software Upgrade**" on page 3–19.

  ~ **Down** — Software can not be upgraded from a storage device. This is the default position.

6. **Watch Dog Jumper**

   Leave the **Watch Dog Jumper** in the default **DISABLE** (**Up**) position.

Deserializer Module

Deserializer Modules (4000A-061) receive serial data and output parallel data, in preparation for processing video within the MLE. A single module processes one bus. The figure below illustrates a simplified block diagram, as the input buses are routed through a *bank* of **Deserializer Modules**. Refer to the section "**Block Diagram**" on page 2–2 for an expanded view.
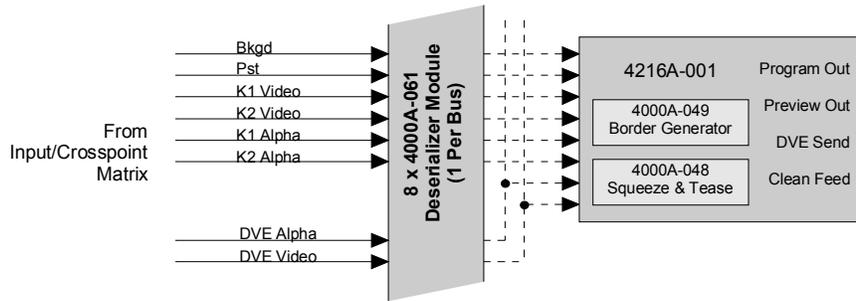
Block Diagram — Deserializer Module

The figure below illustrates a **Deserializer Module**, with four chips highlighted.
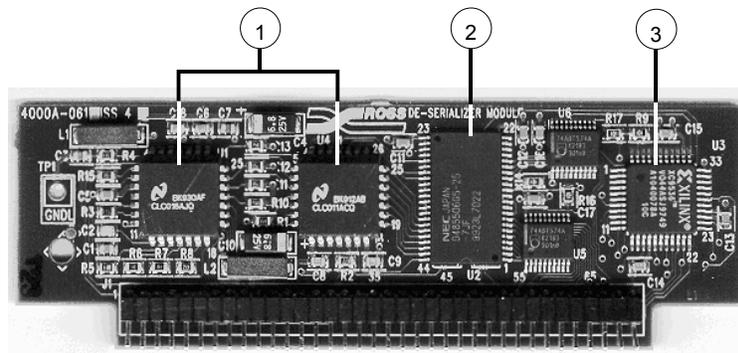
Deserializer Module

1) Serial/Parallel Translation Chip	2) Delay Memory	3) FPGA

1. Serial/Parallel Translation Chips

These chips provide the translation functionality from serial data to parallel data.

2. Delay Memory

This chip provides the delay memory required to handle auto timing.

3. FPGA

This chip is the flash-based FPGA that controls the deserializing process and auto-timing requirements.

Note All **Deserializer Modules** are identical. If a critical module fails (such as Background), you can swap a module from a non-critical location (such as an unused timed Aux Bus slot) in order to continue production. You can *not* hot-swap modules.

Serializer Module

Serializer Modules (4000A-062) receive parallel data and output serial data, in preparation for routing video to the Program Matrix. A single module processes one bus. The figure below illustrates a simplified block diagram, as the MLE output buses are routed through individual **Serializer Modules**. Refer to the section "**Block Diagram**" on page 2–2 for an expanded view.
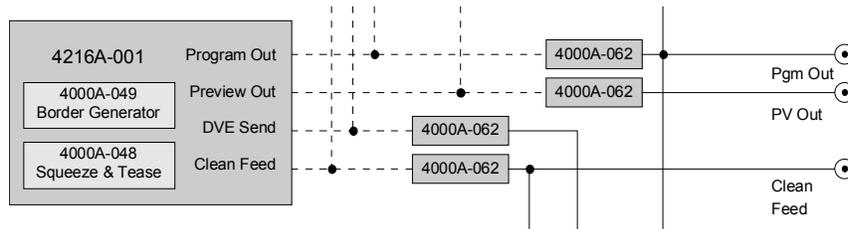
Block Diagram — Serializer Module

The figure below illustrates a **Serializer Module**, with two chips and a jumper highlighted.
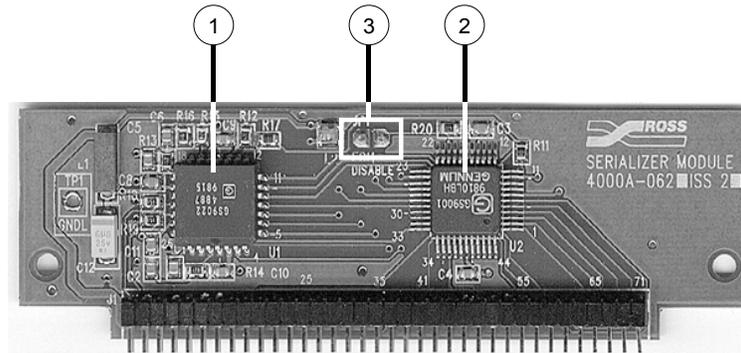
Serializer Module

1) Parallel/Serial Translation Chip	2) EDH Inserter	3) EDH Disable Jumper

1. Parallel/Serial Translation Chip

This chip provides the translation functionality from parallel data to serial data.

2. EDH Inserter

This chip provides EDH (Error Detection Handling) insertion and check sum functionality.

3. EDH Disable Jumper

This jumper disables the normal insertion of EDH checkwords into the output video stream. To disable EDH insertion, simply short this jumper with a wire or solder dot. Note that doing this will often result in EDH checksum errors on the switcher output. Since the switcher manipulates the video, the resultant image's EDH checksum will no longer match that of the original input video, and may be flagged as an error by downstream equipment.

Serializer/Deserializer Module Installation

Installing Serializer and Deserializer modules should only be required when you add an option, such as Clean Feed, or in the event of an upgrade or a component failure.

	Important	All **Serializer Modules** are the same. In case of failure of a critical module (such as Program), you can swap a module from a non-critical location (such as an unused Clean or Aux slot) in order to continue production. You can *not* hot-swap modules.

- An indication that a Deserializer has gone bad would be if all inputs do not work on a particular bus — for example, if you get noise and static when you select crosspoints.

- An indication that a Serializer has gone bad would be if you do not get a program or a preview output.

Please note the following important points regarding Serializer/Deserializer Module installation:

- Modules must be installed with their components facing the rear of the **Frame Processor Board**.

- As you install a module, all the of module's pins must line up properly with the socket. If not, damage can result.

Removing or Installing a Module

Use the following procedure to remove or install a module:

	Caution	Observe all static discharge precautions throughout the procedure.

1. Ensure that the switcher is powered down, and the **Frame Processor Board** is removed and placed on a clean, flat, static-free surface.

2. Locate the desired Serializer or Deserializer module(s) on the **Frame Processor Board**.

3. Remove a module as follows:

   - Hold the module firmly.

   - While applying upward pressure, *slowly* rock the module vertically (from top to bottom), until the module pulls out of the socket. Avoid pulling the board out too quickly — so as not to bend the pins.

4. Install a module as follows:

   - Carefully align the module over the socket.

   - Ensure that the board's components are facing the rear of the **Frame Processor Board**.

   - Use your fingers to "feel" for the proper pin-to-socket alignment.

	Caution	Failure to reinstall a module with a precise 1:1 pin-to-socket orientation will damage the **Frame Processor Board**, the selected module — or both! Double check your work!

- While applying downward pressure, slowly rock the module horizontally (side to side), until the module is fully seated. Avoid flexing the board — so as not to bend the pins.
- After installation, "sight" down the board at the connector level, to make sure that there are no exposed pins.

This completes the procedure to remove or install a Serializer or a Deserializer module.

Working with Installed Options

In This Chapter

This chapter discusses the system menus that enable you to verify the installed options on your Synergy switcher, and install serial numbers and software options.

The following topics are discussed:

- Installed Options Menus – Synergy 1
- Installing Serial Numbers – Synergy 1
- Installing Software Options – Synergy 1
- Storing and Recalling Option Codes – Synergy 1
- Options Menu – Synergy 100
- Installing Software Options – Synergy 100

	Important	Serial numbers allow Ross Video to track which options have been purchased by each customer. Switchers shipped in August 1999 or later have serial numbers that were installed (in flash memory) at the factory. Switchers shipped prior to August 1999 do not have serial numbers installed. Refer to the section "**Installing Serial Numbers – Synergy 1**" on page 6–6 for instructions.

Installed Options Menus – Synergy 1

Several important menus are available that allow you to verify all of the installed options in your Synergy 1 switcher — with serial numbers as well as software option codes. The menus also display the revision levels of all system boards, and allow you to install software options.

Software Options Menu

The main area of the **Software Options Menu** lists your the serial number for your Synergy frame at the top. This number is present at the top of *all* options menus. The main area also provides two columns of information:

- Column 1 lists the available software options.

- Column 2 indicates whether or not the option is installed.

The **Software Options Menu** is provided for information only — no action can be taken.

Use the following procedure to list the software options for your Synergy 1 switcher:

1. Navigate to the **Installed Options Menu** as follows:

   - Press **HOME** (to display the **Main Menu 1-2**).
   - **MORE** (to display the **Main Menu 2-2**).
   - **Setup** (to display the **Setup Menu**).
   - **Installed Options** (to display the **Installed Options Menu 1-2**).

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

```
Installed Options (1-2)
Frame Serial Number:F123456789

Editor Interface          :Yes    Peripheral Bus II        :Yes
VTR Remote Control        :Yes    Still Store (Aprisa)     :Yes
DVE Send and Remote CTRL  :Yes    Character Generator      :Yes
Audio Server Control      :Yes    Small Audio Mixer        :Yes
Video Server Control      :Yes    Large Audio Mixer        :Yes
Router                    :Yes    Robotic System           :Yes
Serial Tally              :Yes    Monitor Wall             :No

  Software      Panel        Frame       Option     Enter Serial
  Options       Boards       Boards      Boards        Number      Add Option
```

Installed Options — Software Options Menu

This completes the procedure to list the software options for your Synergy 1 switcher.

Notes on the Software Options Menu

Please note:

- If a serial number appears at the top of the menu, please verify that this number matches the serial number printed on the inside of the Synergy 1 frame, affixed to the power supply shield. Also verify that the list reflects the exact options that you have purchased. If not, please contact **Technical Support** for further information.

- If the label "**Unknown**" appears, the frame is powered off. Please power on the Synergy frame so that the serial number can be recognized.

- If the label "**000000**" appears, a serial number is required. Your options will be activated *temporarily* but a valid serial number *must* be installed permanently — so that you do

not lose switcher functionality. Refer to the the section "**Installing Serial Numbers – Synergy 1**" on page 6–6 for instructions.

- Serial numbers are unique, and pertain to *your switcher only*. The serial numbers can not be exchanged, or entered on another switcher.

Note   All software options are stored in the Synergy frame. If control panels are swapped around, the enabled options stay with the frame — regardless of which panel is connected to it, even for panel-based options such as "**VTR Remote Control**".

Panel Boards Menu

The main area of the **Panel Boards Menu** provides three columns of information that pertain to the boards installed in the panel:

- **Board** — This column lists each circuit board by part number and name.

- **Rev** — This column lists the hardware revision number of the associated board.

- **FPGA Rev** — This column lists the FPGA revision date of the associated board.

The **Panel Boards Menu** is provided for information only — no action can be taken.

Use the following procedure to list the panel board information for your Synergy 1 switcher:

1. Navigate to the **Installed Options Menu** as follows:

   - Press **HOME** (to display the **Main Menu 1-2**).

   - **MORE** (to display the **Main Menu 2-2**).

   - **Setup** (to display the **Setup Menu**).

   - **Installed Options** (to display the **Installed Options Menu 1-2**).

2. Press **Panel Boards** to display the **Panel Boards Menu**.

```
Installed Options (1-2)
Frame Serial Number:0000000

Board                     Rev  FPGA Rev
4216-033 Panel CPU         5   4000x033.bit 1998/12/01 09:49:35    Use Knob 2
4216-030 Xpt Switch        X                                       to scroll
4216-034 Key Switch        2                                       list.
4216-035 Trans Switch      1
4216-036 Pattern Switch    Xa
4216-037 Function Switch

   Software        Panel         Frame        Option     Enter Serial
   Options         Boards        Boards       Boards        Number
```

Panel Boards Menu

3. Use the middle knob to scroll the list.

This completes the procedure to list the panel board information for your Synergy 1 switcher.

Frame Boards Menu

The main area of the **Frame Boards Menu** provides three columns of information that pertain to the boards installed in the frame:

- **Board** — This column lists each circuit board by part number and name.

- **Rev** — This column lists the hardware revision number of the associated board.

- **FPGA Rev** — This column lists the FPGA revision date of the associated board.

The **Frame Boards Menu** is provided for information only — no action can be taken.

Use the following procedure to list the frame board information for your Synergy 1 switcher:

1. Navigate to the **Installed Options Menu** as follows:

   - Press **HOME** (to display the **Main Menu 1-2**).
   - **MORE** (to display the **Main Menu 2-2**).
   - **Setup** (to display the **Setup Menu**).
   - **Installed Options** (to display the **Installed Options Menu 1-2**).

2. Press **Frame Boards** to display the **Frame Boards Menu**.

```
Installed Options (1-2)
Frame Serial Number:0000000

Board                    Rev  FPGA Rev
4216-001 Synergy1 Frame   5   s1frame.bit 2002/01/18 15:15:13    Use Knob 2
                              s1bigvid.bit 2003/12/08 14:25:25   to scroll
                                                                 list.


   Software      Panel       Frame       Option    Enter Serial
   Options       Boards      Boards      Boards       Number
```

Frame Boards Menu

3. Use the middle knob to scroll the list.

This completes the procedure to list the frame board information for your Synergy 1 switcher.

Option Boards Menu

The main area of the **Option Boards Menu** provides three columns of information that pertain to the optional boards that can be installed in the frame:

- **Board** — This column lists each optional circuit board by name.

- **Rev** — This column lists the hardware revision number of the associated board.

- **FPGA Rev** — This column lists the FPGA revision date of the associated board.

The **Option Boards Menu** is provided for information only — no action can be taken.

Use the following procedure to list Option Boards information for your Synergy 1 switcher:

1. Navigate to the **Installed Options Menu** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**).

   • **MORE** (to display the **Main Menu 2-2**).

   • **Setup** (to display the **Setup Menu**).

   • **Installed Options** (to display the **Installed Options Menu 1-2**).

2. Press **Option Boards** to display the **Option Boards Menu**.

```
┌─────────────────────────────────────────────────┬──────────┐
│Installed Options (1-2)                           │          │
│Frame Serial Number:0000000                       │          │
│                                                  │          │
│Board                  Rev  FPGA Rev              │          │
│MLE1                   N/I  s1mle.bit 2002/11/01 09:20:36│Use Knob 2│
│ Squeeze & Tease 3D     2   SW Ver 16.0 ,  Xilinx Rev 3.10│to scroll│
│ Border card           3c   s1bord.bit 2000/12/19 10:58:45│list.│
│ Ultimatte   v1.03                                │          │
│                                                  │          │
│                                                  │          │
├──────────┬──────────┬──────────┬──────────┬──────┴──────────┤
│ Software │  Panel   │  Frame   │  Option  │ Enter Serial     │
│ Options  │  Boards  │  Boards  │  Boards  │    Number        │
└──────────┴──────────┴──────────┴──────────┴──────────────────┘
```

Option Boards Menu

3. Use the middle knob to scroll the list.

   The status reflects whether or not the following options are installed:

   • **Squeeze & Tease**

   • **Squeeze & Tease 3D**

   • **Dual Border Generator**

   • **Ultimatte Insider**

   • **Dual Aspectizer**

This completes the procedure to list Option Boards information for your Synergy 1 switcher.

Installing Serial Numbers – Synergy 1

Use the following procedure to install a serial number.

1. Navigate to the **Installed Options Menu** as follows:

   - Press **HOME** (to display the **Main Menu 1-2**).
   - **MORE** (to display the **Main Menu 2-2**).
   - **Setup** (to display the **Setup Menu**).
   - **Installed Options** (to display the **Installed Options Menu 1-2**).

✓ **Operating Tip**   If the label "**000000**" appears at the top of the **Installed Options Menu**, a serial number is required.

2. Press **Enter Serial Number** to display the **Serial Number Menu**.

```
Enter Serial Number

Frame Serial Number:0000000
Ross Encrypt Code:6AFD

Please contact Ross Video at:
8 John Street
Iroquois, Ontario, Canada  K0E 1K0
1-613-652-4886
techsupport@rossvideo.com


  Finished      Cancel
```

Serial Number Menu

✎ **Note**   An **Encrypt Code** is a *random number* that is generated each time the Synergy 1 switcher is powered up. Its purpose is to prevent unauthorized installation of software options. The code remains valid until the switcher is powered down or reset. The next time the switcher is powered up, a *new* Encrypt Code is generated.

3. Call **Ross Video Technical Support** at the number listed on the menu.

4. When you speak to our Technical Support representative, tell them your name, your facility name, the serial number printed on the rear of the Synergy 1 frame, and the **Encrypt Code** as listed on the menu.

5. You will be given a numeric code that must be entered on the keypad in the **Global Memory System Group**.

6. Enter the code and press **ENTER** on the keypad or press **Finished** on the **Serial Number Menu**.

✎ **Note**   The system will not accept an invalid code. If the code entered is invalid, the serial number will not be changed. If your numeric code is not accepted, try entering it again, or contact Technical Support for further assistance.

This completes the procedure for entering the serial number.

Installing Software Options – Synergy 1

Use this procedure to activate your software options (after entering a new serial number) or to install a new software option that you have just purchased:

✎ **Note** | Ensure that your serial number has been entered correctly. If not, refer to the section "**Installing Serial Numbers – Synergy 1**" on page 6–6 for instructions.

1. Navigate to the **Software Options Menu** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**).

   • **MORE** (to display the **Main Menu 2-2**).

   • **Setup** (to display the **Setup Menu**).

   • **Installed Options** (to display the **Installed Options Menu 1-2**).

   • **Software Options** (to display the **Software Options Menu**).

✓ **Operating Tip** | Before entering new option codes, save your current option settings to a storage device. Refer to the section "**Storing and Recalling Option Codes – Synergy 1**" on page 6–8 for details.

2. Press **Add Option** to display the **Add Option Menu**.

```
Enter Option Number

Frame Serial Number:0000000
Ross Encrypt Code:519D

Please contact Ross Video at:
8 John Street
Iroquois, Ontario, Canada  K0E 1K0
1-613-652-4886
techsupport@rossvideo.com


    Finished       Cancel
```

Add Option Menu

3. Call **Ross Video Technical Support** at the number listed on the menu.

4. When you speak to our Technical Support representative, tell them your name, your facility name, the switcher's serial number and the **Encrypt Code** as listed on the menu.

5. Tell the Technical Support representative the name of the option(s) that you wish to install. Technical Support keeps an up-to-date record of each switcher's configuration and option status.

6. You will be given a numeric code for each option to enter on the Synergy 1 switcher:

   • Enter the code using the keypad in the **Global Memory System Group**.

   • To complete the process, press **ENTER** on the keypad or press **Finished** on the **Option Number Menu**.

   • Once entered, the menu indicates "**Installed**," and the system displays the **Software Options Menu** to confirm.

7. Repeat steps 5 and 6 for each option.

This completes the procedure to activate your software options.

Storing and Recalling Option Codes – Synergy 1

The **Installed Options Menu 2-2** allows you to store and recall your option codes to a storage device, such as a floppy disk or USB key, for purposes of safe storage.

✎	**Note**	You must have the **USB Removable Media Drive** option installed in order to use a USB key for storing and recalling option codes on the Synergy 1 switcher.

Storing Option Codes

Use the following procedure to store option codes to a storage device:

1. Navigate to the **Installed Options Menu 1-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**).

   • **MORE** (to display the **Main Menu 2-2**).

   • **Setup** (to display the **Setup Menu**).

   • **Installed Options** (to display the **Installed Options Menu 1-2**).

2. Press **MORE** to display **Installed Options Menu 2-2**.

```
Installed Options (2-2)
Frame Serial Number:F123456789

Editor Interface          :Yes    Peripheral Bus II        :Yes
VTR Remote Control        :Yes    Still Store (Aprisa)     :Yes
DVE Send and Remote CTRL  :Yes    Character Generator      :Yes
Audio Server Control      :Yes    Small Audio Mixer        :Yes
Video Server Control      :Yes    Large Audio Mixer        :Yes
Router                    :Yes    Robotic System           :Yes
Serial Tally              :Yes    Monitor Wall             :No

 Store Codes Recall Codes                                Delete All
   to Disk     From Disk                                 SW Options
```

Installed Options Menu 2-2

3. Insert a storage device into the Synergy 1 switcher as follows:

   • Insert a pre-formatted 1.4 MB high-density floppy disk into the floppy disk drive of the Synergy 1 switcher.

   OR

   • Insert a USB key into the USB port of the Synergy 1 switcher. You must wait 5 seconds after inserting the USB key into the USB port before you can store option codes to it.

4. Press **Store Codes to Disk** to store all of your option codes.

⚠	**Caution**	Do NOT remove the floppy disk or USB key from the switcher before the LED on the disk drive or USB port goes out. Doing so may destroy the data on your floppy disk or USB key, as well as the data on the next one you insert into the switcher.

5. Eject the storage device from the Synergy 1 switcher.

6. Label the storage device and store it in a safe place. It is recommended that you place the following information on the label:

    •   Synergy 1

    •   Software Option Codes

    •   Today's Date

    •   Synergy Software Version

    •   Serial Number

This completes the procedure for saving your option codes to a storage device.

Recalling Option Codes

In case the option codes are accidentally erased or deleted, use the following procedure to recall option codes:

Note | Option codes stored to storage device, such as a floppy disk or USB key, will only work on the switcher from which they were saved.

1. Navigate to the **Installed Options Menu 1-2** as follows:

    •   Press **HOME** (to display the **Main Menu 1-2**).

    •   **MORE** (to display the **Main Menu 2-2**).

    •   **Setup** (to display the **Setup Menu**).

    •   **Installed Options** (to display the **Installed Options Menu 1-2**).

2. Press **MORE** to display **Installed Options Menu 2-2**.

3. Insert the storage device with the saved option codes into the Synergy 1 switcher. You must wait 5 seconds after inserting the USB key into the USB port before you can begin to recall your option codes.

4. Press **Recall Codes From Disk** to recall all of your option codes.

Caution | Do NOT remove the floppy disk or USB key from the switcher before the LED on the disk drive or USB port goes out. Doing so may destroy the data on your floppy disk or USB key, as well as the data on the next one you insert into the switcher.

5. Eject the storage device from the switcher.

Note | The **Delete All SW Options** function is reserved for factory use only. Do not use this function.

This completes the procedure to recall option codes.

Options Menu – Synergy 100

An **Options Menu** is available that allows you to verify all of the installed options in your Synergy 100 switcher. All menus are accessed in the **Preview Overlay** mode. Refer to the section, "**Using the Menu System**" in your *Synergy 100 Operation Guide*, for complete instructions.

⚠	**Important**	Serial numbers allow Ross Video to track which options have been purchased by each customer. Serial numbers are installed in flash memory at the factory.

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

Using the Options Menu

The **Options Menu** lists the hardware options that have been installed in your switcher and allows you to link to the **Software Options Menu**. Verify that all options ordered are installed. If not, contact Ross Video Technical Support.

Use the following procedure to view the installed options for your Synergy 100 switcher:

1. Press **MENU** to display the **Main Menu**.

```
Main Menu - Synergy 100          vX.XX-S100

0. Effects              5. Disk
1. Inputs               6. Personality
2. Outputs              7. Options
3. GPIs                 8. S&T 3D
4. Communication        9. Default




MENU      100         10      1      SEL
Exit      Previous     Down    Up     Accept
```

Synergy 100 Main Menu

2. Press **7. Options** in the **Effects Control Group** 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
```

Options Menu

The installation status of hardware **Options 1 – 4** and panel and frame information **Options 5** and **6** are indicated in grey to the right of the option.

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

3. Verify your installed hardware options as follows:

- **1. Opt Card** — This option can be one of two variables, depending upon your particular configuration. The variables are as follows:

    ~ **None** — This variable is displayed when there is no option card installed.

    ~ **Ultimatte** — This variable is displayed when the Ultimatte Insider option is installed.

- **2. S&T DVE —** This option can be one of three variables, depending upon your particular configuration The variables are as follows:

    ~ **2D** — This variable is displayed when the Squeeze & Tease option is installed.

    ~ **3D** — This variable is displayed when the Squeeze & Tease 3D DVE option is installed.

    ~ **None** — This variable is displayed when the option is not installed.

- **3. Border** — This option can be one of two variables, depending upon your particular configuration. The variables are as follows:

    ~ **Yes** — This variable is displayed when the Floating Border Generator option is installed.

    ~ **No** — This variable is displayed when the option is *not* installed.

- **4. Tallies —** This option can be one of two variables, depending upon your particular configuration. The variables are as follows:

    ~ **16** — This variable is displayed when the Frame Tally option is *not* installed.

    ~ **32 —** This variable is displayed when the Frame Tally option is installed.

4. Verify the version number of the processor boards as follows:

- **5. Panel ID** — This heading displays the version number of the Synergy 100 panel's processor board.

- **6. Frame ID** — This heading displays the version number of the processor board for the Synergy frame.

This completes the procedure to view the installed options on your Synergy 100 switcher.

Installing Software Options – Synergy 100

There are three software options that are currently available with the Synergy 100 panel – Editor control, Audio Mixer control, and Serial Tally interface. On the **Software Options Menu**, the headings for these options will indicate if the option is installed, with either an **On** or an **Off** displayed in grey.

Note   The DVE option is not yet implemented for the Synergy 100 switcher.

Use the following procedure to install a software option on your Synergy 100 switcher:

1. Navigate to the **Software Options Menu** as follows:

   • Press **MENU** (to display the **Main Menu**).
   • Press **7. Options** (to display the **Options Menu**).
   • 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.Tally   On



MENU     100        10     1     SEL
Exit     Previous   Down   Up    Accept
```

Software Options Menu

2. Call **Ross Video Technical Support**.

3. When you speak to the Technical Support representative, tell them your name, your facility name, your serial number, which is displayed at the top of the menu, and the **Encrypt Code**, which is displayed beside the **Add** heading. Technical Support keeps an up-to-date record of each switcher's configuration and option status.

Note   The **Encrypt Code** is a *random number* that is generated each time the switcher is powered up. Its purpose is to prevent unauthorized installation of software options. The code remains valid until the switcher is powered down or reset. The next time the switcher is powered up, a *new* Encrypt Code is generated.

4. You will be given a 5-digit numeric code that must be entered in the **Add** field. The **Add** heading will be highlighted.

5. Press **SEL** in the **System Control Group**.

   • The encrypt code will change to **00000**.

   • The left-most digit will be highlighted by changing color.

6. Press the **1** button to scroll through the digits.

7. When you have scrolled to the correct number for that digit, press **SEL** to enter the number. The next digit in line becomes highlighted.

8. Enter all 5 digits, along with any leading zeros.

9. Press **SEL** when you are finished. The *greyed* **Off** indicator for that option will change to **On**.

10. Press the **MENU** button to exit the menus.

This completes the procedure for installing a new software option for your Synergy 100 switcher.

DVE Send Option

In This Chapter

Note

The **DVE Send** option is fully functional within the Synergy 1 switcher, but *not* available for the Synergy 100 control panel.

The Synergy 1 switcher is designed to integrate with all popular brands of DVEs *seamlessly* — as if they were part of the switcher during on air production. The **DVE Send and Remote Control Option** makes this possible.

The following topics are discussed:

- Installing the DVE Send Option
- DVE Send Option Kit
- DVE Send Installation
- Testing the DVE Send Option

Caution

Observe all static discharge precautions throughout each procedure in this chapter. Refer to the the section "**A Word About Static Discharge**" on page 1–7 for more information.

Installing the DVE Send Option

The **DVE SEND** button in the **Transition Group** assigns the external DVE (the "primary" DVE) to the MLE, and selects DVE as the transition type, as opposed to wipe or dissolve. You can then select the next transition, using the **BKGD**, **KEY 1** and **KEY 2** buttons, and press the **AUTO TRANS** button to perform a DVE transition using the selected foreground and background sources.

✓ **Operating Tip**

You cannot perform a DVE Send transition on the external DSKs.

The **DVE Send Option** can be installed without installing the required software registration key — however, the option will not function properly. There are no jumpers that need to be set when installing the option.

This section provides instructions for installing the **DVE Send Option**.

DVE Send Option Kit

The **DVE Send and Remote Control Option** kit consists of the following items:

- Two (2) **Deserializer Modules** (4000A-061)
- Two (2) **Serializer Modules** (4000A-062)
- Software Option Registration Key

Ensure that you have received all hardware components prior to continuing with the installation procedure.

DVE Send Installation

Use the following procedure to install the **DVE Send Option**:

Caution

Observe all static discharge precautions throughout the procedure.

1. Power down the Synergy 1 frame.

2. Carefully remove the **Frame Processor (CPU) Board** (4216A-001) from the frame, and set it on a clean, flat, static free surface.

3. Locate the following two sockets:

   - **J13**, labeled **AUX1 IN**
   - **J12**, labeled **AUX2 IN**

4. Install **Deserializer Modules** (4000A-061) in each socket as follows:

Note

The **AUX1 IN** and **AUX2 IN** signals route the video and alpha signals of the DVE to the third (internal) keyer of the Synergy MLE — which is reserved exclusively for **DVE Send** operations.

*   Carefully align the **Deserializer Module** over the socket.
*   Ensure that the board's components are facing the rear of the **Frame Processor Board**.
*   Use your fingers to "feel" for the proper pin-to-socket alignment.

Caution

Failure to reinstall a **Deserializer Module** with a precise 1:1 pin-to-socket orientation will damage the **Frame Processor Board**, the selected module — or both! Double check your work!

*   While applying downward pressure, slowly rock the **Deserializer Module** horizontally (side to side), until the module is fully seated. Avoid flexing the board — so as not to bend the pins.
*   After installation, "sight" down the board at the connector level, to make sure that there are no exposed pins.

5. Locate the following two sockets:

*   **J28** — labeled **AUX1 OUT**
*   **J27** — labeled **AUX2 OUT**

6. Install a **Serializer Modules** (4000A-062) in each socket as follows:

*   Carefully align the **Serializer Module** over the socket.
*   Ensure that the board's components are facing the rear of the **Frame Processor Board**.
*   Use your fingers to "feel" for the proper pin-to-socket alignment.

Caution

Failure to reinstall a **Serializer Module** with a precise 1:1 pin-to-socket orientation will damage the **Frame Processor Board**, the selected module — or both! Double check your work!

*   While applying downward pressure, slowly rock the **Serializer Module** horizontally (side to side), until the module is fully seated. Avoid flexing the board — so as not to bend the pins.
*   After installation, "sight" down the board at the connector level, to make sure that there are no exposed pins.

7. Replace the **Frame Processor (CPU) Board** in the Synergy 1 frame.
8. Power on the Synergy 1 frame.

This completes the procedure to install the **DVE Send Option**. Next you will install the Software Option Registration Key for the **DVE Send Option**.

Installing the DVE Send Software Option

Use the following procedure to install the Software Option Registration Key for the **DVE Send Option**:

✓	**Operating Tip**	Before entering new option codes, save your current option settings to a storage device. Refer to the section "**Storing and Recalling Option Codes – Synergy 1**" on page 6–8 for details.

1. Navigate to the **Software Options Menu** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**).

   • **MORE** (to display the **Main Menu 2-2**).

   • **Setup** (to display the **Setup Menu**).

   • **Installed Options** (to display the **Installed Options Menu 1-2**).

   • **Software Options** (to display the **Software Options Menu**).

2. Press **Add Option** to display the **Add Option Menu**.

```
Enter Option Number

Frame Serial Number:0000000
Ross Encrypt Code:519D

Please contact Ross Video at:
8 John Street
Iroquois, Ontario, Canada  K0E 1K0
1-613-652-4886
techsupport@rossvideo.com


   Finished      Cancel
```

Add Option Menu

3. Call **Ross Video Technical Support** at the number listed on the menu.

4. When you speak to our Technical Support representative, tell them your name, your facility name, the switcher's serial number and the **Encrypt Code** as listed on the menu.

5. Tell the Technical Support representative that you wish to install the **DVE Send Option**. Ross Video Technical Support keeps an up-to-date record of the configuration and option status of each Synergy switcher.

6. You will be given a numeric code for the option to enter on the Synergy 1 switcher:

   • Enter the code using the keypad in the **Global Memory System Group**.

   • To complete the process, press **ENTER** on the keypad or press **Finished** on the **Option Number Menu**.

   • Once entered, the menu indicates "**Installed**," and the system displays the **Software Options Menu** to confirm.

This completes the procedure to install the Software Option Registration Key for the **DVE Send Option**.

⊛	**Important**	In previous versions of Synergy 1 software, the **DVE Send** button was used to control external DVEs. The default setting in version 14 or higher system software is Internal. Refer to the section "**Setting Up DVE Send**" in the *Synergy 1 Installation Guide* for information on setting the functionality of the **DVE Send** button.

Testing the DVE Send Option

Testing the DVE Send Option requires several important steps — many of which are covered in more detail in the *Synergy 1 Installation Guide*. This section includes an overview for testing the DVE Send Option.

Use the following procedure to test the **DVE Send** Option:

1. Ensure that the **DVE Send** hardware and software options are properly installed, as outlined in the section "**Installing the DVE Send Option** " on page 7–2.

2. Ensure that your DVE is properly installed and cabled to the Synergy 1 switcher. Refer to the section, "**Primary DVE Connections**" of the *Synergy 1 Installation Guide*, for instructions.

Note   The DVE *must* be configured as a *primary* DVE in order to function properly with the **DVE Send** Option.

3. Ensure that reference is properly connected. Refer to the section, "**Reference Connection**" of the *Synergy 1 Installation Guide*, for instructions.

4. Ensure that video and alpha inputs are properly connected from the Aux outputs of the Synergy 1 switcher, to your DVE. Refer to the section, "**Primary DVE Input Connection**" in the *Synergy 1 Installation Guide*, for instructions.

5. Ensure that video and alpha inputs are connected *back* to the Synergy 1 switcher. Refer to the section, "**DVE Output Connections**" of the *Synergy 1 Installation Guide*, for instructions.

6. Ensure that the Aux Buses for the Synergy 1 switcher are properly programmed. Refer to the section, "**Aux Bus Panel Programming**" of the *Synergy 1 Installation Guide*, for instructions.

7. Ensure that the Aux Bus tallies are properly programmed on the Synergy 1 switcher. Refer to the section, "**Assigning Aux Bus Tallies**" of the *Synergy 1 Installation Guide*, for instructions.

8. Ensure that remote control and communications between the Synergy 1 switcher and the DVE are properly installed and configured.

   • Refer to the section, "**Remote Control Connections**" of the *Synergy 1 Installation Guide*, for instructions.

   • Refer to the section, "**DVE Communications Setup**" section of the *Synergy 1 Installation Guide*, for details on establishing RS-422 communications with the primary DVE.

9. Ensure that the **DVE Send** button lights and latches on the Synergy 1 control panel.

10. On the Aux buses that feed the DVE, select signals and check that the DVE is receiving the signals at its input.

11. On the DVE, manually manipulate the image (such as re-sizing it), and leave the image in one static location.

12. On the Synergy 1 control panel, ensure that you can key the DVE as a standard **Auto Select** key.

13. Setup an effect as follows:

   • On the DVE, program a multi-keyframe transition that has both the video and key channels enabled.

   • Store the effect in the numeric range of **1** to **40** on the DVE so that it can be accessed from the switcher's 40 "shot box" buttons in the **Pattern Control Group**.

14. Select foreground and background sources on the MLE, and press the **DVE SEND** button.

15. Select the DVE effect in one of two ways:

   • In the **Pattern Control Group**, press the "shot box" button for the desired DVE effect.

   • Use the keypad of the **Global Memory System Group** to enter the effect number.

   • Press **ENTER**.

16. Select **BKGD** in the **Transition Group** of the Synergy MLE.

17. Press **AUTO TRANS** on the Synergy control panel to initiate the transition.

18. Verify that the Synergy 1 switcher performs the following:

   • Performs a match-frame cut to Keyer 3 (the internal DVE keyer);

   • Cues the DVE to the starting keyframe of the effect; and

   • Issues a "**Run Forward**" or "**Run Reverse**" command to the DVE as appropriate.

This completes the procedure to test the **DVE Send Option**. Refer to Chapter 9 "**DVE Send**" in the *Synergy 1 Operations Guide*, for more detailed instructions on DVE Send operations.

Power Supplies

In This Chapter

This chapter provides information about redundant power, and procedures for changing the Synergy control panel and Synergy frame power supplies in the field.

The following topics are discussed:

- About Redundant Power
- Replacing a Synergy 1 Control Panel Power Supply
- Calibrating the Control Panel Power Supply
- Replacing a Synergy 100 Control Panel Power Supply
- Replacing a Synergy Frame Power Supply
- Replacing a Synergy Frame Power Supply Fan

About Redundant Power

	Note	The **Redundant Power Supply** option is only available in the Synergy 1 control panel. This option is not available for either the Synergy 100 control panel or the Synergy 1 frame.

The **Redundant Power Supply** option provides protection against AC power failure in the Synergy 1 control panel. The option allows the control panel to receive power from two independent power sources. With the option installed, complete failure of one power source will not affect switcher operation.

The installation of the **Redundant Power Supply** option is a complex upgrade procedure that is best performed at the Ross factory. For information on upgrading your Synergy 1 system with redundant power, please contact Ross Technical Support.
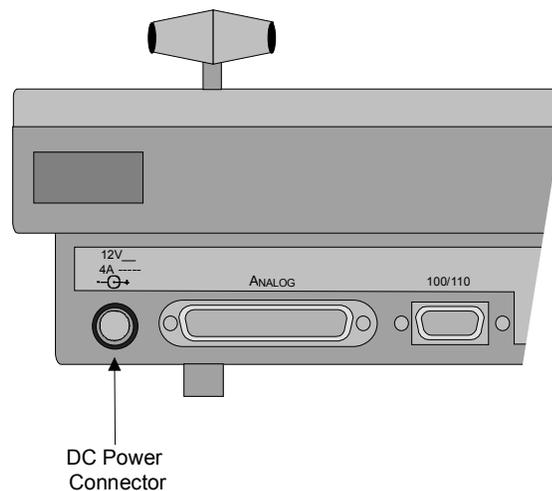
Replacing a Synergy 1 Control Panel Power Supply

This section provides detailed instructions for replacing a failed power supply in the Synergy 1 control panel. Note that a supply failure *may* be indicated by the **PANEL** LED on the control panel.

POWER FAIL

PANEL   FRAME
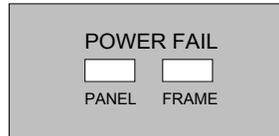
Synergy 1 — Power Fail LEDs

When the **PANEL** LED is lit, it indicates that there is a fault with the primary or secondary power supply for the Synergy control panel.

Replacing the Control Panel Power Supply

Use the following procedure to replace a Synergy 1 control panel power supply.

> **Warning**
> **Hazardous**
> **Voltages**
>
> Hazardous voltages are present inside the control panel tub. This procedure should be performed by qualified service personnel only.
>
> To reduce the risk of electric shock, do not perform any servicing unless you are qualified to do so.

1. Power off the control panel power switches. If a redundant power supply is installed, ensure that *both* switches are turned off.

2. Check the fuses. Each switch has an associated fuse holder that corresponds to the proper power supply. The fuse rating is printed on the panel surface.

   • If the fuse is blown, spare fuses are available in the spare parts kit, or from Ross Video Technical Support.

   • If the fuse is intact, replace it in the holder and continue with the next step.

3. Check that the main breaker for your AC supply has not tripped:

   • If the breaker has tripped, reset it to restore power.

   • If the breaker is intact, please continue with the next step.

4. Unplug all AC power cords from the AC outlets.

5. In order to gain access to the Synergy 1 panel power supplies, you must be able to lift the cover of the control panel off the base. To do this:

   • Gently flip the control panel onto its side on a clean, flat, static free surface.

   • Locate the eleven screws on the underside of the tub, loosen and remove them, and set them aside in a safe place.

   • Gently place the panel back down on its base.

6. For this next step, ensure you have telephone books, or a similar thick, sturdy object available with which to support the control panel cover.

   • Raise the cover and slide the telephone books under the rear area of the side panels to keep it raised and secure while you work.

   • Ensure you have enough workspace to access the power supplies.

   • Position a work light in the control panel tub, if necessary.

7. Locate the power supply you wish to replace.

   • The **Main** power supply is located on the right, at the back of the panel base (as you face the control panel).

   • The **Redundant** supply is on the left.

8. There are ten connections to the power supply, plus five bolts that secure the power supply to the control panel base.

Power Supply Connections
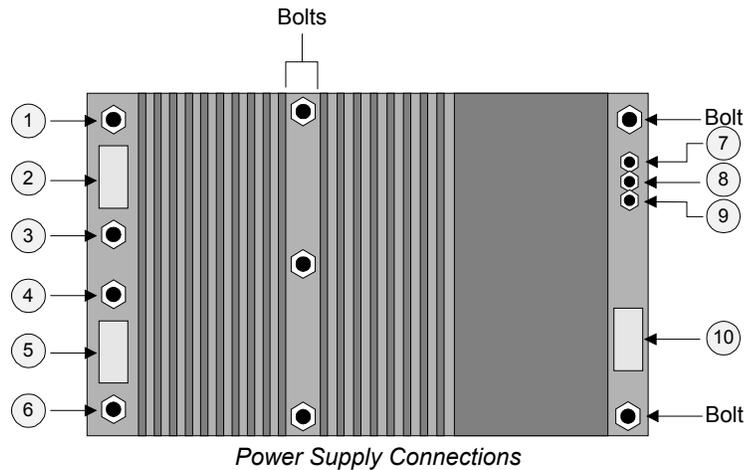
Prior to removing the supply and its connections, use masking tape to label *all ten cables* that are connected to the supply. Use the numbering scheme as illustrated above:

   • **1** to **6** for the six connections on the left side of the power supply.

   • **7** to **10** for the four connections on the right side of the power supply.

This step ensures that all cables are replaced in the same location.

9. Remove cables **1** through **6** from the left side of the supply. Set the nuts aside in a safe place for later re-installation. For cables **1**, **3**, **4** and **6**, note the orientation of components as shown in the side view below.
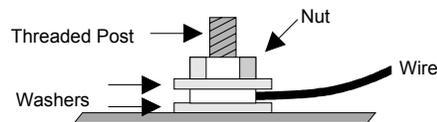
10. Remove cables **7** through **10** from the right side of the supply. Set the nuts aside in a safe place for later re-installation.

11. Remove the five bolts and washers that secure the supply to the panel, and set them aside in a safe place.

12. Detach the old power supply assembly from the captive bolts, remove it from the control panel bay, and set it aside.

13. Unpack the new power supply, and install it onto the five captive bolts inside the control panel bay.

14. Replace the washers and nuts on the five securing bolts.

15. Re-attach cables **7** through **10** to the right side of the new supply. Use the diagram above for reference.

16. Re-attach cables **1** through **6** to the left side of the new supply. Use the diagram above for reference.

17. Pack the old power supply in the new supply's shipping container, and return it to **Ross Video Technical Support**. The supply will be inspected to determine the cause of the failure.

18. Verify all connections. It is not necessary to remove the labels from the ten power supply cables.

19. Re-connect all AC power cords and turn on the control panel power.

✎	**Note**	Do not lower and secure the control panel cover until you have completed the calibration procedure.

This completes the procedure for replacing a control panel power supply. Next, you can calibrate the power supply voltages.

Calibrating the Control Panel Power Supply

Although each control panel power supply is calibrated at the factory, it is highly recommended that you check the supply's voltages and re-calibrate the supply (if required) — once it has been installed in the control panel.

Use the following procedure to check and calibrate the control panel power supply:

1. Ensure that you have access to a digital voltmeter.

2. Ensure that only the *newly installed* power supply (or the one that you want to test) is turned on. If both power supplies are installed and turned on, turn the old one (or the one that you do not want to test) off. This step ensures that correct voltages will be measured.

3. If the top of the control panel is up, lower it momentarily in order to place the panel in the "**Lamp Test**" mode. This diagnostic mode ensures that a suitable load is placed on the power supply.

4. Navigate to **Lamp Test Menu** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**).

   • **MORE** (to display the **Main Menu 2-2**).

   • **Setup** (to display the **Setup Menu**).

   • **Panel Diagnostics** (to display the **Panel Diagnostics Menu**).

   • **Lamp Test** (to display the **Lamp Test Menu**).


```
Lamps Test
                            Hold down F5 and F6, then release
                            them to exit lamp test mode




                                                    Exit        Exit
```
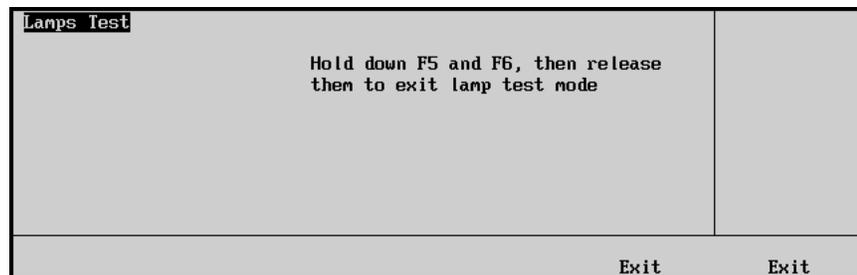
Lamp Test Menu

5. Press any button in the **Pattern Control Group** — to light all of the buttons in the group. Leave the system in "**Lamp Test**" mode for now.

6. Raise the cover of the Synergy control panel to access the Panel CPU circuit board.

7. Locate the calibration controls on the left edge of the circuit board. Use the figure below for reference.
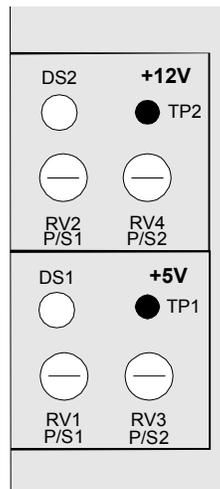
Power Supply Calibration Controls

- The following controls are provided for the Main Supply (**PS1**):
  - ~ **RV1** — This control adjusts the +5volt supply.
  - ~ **RV2** — This control adjusts the +12 volt supply.

- The following controls are provided for the Redundant Supply (**PS2**):
  - ~ **RV3** — This control adjusts the +5 volt supply.
  - ~ **RV4** — This control adjusts the +12 volt supply.

- The following controls are provided for *both* supplies:
  - ~ **DS1** (green) — This control indicates that +5 volt power is on.
  - ~ **DS2** (green) — This control indicates that +12 volt power is on.
  - ~ **TP1** — This control is the +5V test point.
  - ~ **TP2** — This control is the +12V test point.
  - ~ **TP12** — This control is located near the front center of the panel CPU board, and is the ground test point.

8. Ensure that the green LEDs **DS1** and **DS2** are both on.

9. Test the +5V supply as follows:

   - Connect the voltmeter's probes between **TP12** (ground) and **TP1**.
   - Measure the voltage. The proper reading should be +5V, ± 50 millivolts. If not, adjust as follows:
     - ~ Adjust trim pot **RV1** (for power supply 1).
     - ~ Adjust trim pot **RV3** (for power supply 2).

10. Test the +12V supply as follows:

   - Connect the voltmeter's probes between **TP12** (ground) and **TP2**.
   - Measure the voltage. The proper reading should be +12V, ± 50 millivolts. If the voltage does not fall into the correct range, adjust as follows:

~   Adjust trim pot **RV2** (for power supply 1)

~   Adjust trim pot **RV4** (for power supply 2)

11. Once the new supply has been calibrated, lower the cover of the control panel.

12. Exit the "**Lamp Test**" mode by pressing *both* **Exit** buttons beneath the display.

13. Flip the control panel back onto its side.

14.   Replace and tighten the screws to secure the cover.

15. Return the control panel to its normal operating position.

This completes the procedure to check and calibrate the Synergy 1 Control Panel Power Supply.

Replacing a Synergy 100 Control Panel Power Supply

This section provides detailed instructions for replacing a failed Synergy 100 control panel power supply. Note that a power supply failure *may* be indicated by the absence of illuminated LEDs on the control panel.

Replacing a Control Panel Power Supply

Use the following procedure to change a control panel power supply.

1. Unplug the power supply's AC power cord from the AC outlet.

2. Disconnect the power supply from the DC connector on the back of the Synergy 100 panel and set it aside. Use the figure below for reference.

Synergy 100 Control Panel — DC Power Connector

3. Unpack the new power supply, and plug it into the DC connector on the back of the Synergy 100 control panel.

4. Pack the old power supply in the new supply's shipping container, and return it to Ross Video Technical Support.

5. Re-connect the power supply's AC power cord to the AC outlet.

This completes the procedure for replacing the Synergy 100 control panel power supply.

Replacing a Synergy Frame Power Supply

This section provides detailed instructions for replacing a failed power supply in the Synergy frame. A power supply failure *may* be indicated by the **FRAME** LED on the Synergy 1 control panel, or by the four-character displays on the Synergy 100 control panel.
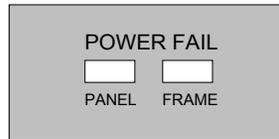
Synergy 1 Control Panel
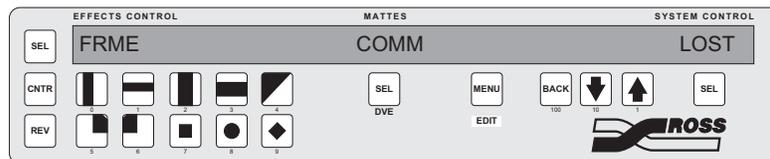
Synergy 100 Control Panel

If the **FRAME** LED on the Synergy 1 control panel is lit, or the text "**FRME COMM LOST**" appears in the four-character displays on the Synergy 100 control panel, it indicates that there is a fault with the frame power supply or fan.

Replacing a Synergy Frame Power Supply

Use the following procedure to change a Synergy frame power supply:

 Warning Hazardous Voltages

Hazardous voltages are present inside the frame power supply housing. This procedure should be performed by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing unless you are qualified to do so.

1. As a first step in troubleshooting, with the power on, look at the power supply indicators on the front of the Synergy frame.
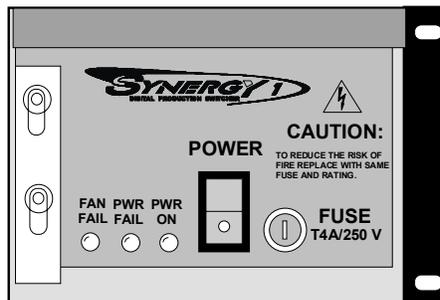
Power Supply Indicators and Switch

Three LEDs indicate the condition of the power supply and the fan:

- **PWR ON** — This green LED is lit during normal operations. It indicates that there are no error conditions in the fan or power supply.
- **PWR FAIL** — This LED indicates that the power supply has failed, or is not connected properly.
- **FAN FAIL** — This LED indicates that the fan is drawing too much current, or has stopped turning.

2. If a **FAIL** LED is on (or if you suspect another type of power supply problem), turn off the frame power switch.

3. Check the fuse. The switch has a fuse holder that corresponds to the power supply. The fuse rating is printed on the panel surface.

   - If the fuse is blown, spare fuses are available in the spare parts kit, or from Ross Video Technical Support.
   - If the fuse is intact, replace it in the holder and continue with the next step.

4. Check that the main breaker for your AC supply has not tripped.

5. If the breaker has tripped, reset it to restore power.

6. If the breaker is intact, unplug the AC power cord from the AC outlet and continue with the next step.

7. Loosen the screws on the power supply lock down plate so that the plate slides up and down easily. Use the figure below for reference.
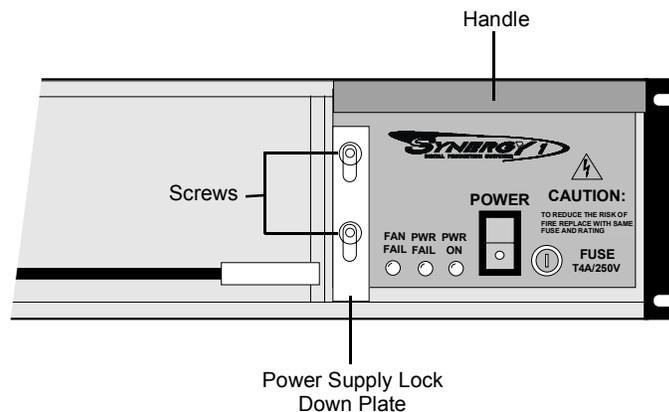
Synergy 1 Frame Power Supply

8. Remove the failed power supply as follows:

   - While holding the lock down plate in the up position, grasp the handle of the power supply tray and remove it from the frame.
   - Set it aside on a clean, flat, static-free surface. Note that the tray does not have a protective cover.

9. Install the new power supply as follows:

   • Unpack the new power supply tray, and insert it into the Synergy frame.

   • Slide the lock down plate into the downward position.

   • Secure the plate using the screws provided with the new power supply.

10. Plug the AC power cord back into the AC outlet and turn on the frame power.

11. Ensure that the green **PWR ON** LED is lit.

Note | For the frame supply, there is no calibration procedure required. The supply is factory set.

This completes the procedure to change a Synergy frame power supply.

Replacing a Synergy Frame Power Supply Fan

This section provides instructions for replacing a failed fan in the Synergy 1 frame. A fan failure *may* be indicated by the **FRAME** LED on the Synergy 1 control panel.

POWER FAIL

PANEL   FRAME
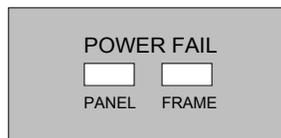
Synergy 1 Control Panel — Power Fail LEDs

If the **FRAME** LED is lit, it indicates that there is a fault with the Synergy 1 frame power supply or fan. If the fan has failed, the **FAN FAIL** LED on the Synergy 1 frame will be lit.

Replacing a Synergy Frame Power Supply Fan

Use the following procedure to change a failed Synergy frame power supply:

**Warning
Hazardous
Voltages**

Hazardous voltages are present inside the frame power supply housing. This procedure should be performed by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing unless you are qualified to do so.

1. As a first step in troubleshooting, with power on, look at the power supply indicators on the front of the frame. If the **FAN FAIL** LED is lit, it indicates that the fan is drawing too much current, or has stopped turning.

2. Turn off the frame power switch and unplug the AC power cord from the AC outlet.

3. To gain access to the power supply fan, you must first remove the power supply tray. Loosen the screws on the power supply lock down plate so that the plate slides up and down easily. Use the diagram on page 7-9 for reference.

4. Remove the power supply tray as follows:

   • While holding the lock down plate in the up position, grasp the handle of the power supply tray and remove it from the Synergy frame.

   • Set it aside on a clean, flat, static-free surface. Note that the tray does not have a protective cover.

Caution

Observe all static discharge precautions.

5. If you have access to the top plate of the Synergy 1 frame, loosen and remove the 17 screws. Set the top plate aside. This step will allow easier access to the power supply fan, which is attached to the motherboard, located behind the power supply. Use the diagram on page 8–13 for reference.
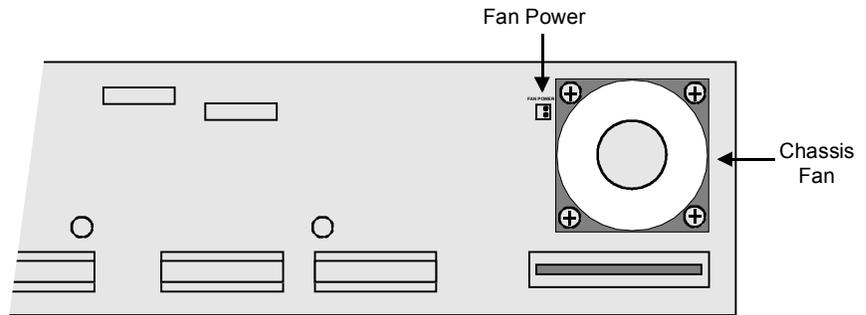
Fan Power

Synergy 1 Frame Motherboard

Chassis
Fan

✎ **Note** | If you are not able to remove the top plate, you will have to perform this procedure through the housing for the power supply.

6. Disconnect the **FAN POWER** connector from the motherboard. Use needle nose pliers, if necessary.

7. Remove the four corner screws that secure the fan to the motherboard and set them aside for later re-installation.

8. Carefully remove the fan and cable harness from the Synergy frame.

9. Install the new fan in the frame, in the same orientation as the old fan (with the cable harness on the left). Secure the fan with the four screws, which were previously removed.

10. Carefully attach the new fan's power connector to the connector block on the motherboard.

11. If you were able to remove the frame's top plate, you can now replace it, and insert and tighten the screws.

12. Replace the power supply tray in the Synergy frame, and position and secure the lock down plate.

13. Plug the AC power cord back into the AC outlet.

14. Power on the Synergy frame.

15. Verify that the **ALL OK** LED is lit.

This completes the procedure to change a failed Synergy 1 frame power supply.

Calibration and Diagnostics

In This Chapter

This chapter provides information about calibrating the Synergy 1 and Synergy 100 switchers, and running a variety of diagnostic tests.

The following topics are discussed:

- Switcher Calibration – Synergy 1
- Switcher Calibration – Synergy 100
- Panel Diagnostic Tools – Synergy 1
- Frame Diagnostic Tools – Synergy 1
- Diagnostic Tools – Synergy 100

Switcher Calibration – Synergy 1

The **Calibration Menu** allows you calibrate all analog controls on the switcher panel, including the faders, the XYZ positioner, and all knobs (excluding those to the right of the display).

⚹	**Important**	It is strongly recommended that you calibrate *all analog controls* on your switcher. Failure to do so may store false limit information into any controls that may have been "bumped" during the calibration process — which in turn will prevent proper switcher operation.

Calibrating the Synergy 1 Switcher

The **Calibration Menu** provides a visual display of all analog controls, including the fader, positioner, and all knobs.

⚠	**Caution**	Use the Calibration Mode with caution.
		Perform the calibration only when you suspect that there has been "drift" in the knobs or the joystick, or that there is a "limit" problem with a fader.

Use the following procedure to calibrate the analog controls of the Synergy 1 switcher:

1. Navigate to the **Calibration Menu** as follows:

    *   Press **HOME** (to display **Main Menu 1-2**)
    *   **MORE** (to display **Main Menu 2-2**)
    *   **Setup** (to display the **Setup Menu**)
    *   **Installation** (to display **Installation Menu 1-2**)
    *   **MORE** (to display **Installation Menu 2-2**)
    *   **Calibration** (to display the **Calibration Menu**)

2. To calibrate the fader:

    *   Move the fader gently to its upper and lower limits.
    *   Repeat this procedure two or three times.

✎	**Note**	Do not use force as false upper and lower fader limits may be programmed in beyond the rubber stops.

    *   As you move the fader, values appear in the **Main Area**, under the **FADER** heading.

3. To calibrate the positioner, move *each axis* as follows:

    *   Calibrate the **X-Axis** by moving the joystick all the way to the left then all the way to the right. Repeat this procedure two or three times.
    *   Calibrate the **Y-Axis** by moving the joystick all the way up then all the way down. Repeat this procedure two or three times.
    *   Calibrate the **Z-Axis** by twisting the joystick knob fully clockwise and counterclockwise. Repeat this procedure two or three times.

    As you move the joystick, you will see a series of values appear in the **Main Area**, under the **POSITIONER** heading. The numbers for each axis *may not match* — this is normal.

4. To calibrate the knobs:

    • Move *each knob* fully clockwise and counterclockwise.

    • Repeat this procedure two or three times for *each knob*.

    As you move the knobs, you will see a series of values appear in the **Main Area**, under the **KNOBS** heading. The numbers for each knob *may not match* — this is normal.

5. At this point, you can complete the calibration or exit the menu safely without accepting the calibration:

Note   Any controls that were not touched during the calibration process will display, "**Not Moved**". These controls will retain their previous calibration limits.

    • To exit the menu safely, *without* accepting the newly calibrated controls, press **HOME**.

    • To complete the calibration, press **Accept**.

Caution   When you press **Accept**, *do not* hold the positioner off center. This will program a false "center" for the joystick, and you will have to re-calibrate the switcher again to clear it.

This completes the procedure to calibrate the analog controls of the Synergy 1 switcher.

Switcher Calibration – Synergy 100

The **Calibration Mode** allows you to calibrate all analog controls on the switcher panel, including the fader, the positioner and all knobs. In addition, the user is able to set the brightness levels of all panel button LEDs.

⚠	**Caution**	Use the Calibration Mode with caution.
		Perform the calibration only when you suspect that there has been "drift" in the knobs or the joystick, or that there is a "limit" problem with a fader.

Calibrating the Synergy 100 Switcher

Use the following procedure to calibrate the analog controls and adjust the brightness levels of the LEDs for the Synergy 100 switcher:

1. Enter **Calibration Mode** by holding down the following three buttons at once:

   • **ROTATE**
   • **SEL** in the **Mattes Group**
   • **SEL** in the **System Control Group**

   The **Panel Calibration Mode Menu** is displayed on the **Preview** monitor.

   ```
   Panel Calibration Mode

   0. Knob/Fader/Positioner Calibration
   1. Overall LED Brightness Control
   2. Logo Brightness
   3. Red Button LED Brightness
   4. Orange Button LED Brightness
   5. Green Button LED Brightness
   6. Red Non-Button LED Brightness
   7. Orange Non-Button LED Brightness
   8. Green Non-Button LED Brightness

   Press any button on lower panel to exit.
   ```

   Synergy 100 — Panel Calibration Mode Menu

   Using pattern buttons **0** through **8** inclusive in the **Effects Control Group**, select the button with the number that coincides with the desired option. The selected button will light.

✳	**Important**	If you select option **0. Knob/Fader/Positioner Calibration**, you must calibrate *all analog controls* on your switcher. Failure to do so will map a false limit into switcher memory for the control(s) that you did not calibrate, thus preventing proper switcher operation.

2. To calibrate the fader:

- Press **0. Knob/Fader/Positioner Calibration**.

- Move the fader to its full upper and lower limit.

- Repeat this procedure two or three times.

    As you move the fader, you will see a series of numbers appear in the four-character displays in the **Effects Control** and **System Control** groups.

- Calibration is complete when the limit values in these four-character displays no longer change.

3. To calibrate the positioner, move *each axis* as follows:

- Ensure the **0. Knob/Fader/Positioner Calibration** option is selected.

- Calibrate the **X-axis** by moving the joystick all the way to the left then all the way to the right. Repeat this procedure two or three times.

- Calibrate the **Y-axis** by moving the joystick all the way up then all the way down. Repeat this procedure two or three times.

- Calibrate the **Z-axis** by twisting the joystick knob fully clockwise and counterclockwise. Repeat this procedure two or three times.

    As you move the joystick, you will see a series of numbers appear in the four-character displays in the **Effects Control** and **System Control** groups.

- Calibration is complete when the limit values in these four-character displays no longer change.

Note   The numbers for each axis *may not match* — this is normal.

4. To calibrate the knobs:

- Ensure the **0. Knob/Fader/Positioner Calibration** option is selected.

- Move *each knob* fully clockwise and counterclockwise.

- Repeat this procedure two or three times for *each knob*.

    As you move the knobs, you will see a series of numbers appear in the four-character displays in the **Effects Control** and **System Control** groups.

- Calibration is complete when the limit values in these four-character displays no longer change.

Note   The numbers for each knob *may not match* — this is normal.

5. To adjust the brightness of all the LEDs on the control panel:

- Press **1. Overall LED Brightness Control**.

- Brightness is adjusted by rotating *any* of the knobs on the panel.

6. To adjust the brightness of the LEDs in the Ross logo in the upper right-hand corner of the control panel:

- Press **2. Logo Brightness**.

- Brightness is adjusted by rotating *any* of the knobs on the panel.

7. To adjust the brightness of the red LEDs under the panel buttons:

    •   Press **3. Red Button LED Brightness**.

    •   Brightness is adjusted by rotating *any* of the knobs on the panel.

8. To adjust the brightness of the orange LEDs under the panel buttons:

    •   Press **4. Orange Button LED Brightness**.

    •   Brightness is adjusted by rotating *any* of the knobs on the panel.

9. To adjust the brightness of the green LEDs under the panel buttons:

    •   Press **5. Green Button LED Brightness**.

    •   Brightness is adjusted by rotating *any* of the knobs on the panel.

10. To adjust the brightness of the red LEDs under the secret-til-lit on-air and bus indicators:

    •   Press **6. Red Non-Button LED Brightness**.

    •   Brightness is adjusted by rotating *any* of the knobs on the panel.

11. To adjust the brightness of the orange LEDs under the secret-til-lit on-air and bus indicators:

    •   Press **7. Orange Non-Button LED Brightness**.

    •   Brightness is adjusted by rotating *any* of the knobs on the panel.

12. To adjust the brightness of the green LEDs under the secret-til-lit on-air and bus indicators:

    •   Press **8. Green Non-Button LED Brightness**.

    •   Brightness is adjusted by rotating *any* of the knobs on the panel.

13. To exit **Calibration Mode**:

    •   Press any button on the lower portion of the panel. In the four-character displays across the top of the panel, you will receive a message asking you if you want to save the calibration.

        ~   To return the switcher to normal operating mode without accepting the newly calibrated controls, press **SEL** in the **System Control Group**.

        ~   To complete the calibration and return the switcher to normal operating mode, press **SEL** in the **Mattes Group**.

This completes the procedure to calibrate the analog controls of the Synergy 100 switcher.

Notes on Saving a Calibration

On rare occasions, if you choose to save the calibration, the new settings fail to save correctly. If this occurs, a message will appear in the display area informing you of this. In addition, the **SEL** buttons in the **Mattes** and **System Control** groups will light. Press either of these buttons to confirm receiving the warning.

You can then attempt to save the settings a second time simply by re-entering Calibration Mode (as per Step 1), and then exiting it. You will again be asked if you wish to save the calibration, to which you can select **Yes** in the **Mattes Group**.

Panel Diagnostic Tools – Synergy 1

The Synergy 1 switcher provides a full array of panel diagnostic tools:

- Displaying Panel Information
- Potentiometer Test
- Fader Test
- Joystick Test
- Button Test
- Lamp Test
- Memory Test
- Display Test
- Disk Test
- Panel TX/RX Test
- Tally Test
- DIP/Jump Test

Each diagnostic function is discussed in the following sections.

Displaying Panel Information

The **Panel Information Menu** is for reference only.

Use the following procedure to display panel information:

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:
   - Press **HOME** (to display the **Main Menu 1-2**).
   - **MORE** (to display **Main Menu 2-2**).
   - **Setup** (to display the **Setup Menu**).
   - **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**).

2. Press **Information** to display the **Panel Information Menu**. The following figure is an example. Information is provided for both the panel and the frame.

```
Information


Panel Info              Frame Info
Apr 11 2005             Apr 11 2005
09:44:34                09:37:56
Synergy 16.00-S1        Synergy 16.00-S1

Stack:15ef89h           Stack:2401h


   System      Errors      Reset Count
```

Information Menu — System Display

3. Press **Errors** to display a list of **Errors**.

```
Information - Communication Com Port Stats

Total Panel Errors          Total Frame Errors      Panel  Total Errors
Bad byte counts:0           Bad byte counts:1              ↓PAN2FRM  (PF)
Bad checksums  :14          Bad checksums  :0
Parity errors  :0           Parity errors  :0       Frame  Total Errors
Framing errors :0           Framing errors :0              ↓FRM2PAN  (FP)
Over runs      :0           Over runs      :0
Forced restarts:0           Forced restarts:0
NACKs received :0           NACKs received :0
Other errors   :0           Other errors   :0


    System          Errors       Reset Count
```

Information Menu — Errors Display

4. View information for the Synergy 1 panel and frame as follows:

    •   Use the top **Panel** knob to scroll through a list of individual panel ports, with the communication errors for the selected port shown in the main area of the display. If **Total Errors** is selected, the information displayed includes *all* communication errors for the entire panel.

    •   Use the middle **Frame** knob to scroll through a list of individual frame ports, with the communication errors for the selected port shown in the main area of the display. If **Total Errors** is selected, the information displayed includes *all* communication errors for the entire frame.

5. Press **Reset Count** to manually reset the error counts. Please note, however, that all counts are automatically reset on power up.

This completes the procedure to display panel information.

Potentiometer Test

The **Pots Test Menu** allows you to test the response of all knobs on the Synergy 1 control panel.

Use the following procedure to test the potentiometers:

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:

    •   Press **HOME** (to display the **Main Menu 1-2**)

    •   **MORE** (to display **Main Menu 2-2**)

    •   **Setup** (to display the **Setup Menu**)

    •   **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

2. Press **Pots Test** to display the **Pots Test Menu**.

```
Pots Test

KNOB:Top Display Knob
Value:0
                                    |




    Normal        Scaled        Raw
```

Pots Test Menu

3. Test the three knobs to the right of the display as follows:

   • Press **Normal**.

   • Turn each knob clockwise and counterclockwise.

   The display indicates the rate at which you are turning the knob with a numeric display and bar graph.

4. Test all other knobs as follows:

   • Press **Scaled**.

   • Turning the knob will display the absolute position of the knob both numerically and graphically. The number (displayed in hexadecimal) should range from **0** (full counter-clockwise) to **FFF** (full clockwise). The number should be stable and jitter-free.

   • If the number does not reach both limits, perform a calibration as described in the section "**Switcher Calibration – Synergy 1**" on page 9–2.

📝 **Note** | Contact **Technical Support** for details on each display value, or if a problem with a potentiometer is suspected.

This completes the procedure to test the potentiometers of the Synergy 1 control panel.

Fader Test

The **Fader Test Menu** allows you to test the fader on the Synergy 1 control panel.

Use the following procedure to test the fader:

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)

   • **MORE** (to display **Main Menu 2-2**)

   • **Setup** (to display the **Setup Menu**)

   • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

2. Press **Fader Test** to display the **Fader Test Menu**.

Fader Test Menu

3. Test the fader as follows:

- Press **Normal**.

- Move the fader up and down.

- The position of the fader is shown both numerically (in hexadecimal) and graphically. The number should range from **000** (up) to **FFF** (down), and the number should be stable and jitter-free.

- If the number does not reach both limits, perform a calibration as described in the the section "**Switcher Calibration – Synergy 1**" on page 9–2.

✎ **Note** | Contact **Technical Support** for details on each display value, or if a problem with the fader is suspected.

This completes the procedure to to test the fader on the Synergy 1 control panel.

Joystick Test

The **Joystick Test Menu** allows you to test all three axis of the Joystick of the Synergy 1 panel.

Use the following procedure to test the Joystick:

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:

- Press **HOME** (to display the **Main Menu 1-2**)

- **MORE** (to display **Main Menu 2-2**)

- **Setup** (to display the **Setup Menu**)

- **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

2. Press **Joystick Test** to display the **Joystick Test Menu**.
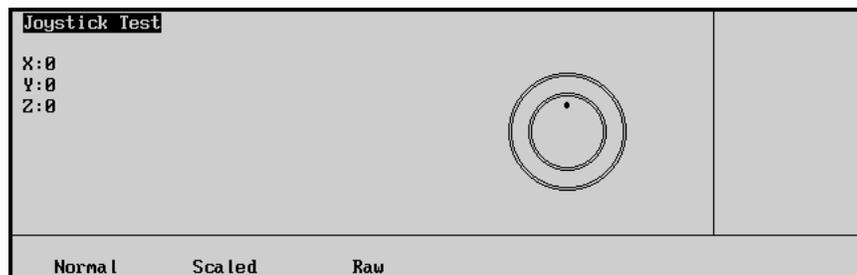
Joystick Test Menu

3. Test the Joystick as follows:

- Press **Normal**.

- Move the positioner up, down, left, right, and twist in both directions.

- The position of the fader is displayed both numerically and graphically. The number should range from **0** (center) to **64**, and the number should be stable and jitter-free.

- If the number does not reach these limits, perform a calibration as described in the the section "**Switcher Calibration – Synergy 1**" on page 9–2.

✎ **Note** | Contact **Technical Support** for details on each display value, or if a problem with the joystick is suspected.

This completes the procedure to test the joystick of the Synergy 1 control panel.

Button Test

The **Button Test Menu** allows you to test all pushbuttons on the Synergy 1 switcher.

Use the following procedure to test the buttons:

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)

   • **MORE** (to display **Main Menu 2-2**)

   • **Setup** (to display the **Setup Menu**)

   • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

2. Press **Button Test** to display the **Button Test Menu**.

```
Button Test

BUTTON    #07          Hold down F5 and F6, then release
AREA      #08          them to exit button test mode
MLE       #01
Last action:Button Up




                                           Exit        Exit
```
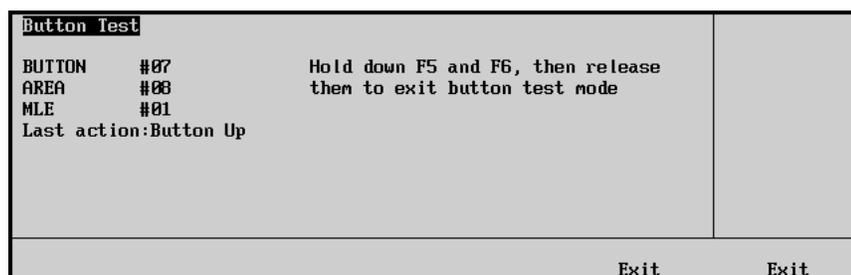
Button Test Menu

3. Press each button, as required, on the Synergy 1 control panel.

4. Exit the menu by pressing *both* **Exit** buttons beneath the display.

This completes the procedure to pushbuttons on the Synergy 1 control panel.

Lamp Test

The **Lamp Test Menu** allows you to test large groups of buttons on the Synergy 1 control panel.

Use the following procedure to test the lamps:

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)

   • **MORE** (to display **Main Menu 2-2**)

   • **Setup** (to display the **Setup Menu**)

   • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

2. Press **Lamp Test** to display the **Lamp Test Menu**.

```
Lamps Test

                    Hold down F5 and F6, then release
                    them to exit lamp test mode





                                           Exit        Exit
```
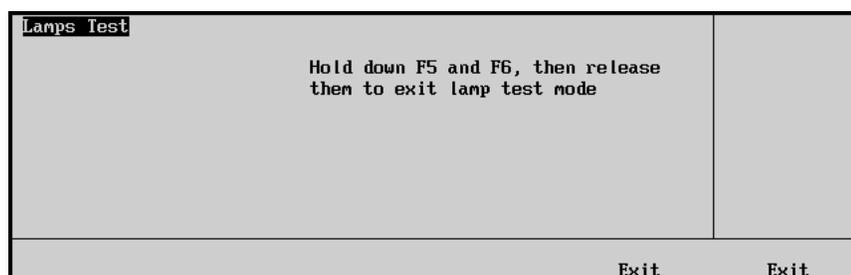
Lamp Test Menu

---

3. Press buttons in selected panel regions, to test *all lamps* in those regions, as required.

4. To exit the menu, press *both* **Exit** buttons beneath the display.

This completes the procedure to test large groups of buttons on the Synergy 1 control panel.

Memory Test

The **Memory Test Menu** allows you to test the system RAM.

Use the following procedure to test the memory:

1. Navigate to the **Panel Diagnostics Menu 2-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2)**
   • **MORE** (to display **Main Menu 2-2**)
   • **Setup** (to display the **Setup Menu**)
   • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)
   • **MORE** (to display **Panel Diagnostics Menu 2-2**)

2. Press **Memory Test** to display the **Memory Test Menu**.

Memory Test Menu

3. Press **Test** to test the system RAM.

   The menu indicates any failures.

This completes the procedure to test the system RAM.

Display Test

The **Display Test Menu** allows you to test the display screen of the Synergy 1 **System Control Group**.

Use the following procedure to test the display:

1. Navigate to the **Panel Diagnostics Menu 2-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2)**
   • **MORE** (to display **Main Menu 2-2**)
   • **Setup** (to display the **Setup Menu**)
   • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)
   • **MORE** (to display **Panel Diagnostics Menu 2-2**)

2. Press **Display Test** to display the **Display Test Menu**.

Display Test Menu

3. Press *any button* below the display to advance to the next in the series of display tests. A variety of tests are available.

4. Press **UP ONE** to exit the **Display Test Menu**.

This completes the procedure to test the display screen of the Synergy 1 System Control Group.

Disk Test

The **Disk Test Menu** allows you to test the floppy disk drive or USB port of the Synergy 1 switcher.

⚠️ **Caution** The contents of the floppy disk or USB key will be lost when you perform this test.

Use the following procedure to test the floppy disk drive or USB port:

1. Navigate to the **Panel Diagnostics Menu 2-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)

   • **MORE** (to display **Main Menu 2-2**)

   • **Setup** (to display the **Setup Menu**)

   • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

   • **MORE** (to display **Panel Diagnostics Menu 2-2**)

2. Press **Disk Test** to display the **Disk Test Menu**.

Disk Test Menu

3. Test the floppy disk drive or USB port as follows:

 • Insert a blank disk or a pre-formatted disk into the drive. If you have a USB port, insert a blank USB key.

 • Press **Test** to begin the disk read/write test.

 • The menu indicates **Pass** or **Fail**.

This completes the procedure to test the floppy disk drive or USB port of the Synergy 1 switcher.

Panel TX/RX Test

The **Panel TX/RX Test Menu** allows you to test communications with various remote control and communications ports. A proper loop-back connector is required to conduct the external test.

Use the following procedure to test the TX/RX functions of the Synergy 1 control panel:

Note   Peripheral equipment should be disconnected from the selected port while running the test.

1. Navigate to the **Panel Diagnostics Menu 2-2** as follows:

 • Press **HOME** (to display the **Main Menu 1-2**)

 • **MORE** (to display **Main Menu 2-2**)

 • **Setup** (to display the **Setup Menu**)

 • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

 • **MORE** (to display **Panel Diagnostics Menu 2-2**)

2. Press **TX/RX Test** to display the **Panel TX/RX Test Menu**.

Panel TX/RX Test Menu

3. Test a port as follows:

 • Use the middle **Com Port** knob to select the port you wish to test.

 • If available, attach an appropriate loop-back connector to the port.

 • If a loop-back connector is not available, the system will only be able to perform a partial test (the UART will be tested, however, the line drivers and receivers will not). Note that a proper loop-back connector is required to conduct the external test.

 • Press **Test** to begin the TX/RX test.

 • The menu indicates **Pass** or **Fail** for internal and external tests:

  ~ The internal test checks the UART that generates the serial data stream.

  ~ The external test also tests the line drivers and receivers.

This completes the procedure to test the TX/RX functions of the Synergy 1 control pane. Repeat the procedure to test any additional ports.

Monitoring Panel TX/RX Functions

You can also monitor the traffic on a selected communications port.

⚛	**Important**	This option is used primarily for troubleshooting and diagnostic purposes. You should not need to use this option unless advised by Ross Video Technical Support.

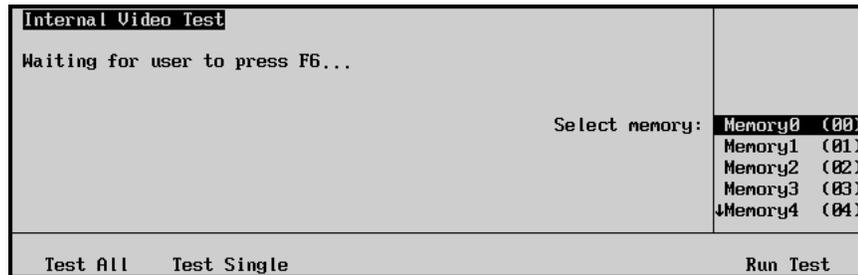Use the following procedure to monitor the traffic on a selected communications port:

1. Navigate to the **Panel Diagnostics Menu 2-2** as follows:

    •   Press **HOME** (to display **Main Menu 1-2**).

    •   **MORE** (to display **Main Menu 2-2**).

    •   **Setup** (to display the **Setup Menu**).

    •   **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**).

    •   **MORE** (to display **Panel Diagnostics Menu 2-2**).

2. Press **TX/RX Test** to display the **Panel TX/RX Test Menu**.

3. Use the middle **Com Port** knob to select the port that you wish to monitor.

4. Press **Monitor** to display the **Comm Port Monitor Menu**. This menu monitors the traffic on the port selected in step 3.
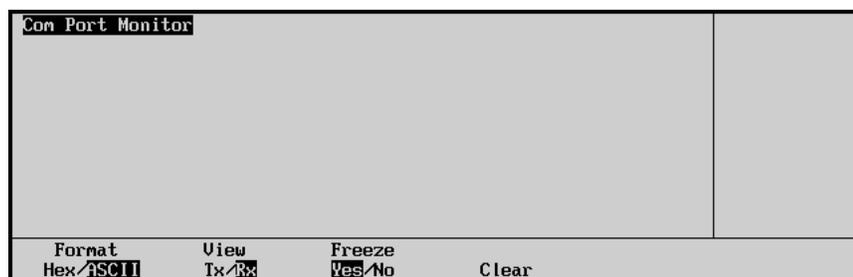
Com Port Monitor Menu

5. Toggle **Format** to change the way the information is displayed as follows:

    •   **Hex** — Use this option to display the raw data as Hexadecimal numbers.

    •   **ASCII** — Use this option to display the data as printed characters.

6. Toggle **View** to display the traffic type as follows:

    •   **Tx** — Use this option to display the traffic being *transmitted from* the panel.

    •   **Rx**— Use this option to display the traffic being *received by* the panel.

7. Toggle **Freeze** between **Yes** and **No** as follows:

    •   **Yes** — Use this option to freeze the current data on the display and ensure that new traffic data is not recorded.

    •   **No** — Use this option to have the old traffic data is continuously cycled out to allow space for the newest traffic data to be displayed.

8. Press **Clear** to clear all recorded data for the selected **Tx** or **Rx** traffic.

This completes the procedure to monitor the TX/RX functions of the Synergy 1 control panel. Repeat this procedure for every communications port you wish to monitor.

Tally Test

The **Tally Test Menu** allows you to test all tally relays.

Use the following procedure to test tally relays:

1.   Navigate to the **Panel Diagnostics Menu 2-2** as follows:

     •   Press **HOME** (to display the **Main Menu 1-2**)

     •   **MORE** (to display **Main Menu 2-2**)

     •   **Setup** (to display the **Setup Menu**)

     •   **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

     •   **MORE** (to display **Panel Diagnostics Menu 2-2**)

2.   Press **Tally Test** to display the **Tally Test Menu**.

```
Tally test

Current lit tally:All Off




     Prev         Next        All On        All Off
```
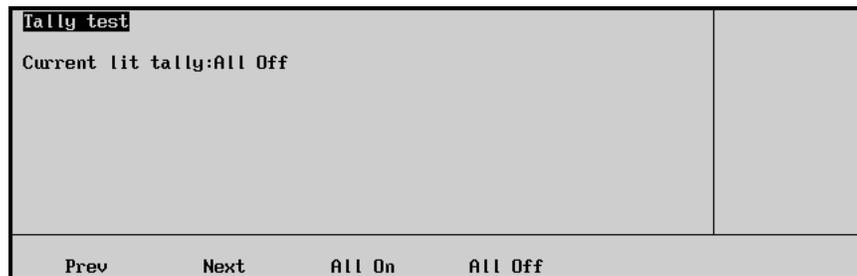
Tally Test Menu

3.   Select the desired tally function as follows:

     •   **Prev** — Press this button to test the previous relay (as indicated on the menu).

     •   **Next** — Press this button to test the next relay (as indicated on the menu).

     •   **All On** — Press this button to turn all tally relays on.

     •   **All Off** — Press this button to turn all tally relays off.

This completes the procedure to test tally relays.

DIP/Jump Test

The **DIP/Jump Test** allows you to test the DIP and jumper switches in the Synergy 1 control panel with the aid of a graphical representation on the display. The graphical representation runs in real time, meaning any changes to the physical state of the panel DIP or jumper switches are instantly displayed.

Important   As the switches are located within the electronics bay inside the control panel and are for factory use only, we do not advise accessing these switches without first contacting Technical Support for assistance.

Use the following procedure to test the panel DIP and jumper switches:

1. Navigate to the **Panel Diagnostics Menu 2-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)
   • **MORE** (to display **Main Menu 2-2**)
   • **Setup** (to display the **Setup Menu**)
   • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)
   • **MORE** (to display **Panel Diagnostics Menu 2-2**)

2. Press **DIP/Jump Test** to display the **DIP/Jump Test Menu**.
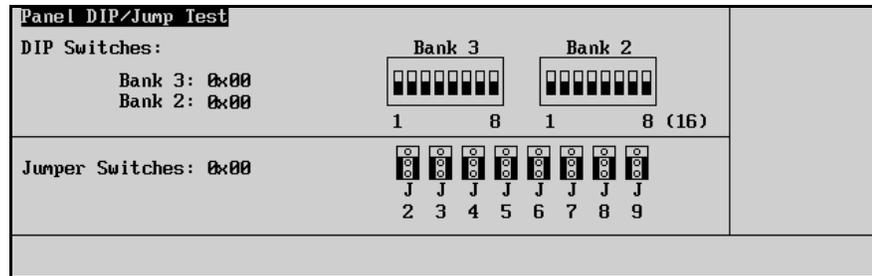
DIP/Jump Test Menu

This completes the procedure to test the panel DIP and jumper switches.

Frame Diagnostic Tools – Synergy 1

The Synergy 1 switcher provides several frame diagnostic tools:

- Frame TX/RX Test
- Frame DIP/Jump Test
- GPI Test
- Frame Tally Test
- Internal Video Test

Each frame diagnostic function is discussed in the following sections.

Frame TX/RX Test

The **Frame TX/RX Test Menu** allows you to test frame communications with various remote control and communications ports.

Use the following procedure to test frame TX/RX functions:

1. Navigate to the **Frame Diagnostics Menu** as follows:
   - Press **HOME** (to display the **Main Menu 1-2**)
   - **MORE** (to display the **Main Menu 2-2**)
   - **Setup** (to display the **Setup Menu**)
   - **Frame Diagnostics** (to display **Frame Diagnostics Menu**)

2. Press **TX/RX Test** to display the **Frame TX/RX Test Menu**.

Frame TX/RX Test Menu

3. Attach the proper RS-232 or RS-422 loop back device.

4. Use the middle **Com Port** knob to select the port you wish to test.

5. Press **Test** to begin the frame TX/RX test. The menu indicates **Pass** or **Fail**.

	Note	**Remote 5** can only be tested if it is enabled in the **Installation Communications Menu**. **Auxpan 1** cannot be tested while **Remote 5** is enabled.
		Testing of the **Pan2Frm** panel /frame port must be performed when the panel is not connected to the frame (stand alone mode). If the menu reverts to the splash screen, press **HOME** three times to get back to the main menu, then re-enter the **Diagnostics TX/RX Menu** and perform the test (a loop back test connector is required).

This completes the procedure to test frame TX/RX functions. Repeat the procedure to test additional ports of the Synergy 1 frame.

Monitoring Frame TX/RX Functions

Use the following procedure to monitor frame TX/RX functions:

1. Navigate to the **Frame Diagnostics Menu** as follows:

    - Press **HOME** (to display the **Main Menu 1-2**)
    - **MORE** (to display the **Main Menu 2-2**)
    - **Setup** (to display the **Setup Menu**)
    - **Frame Diagnostics** (to display **Frame Diagnostics Menu**)

2. Press **TX/RX Test** to display the **Frame TX/RX Test Menu**.

```
Frame TX/RX Test

Waiting for user


                                           Com Port:  FRM2PAN  (FP)
                                                      EDITOR   (ED)
                                                      PERIPH1  (P1)
                                                      PERIPH2  (P2)
                                                      ↓DVE     (D1)

                                                 Monitor      Test
```

Frame TX/RX Test Menu

3. Use the middle **Com Port** knob to select the port you wish to monitor.

4. Press **Monitor** to display the **Com Port Monitor Menu**.

```
Com Port Monitor










   Format        View         Freeze
   Hex/ASCII     Tx/Rx        Yes/No       Clear
```
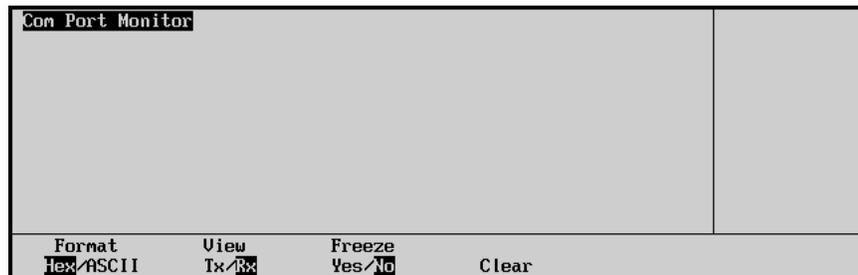
Com Port Monitor Menu

5. Toggle the **Format** button between **Hex** and **ASCII** to set how the information is displayed.

   - **Hex** — Use this option to display the raw data as Hexadecimal numbers.
   - **ASCII** — Use this option to display the data as printed characters.

6. Toggle the **View** button between **Tx** and **Rx** to display traffic flow.

   - **Tx** — Use this option to display the traffic being transmitted from the panel.
   - **Rx** — Use this option to display the traffic being received by the panel.

7. Toggle the **Freeze** button between **Yes** and **No**.

   - **Yes** — Use this option to freeze the current data on the display and not record any new traffic data.
   - **No** — Use this option to continously cycle traffic data to allow for the newest data to be displayed.

8. Press **Clear** to clear all recorded data for the selected traffic flow.

This concludes the procedure to monitor frame TX/RX functions.

Frame DIP/Jump Test

The **DIP/Jump Test** allows you to test the DIP and jumper switches in the Synergy 1 frame with the aid of a graphical representation on the display.

Use the following procedure to test the frame DIP and jumper switches:

1. Navigate to the **Frame Diagnostics Menu** as follows:

   - Press **HOME** (to display the **Main Menu 1-2**)
   - **MORE** (to display the **Main Menu 2-2**)
   - **Setup** (to display the **Setup Menu**)
   - **Frame Diagnostics** (to display Frame **Diagnostics Menu**)

2. Press **DIP/Jump Test** to display the **Frame DIP/Jump Test Menu**.
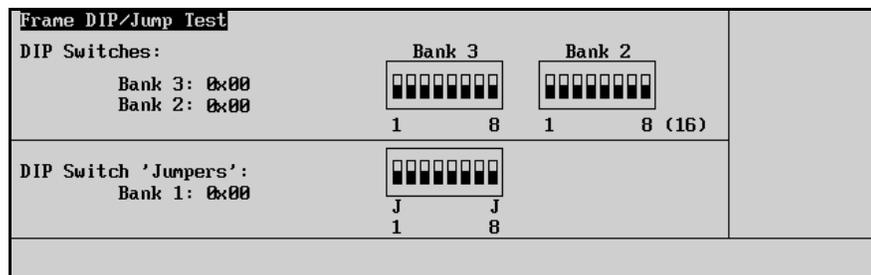
Frame DIP/Jump Test Menu

The graphical representation runs in real time, meaning any changes to the physical state of the frame DIP or jumper switches are instantly displayed. However, as the majority of these switches are for factory use only, we do not advise accessing these switches without first contacting Technical Support for assistance.

This completes the procedure to test the Synergy 1 frame DIP and jumper switches.

GPI Test

The **GPI Test** uses a graphical display of light bulbs to indicate which GPI inputs and outputs are on or off.

Use the following procedure to test the GPI inputs and outputs:

1. If available, attach an appropriate loop-back connector to the **GPI I/O** connector on the back of the frame. If a loop-back connector is not available, turn on one of the GPI outputs as per the instructions in Chapter 9, "**Additional Installation Setups**" of the *Synergy 1 Installation Guide*. Using a jumper wire, connect the active output to the input you wish to test.

> **Note** If you do not use one of the above methods to activate the inputs, the system will only be able to do a partial test (only the outputs will be tested).

2. Navigate to the **Frame Diagnostics Menu** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)

   • **MORE** (to display the **Main Menu 2-2**)

   • **Setup** (to display the **Setup Menu**)

   • **Frame Diagnostics** (to display **Frame Diagnostics Menu**)

3. Press **GPI Test** to display the **GPI Test Menu**.
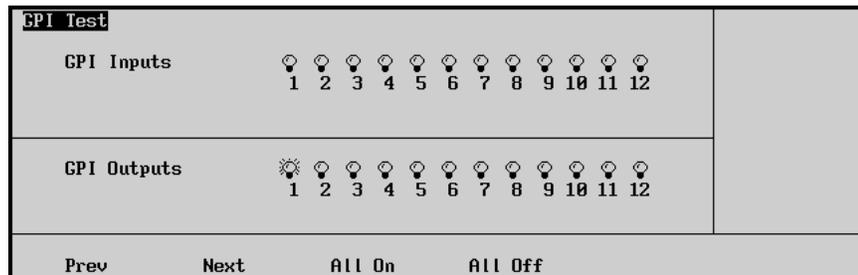
GPI Test Menu

4. Select the desired GPI function as follows:

   • **Prev** — Press this button to test the previous input or output as indicated on the menu.

   • **Next** — Press this button to test the next input or output as indicated on the menu.

   • **All On** — Press this button to turn all GPI inputs and outputs on.

   • **All Off** — Press this button to turn all GPI inputs and outputs off.

This completes the procedure to test the GPI inputs and outputs.

Frame Tally Test

The **Tally Test Menu** allows you to test all frame tally relays.

Use the following procedure to test tally relays:

1. Navigate to the **Frame Diagnostics Menu** as follows:

    *   Press **HOME** (to display the **Main Menu 1-2**)
    *   **MORE** (to display the **Main Menu 2-2**)
    *   **Setup** (to display the **Setup Menu**)
    *   **Frame Diagnostics** (to display **Frame Diagnostics**)

2. Press **Tally Test** to display the **Tally Test Menu**.

```
Tally test

Current lit tally:16




      Prev        Next        All On      All Off
```
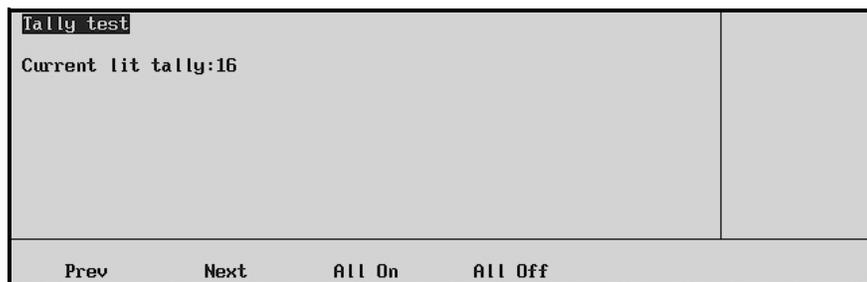
Tally Test Menu

3. Select the desired tally function.

    *   **Prev** — Press this button to test the previous relay as indicated on the menu.
    *   **Next** — Press this button to test the next relay as indicated on the menu.
    *   **All On** — Press this button to turn all tally relays on.
    *   **All Off** — Press this button to turn all tally relays off.

This completes the procedure to test tally relays.

Internal Video Test

The **Internal Video Test** allows you to test the video paths within the Synergy 1 frame. To perform this test, you will need a test file, which is provided by **Ross Video Technical Support**. This file contains stored memories, which were created using the switcher's internally generated video sources, namely color backgrounds and washes. When *any* memory is stored, the system does a video checksum and saves the information. Then, when the memory is recalled from the provided file, it compares the checksum with the one on the memory and gives a Pass/Fail result.

Use the following procedure to test the internal video paths:

1. Navigate to the **Frame Diagnostics Menu** as follows:

    *   Press **HOME** (to display the **Main Menu 1-2**)
    *   **MORE** (to display the **Main Menu 2-2**)
    *   **MORE** (to display **Main Menu 2**)
    *   **Setup** (to display the **Setup Menu**)
    *   **Frame Diagnostics** (to display **Frame Diagnostics Menu**)

2. Press **Internal Video Test** to display the **Internal Video Test Menu**.

```
┌─────────────────────────────────────────────────────┬──────────────┐
│ Internal Video Test                                  │              │
│                                                      │              │
│ Waiting for user to press F6...                      │              │
│                                                      │              │
│                                                      │              │
│                                                      │              │
│                                                      │              │
│                                                      │              │
├──────────────────────────────────────────────────────────────────────┤
│    Test All     Test Single                               Run Test   │
└──────────────────────────────────────────────────────────────────────┘
```
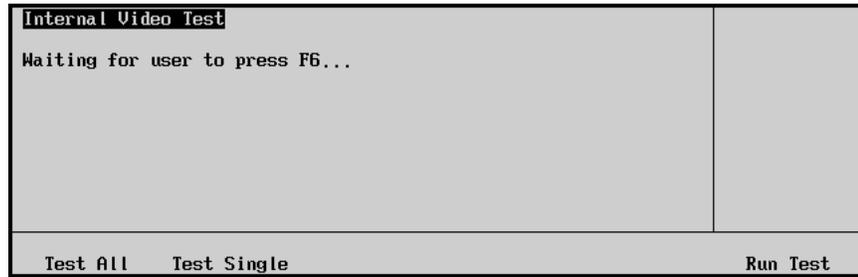
Internal Video Test Menu

3. There are two internal video test options:

   • **Test All** — Use this option to test all of the memory registers at once. This is the switcher default option.

   • **Test Single** — Use this option to test a selected memory register only. The **Test Single Menu** is displayed.

```
┌─────────────────────────────────────────────────────┬──────────────┐
│ Internal Video Test                                  │              │
│                                                      │              │
│ Waiting for user to press F6...                      │              │
│                                                      │              │
│                                  Select memory: │Memory0  (00)│
│                                                 │ Memory1  (01)│
│                                                 │ Memory2  (02)│
│                                                 │ Memory3  (03)│
│                                                 │↓Memory4  (04)│
├──────────────────────────────────────────────────────────────────────┤
│    Test All     Test Single                               Run Test   │
└──────────────────────────────────────────────────────────────────────┘
```

Internal Video Test — Test Single Menu

   ~ Use the middle **Select memory** knob to select the memory you wish to test.

4. Press **Run Test** to begin the internal video test. The menu indicates **Pass** or **Fail** as follows:

   • If you selected **Test Single**, the results apply to the single memory that you selected for test.

   • If you selected **Test All**, a list of failed memories appears in the scroll area of the display. You can scroll through the list using the middle **Failed memories** knob.

This completes the procedure to test the internal video paths.

Diagnostic Tools – Synergy 100

The Synergy 100 switcher provides a full array of control panel diagnostics tools:

- Potentiometer Test
- Fader Test
- Positioner Test
- Button and Lamp Test
- Communication Port Monitoring

Each panel diagnostic function is discussed in the following sections.

⚠	**Important**	Do not open the Synergy 100 control panel without express instructions from Ross Video Technical Support.

Potentiometer Test

The **Potentiometer Test** allows you to test the response of all potentiometers (knobs) on the Synergy 100 control panel.

Use the following procedure to test the potentiometers (knobs) on the panel:

1. Press and hold down the following three buttons at once:

    - **SEL** in the **Effects Control Group**
    - **SEL** in the **Mattes Group**
    - **SEL** in the **System Control Group**

    A message will scroll across the 3 four-character displays in the **Effects Control**, **Mattes**, and **System Control** groups. The message advises you that the control panel is in Diagnostic Mode. This message will continue to scroll until a knob, button, the fader, or the joystick is disturbed.

2. Test the knobs on the Synergy 100 control panel as follows:

✎	**Note**	The name of the knob being tested will be displayed in the **System Control Area** of the display.

    - Rotate the knob you want to test fully counter-clockwise. The zinger next to the fader will decrease until none of the segments are lit.
    - Rotate the knob you want to test fully clockwise. The zinger next to the fader will increase until all of the segments are lit.

3. Verify the information that is displayed in the 3 four-character displays as follows:

    - In the **Effects Control Group**, **Knob** appears in the display.
    - In the **Mattes Group**, a range of numerical values appears in the display.
    - In the **System Control Group**, the name and location of the knob appears in the display. For example, **Dgan** for the **GAIN** knob in the **Downstream Keyer Group**. In addition, the LEDs in the **Transition Progress Bar** will light.

4. Press and hold down the following three buttons to exit the panel Diagnostic Mode:

- **SEL** in the **Effects Control Group**
- **SEL** in the **Mattes Group**
- **SEL** in the **System Control Group**

This completes the procedure to test the potentiometers on the Synergy 100 panel. If you are unsure about the results of the test, or think that the results are incorrect, contact Ross Video Technical Support.

Fader Test

The **Fader Test** allows you to test the MLE fader on the Synergy 100 panel.

Use the following procedure to test the fader.

1. Press and hold down the following three buttons at once:

   - **SEL** in the **Effects Control Group**
   - **SEL** in the **Mattes Group**
   - **SEL** in the **System Control Group**

   A message will scroll across the 3 four-character displays in the **Effects Control**, **Mattes**, and **System Control** groups. The message advises you that the control panel is in Diagnostic Mode. This message will continue to scroll until a knob, button, the fader, or the joystick is disturbed.

2. Test the fader on the Synergy 100 control panel as follows:

   - Move the fader to the upper stop. The zinger next to the fader will increase until all of the segments are lit.
   - Move the fader to the lower stop. The zinger next to the fader will decrease until none of the segments are lit.

3. Verify the information that is displayed in the 3 four-character displays as follows:

   - In the **Effects Control Group**, **Fadr** appears in the display.
   - In the **Mattes Group**, a range of numerical values appears in the display.
   - In the **System Control Group**, **Fadr** appears in the display.
   - In addition, the LEDs in the **Transition Progress Bar** will light.

4. Press and hold down the following three buttons to exit the panel Diagnostic Mode:

   - **SEL** in the **Effects Control Group**
   - **SEL** in the **Mattes Group**
   - **SEL** in the **System Control Group**

This completes the procedure to test the fader on the Synergy 100 control panel. If you are unsure about the results of the test, or think that the results are incorrect, contact Ross Video Technical Support.

Positioner Test

The **Positioner Test** allows you to test the three axes of the positioner (joystick) of the Synergy 100 control panel.

Use the following procedure to test the positioner:

1. Press and hold down the following three buttons at once:

    *   **SEL** in the **Effects Control Group**
    *   **SEL** in the **Mattes Group**
    *   **SEL** in the **System Control Group**

    A message will scroll across the 3 four-character displays in the **Effects Control**, **Mattes**, and **System Control** groups. The message advises you that the control panel is in Diagnostic Mode. This message will continue to scroll until a knob, button, the fader, or the joystick is disturbed.

2. Test the positioner on the Synergy 100 control panel as follows:

    *   Test the **X-Axis** as follows:
        *   ~ Move the positioner all the way to the left to test the X-Axis. The zinger will increase until all of the segments are lit.
        *   ~ Move the positioner back the center position. The zinger will decrease until half of the segments are lit.
        *   ~ Move the positioner all the way to the right to test the X-Axis. The zinger will decrease until none of the segments are lit.

    *   Test the **Y-Axis** as follows:
        *   ~ Move the positioner all the way to the bottom to test the Y-Axis. The zinger will increase until all of the segments are lit.
        *   ~ Move the positioner back the center position. The zinger will decrease until half of the segments are lit.
        *   ~ Move the positioner all the way to the top to test the Y-Axis. The zinger will decrease until none of the segments are lit.

    *   Test the **Z-Axis** as follows:
        *   ~ Rotate the knob on the positioner all the way to counter-clockwise to test the Z-Axis. The zinger will increase until all of the segments are lit.
        *   ~ Rotate the knob on the positioner back the center position. The zinger will decrease until half of the segments are lit.
        *   ~ Rotate the knob on the positioner all the way to clockwise to test the Z-Axis. The zinger will decrease until none of the segments are lit.

3. Verify the information that is displayed in the 3 four-character displays as follows:

    *   In the **Effects Control Group**, **Pos** appears in the display.
    *   In the **Mattes Group**, a range of numerical values appears in the display.
    *   In the **System Control Group**, **Pos** and the letter **X**, **Y**, or **Z** appears in the display, depending on which axis you are testing.
    *   In addition, the LEDs in the **Transition Progress Bar** will light.

4. Press and hold down the following three buttons to exit the panel Diagnostic Mode:

- **SEL** in the **Effects Control Group**
- **SEL** in the **Mattes Group**
- **SEL** in the **System Control Group**

This completes the procedure to test the positioner of the Synergy 100 control panel. If you are unsure about the results of the test, or think that the results are incorrect, contact Ross Video Technical Support.

Button and Lamp Test

The **Button Test** allows you to test all pushbuttons and LEDs on the Synergy 100 control panel.

Use the following procedure to test the Synergy 100 control panel buttons and LEDs:

1. Press and hold down the following three buttons at once:

   - **SEL** in the **Effects Control Group**
   - **SEL** in the **Mattes Group**
   - **SEL** in the **System Control Group**

   A message will scroll across the 3 four-character displays in the **Effects Control**, **Mattes**, and **System Control** groups. The message advises you that the control panel is in Diagnostic Mode. This message will continue to scroll until a knob, button, the fader, or the joystick is disturbed.

2. Test the **Buttons** and **LEDs** on the Synergy 100 control panel as follows:

   - Press and hold down the button you want to test. The number of the button will be shown in the **System Control** area of the display, and the word **down** should be shown in the **Mattes** area of the display.
   - Release the button and the word **up** should be shown in the **Mattes** area of the display.
   - Each time you press the button, the LEDs in that **group**, or on that crosspoint **bus**, will cycle to the next color LED. Typically, this is the green LEDs, followed by the red LEDs, and then the orange LEDs. If the group does not contain all colors of LEDs, only the available colors will be cycled through.

3. Press and hold down the following three buttons to exit the panel Diagnostic Mode:

   - **SEL** in the **Effects Control Group**
   - **SEL** in the **Mattes Group**
   - **SEL** in the **System Control Group**

This completes the procedure to test all pushbuttons on the Synergy 100 control panel. If you are unsure about the results of the test, or think that the results are incorrect, contact Ross Video Technical Support.

Communication Port Monitoring

Use the **Communication Port Monitoring Setup** procedure to set up monitoring capabilities for the data transmitted and received through your communication ports. This function is provided as a troubleshooting tool to assist Ross Video Technical Support.

Use the following procedure to configure the Communication Port Monitoring:

1. Navigate to the **Communication Menu** as follows:

   • Press **MENU** to display the **Main Menu** on the **Preview Overlay**.

   • Press **4. Communication** to display the **Communication Menu**.

```
Communication

0. Port      Editor       5. Protocol  RS232
1. Type      Editor       6. Input     None
2. Device    GVG4000      7. Monitor
3. Baud      38400        8. Option    None
4. Parity    Odd          9. Reserved



MENU         100          10      1      SEL
Exit         Previous     Down    Up     Accept
```

Communication Menu

✎	**Note**	Regardless of the communications parameters you are configuring, for example editor, audio mixer, or tally system interface equipment, **7** will always be **Monitor**.

2. Press **7. Monitor** to display the **Monitor Menu**.

```
Monitor

0. Port      Panel        5. Address   000
1. Format    Hex
2. Tx/Rx     Rx
3. Freeze    No
4. Clear



MENU         100          10      1      SEL
Exit         Previous     Down    Up     Accept
```

Communication – Monitor Menu

3. Select a port to monitor as follows:

   • Press **0. Port**.

   • Use the **UP ARROW** or **DOWN ARROW** (**1** or **10**) buttons to select the communication port you want to monitor.

   • Press the right **SEL** button to accept the new settings.

4. Select a format to display the monitoring information as follows:

- Press **1. Format**.
- Use the **UP ARROW** or **DOWN ARROW** (**1** or **10**) buttons to select a format to display the monitoring information from the selected communications port. You can choose between the following:

  ~ **Hex** — Use this option to display the raw data in Hexadecimal format.

  ~ **ASCII** — Use this option to display the raw data in American Standard Code for Information Interchange format.

- Press the right **SEL** button to accept the new settings.

5. Select the type of monitoring as follows:

- Press **2. Tx/Rx**.
- Use the **UP ARROW** or **DOWN ARROW** (**1** or **10**) buttons to select the traffic flow to monitor on the selected communications port. You can choose between the following:

  ~ **Tx** — Use this option to monitor the Transmit data from the selected port.

  ~ **Rx** — Use this option to monitor the Receive data from the selected port.

- Press the right **SEL** button to accept the new settings.

6. Send or receive data as follows:

- Press **3. Freeze**.
- Use the **UP ARROW** or **DOWN ARROW** (**1** or **10**) buttons to select whether to receive data or not. You can choose between the following:

  ~ **Yes** — Use this option to stop receiving data.

  ~ **No** — Use this option to begin sending or receiving data.

- Press the right **SEL** button to accept the new settings.

7. Select to delete all current data from the buffer as follows:

- Press **4. Clear**.
- Press the right **SEL** button to accept the new settings.

8. Select a buffer location that is beyond the visible display parameters as follows:

- Press **5. Address**.
- Use the **UP ARROW** or **DOWN ARROW** (**1** or **10**) buttons to select the buffer location.
- Press the right **SEL** button to accept the new settings.

9. Press **MENU** to display the **Installation Change Screen**.

10. 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 procedures for setup of the **Communication Port Monitoring** function. If you require further information on the various options and their associated values, contact **Ross Video Technical Support** at the number listed in the front of this guide.

This concludes our discussion of the Synergy 100 panel diagnostics tools.

Control Panel Boards

In This Chapter

This chapter provides details about each "switch" board and the Panel CPU Board layouts of the Synergy 1 and Synergy 100 control panels.

The following topics are discussed:

- Synergy 1 Control Panel Boards
- Synergy 1 Panel CPU Board Layout
- Synergy 1 Rear Panel Connectors
- Panel CPU Replacement for the Synergy 1 Control Panel
- Synergy 100 Control Panel Boards
- Synergy 100 Panel CPU Board Layout
- Synergy 100 Rear Panel Connectors
- Basic Interconnections – Synergy 1
- Basic Interconnections – Synergy 100

Synergy 1 Control Panel Boards

The figure below illustrates a view *underneath* the Synergy 1 control panel.
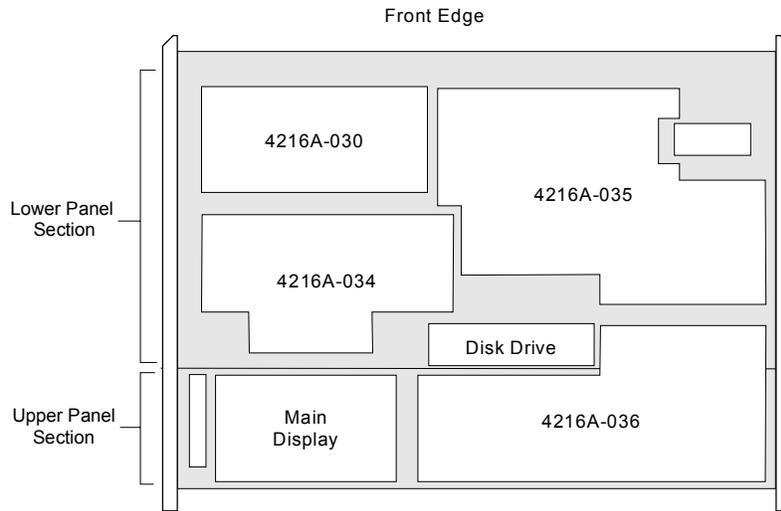
Underside View — Synergy 1 Control Panel

Lower Control Panel Section

The Lower Control Panel Section includes the following components:

- **4216A-030** — This component includes all crosspoint bus and Aux Bus switches.

- **4216A-034** — This component includes buttons, switches and potentiometers in the **Key 1**, **Key 2, Custom Control**, and **Global Memory System** areas. Also included are the function switches, such as **F1** and **F2**, that surround the large display, plus a power module (attached to the top side of the board) that provides power to the display's backlight.

- **4216A-035** — This component includes buttons, switches, and potentiometers in the **Mattes**, **Effects Control**, **Positioner**, **Transition**, **DSK**, and **Fade to Black** areas.

Upper Control Panel Section

The Upper Control Panel Section includes the following components:

- **4216A-036** — This component includes buttons, switches and potentiometers in the **Pattern Control** group, A-D converters for all knobs, faders and joystick, plus the FPGA that decodes the optical potentiometers beside the large display.

Synergy 1 Panel CPU Board Layout

The figure below illustrates a top view of the Synergy 1 **Control Panel CPU Board** (4216A-033).
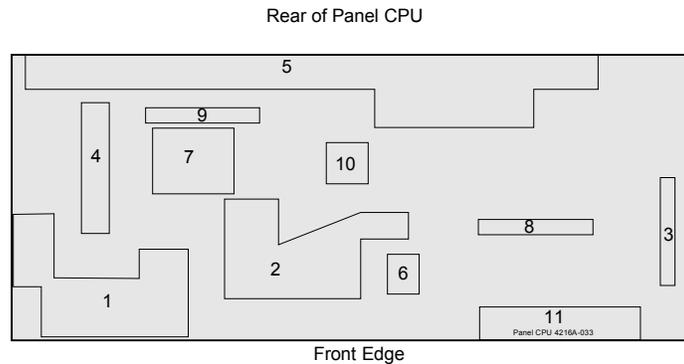
Rear of Panel CPU

Front Edge

Synergy 1 Control Panel CPU Board — Functional Blocks

The major *functional blocks* are described below:

1. **Power Distribution Connectors**

    This area includes power distribution connectors and adjustment controls for most circuit boards in the panel. Each board has its own dedicated power supply connection.

2. **Microprocessor Control and Memory**

    This area includes the microprocessor control and the RAM and flash memory.

3. **Ribbon Cables**

    This ribbon cable is routed to the floppy disk drive. To the left of the cable is the floppy disk controller.

> **Note** A USB controller replaces the floppy disk controller if the **USB Removable Media Drive** option is installed.

4. **Standard Primary Tallies**

    This area provides connectors for the 16 standard tallies of the Synergy control panel.

5. **Rear Panel Connectors**

    This area includes the rear panel connectors, as well as the associated interface electronics. Refer to the the section, "**Synergy 1 Rear Panel Connectors**" on page 10–5 for details. Note that the maximum baud rate for each remote control port is 115,200 K baud.

6. **Socketed IC**

    One socketed IC is provided for the panel's boot prom.

7. **Display Controller**

    This area includes the display controller.

8. **Main Data Cable**

   This ribbon cable is the main data cable for all of the control panel boards.

9. **Display Connector**

   This is the connector for the cable that is routed to the LCD display.

10. **Xilinx IC FPGA**

    One Xilinx IC FPGA is provided, which works in conjunction with the microprocessor to decode and encode a variety of information.

11. **Jumpers and DIP Switches**

    This area includes the factory preset jumpers and DIP switches. There are no user-serviceable jumpers or switches in this area.

Synergy 1 Rear Panel Connectors

The figure below illustrates the connector section for the Synergy 1 control panel. All connectors are *always* present, whether or not you have options installed. In the *Synergy 1 Installation Guide*, refer to Appendix A, "**Specifications**" for a list of all control panel pinouts.
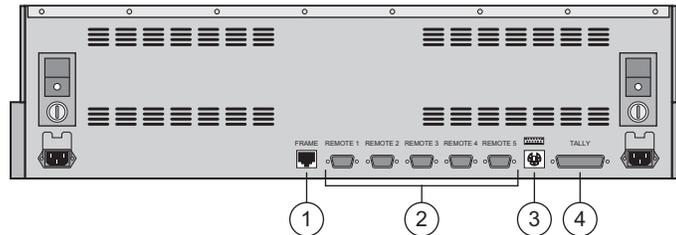
Synergy 1 Control Panel — Rear View, Connector Section

1)	Panel Communications	3)	Keyboard Port
2)	Remote Device Control	4)	Tally Port

1. Panel Communications

A connector is provided for panel communications with the Synergy frame. One 8-pin shielded Telco connector is provided for communications between the frame and the control panel.

2. Remote Device Control

Five 9-pin "D" connectors (RS-422) are provided for communicating with remote peripheral devices, such as VTRs, disk recorders, video servers or audio servers. The appropriate remote control software option must be installed in order to control devices connected to these ports. The ports can be configured for **RS-422** or **RS-232** through the menu system.

Note As the Synergy 1 SD control panel does not have a dedicated AUX port, an RJ-12 to DB9 Aux Adapter is required when connecting Remote Aux panels to the Synergy 1 SD control panel. By default, the Remote 5 Port on the control panel is set to Remote Aux Panel.

3. Keyboard Port

One PS/2 port is provided for connecting a standard keyboard to the control panel.

Important Do NOT place anything on your keyboard or place your keyboard in a position where any of the keys could be accidently pressed. This could result in the Switcher acting unpredictably.

4. Tally Port

One 25-pin "D" connector port is provided for the 16 standard panel tallies.

Panel CPU Replacement for the Synergy 1 Control Panel

If you wish to take advantage of the keyboard functionality available with version 16 and higher of the Synergy 1 SD software, or install the USB Controller for the **USB Removable Media Drive Option**, you will need to upgrade your **Panel CPU Board** to Issue 5.

Caution	Observe all static discharge precautions throughout these procedures. All product servicing should be carried out by qualified service personnel.

Replacing the Synergy 1 Panel CPU Board

Use the following procedure to replace your Synergy 1 **Panel CPU Board**:

1. Ensure your switcher configuration is saved to a storage device.

2. Power down the Synergy 1 control panel.

3. Disconnect all cables attached to the connectors on the rear of the panel, beginning with the AC power connection(s). It is advisable to label each one with the port identification to facilitate reconnection.

4. In order to gain access to the **Panel CPU Board** (4216-033), you must be able to lift the cover of the control panel off the base:

   • Gently flip the control panel onto its side on a clean, flat, static free surface.

   • Locate the eleven screws on the underside of the tub.

   • Loosen and remove the eleven screws, and set them aside in a safe place.

   • Gently place the panel back down on its base.

5. On the rear of the control panel, on either side of the five **REMOTE** ports and the **TALLY** connector, you will find twelve 5mm Hex jack screws. Remove these screws and set aside in a safe place.

6. For this next step, ensure you have telephone books, or a similar thick, sturdy object available with which to support the control panel cover:

   • Raise the cover and slide the telephone books under the rear area of the side panels to keep it raised and secure while you work.

   • Ensure you have enough workspace to access the **Panel CPU Board**.

   • Position a work light in the control panel tub, if necessary.

7. Remove the old **Panel CPU Board** as follows:

   • Disconnect all data and power connectors from the **Panel CPU Board**. Prior to detachment, it is advisable to label the power cables on the front left corner of the board to ensure that they are later re-attached to the correct connector. However, the balance of the cables are of different widths and should not need to be labeled.

   • Locate and remove the six screws that secure the **Panel CPU Board** to the bottom of the tub, and set them aside for later reassembly. These screws are identified as **MP1**, **MP2**, **MP3**, **MP5**, **MP6**, and **MP7**.

   • Carefully remove the old **Panel CPU Board**. Note that the top left corner contains the **Frame Tally Board** (4216A-004). This daughter board is attached to the **Panel CPU Board** by two header/socket connectors and one screw and standoff, marked **MP10**.

8. Remove the **Frame Tally Board** from the old **Panel CPU Board** as follows:

- Loose and remove the screw that holds the **Frame Tally Board** and the **Panel CPU Board** together.

- Gently pry off the **Frame Tally Board**, being careful not to bend the pins.

- Remove the standoff, and install it in the same location on the new **Panel CPU Board**.

9. Install the **Frame Tally Board** onto the new Issue 5 **Panel CPU Board** as follows:

- Carefully align the tally board with the appropriate connectors on the new **Panel CPU Board**.

⚠ **Caution**

> Failure to reinstall a module with a precise 1:1 pin-to-socket orientation will damage the **Panel CPU Board**, the **Frame Tally Board** — or both! Double check your work!

- Press down on the tally board until it is fully seated.

- Ensure you have the proper pin-to-socket alignment.

- Re-install and tighten the screw on the standoff.

⚠ **Caution**

> As a general rule, to avoid damage to the boards and panel, *do not overtighten the screws* when re-assembling the control panel.

10. Install the new **Panel CPU Board** as follows:

- Carefully position in the new **Panel CPU Board** in the identical location from where the old **Panel CPU Board** was removed.

- Secure the board to the bottom of the tub using the six screws that you removed earlier.

- Re-attach all data and power connectors.

11. Finish installing the new **Panel CPU Board** as follows:

- Close the control panel top.

- Re-install the twelve jack screws on the rear connector panel.

- Flip the control panel onto its side.

- Replace and tighten the screws to secure the cover and return the control panel to operating position.

- Re-attach all cables to the remote and tally ports on the rear of the panel.

This completes the procedure for replacing the **Panel CPU Board** in the Synergy 1 control panel. When you have finished this procedure, re-calibrate your switcher as per the instructions in the section, "**Switcher Calibration – Synergy 1**" on page 9–2. If you require additional information, please contact Ross Video Technical Support.

Synergy 100 Control Panel Boards

The figure below illustrates a view *underneath* the Synergy 100 control panel.

Front Edge

Disk Drive	

Upper Panel Section

| Positioner | 4100A-036 |
| | 4100A-037 |

Rear Panel Section

| | 4100A-039 |
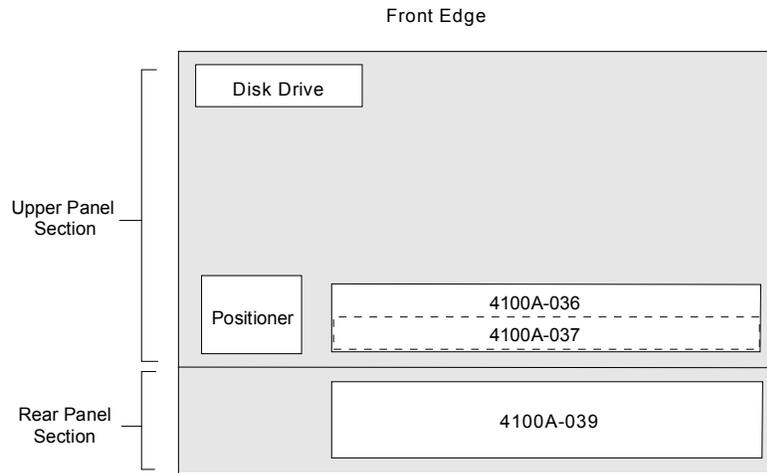
Underside View — Synergy 100 Control Panel

⚠ **Important** Do not open the Synergy 100 control panel without express instructions from Ross Video Technical Support.

Upper Control Panel Section

The Upper Control Panel Section includes the following components:

- **4100A-036** — This component includes the buttons and indicators in the **Pattern Control Group**.

- **4100A-037** — This component is the display board, which contains the 3 four-character displays and the 4 seven-segment displays.

Rear Control Panel Section

The Rear Control Panel Section includes the following components:

- **4100A-039** — This is the I/O board which houses all the connectors for panel-to-frame communication. Also included are the connectors for the 16 standard panel tallies, the connector for the disk drive, or USB port if you have the **USB Removable Media Drive Option** installed, and the connector for the DC power supply.

Synergy 100 Panel CPU Board Layout

The figure below illustrates a top view of the Synergy 100 **Control Panel CPU Board** (4100A-033).
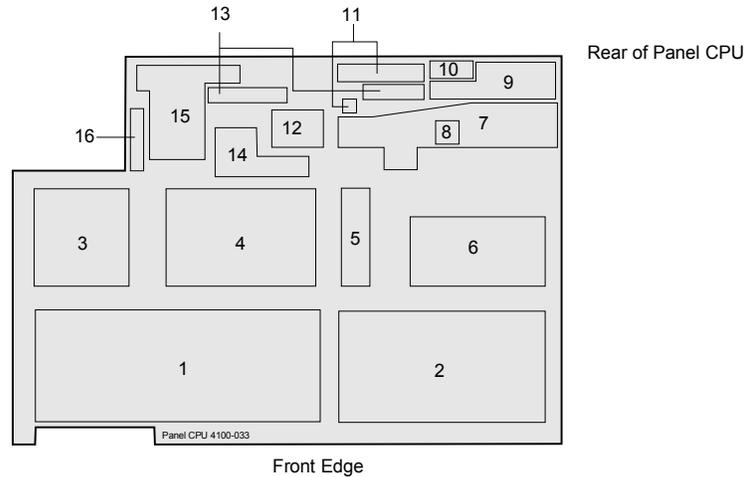
Synergy 100 Control Panel CPU Board — Functional Blocks

The major *functional blocks* are described below:

> **Important**   Do not open the Synergy 100 control panel without express instructions from Ross Video Technical Support.

1. **Program/Preset Buses**

   This area includes the buttons for the PGM, PST, and Key buses.

2. **Transition Control Group**

   This area includes all the transition control buttons and the fader.

3. **Effects Control Group**

   This area includes all the buttons and potentiometers for the **Effects Control Group**.

4. **Effects Keyer Group**

   This area includes all the buttons and knobs in the **Effects Keyer Group**.

5. **Mattes Group**

   This area includes the knobs for the **Mattes Group**.

6. **Downstream Keyer Group**

   This area includes the buttons and potentiometers in the **Downstream Keyer Group**.

7. **FPGA**

   This area includes the FPGA with its 2.5V power components, the microprocessor, and the memory chips.

8. **Socketed IC**

   One socketed IC is provided for the panel's boot prom.

9. **Power Distribution Components**

   This area includes the 3.3-volt power distribution components. These provide the power supply for most circuit boards and LEDs in the panel.

10. **LEDs and Reset Switch**

    This area includes the communications LEDs and the reset switch.

11. **Floppy Disk Controller**

    This section includes the floppy disk controller and the FDC and communication connector.

Note   A **USB Controller** replaces the Floppy Disk Controller if you have the **USB Removable Media Drive** option installed.

12. **Digital Power Components**

    This area includes the 5V digital power components, which run the communications drivers.

13. **Power and Data Connectors**

    These two areas include the daughter board power connector and the data cable connector.

14. **Analog Power and Conversion Components**

    This area includes the 5V analog power, which supplies power to all analog devices, and all the analog-to-digital conversion components.

15. **Tallies**

    This area provides the relays for the panel's standard 16 primary tallies and the tally and communication connector.

16. **Positioner Connector**

    This is the connector for the positioner (joystick).

Synergy 100 Rear Panel Connectors

The figure below illustrates the rear panel's connector section. All connectors are *always* present, whether or not you have options installed. In the *Synergy 100 Installation Guide*, refer to Appendix A, "**Specifications**" for a list of all control panel pinouts.
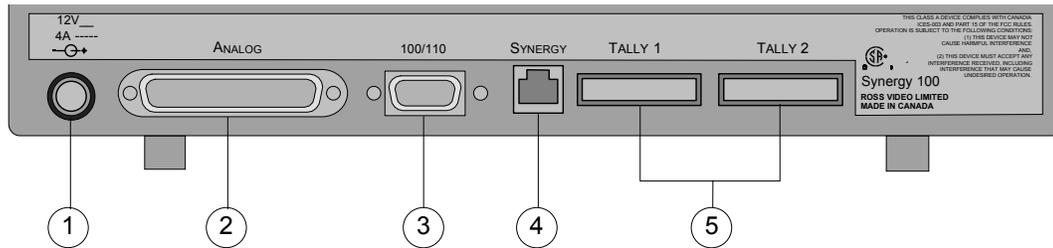
Synergy 100 Control Panel — Rear View, Connector Section

1) Power	3) 100/110 Connector	5) Tally Connectors
2) Analog Connector	4) Synergy Connector	

1. Power

One DC connector is provided to supply power to the control panel.

2. Analog Connector

One 50-pin connector labeled **ANALOG** is provided for those users who wish to use their existing Ross RVS-210 or Ross RVS-216 control cable to connect their Synergy 100 panel to the frame.

3. 100/110 Connector

One 15-pin "D" connector labeled **100/110** is provided for those users who wish to use their existing GVG 100/110 control cable to connect their Synergy 100 panel to the frame.

4. Synergy Connector

One 8-pin shielded Telco connector labeled **SYNERGY** is provided for those users who wish to use a Telco control cable (supplied) to connect their Synergy 100 panel to the frame.

5. Tally Connectors

Two 12-pin connectors labeled **TALLY 1** and **TALLY 2** are provided for a total of 16 standard panel tally relays.

Basic Interconnections – Synergy 1

This section describes the basic types of interconnections on the control panel boards.

In the Synergy 1 panel, a single 50-pin ribbon cable is used that runs from the **Panel CPU Board** (4216A-033) to the **Pattern Switch Board** (4216A-036), up to the **Key Switch Board** (4216A-035), across to the **Transition Switch Board** (4216A-034) and then up to the **Crosspoint Switch Board** (4216A-030).

The ribbon cable connectors are the same, but the orientation of each connector allows it to be attached only in one place.

Notes on Synergy 1 Basic Interconnections

Please note the following with regards to the Synergy 1 basic interconnections:

- Each each upper control panel board has a 6-pin keyed power connector (white), that carries +5V, +12V and ground.

- The faders are connected through a 16-pin dip-style socketed connector, with an indicator that shows the location of pin 1.

- The blue display in the panel memory area also has a 16-pin connector, directly beside the display module.

- The Positioner of the control panel connects with a 16-pin ribbon cable.

- A 34-pin ribbon cable connects the **Key Switch Board** (4216A-035) to the **Pattern Switch Board** (4216A-036). This cable carries fader analog signals, and connects the switches in the transition area to the **A-D Converter Board**.

- The floppy drive, or USB port if you have the **USB Removable Media Drive Option** installed, has a dedicated data connector and power connector that each run from the **Panel CPU Board**.

- A 16-pin ribbon cable runs from the **Panel CPU Board** (4216A-033) and connects to a mating connector on the **Transition Switch Board** (4216A-034). The **Transition Switch Board**, in turn, has a single 15-pin cable that runs to the display itself, plus another 2-pin connector that plugs into the **Backlight Converter Module** for purposes of power and control.

Notes on Optical Encoders

Note the following important point regarding the optical encoders on the Synergy 1 control panel:

- The optical encoders (at the edge of the display) use 4-pin connectors that plug into the edge of the **Pattern Switch Board** (4216A-036).

⚠	**Caution**	If you need to remove these connectors in order to service an optical encoder, *do not* plug them in backwards. If the connection polarity is wrong, it will destroy the encoder. If you remove them, note the polarity. Synergy 1 switchers have keyed connectors for the encoders.

Basic Interconnections – Synergy 100

This section describes the basic types of interconnections on the Synergy 100 control panel boards.

In the Synergy 100 panel, there are two 50-pin ribbon cables that run from the **Display Board** (4100A-037) to the **Pattern Switch Board** (4100A-036), and then to the **Panel CPU Board** (4100A-033).

The ribbon cable connectors are the same, but the orientation of each connector allows it to be attached only in one place.

⚠	**Important**	Do not open the Synergy 100 control panel without express instructions from Ross Video Technical Support.

Notes on the Synergy 100 Basic Interconnections

Please note:

- The faders are connected through a 16-pin dip-style socketed connector, with an indicator that shows the location of pin 1.

- The Positioner for the Synergy 100 panel connects with a 16-pin ribbon cable.

- The **Interface Board** (4100A-039) is connected using edge card fingers that are inserted into connectors on the **Panel CPU Board** (4100A-033).

- The floppy drive is connected to the **Interface Board** (4100A-039) with a 26-pin ribbon cable.

✎	**Note**	A USB port replaces the floppy drive if you have the **USB Removable Media Drive** option installed. The USB port connects to the **Panel CPU Board** (4100A-033) with a 60-pin ribbon cable.

Synergy 1 Panel Maintenance

In This Chapter

This chapter provides instructions for a variety of Synergy 1 control panel maintenance procedures.

The following topics are discussed:

- Replacing a Bulb
- Replacing a Button
- Replacing a Fader
- Replacing a Knob (Potentiometer)
- Replacing the Display

Replacing a Bulb

This section provides instructions for replacing a burned-out bulb in a control panel switch.

Testing the Lamps

Use the following procedure to verify the target bulb is burned out:

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:

   - Press **HOME** (to display the **Main Menu 1-2**)
   - **MORE** (to display the **Main Menu 2-2**)
   - **Setup** (to display the **Setup Menu**)
   - **Panel Diagnostics** (to display the **Panel Diagnostics Menu 1-2**)

2. Press **Lamp Test** to display the **Lamp Test Menu**.

```
Lamps Test

                        Hold down F5 and F6, then release
                        them to exit lamp test mode




                                              Exit        Exit
```
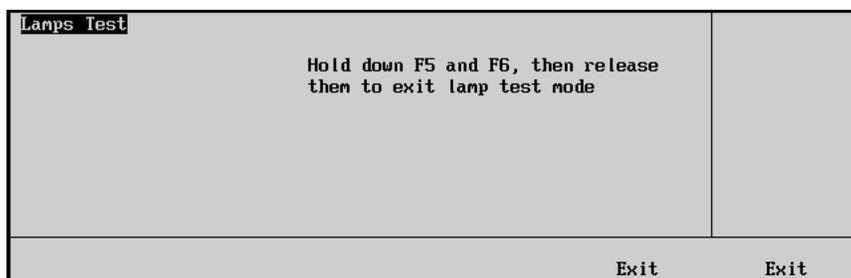
Lamp Test Menu

3. Test the lamps as follows:

   - Press buttons in selected panel regions, to test *all lamps* in those regions as required.
   - To exit the menu, press *both* **Exit** buttons beneath the display.

This completes the procedure to verify that the target bulb is burned out. Next, you will replace the faulty bulb.

Note | Check the bulb before you proceed. The button may not be lighting simply because the bulb has become loose. Try pushing the bulb down to fully seat it. If this does not solve the problem, please continue with the replacement procedure.

Replacing a Bulb

Use the following procedure to replace a bulb:

1. Once you have located the burned-out bulb, turn the control panel power switch off.

2. Remove the keycap to reveal the sleeve and bulb within.
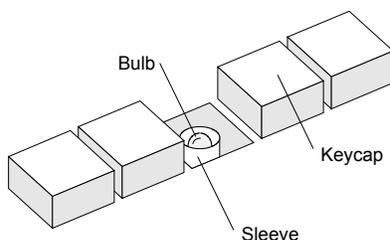
Location of Sleeve and Bulb

✓	**Operating Tip**	If you have trouble removing a control panel button, use a pair of wide-tipped pliers (1/2 inch) with masking tape wrapped around the ends. For best results, wiggle the button back and forth as you extract it. This helps to remove the button easily and also avoids scratching the surface paint.

3. Remove the burned-out bulb as follows:

    •   Carefully push down the sleeve with your fingers.

    •   While holding down the sleeve, use needle-nose pliers to carefully grab the plastic body of the bulb and pull it out. Note that the bulb has a two-wire connection in which polarity is not important.

4. Replace the burned-out bulb as follows:

    •   Select a new bulb from your spare-parts kit.

    •   Align the two pins of the replacement bulb with the two holes in the button — the orientation of the bulb does not matter.

    •   Replace the keycap.

⚠	**Important**	Ensure to align the notch in the base of the keycap vertically to the panel, as shown below. If it is not aligned in this manner, it will not properly snap in place.
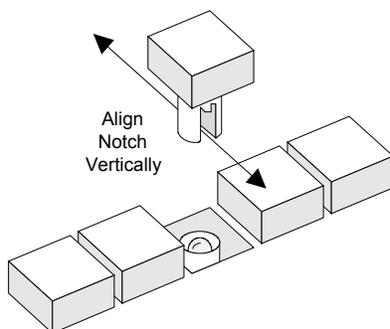
Aligning the Keycap

5. Power on the Synergy 1 control panel.

6. Verify that the bulb is working. Refer to the section "**Testing the Lamps** " on page 11-2 for instructions.

This completes the procedure to replace a bulb.

Replacing a Button

This section provides instructions for replacing a button in the control panel. This procedure may become necessary if a button contact fails, or if the button becomes sticky.

⚠️ **Caution** | This procedure should be performed by qualified service personnel only — in particular, those *highly skilled* at de-soldering and soldering components.

To reduce the risk of damage to the button solder pads, do not perform any servicing unless you are qualified to do so.

Testing a Button

As a prerequisite, use the **Button Test Menu** to verify that the target button is sticky or has failed.

Use the following procedure to test the button:

1. Navigate to **Panel Diagnostics Menu 1-2** as follows:

    • Press **HOME** (to display the **Main Menu 1-2**)

    • **MORE** (to display the **Main Menu 2-2**)

    • **Setup** (to display the **Setup Menu**)

    • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

2. Press **Button Test** to display the **Button Test Menu**.


```
Button Test

BUTTON     #07          Hold down F5 and F6, then release
AREA       #08          them to exit button test mode
MLE        #01
Last action:Button Up




                                              Exit        Exit
```
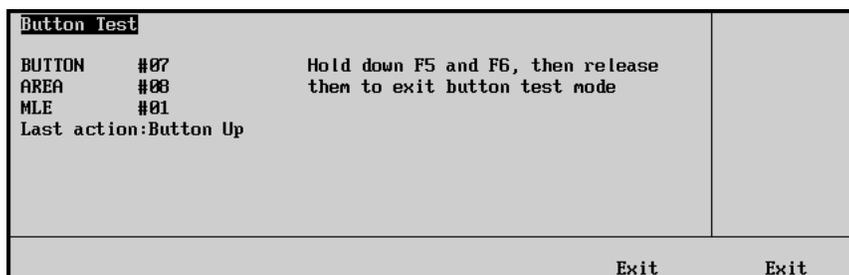
Button Test Menu

3. Press the target panel button(s) as required.

4. Exit the menu by pressing *both* **Exit** buttons beneath the display.

This completes the procedure to test the buttons. Next you will replace the failed button.

Replacing a Button

Use the following procedure to replace the failed button:

1. Turn control panel power off.

2. Remove the keycap to reveal the sleeve and bulb within. Refer to the diagram below.
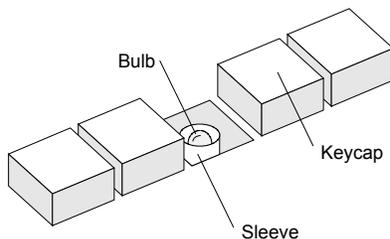
Location of Sleeve and Bulb

✓ **Operating Tip**

> If you have trouble removing a control panel button, use a pair of wide-tipped pliers (1/2 inch) with masking tape wrapped around the ends. For best results, wiggle the button back and forth as you extract it. This helps to remove the button easily and also avoids scratching the surface paint.

3. Remove the bulb as follows:

   • Carefully push down the sleeve with your fingers.

   • While holding down the sleeve, use needle-nose pliers to carefully grab the plastic body of the bulb and pull it out.

   • Note that the bulb has a two-wire connection in which polarity is not important.

4. In order to gain access to the Synergy 1 panel boards and locate the button that has failed, you must be able to lift the cover of the control panel off the base.

   • Gently flip the control panel onto its side on a clean, flat, static free surface.

   • Locate the eleven screws on the underside of the tub.

   • Loosen and remove the eleven screws, and set them aside in a safe place.

   • Gently place the panel back down on its base.

5. For this next step, ensure you have telephone books, or a similar thick, sturdy object available with which to support the control panel cover.

   • Raise the cover and slide the telephone books under the rear area of the side panels to keep it raised and secure while you work.

   • Ensure you have enough workspace to access the failed button.

   • Position a work light in the control panel tub, if necessary.

6. There are two types of buttons used in the panel — a large tall button used for the crosspoint buses, and a smaller, short button used for all other functions.

   The figure below shows the underside of each button and the arrangement of solder pads. Each type of button has six solder pads.

Button Types — Solder Pads

7. Carefully heat each solder pad, and add a small amount of solder to each pad. Then use a solder-sucker to remove the solder.

⚠️ **Caution**

> A fair amount of heat is required to de-solder each pad, due to the large ground plane within the boards. However, using too much heat may damage the solder pads themselves. This procedure should be performed by qualified service personnel only — those highly skilled at soldering and de-soldering.

8. Once all solder has been removed, pull out the button from the top of the control panel.

9. Insert a new button in the same orientation as the removed one as follows:

   • **Large buttons** — Ensure that the peg on the base of the button is properly aligned with the keyhole in the switcher board itself.

   • **Small buttons** — Ensure that the **+** indicator on the base of the button is properly aligned with the **+** sign (or square pad) on the switcher board itself.

10. Re-solder the button to secure it in position.

11. Reposition the control panel as follows:

   • Close the top of the control panel.

   • Flip the control panel back onto its side.

   • Replace and tighten the screws to secure the cover.

   • Return the control panel to operating position.

12. Replace the bulb and keycap, and be careful to align the notch in the base of the keycap vertically to the panel, as shown below. If it is not aligned in this manner, it will not snap into place properly.

Align
Notch
Vertically
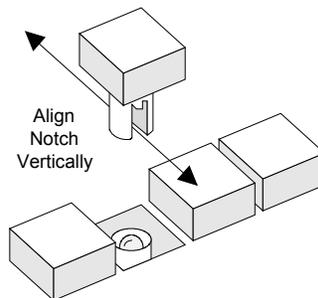
Aligning the Keycap

13. Power on the control panel power.

14. Verify that the button works correctly. Refer to the section "**Testing a Button**" on page 11-4 for instructions.

This completes the procedure to replace a failed button.

Replacing a Fader

This section provides instructions for replacing the fader in the Synergy 1 control panel.

Testing the Fader

As a prerequisite, use the **Fader Test Menu** to verify that the target fader has failed

Use the following procedure to test the target fader:

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**).

   • **MORE** (to display the **Main Menu 2-2**).

   • **Setup** (to display the **Setup Menu**).

   • **Panel Diagnostics** (to display the **Panel Diagnostics Menu 1-2**).

2. Press **Fader Test** to display the **Fader Test Menu**.

Fader Test Menu

3. Test the fader as follows:

   • Press **Normal**.

   • Move the fader up and down.

   • The position of the fader is shown both numerically (in hexadecimal) and graphically. The number should range from **000** (up) to **FFF** (down), and the number should be stable and jitter-free.

   • If the number does not reach both limits, perform a calibration as described in the the section "**Switcher Calibration – Synergy 1**" on page 9-2.

✎   **Note** | Contact **Technical Support** for details on each display value, or if a problem with the fader is suspected.

This completes the procedure to to test the fader on the Synergy 1 control panel. Next you will replace the fader on the Synergy 1 control panel.

Replacing the Fader

Use the following procedure to replace the failed fader:

1. Test the fader as outlined in the section "**Testing the Fader**" on page 11-7.

2. Power down the Synergy 1 control panel.

3. Remove the screws on either side of the handle, as illustrated below.

   • Once removed, the handle will separate, leaving the fader shaft.

   • Set all parts aside for later reassembly.
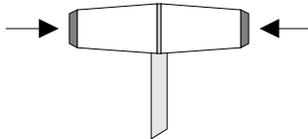
Location of Screws in the Fader Handle

4. In order to gain access to the failed fader, you must be able to lift the cover of the control panel off the base.

   • Gently flip the control panel onto its side on a clean, flat, static free surface.

   • Locate the eleven screws on the underside of the tub.

   • Loosen and remove the eleven screws, and set them aside in a safe place.

   • Gently place the panel back down on its base.

5. For this next step, ensure you have telephone books, or a similar thick, sturdy object available with which to support the control panel cover. Use the diagram "**Fader Assembly — View from Bottom**" for reference.

   • Raise the cover and slide the telephone books under the rear area of the side panels to keep it raised and secure while you work.

   • Ensure you have enough workspace to access the fader assembly.

   • Position a work light in the control panel tub, if necessary.
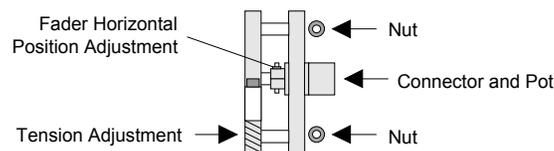
Fader Assembly — View from Bottom

6. Disconnect the cable from the circuit board to the Connector/Pot assembly, and note its orientation.

7. Remove the two nuts that secure the entire fader assembly to the tub, and set them aside for later reassembly.

8. Remove the entire assembly and replace with a new fader assembly.

9. Secure the assembly to the tub using the two nuts, and then re-attach the connector from the circuit board to the fader.

10. Although the fader is factory-calibrated, ensure that the fader arm is positioned directly in the middle of the control panel slot. If not, loosen the **Horizontal Position Adjustment** screw, re-position the shaft, and secure once again.

11. If required, adjust the tension of the fader using the **Tension Adjustment** screw, a Hex nut driver, and a Phillips screwdriver.

Note | The tension of all faders should be adjusted to suit user preference, and to ensure that the tension on all switcher faders is similar. Do not overtighten the tension adjustment screw.

12. Reposition the Synergy 1 control panel as follows:

   • Close the control panel top and flip the control panel back onto its side.

   • Replace and tighten the screws to secure the cover.

   • Return the control panel to operating position.

13. Re-attach the two sides of the handle, and tighten them securely. If the handle does not seat tightly or if it rattles, insert a small piece of tissue paper inside the inner machine groove, as shown below.

Insert Tissue

Fader Handle
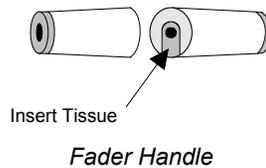
14. Power on the Synergy 1 control panel.

15. Verify that the fader functions correctly. Refer to the section "**Testing the Fader**" on page 11-7 for instructions.

This completes the procedure to replace a failed fader.

Replacing a Knob (Potentiometer)

This section provides instructions for replacing a knob (potentiometer) in the control panel's **Pattern Control**, **Effects Control** and **Mattes** areas. The procedure does not cover changing the rotary encoders to the right of the display in the **System Control** area. Contact Ross Technical Support for instructions if one of the rotary encoders has failed.

Testing a Knob (Potentiometer)

As a prerequisite, use the **Pots Test Menu** to verify that the target knob (potentiometer) has failed.

Use the following procedure to test the target knob (potentiometer):

1. Navigate to the **Panel Diagnostics Menu 1-2** as follows:

    *   Press **HOME** (to display the **Main Menu 1-2**).
    *   **MORE** (to display the **Main Menu 2-2**).
    *   **Setup** (to display the **Setup Menu**).
    *   **Panel Diagnostics** (to display the **Panel Diagnostics Menu 1-2**).

2. Press **Pots Test** to display the **Pots Test Menu**.

```
 Pots Test

 KNOB:Top Display Knob
 Value:0
                                    |




     Normal        Scaled        Raw
```

Pots Test Menu

3. Test the three knobs to the right of the display as follows:

    *   Press **Normal**.
    *   Turn each knob clockwise and counterclockwise.

    The display indicates the rate at which you are turning the knob with a numeric display and bar graph.

4. Test all other knobs as follows:

    *   Press **Scaled**.
    *   Turning the knob will display the absolute position of the knob both numerically and graphically. The number (displayed in hexadecimal) should range from **0** (full counter-clockwise) to **FFF** (full clockwise). The number should be stable and jitter-free.
    *   If the number does not reach both limits, perform a calibration as described in the section "**Switcher Calibration – Synergy 1**" on page 9-2.

✎ **Note** | Contact **Technical Support** for details on each display value, or if a problem with a potentiometer is suspected.

This completes the procedure to test a knob (potentiometer) of the Synergy 1 control panel. Refer to the section "**Switcher Calibration – Synergy 1**" on page 9-2 for detailed instructions on performing switcher calibrations. Repeat the pots test after the calibration. If the number does not reach both limits or if it does not respond, please continue with the replacement procedure.

✎	**Note**	If *all pots* appear to be bad, the problem is in the cable or in the A-D converter. In this situation, please contact Ross Technical Support, as a board swap may be required.

Replacing a Potentiometer

Use the following procedure to replace a knob (potentiometer):

1. Power down the Synergy 1 control panel.

2. Remove the potentiometer caps as follows:

    • Remove *all* the potentiometer caps in the *entire section* that contains the failed potentiometer as follows:

       ~ **Pattern Control** potentiometers — These knobs are all in one section on the **4216A-036** board.

       ~ **Effects Control** and **Mattes** potentiometers — These knobs are all in one section on the **4216A-035** board.

    • Each potentiometer has a small screw that secures the knob (potentiometer) to the shaft.

    • Loosen the screw ¼ turn and lift off the cap.

3. In order to gain access to the failed potentiometer, you must be able to lift the cover of the control panel off the base.

    • Gently flip the control panel onto its side on a clean, flat, static free surface.

    • Locate the eleven screws on the underside of the tub.

    • Loosen and remove the eleven screws, and set them aside in a safe place.

    • Gently place the panel back down on its base.

4. For this next step, ensure you have telephone books, or a similar thick, sturdy object available with which to support the control panel cover.

    • Raise the cover and slide the telephone books under the rear area of the side panels to keep it raised and secure while you work.

    • Ensure you have enough workspace to access the failed potentiometer.

    • Position a work light in the control panel tub, if necessary.

5. Locate the board that contains the failed knob (potentiometer).

6. Disconnect all power and data connectors from the board. Because the end of each connector rests in close proximity to the mating header (when disconnected), there is no need to label the connectors.

7. Remove *all screws* from the bottom of the board, and set them in a safe place for later reconnection.

8. Carefully drop the board out from underneath the control panel cover, and set it on a clean, flat, static-free surface. All potentiometers are secured to the board by a metal plate. Note the position of the failed potentiometer.

9. Remove the failed knob (potentiometer) as follows:

   • Using a socket driver, loosen and remove *all nuts and lock washers* that secure the potentiometers to the metal plate.

   • Remove the metal plate and set it aside in a safe place, along with all nuts and lock washers.

   • All potentiometers are now supported only by their leads. On the bottom of the board, locate the failed potentiometer.

   • De-solder the three connecting leads. The figure below illustrates the silk-screened potentiometer symbol on the board.

Pot Leads
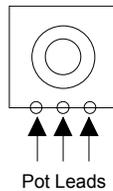
Potentiometer Label

10. Replace the failed knob (potentiometer) with the new knob in the proper orientation.

11. Carefully re-solder the three leads.

12. Prior to re-assembling all components, it is highly recommended you test out the replaced potentiometer:

   • Set the circuit board on a piece of cardboard to insulate it, and re-connect all power and data cables to the circuit board.

   • Turn on control panel power.

   • Perform the diagnostic test as outlined in the section "**Testing a Knob (Potentiometer)**" on page 11-10.

13. Once you have verified that the potentiometer has passed the test, continue the with full re-assembly as follows:

   • Power down the Synergy 1 control panel.

   • Disconnect all power and data cables from the board.

   • Continue with the full re-assembly.

   • Reconnect the metal plate using the lock washers and nuts.

   • Tighten all nuts securely.

14. Carefully replace the circuit board through the underside of the control panel.

⚠ **Important**

> Replacing the circuit board is a tricky procedure, due to the tight tolerances of the LEDs. It is highly recommended that you use two people to perform the re-installation procedure, with one person supporting the board from below, and the other guiding it from the top.
>
> • If required, remove button keycaps that are adjacent to the LEDs, to facilitate your ability to insert a screwdriver and gently *nudge* the LEDs into place.
>
> • If required, remove the LEDs themselves from the circuit board, and make a careful note of their position, color and orientation. Next, re-connect the circuit board using a minimum number of screws, and insert the LEDs through the top of the control panel, until they are firmly seated in their sockets. Use the lamp diagnostic test to verify that all LEDs are properly inserted in the board.

15. Secure the board to the Synergy 1 control panel with the mounting screws.

16. Reposition the Synergy 1 control panel as follows:

    • Reconnect all power and data cables to the board.

    • Close the top of the Synergy 1 control panel.

    • Flip the control panel back onto its side.

    • Replace and tighten the screws to secure the cover.

    • Return the control panel to operating position.

17. Power on the Synergy 1 control panel.

18. Verify that the potentiometer functions properly as outlined in the section "**Testing a Knob (Potentiometer)**" on page 11-10.

19. Perform the switcher calibration procedure, to ensure that all potentiometers are properly calibrated. Refer to the section "**Switcher Calibration – Synergy 1**" on page 9-2 for instructions.

This completes the procedure to replace a knob (potentiometer) on the Synergy 1 control panel.

Replacing the Display

This section provides instructions for replacing the entire display. This procedure may be required if the display fails, or more likely, if the backlight begins to fade (with age), and becomes too dim for your preference.

Testing the Display

As a prerequisite, use the **Display Test Menu** to verify the condition of the display.

Use the following procedure to test the display:

1. Navigate to the **Panel Diagnostics Menu 2-2** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)

   • **MORE** (to display the **Main Menu 2-2**)

   • **Setup** (to display the **Setup Menu**)

   • **Panel Diagnostics** (to display **Panel Diagnostics Menu 1-2**)

   • **MORE** (to display **Panel Diagnostics Menu 2-2**)

2. Press **Display Test** to show the **Display Test Menu**.

Display Test Menu

3. Press *any button* below the display to advance to the next in the series of display tests. A variety of tests are available.

4. Press **UP ONE** to exit the **Display Test Menu**.

This completes the procedure to test the display screen of the Synergy 1 System Control Group. You may want to adjust the contrast of the display before you proceed with the replacement procedure.

Adjusting the Contrast

Use the following procedure to adjust the contrast of the display:

1. Navigate to the **Display Menu** as follows:

   • Press **HOME** (to display the **Main Menu 1-2**)

   • **MORE** (to display the **Main Menu 2-2**)

   • **Setup** (to display the **Setup Menu**)

   • **Display** (to display the **Display Menu**)

2. Press **Large Display** to display the **Large Display Menu**.


```
Display                                              ( 25.0%)
                                                     Contrast




    Large        Mnemonic
    Display      Displays
```

Display Test Menu

3. Use the middle **Contrast** knob to adjust contrast.

This completes the procedure to adjust the contrast of the display. If the readability of the display does not improve, continue to the replacement procedure.

Replacing the Display

Use the following procedure to replace the display:

1. Once you have verified the condition of the display, turn the Synergy control panel power switch off.

⚡ **Warning Hazardous Voltages**

> Ensure that power is off. This step is extremely important, because high voltages are present in the display module area when it is running.

2. In order to gain access to the **Display Module**, you must be able to lift the cover of the Synergy 1 control panel off the base.

   • Gently flip the control panel onto its side on a clean, flat, static free surface.

   • Locate the eleven screws on the underside of the tub.

   • Loosen and remove the eleven screws, and set them aside in a safe place.

   • Gently place the control panel back down on its base.

3. For this next step, ensure you have telephone books, or a similar thick, sturdy object available with which to support the control panel cover.

   • Raise the cover and slide the telephone books under the rear area of the side panels to keep it raised and secure while you work.

   • Ensure you have enough workspace to access the **Display Module**.

   • Position a work light in the control panel tub, if necessary.

4. Remove the failed **Display Module** as follows:

- Disconnect the data cable from the display module's 15-pin header. This data cable originates from the **Key Switch Board** (4216A-034).

- Use needle-nose pliers to disconnect the single small power connector that also originates from the adjacent **Key Switch Board** (4216A-034).

- Remove the screws from each corner of the **Display Module**, and set them aside for later re-assembly.

- Carefully drop the display module out from underneath the control panel.

5. Install the new **Display Module** as follows:

- Carefully place the new **Display Module** into the control panel.

- Secure the new **Display Module** with the four corner screws.

- Use needle-nose pliers to reconnect the single small power connector (that originates from the **Key Switch Board** (4216A-034)) to the **Display Module**.

- Reconnect the data cables to the 15-pin header of the new **Display Module**.

- Ensure that the data cables and the header are properly aligned.

6. Reposition the Synergy 1 control panel as follows

- Close the top of the control panel.

- Flip the control panel back onto its side.

- Replace and tighten the screws to secure the cover.

- Return the control panel to operating position.

7. Power on the Synergy 1 control panel.

8. Verify that the display functions properly. Refer to the the section "**Testing the Display**" on page 11-14 for instructions.

9. Adjust the contrast of the new **Display Module** for optimum readability as follows:

- Navigate to the **Large Display Menu** as follows:

  ~ Press **HOME** (to display the **Main Menu 1-2**)

  ~ **MORE** (to display the **Main Menu 2-2**)

  ~ **Setup** (to display the **Setup Menu**)

  ~ **Display** (to display the **Display Menu**)

  ~ **Large Display** (to display the **Large Display Menu**)

- Use the middle **Contrast** knob to adjust contrast.

This completes the procedure to replace the display of the Synergy 1 control panel.

Synergy 1 Control Panel Options

In This Chapter

This chapter provides instructions for installing control panel options in the Synergy 1 switcher. These options are not available in the Synergy 100 switcher.

The following topics are discussed:

- Installing the Routing Switcher Interface Option
- Installing the Character Generator Interface Option
- Installing the VTR Remote Control Option
- Installing the Audio Server Control Option
- Installing the Video Server Control Option
- Installing the Robotic Camera System Interface Option
- Installing the Monitor Wall Interface Option

Installing the Routing Switcher Interface Option

This section provides general instructions for installing the **Routing Switcher Interface Option**, which adds routing switcher interface capability to your Synergy digital production switcher. You can connect a number of Routers to your Synergy 1 switcher. The procedure for connecting the Router will depend on the type of Router you have. For more information on setting up your device with the Synergy switcher, refer to the *Synergy 1 Installation Guide*.

Use the following procedure to install the **Routing Switcher Interface Option**:

1. Install the **Routing Switcher Interface Option**. Refer to the section "**Installing Software Options – Synergy 1**" on page 6-7 for instructions.

2. Ensure that one of the serial ports on your router is properly set up to communicate with the Synergy 1 switcher.

3. Ensure that the serial ports on your router is properly connected to a remote port on the Synergy 1 switcher. Refer to the documentation for your device to learn more on its specific remote control communications port.

4. Ensure that you have set up a communications port on the Synergy 1 switcher for a router. Refer to the section, "**Setting up the Switcher**" in the *Synergy 1 Installation Guide*, for instructions.

5. Ensure that the desired BNC is configured for a router on the Synergy 1 switcher. Refer to the section, "**Setting Up Router BNCs**" the *Synergy 1 Installation Guide* for instructions.

This completes the procedure to install the **Routing Switcher Interface Option**.

Installing the Character Generator Interface Option

This section provides general instructions for installing the **Character Generator Interface Option**, which allows you to control your device directly from the Synergy 1 switcher. You can connect a number of character generators to your Synergy switcher. The procedure for connecting the character generator will depend on the type of device you have. For more information on setting up your device with the Synergy switcher, refer to the *Synergy 1 Installation Guide*.

Use the following procedure to install the **Character Generator Interface Option**:

1. Install the **Character Generator Interface Option**. Refer to the section "**Installing Software Options – Synergy 1**" on page 6-7 for instructions.

2. Ensure that one of the serial ports on your character generator is properly set up to communicate with the Synergy 1 switcher.

3. Ensure that the serial ports on your character generator are properly connected to a remote port on the Synergy 1 switcher. Refer to the documentation for your device to learn more on its specific remote control communications port.

4. Ensure that you have set up a communications port on the Synergy 1 switcher for a character generator. Refer to the section, "**Setting up the Switcher**" in the *Synergy 1 Installation Guide*, for instructions.

5. Ensure that the desired BNC is configured for a character generator on the Synergy 1 switcher. Refer to the section, "**Setting Up Character Generator BNCs**" in the *Synergy 1 Installation Guide* for instructions.

This completes the procedure to install the **Character Generator Interface Option**.

Installing the VTR Remote Control Option

This section provides instructions for installing the **VTR Remote Control Option**, which controls up to four VTRs, disk recorders, or other devices compatible with the Betacam serial control protocol — directly from the Synergy control panel. For more information on setting up your device with the Synergy switcher, refer to the *Synergy 1 Installation Guide*.

Use the following procedure to install the **VTR Remote Control Option**:

1. Install the software registration key for the **VTR Remote Control Option**. Refer to the section "**Installing Software Options – Synergy 1**" on page 6-7 section for instructions.

2. Ensure that the serial port of your VTR is properly set up to accept commands via its remote port.

    •   Many VTRs have a switch labeled **Local/Remote**. This switch should be set to the **Remote** position when the VTR is under control of the Synergy 1 switcher.

    •   Refer to the documentation for your VTR to learn more on its specific remote control communications port.

3. Ensure that the desired BNC is configured as a VTR on the Synergy 1 switcher. Refer to the section, "**Setting Up BNCs for VTRs**" in the *Synergy 1 Installation Guide* for instructions.

4. Ensure that you have set up a communications port on the Synergy 1 switcher for a VTR. Refer to the section, "**VTR Communications Setup**" in the *Synergy 1 Installation Guide*, for instructions.

	Note	When you press **Select VTR (Clip)** to choose the type of protocol, be sure to choose **Betacam**.

This completes the procedure to install the **VTR Remote Control Option.** In the *Synergy 1 Operation Guide,* refer to Chapter 12, "**VTR Clip Control**" for detailed operating instructions.

Installing the Audio Server Control Option

This section provides instructions for installing the **Audio Server Control Option**, which can control up to four audio servers directly from the Synergy 1 control panel. For more information on setting up your device with the Synergy switcher, refer to the *Synergy 1 Installation Guide*.

Use the following procedure to install the **Audio Server Control Option**:

1. Install the software registration key for the **Audio Server Control Option**. Refer to the the section "**Installing Software Options – Synergy 1**" on page 6-7 for instructions.

2. Ensure that the serial port on your audio server is properly set up to accept commands via its Ensure that the serial port of your Audio Server is properly set up to accept commands via its remote port. Refer to the documentation for your device to learn more on its specific remote control communications port.

3. Set up a communications port on the Synergy 1 switcher for your audio server. Refer to the section, "**Setting up the Switcher**" in the *Synergy 1 Installation Guide*, for instructions.

4. Ensure that the audio server is properly connected to the Synergy 1 control panel and is assigned a BNC input on the Synergy switcher. Refer to the section, "**Setting Up Audio Server BNCs**" in the *Synergy 1 Installation Guide*, for instructions.

This completes the procedure to install the **Audio Server Control Option**. In the *Synergy 1 Operation Guide*, refer to the section, "**Clip Control**" for detailed operating instructions.

Installing the Video Server Control Option

This section provides instructions for installing the **Video Server Control Option**, which can control up to four video servers, disk recorders, or other devices that use the Louth VDCP control protocol — directly from the Synergy 1 control panel. For more information on setting up your device with the Synergy switcher, refer to the *Synergy 1 Installation Guide*.

Use the following procedure to install the Video Server Control Option:

1. Install the software registration key for the **Video Server Control Option**. Refer to the section "**Installing Software Options – Synergy 1**" on page 6-7 for instructions.

2. Ensure that the serial port of your video server is properly set up to accept commands via its remote port. Refer to the documentation for your device to learn more on its specific remote control communications port.

3. Set up the communications port on the Synergy 1 switcher for your video server. Refer to the section "**Setting Up the Switcher**" in the *Synergy 1 Installation Guide*, for instructions.

4. Assign BNCs to your video server. Refer to the section "**Setting Up BNCs**" in the *Synergy 1 Installation Guide*, for instructions.

This completes the procedure to install the **Video Server Control Option**. Refer to the section, "**Programming Clips**" in the *Synergy 1 Operation Guide*, for detailed operating instructions.

Installing the Robotic Camera System Interface Option

This section provides general instructions for installing the **Robotic Camera System Interface Option**, which enables serial control over robotic camera systems including pan, tilt, zoom, focus, and scene recalls — directly from the Synergy 1 switcher. For more information on setting up your device with the Synergy switcher, refer to the *Synergy 1 Installation Guide*

Use the following procedure to install the **Robotic Camera System Interface Option**:

1. Install the **Robotic Camera System Interface** software option. Refer to the section "**Installing Software Options – Synergy 1**" on page 6-7 for instructions.

2. Ensure that the serial port of your robotic camera is properly set up to accept commands via its remote port. Refer to the documentation for your device to learn more on its specific remote control communications port.

3. Ensure that you have set up a communications port on the Synergy 1 switcher for a robotic camera. Refer to the section, "**Setting up the Switcher**" in the *Synergy 1 Installation Guide*, for instructions.

4. Ensure that the desired BNC is configured as a robotic camera on the Synergy 1 switcher. Refer to the section, "**Setting Up Robotic Camera BNCs**" in the *Synergy 1 Installation Guide* for instructions.

This completes the procedure to install the **Robotic Camera System Interface Option**. Refer to the section, "**Remote Camera Control Interface**" in the *Synergy 1 Operation Guide*, for detailed operating instructions.

Installing the Monitor Wall Interface Option

This section provides general instructions for installing the **Monitor Wall Interface Option**, which allows you to interface between the Synergy 1 switcher and a multi-image display system. You can perform functions such as loading a preset layout, changing the input channel on a particular monitor, or editing dynamic text. Refer to the *Synergy 1 Installation Guide*, for setup details.

Use the following procedure to install the **Monitor Wall Interface Option**:

1. Install the **Monitor Wall Interface Option**. Refer to the section "**Installing Software Options – Synergy 1**" on page 6-7 for instructions.

2. Ensure that one of the serial ports on your monitor wall is properly set up to communicate with the Synergy 1 switcher.

3. Ensure that the serial ports on your monitor wall are properly connected to a remote port on the Synergy 1 switcher. Refer to the documentation for your device to learn more on its specific remote control communications port.

4. Ensure that you have set up a communications port on the Synergy 1 switcher for a monitor wall. Refer to the section, "**Setting up the Switcher**" in the *Synergy 1 Installation Guide*, for instructions.

This completes the procedure to install the **Monitor Wall Interface Option**. Refer to Chapter 8, "**Custom Controls**" in the *Synergy 1 Installation Guide*, for details on programming macros for your monitor wall.

Miscellaneous Options

In This Chapter

This chapter provides instructions and information for miscellaneous options for the Synergy 1 and Synergy 100 switchers.

The following topics are discussed:

- Installing the Editor Interface Option
- Synergy 1 USB Controller Installation

Installing the Editor Interface Option

The **Editor Interface Option** allows a Synergy 1 or Synergy 100 switcher to interface with all popular editing systems. The option itself is comprised of software plus security codes. For more information on setting up your device with the Synergy switcher, refer to the *Synergy Installation Guide* for your switcher.

Use the following procedure to install the **Editor Interface Option** for your Synergy switcher:

1. Install the software registration key for the **Editor Interface Option**.

   • Refer to the section "**Installing Software Options – Synergy 1**" on page 6–7 for instructions on installing software options on a Synergy 1 switcher.

   • Refer to the section "**Installing Software Options – Synergy 100**" on page 6–12 for instructions on installing software options on a Synergy 100 switcher.

2. Ensure that one of the serial ports on your editing system is properly set up to control your Synergy switcher.

3. Ensure that the serial ports on your editing system is properly connected to the **Editor Port** on the Synergy switcher. Refer to the documentation for your edit controller to learn more on its specific remote control communications port.

4. Ensure that communications with your editing system is properly set up.

   • Refer to the section, "**Editor Communications Setup**" in the *Synergy 1 Installation Guide* for details on setting up communications between your device and the Synergy 1 switcher

   • Refer to the section, "**Communications Setup - Editor**" in the *Synergy 100 Installation Guide* for details on setting up communications between your device and the Synergy 100 switcher.

This completes the procedure to install the **Editor Interface Option** for your Synergy switcher.

Synergy 1 USB Controller Installation

This installation procedure allows you to replace the floppy disk drive in your Synergy 1 switcher with a USB controller. This procedure is required should you wish to make use of the USB controller functionality, which is available with version 16 and higher of the Synergy 1 SD software.

There are three main steps:

- Replacing the EEPROM

- Removing the Floppy Disk Drive

- Installing the USB Controller

Important | USB support requires **Synergy Software version 16** or later and a **version 5** or later **Panel CPU Board**. If your switcher does not meet *both* of these requirements, contact Ross Video Technical Support for information on a switcher software and panel upgrade.

Once you begin the upgrade process, ensure that you fully complete each of the steps before returning your switcher to service. You may also find it useful to have the *Synergy 1 Installation* and *Operation Guides* with you while performing the upgrade.

Caution | These procedures should be performed by qualified service personnel only. If you are not familiar with the handling of electronic components, please contact Ross Video Technical Support for assistance in completing the USB controller installation.

Observe all static discharge precautions throughout the installation.

Installation Tip | Your Synergy 1 switcher may have shipped with a **USB Data Cable** pre-installed. If so, you can skip certain steps of the upgrade procedure. Look for tips like this one that describe which steps may be skipped.

Required Materials and Tools

This section lists the materials and tools you require to complete the USB installation. Contact Ross Video Technical Support if you are missing any materials.

You will need the following materials to complete the USB installation:

- one USB Controller Kit (4000K-441A)

- one 50-pin USB Data Cable (4216C-300A-01)

- one Boot EEPROM (4216E-033-01 revision 6 or later)

- one USB key

You will also need the following tools:

- one medium Phillips screwdriver

- PLCC Extraction Tool

Replacing the EEPROM

The first step in the USB controller upgrade is to replace the EEPROM, a process that requires you to:

- Open the switcher panel
- Replace the EEPROM

Opening the Synergy 1 Control Panel

Use the following procedure to open your Synergy 1 control panel:

1. Create a backup of all your Synergy memory registers. Refer to the section "**Storing Memory Registers**" of the *Synergy 1 Operation Guide* for information on saving memory registers to a floppy disk.

2. Power off the switcher panel power supply (if your panel has dual power supplies, make sure that both are turned off). Disconnect the power cable(s) and any other cabling attached to the switcher.

Installation Tip

> You may find it helpful to label the cables as you unplug them to facilitate reattaching them when you have finished the USB controller installation.

3. Tip the panel up so that it is resting on its back. You should see a number of screws on the bottom of the panel.

Caution

> Synergy switcher panels are heavy and contain delicate electronic components. You may need assistance to lift the control panel.
> Be careful not scratch the control panel as you lift it. You may wish to place the control panel on a soft surface before opening it.
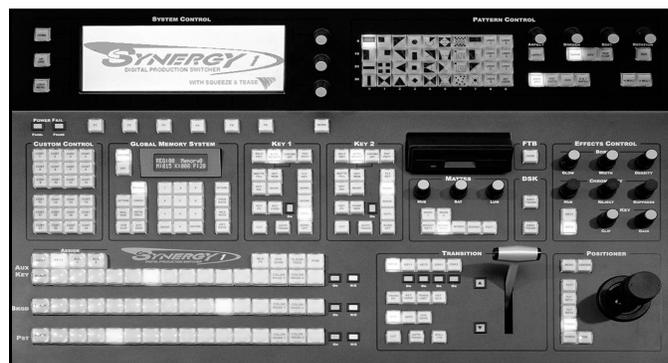
Synergy 1 Switcher

4. Remove all the screws from the panel bottom. Use the figure below for reference.
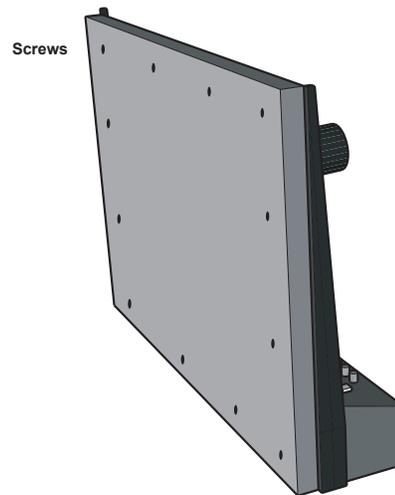
Screws

Removing Screws

5. Open the panel by lowering the top of the panel so that it rests upside down on the table or work surface. Ensure that you provide adequate support so that the panel is not resting on the fader arm or positioner joystick.
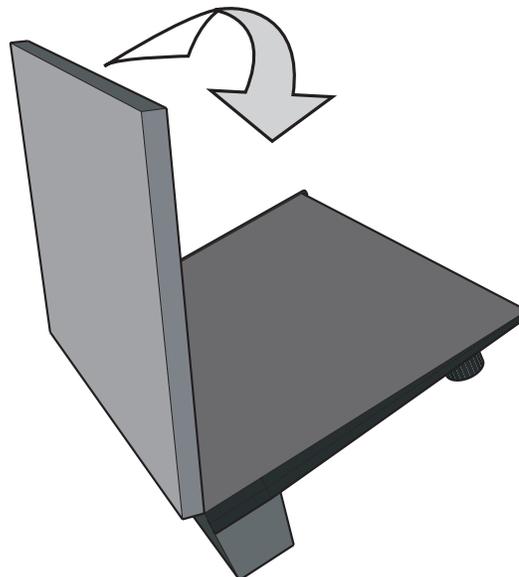
Opened Switcher Panel

Your panel should now look similar to the following photograph. Major components for this procedure are identified to help you orient this photograph with your panel.
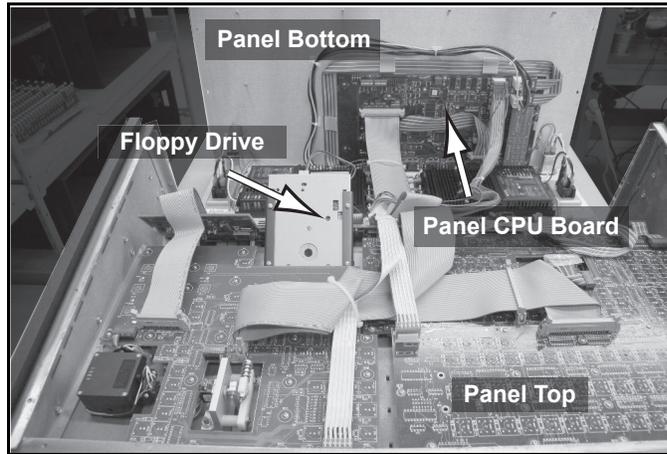
Open Switcher Panel

This completes the procedure for opening the Synergy 1 switcher:

Replacing the EEPROM

The EEPROM that needs to be replaced is located on the **Panel CPU Board** (4216A-033). This board is located on the switcher panel bottom.

Use the following procedure to replace the EEPROM in your Synergy 1 switcher:

Caution | Observe all static discharge precautions throughout the procedure.

1. Locate the EEPROM on the **Panel CPU Board** (4216A-033). It is located near the red reset button and is marked **U61**.
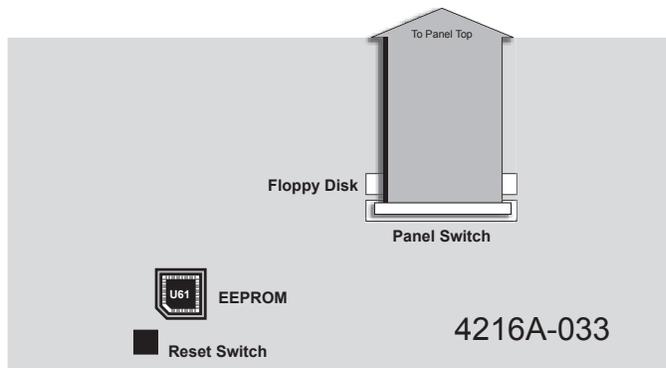
Locating the EEPROM

2. Using your PLCC extraction tool, carefully remove the old EEPROM from its socket.

⚠ **Caution** | Be careful not to damage any of the surrounding electronic components when you remove the EEPROM. If you are not comfortable using the PLCC extraction tool, please contact **Ross Video Technical Support** for assistance in removing the EEPROM.

3. Insert the new EEPROM into the EEPROM socket paying careful attention to polarity. The EEPROM has one corner notched so that it will only fit in the socket in the correct orientation (see diagram below).

⚠ **Caution** | **DO NOT FORCE THE EEPROM INTO THE SOCKET.** If it does not fit easily into the socket, you may be attempting to install it in the wrong orientation. Match the notched corner of the EEPROM with the notched corner of the socket.
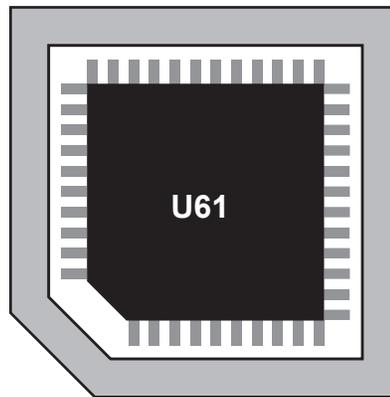
Synergy 1 EEPROM

This completes the procedure for replacing the EEPROM. Next you will remove the floppy disk drive.

Removing the Floppy Disk Drive

The next step in the USB controller upgrade is to remove the floppy disk drive. Removing the floppy disk requires you to:

- Remove the floppy disk drive cabling
- Remove the control cable
- Remove the floppy disk drive

Removing the Floppy Disk Drive Cabling

The floppy disk drive is connected to the **Panel CPU Board** by two cables: a data cable and a power cable. Both cables must be removed.

Use the following procedure to remove the data and power cables:

Caution | Observe all static discharge precautions throughout the procedure.

1. Locate the floppy disk drive and the two cables (data and power).
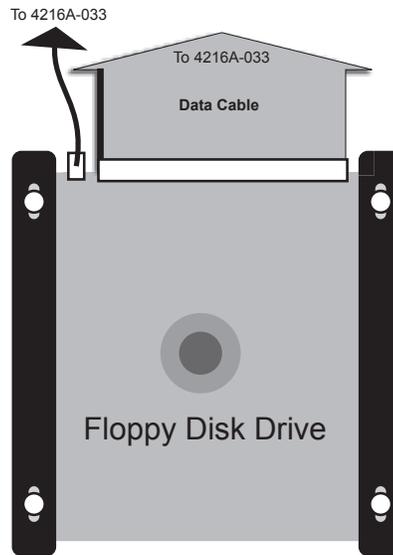
Floppy Disk Drive and Cabling

2. Remove the data cable from the back of the drive by grasping the header and pulling it straight out.

3. Remove the power cable from the back of the drive by grasping the header and pulling it up slightly away from the disk drive base and then straight out.

Operating Tip | The data and power cables fit quite snuggly into their sockets. You may have to wiggle the cable headers from side to side to unseat them.

4. Locate the other end of the floppy disk drive data cable (it is plugged into **Panel CPU Board** (4216A-033)). The socket is labeled **Floppy Disk**.
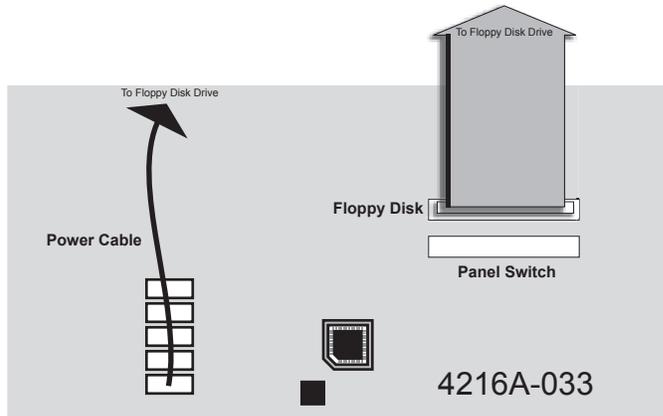
Data Cable Plugged into Panel CPU Board

5. Remove the data cable by unlatching the data cable header from the socket and pulling the header. Also, cut any tie wraps that may be securing the data cable.

⚠️ **Caution** | The latches that hold the data cable are fragile. Be careful when opening and closing them.

6. Locate the other end of the floppy disk drive power cable (it is plugged into **Panel CPU Board** (4216A-033) with all the other power cables. Use the figure "**Data Cable Plugged into Panel CPU Board**" on page 13–9 for reference).

7. Remove the power cable from the **Panel CPU Board** by pulling the power cable header. Also, cut any tie wraps that may be securing the power cable.

This completes the procedure for removing the floppy disk cabling.

Removing the Control Cable

Use the following procedure to remove the control cable:

Caution | Observe all static discharge precautions throughout the procedure.

1. Locate the end of the controller cable that is plugged into the **Panel CPU Board** (4216A-033). It is plugged into the socket labeled **Panel Switch** (see diagram below).
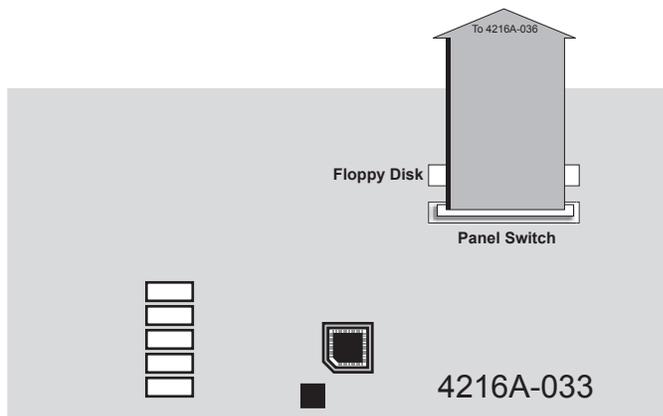
Removing the Controller Cable

2. Remove the controller cable by unlatching the data cable header from the socket and pulling the header.

3. Follow this cable and remove it from the four other sockets it is plugged into. Also, cut any tie wraps that may be securing the cable.

✓	**Installation Tip**	The data, power, and control cables fit quite snuggly into their sockets. You may have to wiggle the cable headers from side to side to unseat them.

This completes the procedure for removing the control cable.

Removing the Floppy Disk Drive

Now that the floppy disk drive cabling has been removed, you can remove the floppy disk drive from its bracket.

Use the following procedure to remove the floppy disk drive:

⚠	**Caution**	Observe all static discharge precautions throughout the procedure.

1. Remove the four screws securing the floppy disk drive to the drive bracket. Ensure that you are holding onto the floppy disk drive when you remove the final screw so that it does not fall out of the bracket and damage any of the switcher components.
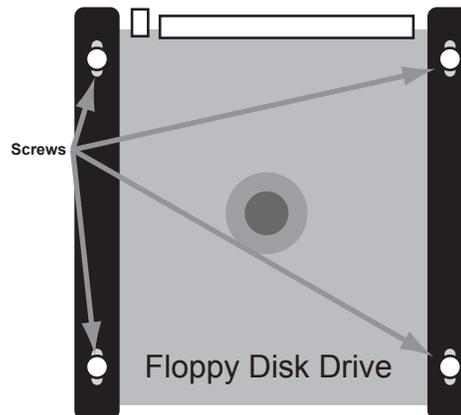
Screws Holding Floppy Disk Drive to Bracket

2. Slide the floppy disk drive out of the bracket to remove it from the switcher.

This completes the procedure for removing the floppy disk drive. Next you will install the USB controller into the Synergy 1 control panel.

Installing the USB Controller

The next step is to install the USB controller. There are three main steps:

• Install the USB controller

• Install the USB data and power cables

• Close the switcher panel

Installing the USB Controller

The USB controller attaches to the bracket that was used to hold the floppy disk drive.

Use the following procedure to install the USB controller:

1. Slide the USB controller into the bracket so that the screw-holes in the USB controller match the screw holes in the bracket.

✓ **Installation Tip**

> The screw holes in the bracket are elongated to allow some play in the controller card installation. Slide the controller card as far as necessary to ensure that its faceplate sits flush with the switcher panel while still maintaining alignment between the screw holes on the controller card and the screw holes on the bracket.

2. Secure the controller card to the bracket with the four provided screws. Before fully tightening the screws, once again check that the USB controller face plate is flush with the front of the switcher panel.
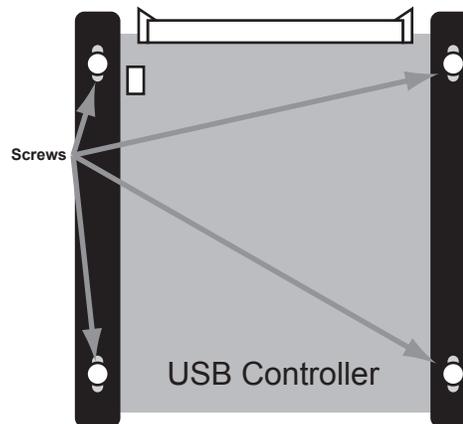
Installed USB Controller

This completes the procedure to install the USB controller.

Installing the USB Controller Cabling

The USB controller is connected to the switcher by two cables: a data cable and a power cable. Use the following procedure and diagram to connect the USB controller Cabling:

Overview

The following diagram is an overview of the USB controller cabling installation. The circled letters in the diagram correspond to the major steps in the installation process. The letters will aid you in referring to the overview diagram during the installation process.

✎ **Note**

> Some boards may have a letter after the first four digits of their label such as **4216A-034**. These boards are referred to throughout this document without the letter (i.e. **4216-034**).

Panel Top

4216A-030

J1

E

F

D

4216A-035

J1

4216A-034

J1

USB Controller

C

B

J1

4216A-036

Power Supply

Power Supply

Panel Bottom

A

Panel Switch

4216A-033
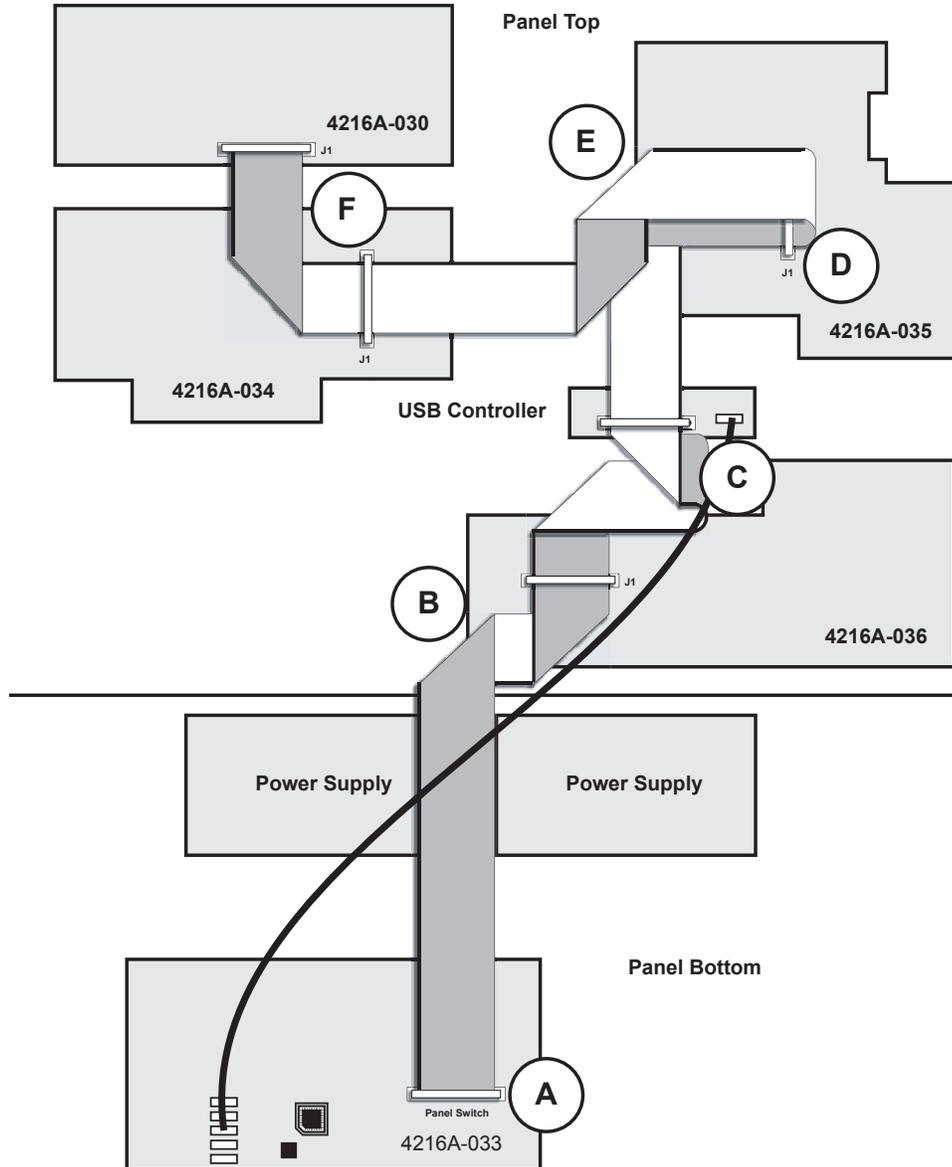
Synergy 1 USB Installation Overview

Installing the USB Data Cable

The USB data cable plugs into the panel boards in five places and the USB controller once. The data cable has six headers spaced along its length and will only reach all the necessary sockets if it is installed correctly. One end of the cable is marked to indicate it is to be installed into the CPU board. Ensure that you start with this end of the data cable.

Notice the red line running the length of the data cable along one edge. This line denotes pin 1 of the cable and is used to verify cable polarity during installation. Keep this in mind when installing the USB data cable.

Use the following procedure to install the USB data cable:

(A) 1. Determine which end of the USB data cable plugs into the **Panel CPU Board** (4216A-033). Plug this end into the **Panel CPU Board** socket labeled **Panel Switch** and secure the latches around the cable header. The socket is located on the **Panel CPU Board** next to the **Floppy Disk** socket.

To 4216A-036

J1

Panel Switch

4216A-033
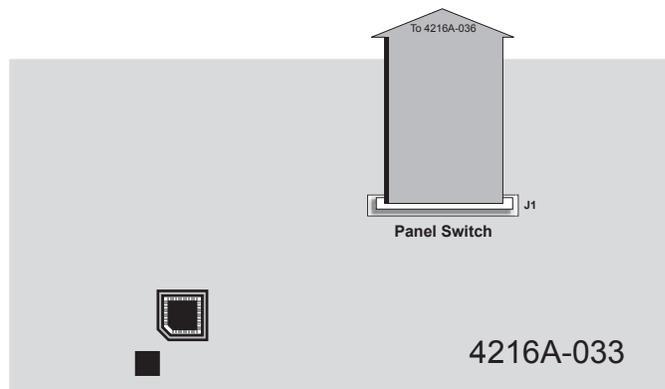
Data Cable Plugged into Panel Switch Socket

⚠ **Caution** | **DO NOT FORCE THE DATA CABLE INTO THE SOCKET.** If it does not fit easily into the socket, you may be attempting to install it in the wrong orientation. Match the notch in the center of the cable header with the notch cutout in the **Panel Switch** socket.

⚠ **Caution** | The latches that hold the data cable are fragile. Be careful when opening and closing them.

(B) 2. Run the cable past the power supply (run the cable between the two power supplies if your switcher has redundant power supplies) to the socket labeled **J1** on **Board 4216A-036**. It is located next to the USB controller.

- The data cable must be folded twice to facilitate easy connection with this socket. Holding the cable vertically, fold it with a twist so that you change its direction by 90 degrees (see diagram below). This first fold should be approximately 2 inches (5 cm) before the header.

- Make a second fold with a twist so that you change the direction of the cable by 90 degrees as shown in the diagram. The cable should now run across socket **J1** and the next data cable header should easily fit into the socket.

- Plug the header into the socket and secure the latches.
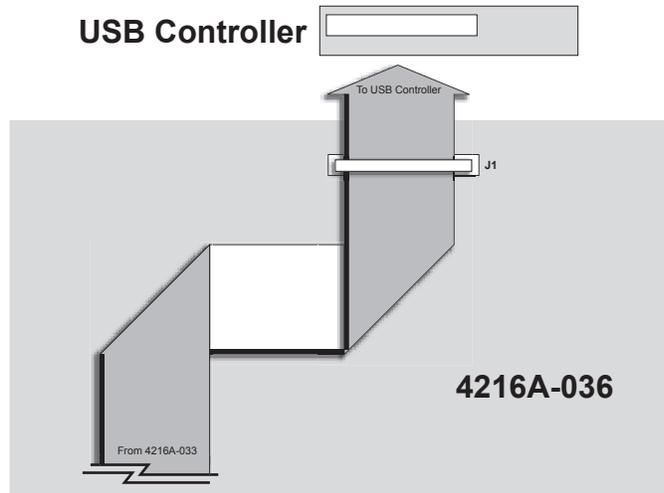
USB Controller

Running the Data Cable to the First Socket

C

3. You must now connect the data cable to the USB controller. However, the socket on the USB controller is reversed from socket **J1** on **Board 4216A-036** so the cable needs to be flipped before plugging into the USB controller.

   • Holding the cable vertically, fold it with a twist so that you change its direction by 90 degrees (see diagram below). Run the cable approximately 1 ½ inches (3 cm) and then fold it back along itself.

   • Immediately make another twisted fold to change the cable's direction by 90 degrees. The cable should now run across the socket in the USB controller. Notice how the red line on the data cable has switched sides, enabling the cable to plug into the USB controller.

   • Plug the next data cable header into the socket on the USB controller and secure the latches.
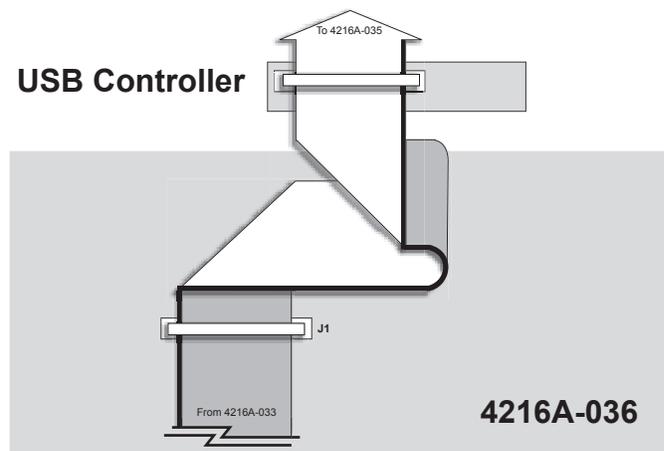
Running the Data Cable to the USB Controller

D

4. Continue running the cable past the USB controller toward the next socket labeled **J1** on **Board 4216A-035**.

   • Make a twisted fold to change the cable's direction by 90 degrees as shown in the diagram below. The cable should now run across socket **J1**.

   • Plug the next data cable header into the socket and secure the latches.

✓ **Installation Tip**

The USB data cable has an extra 3 inches (7.5 cm) of length that you should neatly fold over and wrap here.
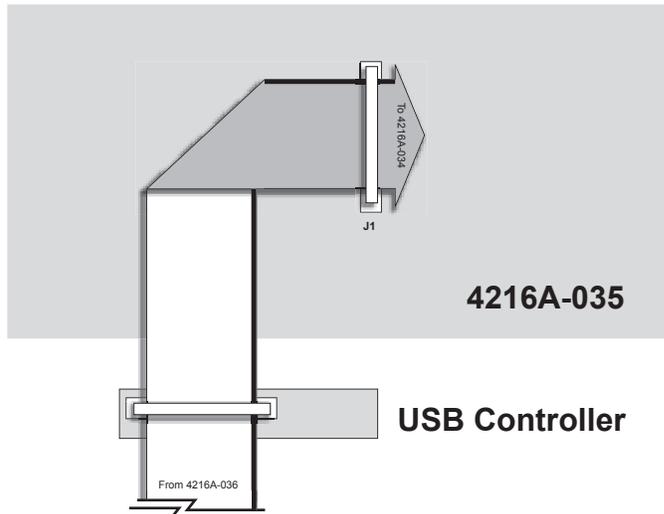
Running the Data Cable to Board 4216A-035

D

5. Immediately fold the data cable back over itself and socket **J1**.
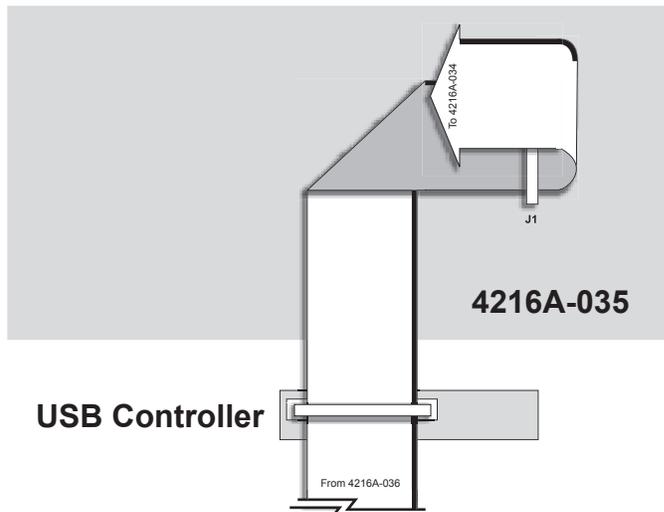
Looping the Data Cable Back toward 4216A-034

E

6. Make a twisted fold to change the cable's direction by 90 degrees as shown below. Immediately, make another twisted fold to change the cables direction by 90 degrees and run it toward socket **J1** on **Board 4216A-034**.

J1

4216A-035

To 4216A-034

USB Controller

From 4216A-036
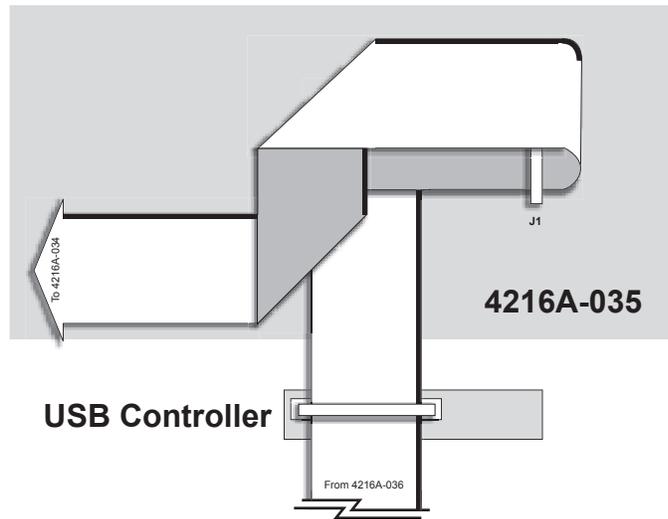
Running the Data Cable to Board 4216A-034

F

7. Run the data cable over socket **J1** on **Board 4216A-034** and plug the next header into it, securing the latches around the header (see diagram below).

4216A-030

J1

From 4216A-035

J1
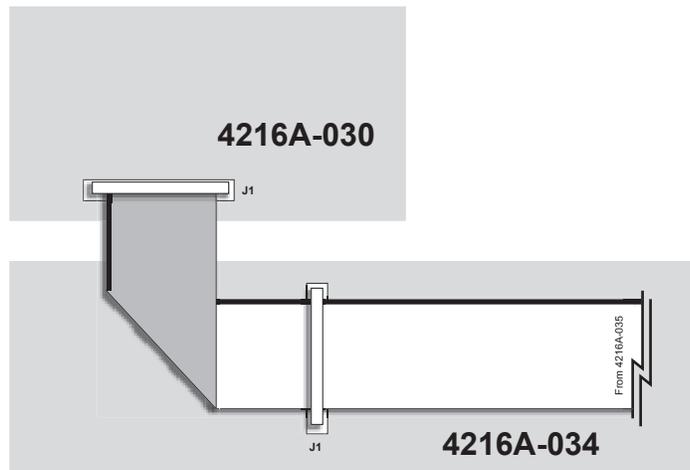
4216A-034

Finishing the Data Cable Installation

8. Make a twisted fold to change the cable's direction by 90 degrees and run the cable toward the final socket labeled **J1** on **Board 4216A-030**.

9. Plug the last cable header into the socket and secure the latches.

This completes the procedure for installing the USB cable.

Installing the USB Controller Power Cable

⚠	**Important**	If you skipped the last section because your switcher had a USB data cable preinstalled, you will have to plug the data cable into the USB controller. Locate the unsecured header on the data cable (it should be near the USB controller) and plug it into the USB controller. Secure the latches around the header.

The USB controller power cable has one header which is smaller than the other. The smaller header plugs into the USB controller while the larger header plugs into the **Panel CPU board**.

Use the following procedure to install the USB controller power cable.

1. Plug the small header of the USB power cable into the USB controller.
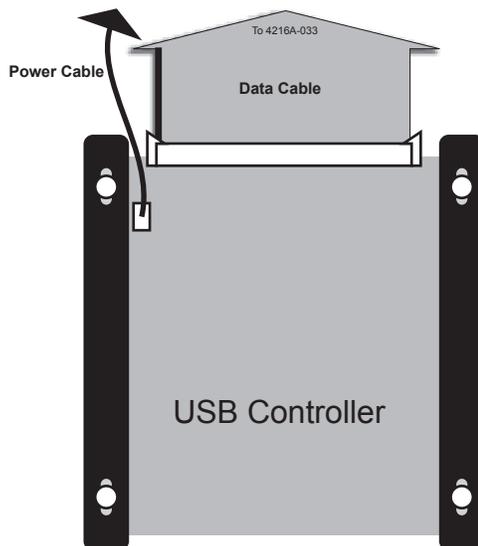
Plugging the USB Power Cord into the USB Controller

2. Plug the other end of the USB power cable into the **Panel CPU Board**. It plugs into the same socket that the floppy disk drive power cable was plugged into.
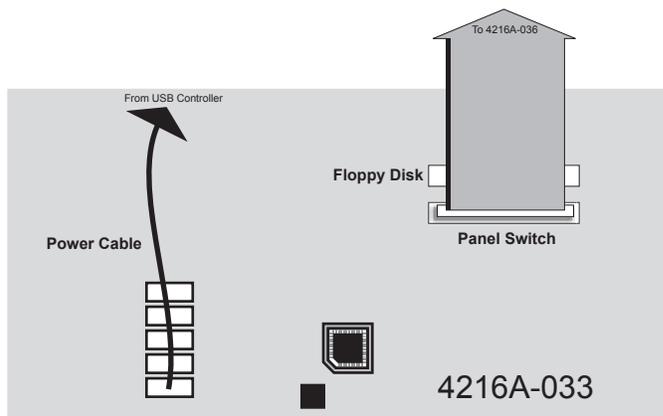
Plugging the USB Power Cord into the CPU Panel

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3. Secure the data and power cables with tie wraps as appropriate to keep them from interfering with any other cables or components.

This completes the procedure for installing the USB controller power cable.

Closing the Synergy 1 Switcher Panel

Use the following procedure to close the Synergy 1 control panel:

1. Raise the panel top up to a vertical position so that it meets the panel bottom.

	Important	Be careful not to pinch any cables as you are raising the panel top. If any cables interfere with the raising of the panel top, secure them safely out of the way with tie wraps.
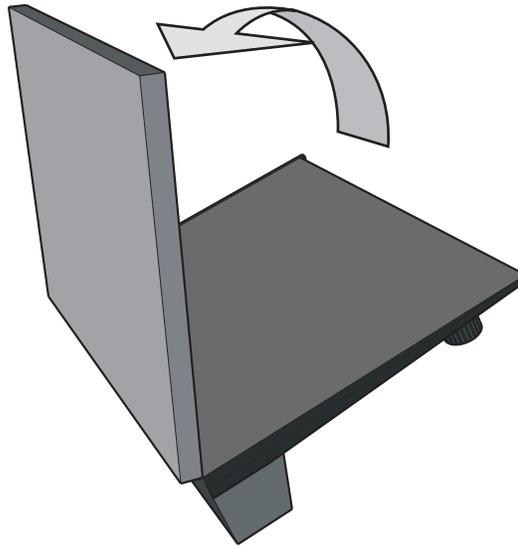
Raising the Panel Top

2. Secure the two halves of the switcher panel together with screws through the panel bottom into the panel top.
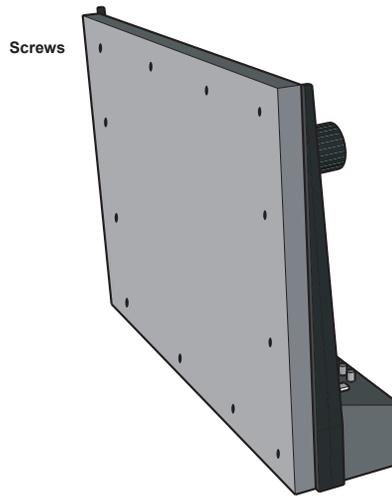
Screws

Securing the Switcher Panel With Screws

3. Lower the switcher panel down onto the table so that it is resting on the panel bottom. If you need to move it back into its original position, do so now.

4. Attach all the cables to the back of the switcher that you removed when you were beginning the USB controller installation. Attach the power cord(s) last.

5. Power on the Synergy 1 control panel. If your switcher has dual power supplies, turn them both on.

6. Follow any on-screen instructions.

This completes the procedure to close the Synergy 1 control panel.

Transferring Files to a USB Key

If you wish to recall any memory registers that you previously saved to floppy disk, you need to transfer them to a USB key via a PC with both a floppy disk drive and a free USB port.

Use the following procedure to copy memory files unto a USB key:

1. With your computer running, insert a USB key into an available USB port. It should appear on your desktop as a removable storage device.

Note	USB keys are accessed in various ways depending on the PC's operating system. Consult your operating system documentation or I.T. department if you are unsure how to access a USB key.

2. Insert the floppy disk containing the Synergy files you wish to copy into the floppy disk drive of the PC.

3. Copy the files from the floppy disk to the root directory of the USB key.

Note	If you are unsure how to copy files, consult your operating system documentation or I.T. department.

4. Ensure that the light on the floppy disk drive is off, then eject the floppy disk.

5. Safely remove the USB key from the USB port.

Important	Failure to safely remove the USB key may result in data-corruption or data-loss. Consult your operating system documentation or I.T. department for instructions on safely removing a USB key.

This completes the procedure for copying Synergy files from a floppy disk to a USB key. You can now use the USB key in your Synergy switcher. Refer to the section "**Working with Storage Devices**" of the *Synergy 1 Operation Guide* for information on using a USB key with the switcher.

This completes the procedure for replacing the Synergy 1 floppy disk drive with a USB controller.

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