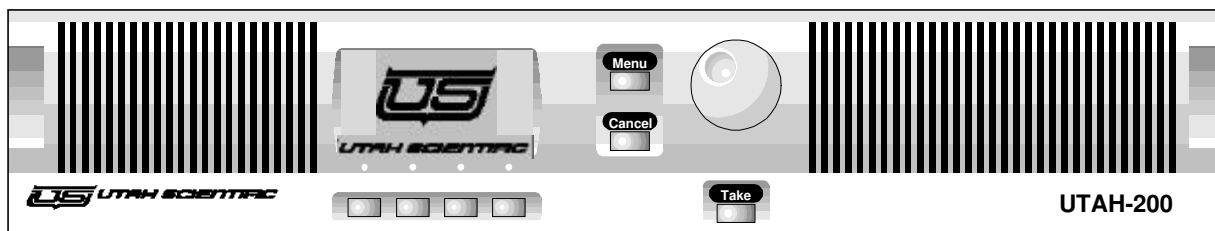**UTAH SCIENTIFIC**

UTAH-200
Compact Routing Switcher

User's Guide

UTAH-200 Compact Routing Switcher • User's Guide

- Document Number: **82101-0045**
- Document Version: 3.10
- Date: January 2001
- Printed in U.S.A.

Copyrights and Trademarks

Notice

FCC Compliance

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. Shielded cables must be used to ensure compliance with the FCC Class A limits.

Declaration of Conformity

Utah Scientific , Inc.
4750 Wiley Post Way
Salt Lake City, Utah 84116-2878   USA

declare our sole responsibility that the UTAH-200 Compact Routing Switcher system is in conformity with the following standards:

- • EN50081-1 Generic Emission Standard
- • EN50082-1 Generic Immunity Standard
- • IEC-950 Product Safety
- • C-UL 1950 Product Safety
- • UL 1950 Product Safety

Following the provisions of the Directive(s) of the Council of the European Union:

- • **EMC Directive 89/336/EED**
- • **Low Voltage Electrical Directive 72/23/EEC**

Utah Scientific , Inc. hereby declares that the product specified above conforms to the above Directive(s) and Standard(s).

$$C\:E$$

Important Safeguards and Notices

This section provides important safety guidelines for both the Operator and Service Personnel. Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, noting especially those instructions related to risk of fire, electric shock or injury to persons.

Safety Symbols

- **Hazardous Voltage** symbol.

- **Caution** symbol: The product is marked with this symbol when it is necessary to refer to the manual to prevent damage to the product.

Warnings

Please observe the following important warnings

- Any instructions in this guide that require opening the chassis, changing a power supply, or removing a board 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.

- Heed all warnings on the unit and in the operating instructions.

- Do not use this product in or near water. Disconnect AC power before installing any options or servicing the unit unless instructed to do so by this manual.

- This product is grounded through the power cord grounding conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product inputs or outputs.

- Route power cords and other cables so that they are not likely to be damaged. Disconnect power before cleaning. Do not use liquid or aerosol cleaners; use only a damp cloth.

- Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on. Do not insert anything into either of the system's two power supply cavities with power connected.

- Do not wear hand jewelry or watches when troubleshooting high current circuits, such as the power supplies. During installation, do not use the door handles or front panels to lift the equipment as they may open abruptly and injure you.

- To avoid fire hazard, use only the specified correct type, voltage and current rating as referenced in the appropriate parts list for this product. Always refer fuse replacement to qualified service personnel.

- Have qualified personnel perform safety checks after any service.

Cautions

Please observe the following important cautions:

- When installing this equipment, do not attach the power cord to building surfaces. To prevent damage when replacing fuses, locate and correct the trouble that caused the fuse to blow before applying power.

  - ~ In Chapter 2, refer to the "**Checking and Replacing Fuses**" section for details on chassis fuses.

  - ~ In Appendix B, refer to the sections on each individual module for details on board-level fuses.

- Use only specified replacement parts. Follow static precautions at all times when handling this equipment.

- Slots and openings in the chassis are provided for ventilation. *Do not block them.* Leave the back of the frame clear for air exhaust cooling and to allow room for cabling — a minimum of 6 inches (15.25 cm) of clearance is recommended.

Notices

Please observe the following important notes:

- When the adjacent symbol is indicated on the chassis, please refer to the manual for additional information.

- For the UTAH-200 chassis, refer to the "**Connecting and Disconnecting Power**" section in Chapter 2 for important information regarding the chassis power connector.

Company Information

4750 Wiley Post Way
Salt Lake City, Utah 84116-2878 USA

- **Telephone**:   +1 (801) 575-8801
- **Fax**:   +1 (801) 537-3098
- **Customer Support (Voice)**:   +1 (800) 447-7204
- **Customer Support (Fax)**:   +1 (801) 537-3009
- **E-mail (General Info)**:   info@utsci.com
- **E-mail (Customer Support)**:   service@utsci.com
- **World Wide Web:**   http://www.UtahScientific.com
- **After hours emergency**:   +1 (800) 447-7204, follow menu
                                          instructions for emergency service

Contents

Installing the RMS-200   3-1

System Configuration   4-1

Operations   5-1

Appendix A. Troubleshooting   6-1

Appendix B. Hardware Specifics   7-1

Appendix C. Specifications   8-1

Index

Introduction

In This Guide

This guide provides instructions for installing, configuring and operating the UTAH-200 compact routing switcher. The following chapters and appendices are included:

- Chapter 1, "**Introduction**" summarizes the guide and describes the hardware and software components of the system.

- Chapter 2, "**Hardware Installation**" provides instructions for installing the UTAH-200 in your facility.

- Chapter 3, "**Installing the RMS-200**" outlines steps for installing the Windows®-based RMS-200 application.

- Chapter 4, "**System Configuration**" provides instruction for using the RMS-200 application to create custom source, destination, and signal level names.

- Chapter 5, "**Operations**" provides detailed instructions for operating the system from a control panel.

- Appendix A, "**Troubleshooting**" provides troubleshooting tables to assist with solving typical system hardware and software problems.

- Appendix B, "**Hardware Specifics**" provides technical details (such as jumper information) for each available signal level.

- Appendix C, "**Specifications**" lists all system audio, video, control, physical, power, and regulatory specifications.

- Appendix D, "**Remote Diagnostics**" provides important information about remote system diagnosis.

An index is also provided for your reference.

How To Use This Guide

The chapters in this guide follow a logical sequence, from introduction through operations:

- Read *this chapter* (Chapter 1, "**Introduction**") to familiarize yourself with the product and all of its components.

- Follow the instructions in Chapter 2, "**Hardware Installation**" to install your system hardware — including all frames, control panels, signal levels, and inter-system communications.

- Follow the steps in Chapter 3, "**Installing the RMS-200**" to install the RMS-200 (Router Management System) and establish communications with the router.

- Follow the steps in Chapter 4, "**System Configuration**" to create custom source, destination, and signal level names.

- Read Chapter 5, "**Operations**" to learn how to operate the UTAH-200 from any control panel.

- Use the appendices for reference, when you need additional information about troubleshooting, hardware, system specifications, and diagnostics.

Once you're familiar with the product, start with the Index when you need assistance on a specific subject.

On-Line Help

The RMS-200 application includes an on-line help file and tool-tip help fields. The on-line help file provides the entire contents of the UTAH-200 User's Guide, plus a complete index.

- **On-line Help**

  In the **Menu Bar**, click **Help**, then **Contents** to display the help file's table of contents. In the **Help Window**, you can also click the **Search** button for a complete index of UTAH-200 and RMS-200 topics.

- **Tool-tip Help**

  Many buttons and displays in the RMS-200 application have tool-tip help fields. To use this feature, simply move the cursor over a field and pause for a second to display the help field.

Conventions

The following conventions are used throughout this guide:

- In the Windows-based RMS-200 application, buttons and tabs *on screen* are indicated in bold-faced upper and lower case text, using a sans-serif font. For example:

  ... click the **Install** button and follow the prompts ...

- In the RMS-200, windows and dialogs *on screen* are indicated in bold-faced upper and lower case text. For example:

  ... the **Connections Dialog** appears, signifying that ...

- Buttons, knobs and connectors on the UTAH-200's control panel and frame are indicated in bold-faced upper and lower case text, using a sans-serif font. For example:

  Press **Take** to perform ...
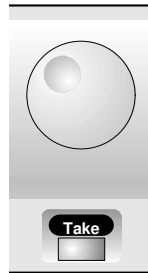
- On the UTAH-200's **LCD Display**, labels and commands are indicated in bold-faced upper and lower case text, using a sans-serif font. For example:

  Press **PRE** to pre-select the ...
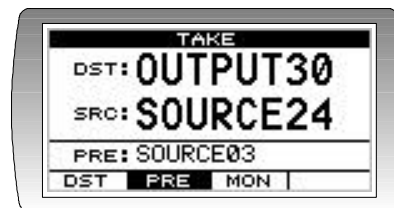
Abbreviations

The following abbreviations are used throughout this guide:

Abbreviations

Abbreviation	Description
ATR	Audio Tape Recorder
CPU	Central Processing Unit
DIP	Dual Inline Package
DTR	Digital Tape Recorder
I/O	Input/Output
IP	Internet Protocol
MX Bus	UTAH router control communications bus
RMS	Router Management System
RU	Rack Unit
U-Net	UTAH control panel communications network
UTP	Unshielded Twisted Pair
VTR	Video Tape Recorder

Terms

The following documentation terms are used throughout this guide:

- "**Operator**" and "**User**" refer to the person using or operating the UTAH-200 routing switcher.

- "**System**" refers to all interconnected UTAH-200 routing switcher components, including electronics frames, control panel(s), and the RMS-200.

- "**Router**" is short for routing switcher.

- "**Frame**" refers to a single UTAH-200 electronics chassis, configured as an audio-only, video-only, or audio/video routing switcher matrix.

- "**Main Frame**" refers to the *one frame* in a UTAH-200 system that contains the CPU (controller) board. The main frame also contains one (or more) signal levels.

- "**Auxiliary Frame**" refers to one (or more) additional frames in a system that *do not* contain a CPU board. All auxiliary frames are connected to the main frame via the MX Bus, and are controlled exclusively by the main frame.

- "**Input**" refers to an audio or video signal that is connected to a UTAH-200 frame. Input also refers to the physical input connectors on the UTAH-200 frame.

  - One video input represents a single output from an analog or digital video source.
  - One analog audio input represents a *single* monophonic track from an *analog* audio source.
  - One digital audio input represents *two* tracks (left and right) from a *digital* audio source.

- "**Source**" refers to an audio/video device whose output signals are connected to one or more UTAH-200 inputs. Examples of audio/video sources are the output signals originating from ATRs, VTRs, DTRs, cameras, video production switchers, audio mixers, graphics systems, and satellite feeds.

- "**Output**" refers to an audio or video signal that is connected *from* the UTAH-200 frame to a destination device. Output also refers to the physical output connectors on the frame.

- "**Destination**" refers to an audio/video device that receives one or more signals from the UTAH-200. Examples of audio/video destinations are the inputs of ATRs, VTRs, DTRs, video production switchers, additional routing switchers, audio mixers, graphics systems, and satellite feeds.

- "**Signal Level**" refers to the specific type of audio/video element that a frame is capable of routing. The UTAH-200 system can switch up to eight signal levels, which can be any combination of the following:

  - ~ Digital Video
  - ~ Digital Audio
  - ~ Analog Video (Composite or Component)
  - ~ Analog Audio (Left and Right)

  Refer to the "**System Configurations**" section for examples of the types of signal level combinations that a frame can route.

- "**Hot Swappable**" refers to an electronics board that can be removed from the chassis (or installed in the chassis) while system power is on.

- "**Control Panel**" refers to current (and future) physical human interfaces that are used for system input/output routing assignments. Specifically for *this* user's guide, the UTAH-200 control panel is a 2-RU unit with integral LCD display, soft keys, and scroll knob. Up to 32 control panels can be connected to a UTAH-200 main frame via U-Net.

- "**Display**" refers to the control panel's integral LCD display.

- "**Highlight**" refers to a button (or *label*) on the display whose function has been activated or selected. The highlighted label is shown in reverse-video characters, as illustrated below:

Highlighted ——— ——— Normal
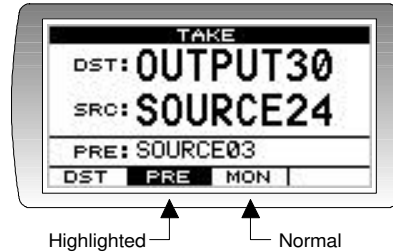
- "**Lock**" refers to a special condition whereby a source-to-destination routing *cannot* be changed by any user, but *can* be unlocked by *any user* from a control panel (or cleared from the RMS-200).

- "**Protect**" refers to a special condition whereby a source-to-destination routing can *only* be changed by the user at the originating panel (the panel on which the protect was entered). Similar to Locks, a protect can also be unlocked by *any user* from a control panel (or cleared from the RMS-200).

Company Information

Utah Scientific Video Systems, Inc.

4750 Wiley Post Way

Salt Lake City, Utah 84116-2878   USA

•	**Telephone**:	+1 (801) 575-8801
•	**Fax**:	+1 (801) 537-3098
•	**Customer Support (Voice)**:	+1 (800) 447-7204
•	**Customer Support (Fax)**:	+1 (801) 537-3009
•	**E-mail (General Info)**:	info@utsci.com
•	**E-mail (Customer Support)**:	service@utsci.com
•	**World Wide Web:**	http://www.UtahScientific.com
•	**After hours emergency**:	+1 (800) 447-7204, follow menu instructions for emergency service

Routing Switcher Basics

A routing switcher is a specialized form of broadcast switcher that allows you to connect large numbers of source and destination devices together electronically — without patching, without running cables across the floor, and without losing signal quality.

In any type of facility, whether it's broadcast, industrial, or consumer, a routing switcher solves problems and reduces connectivity errors. Instead of running audio and video cables inefficiently throughout your facility (and re-running them each time a routing requirement changes), you simply connect all the "ins" and "outs" from each device to the routing switcher. From that point forward, all equipment interconnections are performed electronically— at the routing switcher's control panel — rather than at each device's rear panel.

Please note the following important points about routing switchers in general:

- Routing switchers can switch many signal levels simultaneously — up to eight in the case of the UTAH-200. For example:

    - A simple route connects *one signal level* from one source device (such as a VTR) to *one destination* device (such as a video monitor).

    - A complex route connects *multiple signal levels* from one source device (such as a satellite feed) to *multiple destinations* (such as a group of VTRs and monitors).

- Audio and video signal levels can be switched individually or in groups. Any input can be switched to any output (or group of outputs).

- You can switch in an "all-follow" mode (where a source's audio and video switch together), or in a "breakaway" mode (where audio is taken from one source and video from another).

- Routing switchers can be switched manually from a control panel, or automatically via computer control.

Switching Matrix

A switching matrix is the internal array of inputs, outputs and crosspoints that allows a routing switcher to perform the task of moving signals from sources to destinations. The figure below illustrates a simple 10x10 switching matrix — with 10 inputs and 10 outputs.
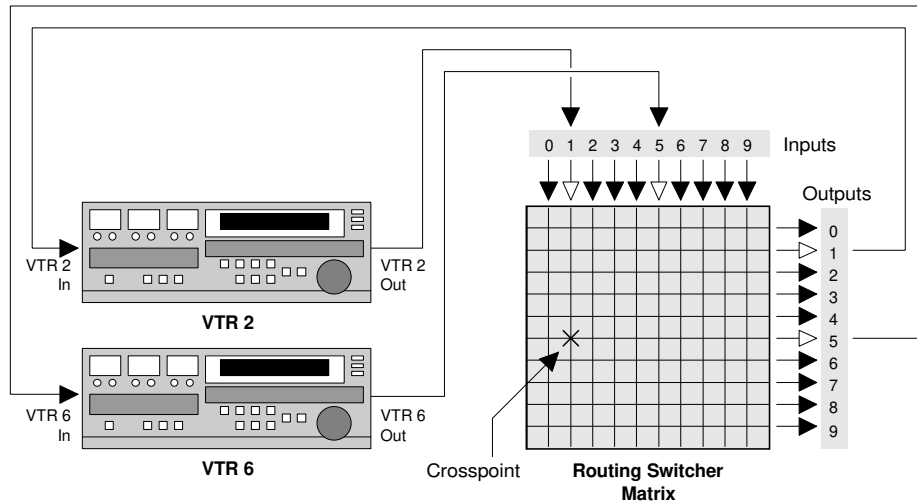
Note the following points regarding the illustration:

- Each VTR is fully-connected to the matrix — all audio/video inputs and all audio/video outputs.

- A crosspoint (represented by an **X**) is the internal intersection of an input and an output — either audio or video. When a crosspoint is turned on, a connection is made between a selected source and one (or more) destinations. The act of turning a crosspoint on or off is known as a **Take**.

- When an *entire* audio/video array is connected in this manner, from all devices in your facility, you have full routing flexibility. Without re-patching or running new cables, a device can play back one moment (as a source), and record the next moment (as a destination).

- Even though the matrix size shown above is 10x10, in the UTAH-200 you can configure two different matrices: 16x16 and 32x32.

Signal Levels

A "signal level" represents one of many specific types of audio or video elements that a routing switcher is capable of handling. The UTAH-200 can switch up to *eight* signal levels, which can be any combination of the following:

- Digital Video
- Digital Audio
- Analog Video
- Analog Audio (Left and Right)

Some systems can be configured with one signal level, while others can be configured with multiple signal levels.

While the diagram in the previous section shows only *one* signal level, a multi-signal level system is capable of routing any combination of the eight levels — each with its own matrix and crosspoints. The figure below illustrates a multi-signal level 10x10 system.
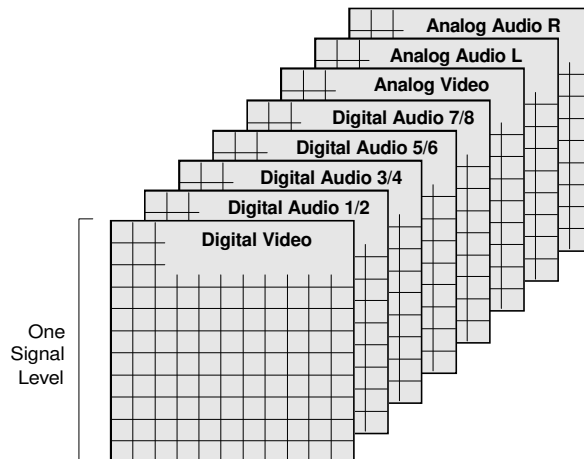
In addition, the size of the various matrices need not be consistent throughout the routing switcher. For example:

- A symmetrical matrix might have 32x32 digital video and digital audio.
- A non-symmetrical matrix might have 32x32 digital video, but only 16x16 analog audio.

Although the concept of a full multi-signal level 32x32 system (with its thousands of crosspoints) may seem complicated, the beauty of the system is its operational *simplicity*. As a user, you need only think about **sources** and **destinations**. You can perform all operations at the UTAH-200's display — with ease and convenience, without ever thinking about the underlying concepts, matrices, and electronics.

Introducing the UTAH-200

The UTAH-200 is a powerful and compact routing switcher system designed to meet the needs of users who require flexible control, multi-format routing and expansion capability. Using a small and cost-effective package, the UTAH-200 is well-suited for small matrix routing requirements, master control routing or as an ideal "migration" router that easily adapts as a facility migrates to digital.

The UTAH-200 offers the following advantages:

- Analog and digital signal levels can be mixed or matched in a single frame without restriction.

- Each frame is small and self-contained, including power, communications, and crosspoint matrices.

- Each "**Main Frame**" includes an integrated control system, with full redundancy available. In the event of a failure, the system automatically switches to the "standby" control card. Additional control-specific frames are not required.

- Each frame's power supply is internal, with full redundancy available in audio-only or video-only configurations. Additional power supply frames are not required.

- The system's power supplies, CPU board, and crosspoint matrix boards are hot-swappable.

- Each system can be switched between 525 (NTSC) and 625 (PAL) using jumper **JP1** on the **Controller Board**. Refer to Appendix B, "**Hardware Specifics**" for details.

- For added flexibility in all applications, each system operates on either 117/234 Volts AC or -48 Volts DC.

- Each frame has an integral SMPTE alarm system which monitors vital components such as temperature, power supply voltage and fan integrity. If a failure occurs, a relay-closure can trigger a facility alarm.

- Operations are performed through a simple UTAH-200 control panel with integral LCD display, soft keys, and scroll knob.

- System setup and configuration is performed with the Windows-based RMS-200 application. This application (which runs on Windows 95 and NT) allows you to create custom source, destination, and signal level names.

- The UTAH-200 system can operate in conjunction with (and can be controlled by) other Utah Scienific routers and peripherals using the SC-2 and SC-3 control systems. Refer to the *SC-2* and *SC-3 User's Guides* for complete details.

- In addition to unrestricted flexibility in routing audio and video between (up to) 32 sources and 32 destinations, the system also offers extensive "Breakaway" functionality. This feature allows you, for example, to take video from a primary source and audio from a secondary source. Any of the available signal levels can be broken away to suit your precise routing needs.

- An optional monitor matrix can be installed for each signal level, allowing you to conveniently monitor each signal level's multiple outputs — without affecting the actual destinations.

- The system's **Digital Audio Board** is available in two versions:

  ~ The **Asynchronous** version accepts AES/EBU digital audio signals that are arbitrary in sampling rate, up to a maximum of 100 kHz. Switching is synchronized to the vertical interval of the system's video reference signal, but *not* to an audio reference.

  ~ The **Synchronous** version requires that *all* input sources are synchronized to a common reference frequency. The board accepts a default AES/EBU reference of 48 kHz, or the board can be factory configured for 44.1 kHz. The sample rate and frame synchronization pulses are extracted from the chosen reference.

  For additional information on the **Digital Audio Board**, refer to the "**Digital Audio Backplane**" section in this chapter, and the "**Digital Audio Board**" section in Appendix B.

- Three **Video Equalization** options are available for the system's **Analog Video Board**. The following lengths of cable can be equalized:

  ~ 100 ft.
  ~ 150 ft.
  ~ 200 ft.

  Each equalizer is a small *passive* unit that connects to the **Analog Video Backplane**, and each unit is capable of equalizing four adjacent input or output channels. All connectors are standard BNCs.

Note

> A new **Analog Video Board** *may* be required, as the installation procedure requires the setting of specific gain compensation jumpers. Please contact **Customer Support** for details.

For additional information and installation instructions for the **Video Equalization** option, refer to the "**Video Equalization Option**" section in Appendix B.

System Configurations

As a foundation building block, the UTAH-200 utilizes a 16x16 crosspoint matrix. By installing two 16x16 matrices, you can expand a signal level to 32x32. The keyword is simplicity, with all facets of the product — installation, configuration, operation, and expansion.

The UTAH-200 system is modular, with the ability to interconnect frames for easy expansion. Each frame consists of one 2-RU chassis that includes bays for crosspoint matrices, CPU boards, and power supplies.

Refer to the "**Sample Configurations**" section below for examples of the types of signal level combinations that a frame can route.

Note

> Only one Main Frame (with CPU controller board) is required per system, although the Main Frame may be equipped with an optional redundant controller board.

Sample Configurations

Several sample UTAH-200 configurations are illustrated below. Each configuration includes a single CPU board and dual power supplies.

- **32x32 Digital Video**

    Bay 1: 16x16 digital video
    Bay 2: 16x16 digital video
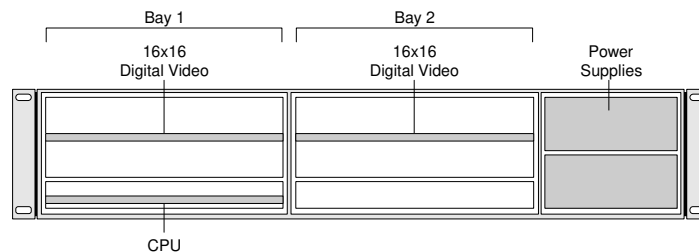
In this single-frame configuration, a video backplane is installed on the rear of Bay 1 (with input/output connector numbers **0** to **15**), and a second video backplane is installed on the rear of Bay 2 (with input/output connector numbers **16** to **31**).

- **32x32 Stereo Analog Audio**

    Bay 1, **Slot 1**: 16x16 Analog Audio (Ch. 1)
    Bay 1, **Slot 2**: 16x16 Analog Audio (Ch. 1)
    Bay 2, **Slot 1**: 16x16 Analog Audio (Ch. 2)
    Bay 2, **Slot 2**: 16x16 Analog Audio (Ch. 2)
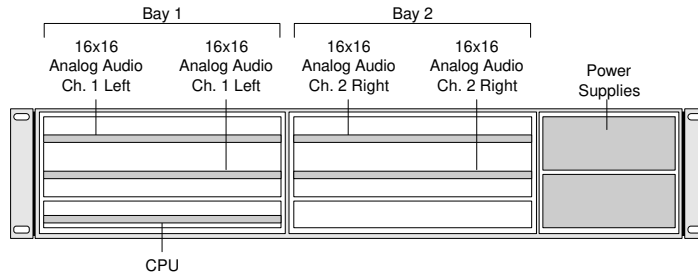
In this configuration, an audio backplane is installed on the rear of Bay 1 (with connectors for 32 inputs and outputs), and a second audio backplane is installed on the rear of Bay 2 (with connectors for 32 inputs and outputs).

- **16x16 Digital Video, 16x16 Stereo Analog Audio**

    Bay 1: 16x16 digital video
    Bay 2, **Slot 1**: 16x16 Analog Audio (Ch. 1)
    Bay 2, **Slot 2**: 16x16 Analog Audio (Ch. 2)
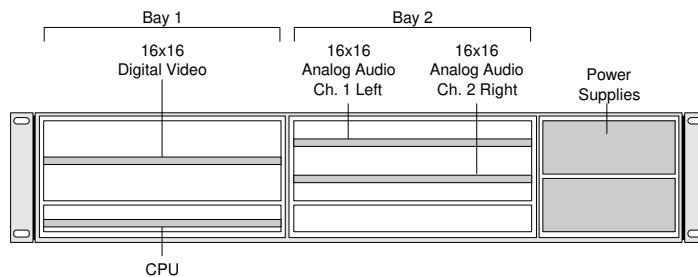
In this single-frame configuration, a video backplane is installed on the rear of Bay 1 (with input/output connector numbers **0** to **15**), and an audio backplane is installed on the rear of Bay 2 (with connectors for 32 inputs and outputs).

Note

In the above configuration, one power supply is used for the video, and a *different supply* is used for the audio. The configuration can not support redundant power supplies. Either supply, however, can be installed in either position.

- **16x16 Digital Video**

> **Bay 1**: 16x16 digital video
> **Bay 2**: open
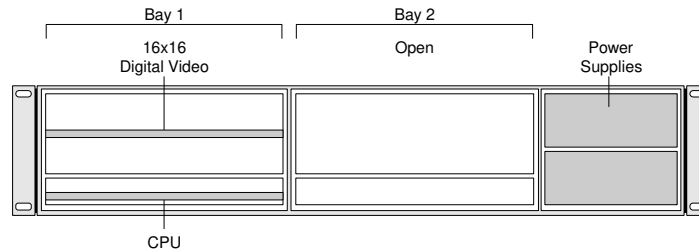
In this single-frame configuration, a video backplane is installed on the rear of Bay 1 (with input/output connector numbers **0** to **15**), and a second video backplane is installed on the rear of Bay 2 (with input/output connector numbers **16** to **31**). This chassis is thus factory-configured for a field upgrade to 32x32 Digital Video.

- **16x16 Stereo Analog Audio**

> **Bay 1**, **Slot 1**: 16x16 Analog Audio (Ch. 1)
> **Bay 1**, **Slot 2**: 16x16 Analog Audio (Ch. 2)
> **Bay 2**: open
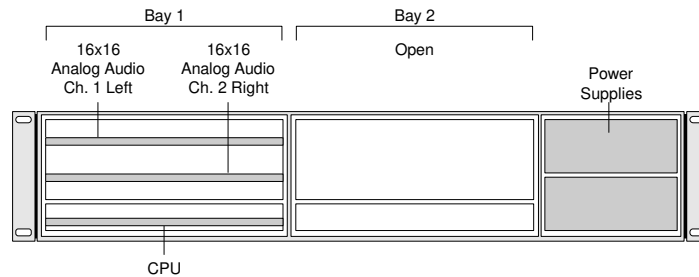
In this single-frame configuration, an audio backplane is installed on the rear of Bay 1 (with connectors for 32 inputs and outputs), and a second audio backplane is installed on the rear of Bay 2 (with connectors for 32 inputs and outputs).

This chassis is thus factory-configured for a field upgrade to 32x32 Stereo Analog Audio.

- **32x32 Digital Video, 32x32 Stereo Analog Audio**

  Frame 1, **Bay 1**: 16x16 digital video
  Frame 1, **Bay 2**: 16x16 digital video
  Frame 2, **Bay 1**, **Slot 1**: 16x16 Analog Audio (Ch. 1)
  Frame 2, **Bay 1**, **Slot 2**: 16x16 Analog Audio (Ch. 1)
  Frame 2, **Bay 2**, **Slot 1**: 16x16 Analog Audio (Ch. 2)
  Frame 2, **Bay 2**, **Slot 2**: 16x16 Analog Audio (Ch. 2)
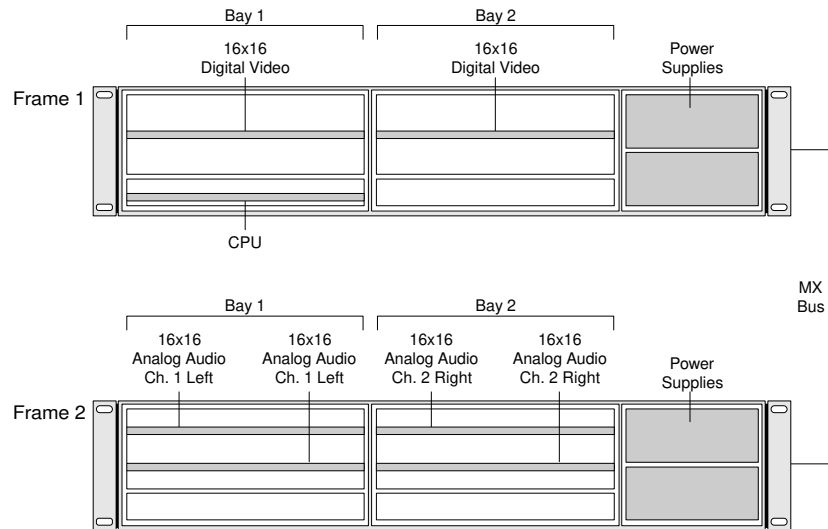
In this multi-frame configuration:

~ Frame 1 includes a video backplane installed on the rear of Bay 1 (with input/output connector numbers **0** to **15**), and a second video backplane is installed on the rear of Bay 2 (with input/output connector numbers **16** to **31**). Frame 1 is connected to Frame 2 via the MX Bus.

~ Frame 2 includes an audio backplane installed on the rear of Bay 1 (with connectors for 32 inputs and outputs), and a second audio backplane is installed on the rear of Bay 2 (with connectors for 32 inputs and outputs). Frame 2 does *not* include a CPU board.

Control Panel

The figure below illustrates the UTAH-200's control panel, which is designed for simplicity and ease of operation.

- When used locally, the panel snaps onto the front of the Main Frame, with a simple ribbon-cable connection between the two. The ribbon cable provides power and U-Net communications.

- When used in a remote configuration, the standalone panel is rack-mountable. Power is provided from an external supply, and U-Net communications are provided via U-Net cable.
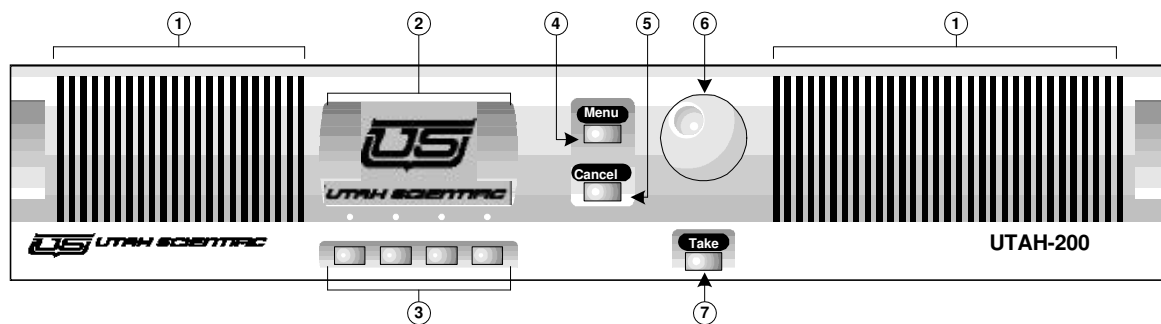
1)	Air Vents	4)	Menu Button	7)	Take Button
2)	Display	5)	Cancel Button		
3)	Soft Keys	6)	Scroll Knob		

1) **Air Vents**

   The vertical grilles on each side of the control panel are intakes for the frame's air flow. To ensure proper internal temperature, do not obstruct the dual air vents.

2) **Display**

   The LCD display provides clear indications of all system operating modes and routing options (such as source, destination, and breakaway choices). Labels (or *menu options*) that appear on the display's bottom row are activated by pressing the corresponding Soft Key below the display. The labels *change* depending upon the selected mode of operation.

3) **Soft Keys**

   The four Soft Keys correspond to labels that appear on the display. Pressing a Soft Key *highlights* the corresponding label, and activates the selected function.

4) **Menu Button**

   Press **Menu** to return the display to either "**Main Menu 1**" or "**Main Menu 2**" — the one *last selected*. The button is always backlit.

5) **Cancel Button**

   Press **Cancel** to halt a procedure in progress. The **Cancel** button is always backlit. Refer to the "**User Interface**" section in Chapter 5 for additional rules regarding **Cancel**.

6) **Scroll Knob**

   Depending on the selected mode, the **Scroll Knob** allows you to move through lists of choices on the display — such as sources, destinations and system options.

7) **Take Button**

   Press **Take** to accept (and activate) any *pending* audio/video routing assignment. The **Take** button flashes *only* when an assignment is pending. Once the button is pressed, the flashing stops and the lamp is off.

Note the following important points regarding the control panel:

- A system's Main Frame may or may not have a control panel mounted on the front of the frame — depending upon your specific installation. If a control panel is *not* mounted on the front, a blank panel is installed. Refer to the "**Blank Panel**" section for an illustration.

- Using U-Net, up to 32 control panels can be connected (in daisy-chain fashion) to a system's Main Frame. This allows you to place individual control panels throughout your facility as required, to meet specific routing needs. For example:

  – One or more control panels can be placed in the machine room or transmission room for specific production and transmission routing requirements.

  – A control panel can be placed in each edit suite, allowing the editor to route audio and video between playback and record devices.

  – For installations with large audio/video showrooms, a control panel in each demonstration suite allows any staff-member to route signals between receivers, CD players, tape players, and speaker systems with ease.

- When control panels are daisy-chained together, the *total length* of the entire cable run can not exceed 1000 feet.

Rear Control Panel

In terms of rear connectors, there are two types of control panels — one used *locally* (on the front of the Main Frame), and those used in *standalone* configurations (away from the Main Frame).

- **Local Control Panel**

  The figure below shows the rear connector layout of a *local* control panel.
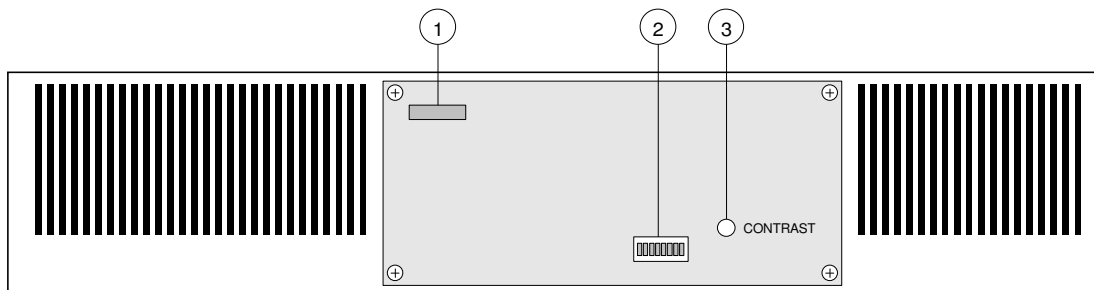
1) **U-Net/Power Connector**

   This connector is a 16-pin header that accepts power and U-Net communications from the Main Frame (via ribbon cable). Refer to Appendix B "**Hardware Specifics**" for connector pinout details.

2) **DIP Switch**

   Use the **DIP Switch** to set the control panel's unique ID number. In Chapter 2, refer to the "**Setting Control Panel ID Switches**" section for instructions.

3) **Contrast**

   Use the **Contrast** control to adjust the display's contrast.

Note

> The rear of the **Local Control Panel** includes a protective cover (not shown above) that shields the panel's circuitry. If you need to adjust the **DIP Switch** or the **Contrast** control, remove the protective cover — and be sure to replace it when all adjustments are complete.

• **Standalone Control Panel**

The figure below illustrates the rear layout of a *standalone* control panel.
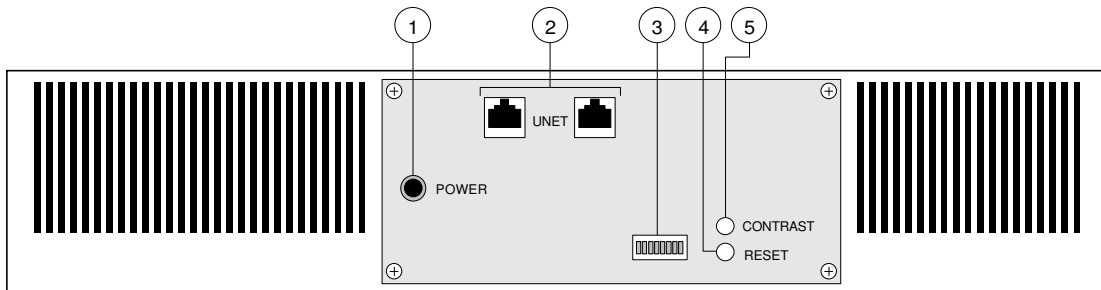
1) **Power Connector**

   The **Power** connector connects to the (supplied) external universal power supply.

2) **U-Net Connectors**

   The two **U-Net** connectors (RJ-45) are used for control panel communications.

   ~   One of the two **U-Net** ports (either one can be used) connects via U-Net cable to the Main Frame's **U-Net** port — or to the *previous* standalone control panel in your system.

   ~   The remaining **U-Net** port connects to the *next* standalone control panel in your system — or is terminated with a special **U-Net Terminator** plug.

   Refer to the "**Master Control Block Connectors**" section for additional information about U-Net.

3) **DIP Switch**

   Use the **DIP Switch** to set the control panel's unique ID number. In Chapter 2, refer to the "**Setting Control Panel ID Switches**" section for instructions.

4) **Reset**

   Press the **Reset** switch to reset the control panel's CPU.

5) **Contrast**

   Use the **Contrast** control to adjust the contrast of the LCD display.

Blank Panel

There are two situations in which blank panels would be installed on
UTAH-200 frames:

- On Main Frames that do *not* have a control panel installed.
- On all Auxiliary frames.

The figure below illustrates the UTAH-200's snap-on Blank Panel:
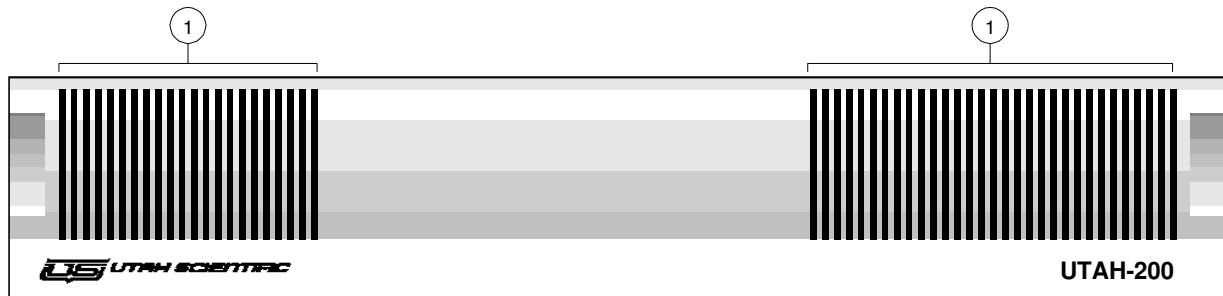
1) **Air Vents** — the vertical grilles on each side of the blank panel
   are intakes for the frame's air flow. To ensure proper internal
   temperature, do not obstruct the vents.

Front Chassis

With the control panel (or blank panel) removed, the front chassis is divided into the following sections:
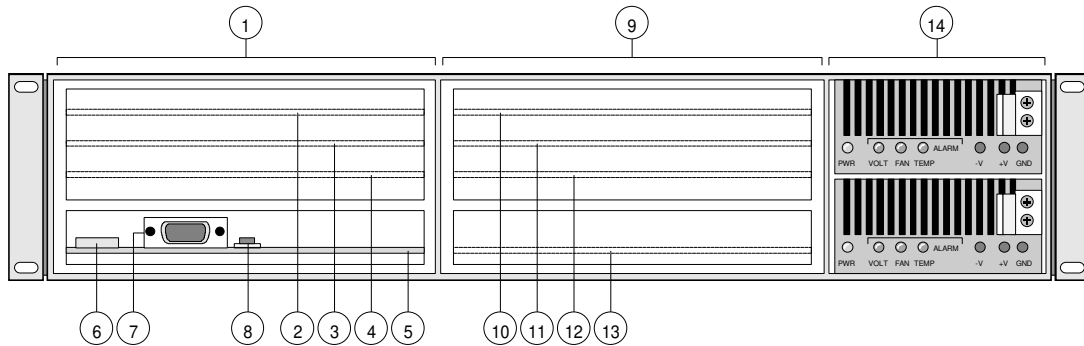
1) Signal Level Bay 1	6) U-Net/Power Connector	11) Bay 2 Crosspoint Slot 2 (Video)
2) Bay 1 Crosspoint Slot 1 (Audio)	7) Diagnostic Port	12) Bay 2 Crosspoint Slot 3 (Audio)
3) Bay 1 Crosspoint Slot 2 (Video)	8) Reset	13) Bay 2 CPU Slot
4) Bay 1 Crosspoint Slot 3 (Audio)	9) Signal Level Bay 2	14) Power Supply Bay
5) Bay 1 CPU Slot	10) Bay 2 Crosspoint Slot 1 (Audio)	

1) **Signal Level Bay 1**

   If the unit is a Main Frame, this bay can house one CPU board, plus three slots for crosspoint matrix boards:

   - If redundant CPU boards are installed, this CPU board is either active or in standby mode.
   - If a video backplane is installed, slot 2 can house one 16x16 video matrix.
   - If an audio backplane is installed, slots 1 and 3 can each house one 16x16 audio matrix.
   - The bay can not house an audio and video matrix simultaneously.
   - All crosspoint matrix boards are hot-swappable.

   If the unit is an Auxiliary Frame, the bay houses slots for crosspoint matrix boards only, and no CPU board is installed.

2) **Bay 1 Crosspoint Slot 1**

   If an audio backplane is installed, slot 1 can house a 16x16 audio matrix board.

3) **Bay 1 Crosspoint Slot 2**

   If a video backplane is installed, slot 2 can house a 16x16 video matrix board.

- • If the 16x16 video matrix is the only one in the frame, an **Input Terminator Card** is installed across the front of the video matrix board.
- • If a *second* 16x16 video matrix is installed in the frame, the **Input Interface Board** is installed across the fronts of both video matrix boards. Refer to Appendix B, "**Hardware Specifics**" for details on the **Input Interface Board**.

4) **Bay 1 Crosspoint Slot 3**

   If an audio backplane is installed, slot 3 can house a second 16x16 audio matrix board.

5) **Bay 1 CPU Slot**

   This slot (identical to the Bay 2 CPU slot) can house one CPU board. Please note:
   - • If redundant CPU boards are installed, *this* CPU board is either active or in standby mode.
   - • CPU boards are hot-swappable.

   If the unit is an Auxiliary Frame, no CPU board is installed.

6) **U-Net/Power Connector**

   This connector is a 16-pin header that sends power and U-Net communications to the Control Panel (via ribbon cable). If two CPU boards are installed, the ribbon cable can be connected to either CPU board. Refer to Appendix B "**Hardware Specifics**" for connector pinouts.

7) **Diagnostic Port**

   The CPU board includes a **Diagnostic** port which is used for initial system setup and remote diagnostics. Please refer to Appendix D for more information about the diagnostic port.

8) **Reset**

   Press to reset this CPU board's microprocessor.

9) **Signal Level Bay 2**

   If the unit is a Main Frame, this bay can house one CPU board, plus three slots for crosspoint matrix boards:

   - • If redundant CPU boards are installed, this CPU board is either active or in standby mode.
   - • If a video backplane is installed, slot 2 can house one 16x16 video matrix.
   - • If an audio backplane is installed, slots 1 and 3 can each house one 16x16 audio matrix.
   - • The bay can not house an audio and video matrix simultaneously.

- All crosspoint matrix boards are hot-swappable.

If the unit is an Auxiliary Frame, the bay houses slots for crosspoint matrix boards only, and no CPU board is installed.

10) **Bay 2 Crosspoint Slot 1**

If an audio backplane is installed, slot 1 can house a 16x16 audio matrix board.

11) **Bay 2 Crosspoint Slot 2**

If a video backplane is installed, slot 2 can house a 16x16 video matrix board.

- If the 16x16 video matrix is the only one in the frame, an **Input Terminator Card** is installed across the front of the video matrix board.

- If a *second* 16x16 video matrix is installed in the frame, the **Input Interface Board** spans the fronts of both video matrix boards. See Appendix B, "**Hardware Specifics**" for details on the **Input Interface Board**.

12) **Bay 2 Crosspoint Slot 3**

If an audio backplane is installed, slot 3 can house a second 16x16 audio matrix board.

13) **Bay 2 CPU Slot**

This slot (identical to the Bay 1 CPU Slot) can house one CPU board. Please note:
- If redundant CPU boards are installed, *this* CPU board is either active or in standby mode.
- CPU boards are hot-swappable.

If the unit is an Auxiliary Frame, no CPU board is installed.

14) **Power Supply Bay**

This bay provides two slots for up to two modular power supplies of varying types (AC or 48V, per your system's requirements). All power supplies are hot-swappable.

A variety of configurations are possible:

- Either slot could house the unit's *only supply*.
- If the crosspoint matrix cards in Bay 1 and Bay 2 are identical, one slot could contain the primary supply, while the second slot contained an optional "backup" supply.
- If the crosspoint matrix cards in Bay 1 and Bay 2 are *not identical*, one slot must contain a supply rated for the first matrix's voltage, while the second slot must contain a supply rated for the second matrix's voltage requirements.

Rear Chassis

A sample rear chassis panel is illustrated below. The rear panel is divided into three sections:

1) Control Block	2) Bay 2 Backplane	3) Bay 1 Backplane
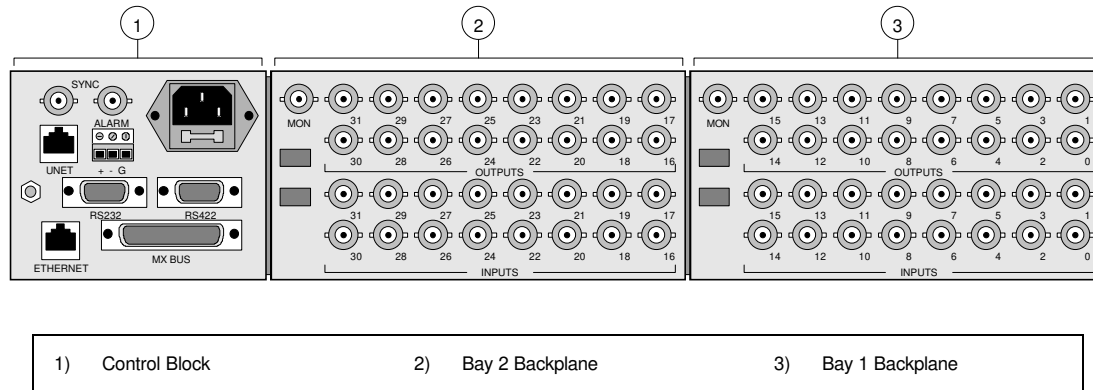
1) **Control Block**

   The Control Block is available in two different configurations:

   - **Master Control Block** — this configuration (as shown above) is standard on all UTAH-200 "**Main Frames**" — those containing CPU boards. The control block includes all the connectors necessary for system communication and frame interconnection.

   - **Slave Control Block** — this configuration is standard on all UTAH-200 "**Auxiliary Frames**" — those that do *not* include CPU boards. The block includes a *minimum* number of connectors for frame interconnection only.

2) **Bay 2 Backplane**

   This panel can contain an audio or video backplane for the audio or video crosspoint matrix (or matrices) that are installed in bay 2. The backplane houses the input, output, and monitor connectors, plus a crosspoint assignment **DIP SWITCH**.

3) **Bay 1 Backplane**

   This panel can contain an audio or video backplane for the audio or video crosspoint matrix (or matrices) that are installed in bay 1. The backplane houses the input, output, and monitor connectors, plus a crosspoint assignment **DIP SWITCH**.

Master Control Block Connectors

The figure below illustrates the connectors that are included on a **Master Control Block**:
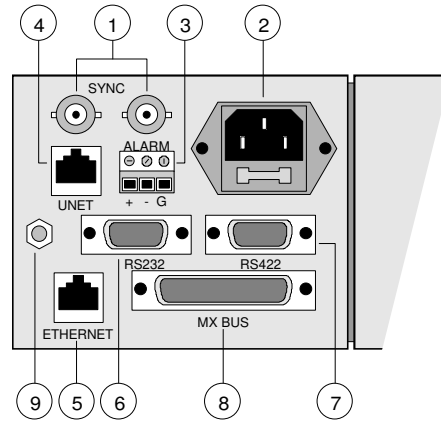
1)	Sync	4)	U-Net	7)	RS422
2)	Power	5)	Ethernet	8)	MX Bus
3)	Alarm	6)	RS232	9)	Frame Ground

1) **Sync**

   Two connectors are provided for a sync reference signal (such as **Black Burst**): one for input and one for loop-through (either can be used). If black burst is *not* looped to another device in your system, the open connector must be terminated (standard 75Ω terminator).

2) **Power**

   The AC line cord connects here to provide chassis power. Ensure that your power source is stable, and free from noise and voltage spikes.

3) **Alarm**

   Each frame has its own alarm circuitry (conforming to SMPTE 269M standard) that monitors vital components. The 3-pin **Alarm** connector provides a relay-closure output that can be connected to your facility's alarm monitoring system. In the event of an alarm, the frame can be taken out of service and repaired without disruption to other functional frames.

4) **U-Net**

The **U-Net** connector (RJ-45) is used for inter-system control panel communications. U-Net (a token bus architecture) uses category five, 10Base-T cable configuration running on four twisted pairs. Up to 32 control panels can be connected (and automatically synchronized) to the main frame via U-Net. The last panel in the chain must be terminated with a special **U-Net Terminator** plug.

5) **Ethernet**

The **Ethernet** connector (RJ-45) is used for communications with the RMS-200 application, and for other forms of remote communications with the UTAH-200. The system uses category five, 10Base-T Ethernet cable. For initial setup of the **IP Address**, the diagnostic port is required. Contact Customer Support for details on supported Ethernet commands.

6) **RS232** (9-Pin "D")

The **RS232** connector can be connected to a PC for remote system configuration (with the RMS-200), and for other forms of serial control.

7) **RS422** (9-Pin "D")

The **RS422** connector can be connected to a PC for remote system configuration (with the RMS-200), and for other forms of serial control.

8) **MX Bus** (25-Pin "D")

The **MX Bus** is a parallel bus used for router control. From the main frame, the bus is "daisy-chained" to other non-CPU auxiliary frames in your system. The last MX Bus connector in the chain must be terminated with a special **MX Bus Terminator** plug.

9) **Frame Ground**

A hex-nut and washer are provided for strapping the frame to ground, if required. Note that proper installation of the frame in your equipment rack will *automatically* ground the chassis.

Slave Control Block Connectors

The figure below illustrates the connectors that are included on a **Slave Control Block**:
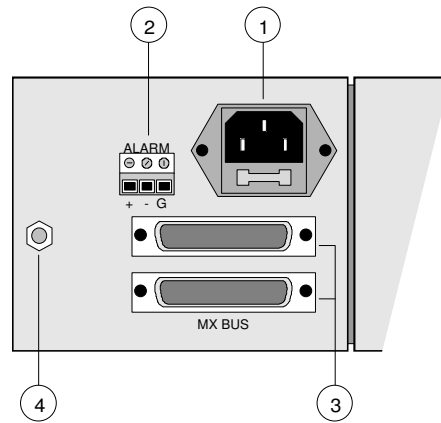
| 1) Power | 3) MX Bus | 4) Frame Ground |
| 2) Alarm | | |

1) **Power**

   The AC line cord connects here to provide chassis power.

2) **Alarm**

   The 3-pin **Alarm** connector provides a relay-closure output that can be connected to your facility's alarm monitoring system.

3) **MX Bus** (25-Pin "D")

   The MX Bus is a parallel bus used for router control. On slave Control Blocks, two connectors are provided: one for the bus input and the other for looping.

   • Either connector can be used for either input or looping.

   • The input connector can receive its signal either from the main frame, or from another auxiliary (non-CPU) frame.

   • The "loop" connector can be routed to the next auxiliary (non-CPU) frame, or, if the frame is the last unit in the chain, the connector must be terminated with a special **MX Bus Terminator** plug.

4) **Frame Ground**

   A hex-nut and washer are provided for strapping the frame to ground, if required. Note that proper installation of the frame in your equipment rack will *automatically* ground the chassis.

Video Backplane

The figure below illustrates a 16x16 video backplane that can be used for both analog and digital video applications.
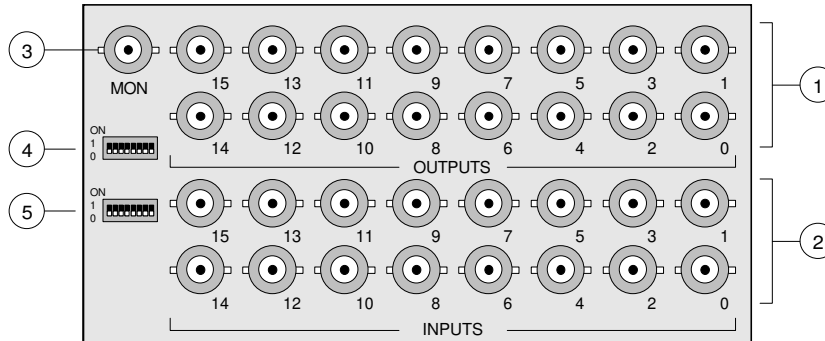
1) Output Video Connectors	3) Monitor Connector	5) Signal Level DIP Switch
2) Input Video Connectors	4) Starting Address DIP Switch	

1) **Output Video Connectors**

   BNC connectors are provided for 16 analog or digital outputs. If your matrix is 32x32, a second backplane is provide with output labels 16-31.

2) **Input Video Connectors**

   BNC connectors are provided for 16 analog or digital inputs. All inputs are internally terminated (75Ω). If your matrix is 32x32, a second backplane is provide with input labels 16-31.

3) **Monitor Connector**

   One BNC connector is provided for the optional analog or digital video monitor matrix output. The connector is present, whether or not the option is installed. If your matrix is 32x32, the second backplane also includes a monitor connector, but it is *unlabeled*. In this configuration, both monitor matrices are connected internally, but only the output on the first backplane is active. All switching is performed from the control panel.

4) **Starting Address DIP Switch**

   The top DIP switch sets the starting address for the matrix.

5) **Signal Level DIP Switch**

   The bottom DIP switch sets the signal level address for the matrix, and also sets the expansion input offset.

In Chapter 2, refer to the "**Setting Frame ID Switches**" section for DIP switch instructions.

Audio Backplane

The figure below illustrates the 32x32 audio backplane, which is used for both analog and digital audio connections.

- For analog audio, the backplane can be used for 16x16 mono, 16x16 stereo or 32x32 mono, depending on your configuration of analog audio boards.

- For digital audio, the backplane applies to both the **Asynchronous** and **Synchronous** versions of the **Digital Audio Board**. The backplane can be used for one or two 16x16 AES/EBU levels or for one 32x32 level — depending on your configuration of digital audio boards.
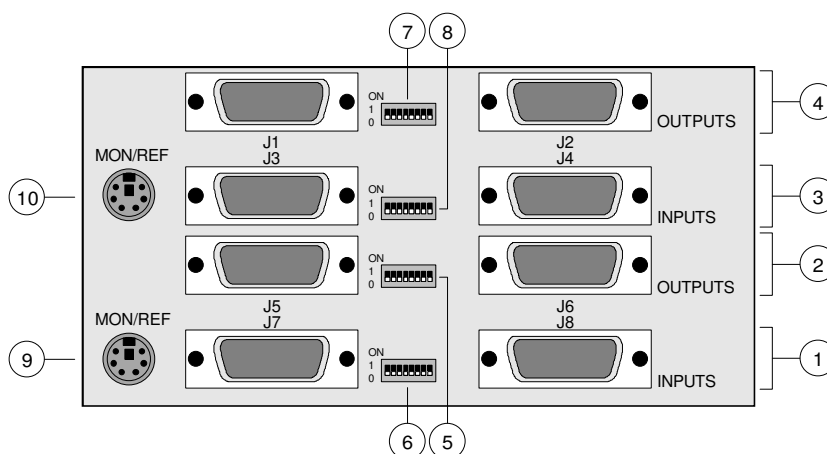
1)	Audio Inputs 0-15	5)	Address DIP Sw., Bottom Board	9)	Mon/Ref Connector, Bottom Board
2)	Audio Outputs 0-15	6)	Device Number DIP Sw., Bottom Board	10)	Mon/Ref Connector, Top Board
3)	Audio Inputs 0-15 or 16-31	7)	Address DIP Sw., Top Board		
4)	Audio Outputs 0-15 or 16-31	8)	Device Number DIP Sw., Top Board		

Note All audio input and output connectors are 26-pin high-density female sub-miniature "D" connectors.

1) **Audio Inputs 0-15**

   Two connectors are provided for audio inputs 0-15:

   - **J8**, inputs 0-7
   - **J7**, inputs 8-15

   These inputs can be used as follows:

   Analog Audio:

   - Mono 32x32: inputs 0-15
   - Stereo 16x16: inputs 0-15 (channel 1)

Digital Audio:

- 32x32: AES inputs 0-15 (channels 1/2)
- 16x16: AES inputs 0-15 (channels 1/2)

2) **Audio Outputs 0-15**

Two connectors are provided for audio outputs 0-15:

- **J6**, outputs 0-7
- **J5**, outputs 8-15

These outputs can be used as follows:

Analog Audio:

- Mono 32x32: outputs 0-15
- Stereo 16x16: outputs 0-15 (channel 1)

Digital Audio:

- 32x32: AES outputs 0-15 (channels 1/2)
- 16x16: AES outputs 0-15 (channels 1/2)

3) **Audio Inputs 0-15 or 16-31**

If a second audio board is installed, two connectors are provided for audio inputs 0-15 or 16-31:

- **J4**, inputs 0-7 or 16-23
- **J3**, inputs 8-15 or 24-31

These inputs can be used as follows:

Analog Audio:

- Mono 32x32: inputs 16-31
- Stereo 16x16: inputs 0-15 (channel 2)

Digital Audio:

- 32x32: AES inputs 16-31 (channels 1/2)
- 16x16: AES inputs 0-15 (channels 3/4)

4) **Audio Outputs 0-15 or 16-31**

If a second audio board is installed, two connectors are provided for audio outputs 0-15 or 16-31:

- **J2**, outputs 0-7 or 16-23
- **J1**, outputs 8-15 or 24-31

These outputs can be used as follows:

Analog Audio:

- Mono 32x32: outputs 16-31
- Stereo 16x16: outputs 0-15 (channel 2)

Digital Audio:

- 32x32: AES outputs 16-31 (channels 1/2)
- 16x16: AES outputs 0-15 (channels 3/4)

5) **Address DIP Switch, Bottom Board**

The DIP switch adjacent to connector **J5** sets the starting address for board 1's matrix.

6) **Signal Level DIP Switch, Bottom Board**

The DIP switch adjacent to connector **J7** sets the signal level address for board 1's matrix, and also sets the board's expansion input offset.

7) **Starting Address DIP Switch, Top Board**

The DIP switch adjacent to connector **J1** sets the starting address for board 2's matrix.

8) **Signal Level DIP Switch, Top Board**

The DIP switch adjacent to connector **J3** sets the signal level address for board 2's matrix, and also sets the board's expansion input offset.

Note

> In Chapter 2, refer to the "**Setting Frame ID Switches**" section for DIP switch instructions.

9) **Monitor/Reference Connector, Bottom Board**

One 6-pin circular mini-DIN connector is provided for two individual audio functions:

Monitor Matrix

Three pins are provided for the optional monitor matrix output.

- **Analog Audio** — with an analog audio board installed, the output provides analog audio only.

- **Digital Audio** — with a digital audio board installed, the output can be configured as either digital or analog. In Appendix B, refer to the "**Digital Audio Board**" section for instructions on selecting the monitor output format.

AES Reference

Three pins are provided for an AES reference input.

- **Analog Audio** — with an analog audio board installed, the reference input is unused.

- **Digital Audio** — with a digital audio board installed, the input is active *only* when the **Synchronous** version of the **Digital Audio Board** is installed, and when jumper **JP1** is installed on the **Synchronous** module. In Appendix B, see the "**Digital Audio Board**" section for instructions on setting the jumper position.

The **Monitor/Reference Connector** is present, whether or not the option is installed. Outputs 0-15 (in a 16x16 configuration) or outputs 0-31 (in a 32x32 configuration) are available on the connector, and switching is performed from the control panel. In chapter 2, see the "**Audio Connector Wiring Charts**" section for connector pinouts.

10) **Monitor/Reference Connector, Top Board**

If a second audio board is installed, one 6-pin circular mini-DIN connector is provided for two individual functions:

Monitor Matrix

Three pins are provided for the optional monitor matrix output.

- **Analog Audio** — with an analog audio board installed, the output can be used as follows:

  ~ In a mono 32x32 configuration, the monitor matrices of both analog boards are connected internally, and all 32 outputs are available on each monitor connector on the backplane. Both outputs are switched simultaneously from the control panel.

  ~ In a stereo 16x16 configuration, this board's monitor matrix can be used *independently* to switch channel 2.

- **Digital Audio** — with a digital audio board installed, the output can be configured as either digital or analog.

  ~ In a single level 32x32 configuration (one AES pair), the matrices of both boards are connected internally, and all 32 outputs are available on each monitor connector. Both outputs are switched simultaneously from the control panel.

  ~ In dual-level 16x16 configuration (two AES pairs), this board's monitor matrix can be used *independently* to switch channels 3 and 4.

  In Appendix B, refer to the "**Digital Audio Board**" section for instructions on selecting the monitor output format.

AES Reference

Three pins are provided for an AES reference input.

- **Analog Audio** — with an analog audio board installed, the reference input is unused.

- **Digital Audio** — with a digital audio board installed, the input is active *only* when the **Synchronous** version of the **Digital Audio Board** is installed, and when jumper **JP1** is installed on the **Synchronous** module.

~ In a single level 32x32 configuration (one AES pair), a reference connection is not required here, as the signal from the base board's reference connector is carried through the ribbon cable that interconnects the two digital audio boards.

~ In dual-level 16x16 configuration (two AES pairs), this reference connection is active.

In Appendix B, refer to the "**Digital Audio Board**" section for instructions on setting the jumper position.

In *both* configurations of the top board, DIP switch settings determine the board's level and offset. In Chapter 2, refer to the "**Setting Frame ID Switches**" for DIP switch instructions. In chapter 2, see the "**Audio Connector Wiring Charts**" section for connector pinouts.

Note

In a previous version of UTAH-200 hardware, a different analog audio backplane was used which included a 3-pin terminal for the **Analog Monitor Matrix Connector**. For details on this connector, please contact **Customer Support**.

Functional Diagram

The figure below illustrates a functional block diagram of the UTAH-200 system.
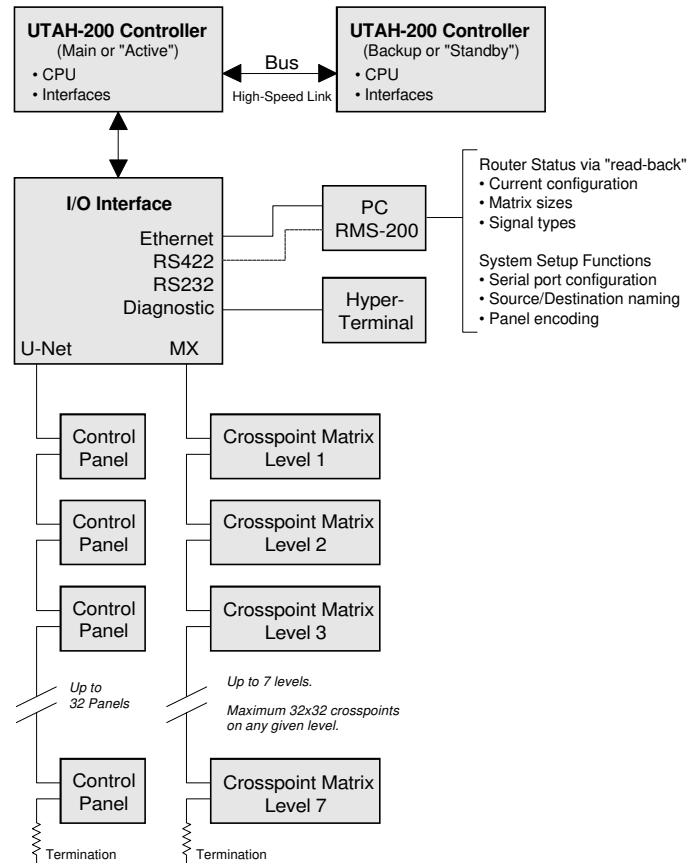
The heart of the unit is the **Main** (or "Active") **Controller**, which contains the CPU board for all processing and interface requirements. If a second **Backup** (or "Standby") **Controller** is installed, these functions are redundant.

The Main Controller is the CPU currently operating. The Backup Controller is kept in synch with the Main Controller via communications over a special high-speed link. If a new backup controller is installed in a single-controller system, the *active* board updates (or synchronizes) the *standby* board, once communications are established.

On the CPU board itself, the I/O (input/output) interface includes communications such as Ethernet, serial RS422, RS232, U-Net, MX, and diagnostics:

- The **Ethernet** port is used for communications with the RMS-200 application.

- **RS422** serial communications is used for router control from an external source.

- **RS232** serial communications (by default) is used for configuring the system from a PC (running the RMS-200 application), and for control from an external source.

- **U-Net** is used for control panel communications (up to 32 panels can be daisy-chained). The last unit in the chain must be terminated.

- **MX Bus** is used for audio/video router crosspoint control (up to eight frames can be daisy-chained, with a maximum matrix of eight 32x32 signal levels). The last unit in the chain must be terminated.

- The **Diagnostic** port is used for initial system setup and remote diagnostics, using a terminal such as the hyper-terminal in Windows 95 or NT.

Now that you are familiar with the basic functionality, capabilities, and components of the UTAH-200 system, please continue with chapter 2, "**Hardware Installation**."

Hardware Installation

In This Chapter

This chapter provides instructions for installing the UTAH-200 in your facility. The following topics are covered:

- Unpacking and Inspection
- Installing Hardware
- Installing Physical Equipment
- Interconnecting Frames
- Interconnecting Control Panels
- Installing Communication Cables
- Connecting the Reference Signal
- Setting Frame ID Switches
- Setting Control Panel ID Switches
- Installing Audio/Video Signals
- Connecting and Disconnecting Power
- Checking and Replacing Fuses
- Hardware Checkout

Caution

To avoid damage to the system, do not connect AC power until the hardware is fully installed.

Unpacking and Inspection

When you receive your UTAH-200 system, inspect each shipping carton for signs of damage. Contact your dealer and the shipper *immediately* if you suspect any damage has occurred during shipping. Check the contents of each box to be sure that all parts are included. If any items are missing, contact your dealer immediately. After unpacking, please save the packing materials for future shipping convenience.

Installing Hardware

The UTAH-200 installation procedure requires the following steps:

1. Installing physical equipment
2. Interconnecting frames
3. Interconnecting control panels
4. Installing communication cables
5. Connecting the reference signal
6. Setting frame ID switches
7. Setting control panel ID switches
8. Installing audio/video signals
9. Connecting power
10. Hardware checkout

Each step is detailed in the following sections.

Installing Physical Equipment

In this step, you will install each routing switcher frame and control panel. Please note:

- All routing switcher frames and control panels mount in standard EIA 19-inch equipment racks.
- Each frame and control panel requires 3.5 inches of vertical space (2RU).

Routing Switcher Frame Installation

Use the following steps to install each routing switcher frame:

1. Determine the vertical layout of your frames before you begin installing them in your equipment rack. Please note:
   - You may wish to place one blank rack panel (1RU) between frames to increase ventilation and to make the cabling of each frame easier.
   - You may wish to install your frames in a way that reflects the priority of your system's audio/video signal levels.

For example, if digital video is assigned as signal level one — and four pairs of AES digital audio are configured as signal levels two through five, physically arrange your frames to mirror this configuration — starting with signal level one at the top.

The figure below illustrates one *sample layout*, with five signal levels that reflect the sample system's actual priority.

Note that the "signal level one" frame (with an integral control panel) is mounted at the top of the array.

Blank Rack
Panels

Signal Level One:
Digital Video

Signal Level Two:
AES Digital Audio
Channels 1/2

Signal Level Three:
AES Digital Audio
Channels 3/4

Signal Level Four:
AES Digital Audio
Channel 5/6

Signal Level Five:
AES Digital Audio
Channel 7/8
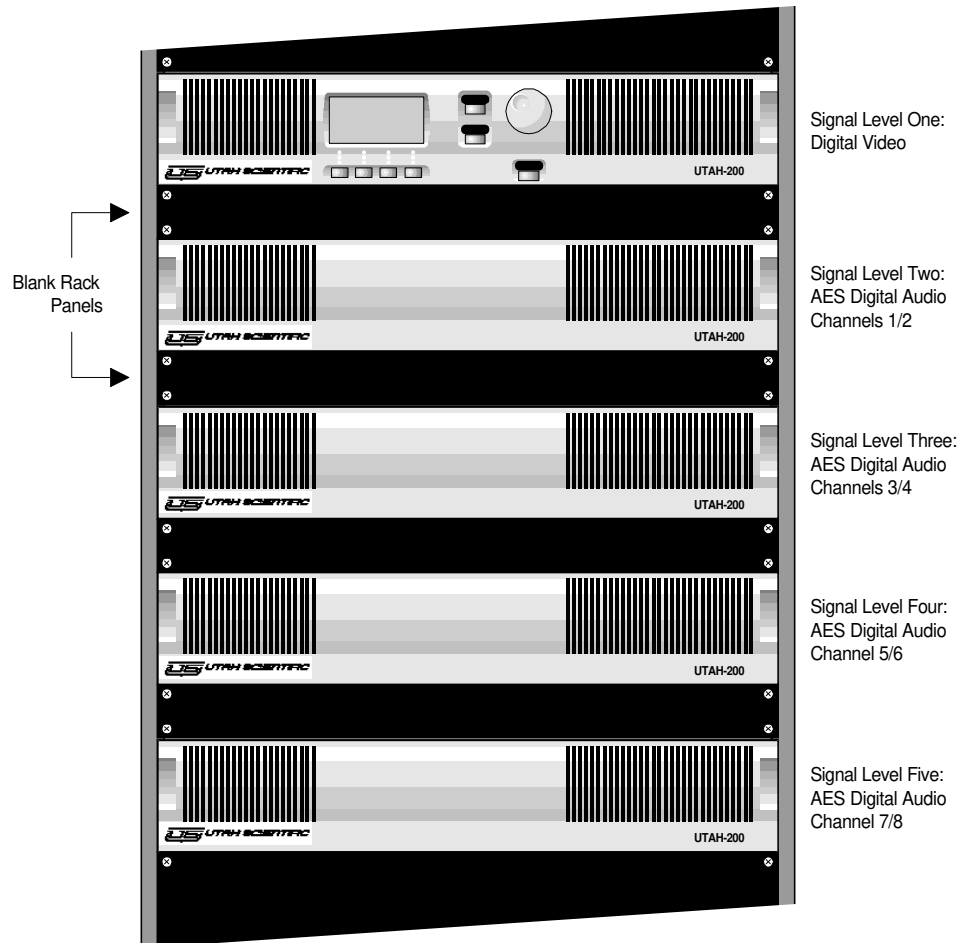
2. Once the layout is determined, remove the "snap-on" front cover from each UTAH-200 frame, and set the cover aside.

<table>
<tr><td>Note</td><td>With frames that include an integral control panel, carefully disconnect the ribbon cable that connects the control panel to the frame's CPU board. Note the location and orientation of the CPU board's ribbon cable connector — you will need to remember this location when you reconnect the control panel. The cable includes a polarizing plug, and each connector has a pin removed to assist with correct cable installation.</td></tr>
</table>

3. Install each frame in your equipment rack for easy cabling and to minimize interconnecting cable lengths. Please note:

   • The mounting holes in the front of each frame support the *entire* weight of the chassis.

Mounting Holes
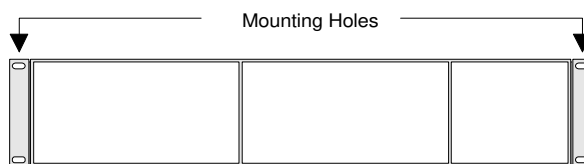
   Because of this *front* support method, ensure that all screws are tightened securely as you install each frame.

   • Do not obstruct the front air vents or side fan exhaust vent. This will ensure optimum air flow and maximum cooling.

   • Provide sufficient space behind each frame for running your cables and for performing maintenance if required.

<table>
<tr><td>Note</td><td>Each frame is designed to accommodate an optional center-mount rack kit. Contact Customer Support for details.</td></tr>
</table>

4. Replace all front covers. If a control panel was removed, re-connect the ribbon cable to the CPU board's connector, and then snap the control panel in place.

<table>
<tr><td>Note</td><td>A frame ground stud is provided on each frame's rear panel for strapping the frame to ground (if required). The stud is located at the left edge of the control block. Note that proper installation of the frame in your rack *automatically* grounds the chassis.</td></tr>
</table>

This completes the installation of each routing switcher frame.

Standalone Control Panel Installation

Each standalone control panel is comprised of two parts:

- A shallow frame for mounting purposes only
- The self-contained control panel

Use the following steps to install each control panel:

1. Determine the location for each UTAH-200 control panel in your facility.

   ~ Ensure that each location is within 5 feet of an AC outlet. This distance is the length of the DC power cord.

   ~ Control panels are typically located in edit suite consoles, at various locations in the machine room or transmission room, in studio control rooms, or in audio/video showrooms or conference rooms — any place where you are required to route or monitor audio and video.

2. For each control panel, remove the "snap-on" front cover from the frame and set the panel aside.

3. Install each frame in the destination rack or console. Ensure that all screws are tightened securely.

4. Retrieve the panel, and snap it in place on the frame.

5. Repeat steps 2 through 4 for each control panel that you want to install.

This completes the installation of each standalone control panel.

Interconnecting Frames

In this step, you will interconnect each routing switcher frame (in "daisy-chain" fashion) using the rear chassis **MX-Bus** connectors.

- One **MX Bus Interconnect Cable** (10 ft. length) is supplied with each Auxiliary Frame. Other lengths are available (1 ft., 5 ft., 10 ft., and 50 ft.).
- One **MX Bus Terminator** plug is supplied per system.

Use the following diagram for reference throughout the procedure:
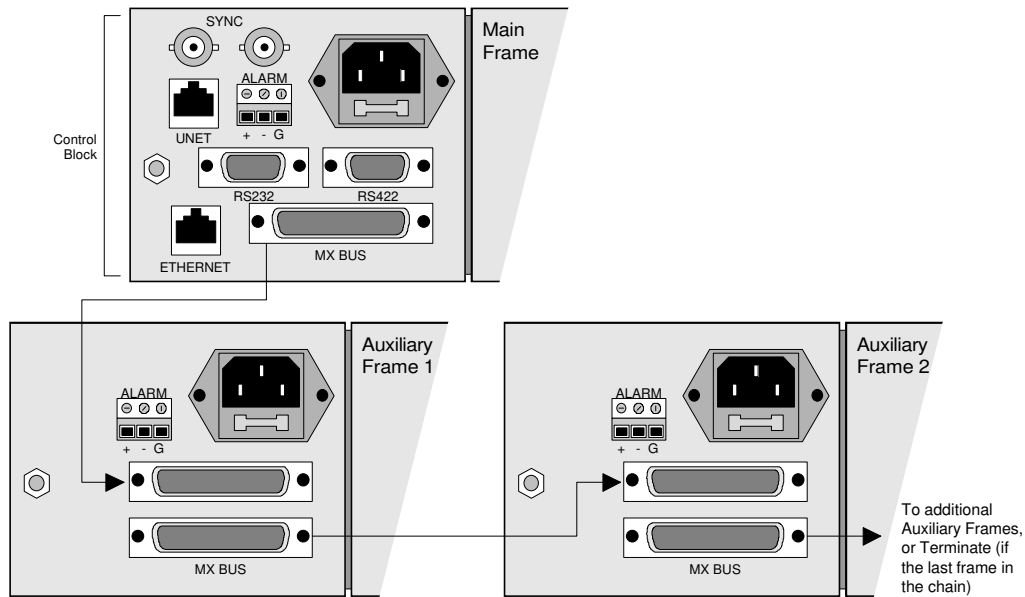
Use the following steps to interconnect frames:

1. Locate your system's "**Main Frame**" — easily identified by the large group of connectors in the **Control Block**.
2. In the Control Block, locate the **MX Bus** connector.
3. Using the supplied **MX Bus Interconnect Cable**, connect the Main Frame's **MX Bus** connector to either **MX Bus** connector on your first **Auxiliary Frame**.
4. Using another supplied **MX Bus Interconnect Cable**, connect the first Auxiliary Frame's open **MX Bus** connector to either **MX Bus** connector on your *second* Auxiliary Frame.
5. Repeat step 4 for each additional Auxiliary Frame in your UTAH-200 system.
6. On the last Auxiliary Frame in the chain, connect the supplied **MX Bus Terminator** plug to the open **MX Bus** connector.

This completes the interconnection of each routing switcher frame.

Interconnecting the UTAH-200 in a Larger System

The UTAH-200 can operate in conjunction with (and can be controlled by) other Utah Scientific routers and peripherals using the SC-2 and SC-3 control systems.

Note

> In this type of configuration, the UTAH-200 would be installed *without a Main Frame*. Thus, with no CPU board installed, the UTAH-200's Auxiliary Frames would be controlled by the SC-2 or SC-3 controller.

The figure below illustrates one example of this type of system interconnection, where the UTAH-200 Auxiliary Frames are connected via MX Bus to the UTAH-300's matrix and SC-3 controller.
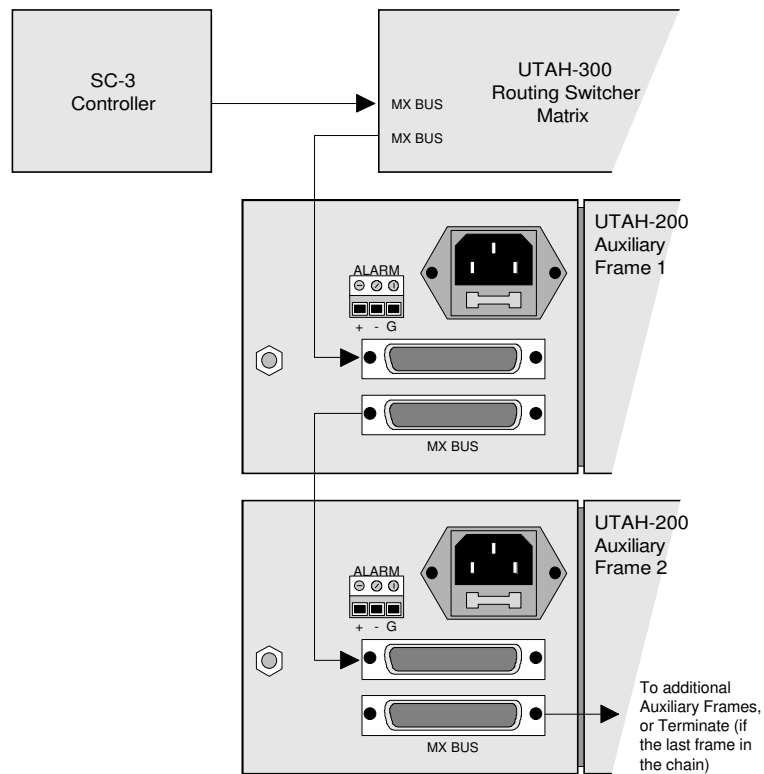
Refer to the *SC-3 User's Guide* for complete details on interconnecting the UTAH-200 within a larger system.

Interconnecting Control Panels

In this step, you will interconnect each control panel to the main frame (in "daisy-chain" fashion) using the rear chassis **U-Net** connectors. **U-Net** uses category five, 4-pair UTP (unshielded twisted pair) cable with RJ-45 connectors. Up to 32 control panels can be connected to the main frame via U-Net.

Note

> When control panels are daisy-chained together, the *total length* of the entire cable run can not exceed 1000 feet.

- **U-Net Cables** are not supplied. You can purchase Ethernet cables, or you can construct a custom cable. See Appendix C, "**Specifications**" for cable specifications and pinouts.

- One **U-Net Terminator** plug is supplied per Main Frame.

Use the following diagram for reference throughout the procedure:
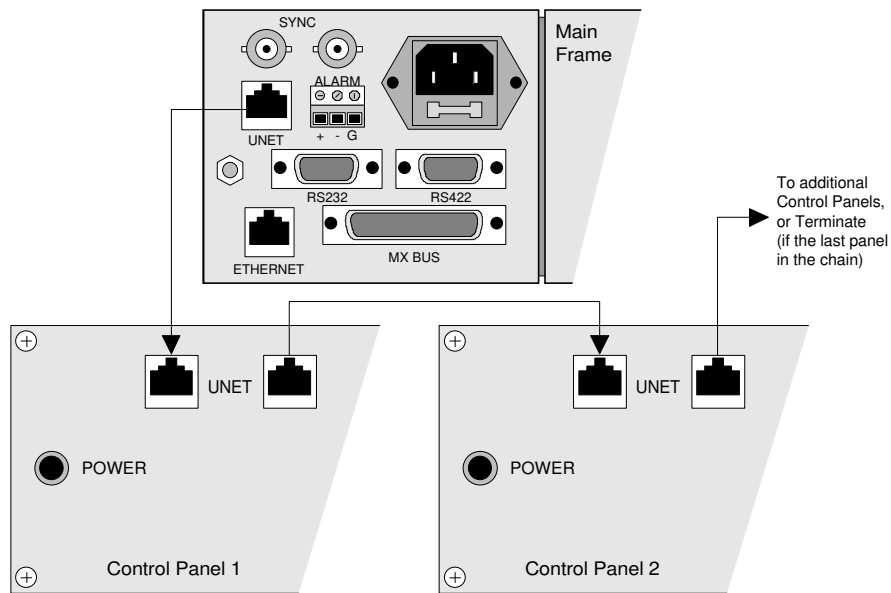
Use the following steps to interconnect control panels:

1. In the Control Block of your system's "**Main Frame**," locate the **U-Net** connector.

2. Using a customer-supplied **U-Net Cable**, connect the Main Frame's **U-Net** connector to either **U-Net** connector on your first control panel.

3. Using another **U-Net Cable**, connect the first control panel's open **U-Net** connector to either **U-Net** connector on your *second* control panel.

4. Repeat step 3 for each additional control panel.

5. On the last control panel in the chain, connect the supplied **U-Net Terminator** plug to the open **U-Net** connector.

This completes the interconnection of each control panel.

Installing Communication Cables

In this section, you will install the following communication cables:

- RS232
- RS422
- Ethernet
- Alarm

Detailed procedures are provided in the following sections.

Installing RS232 Communications

RS232 is used for communicating with a PC (equipped with the RMS-200 application), or with other types of remote serial control devices.

Use the following diagram for reference:
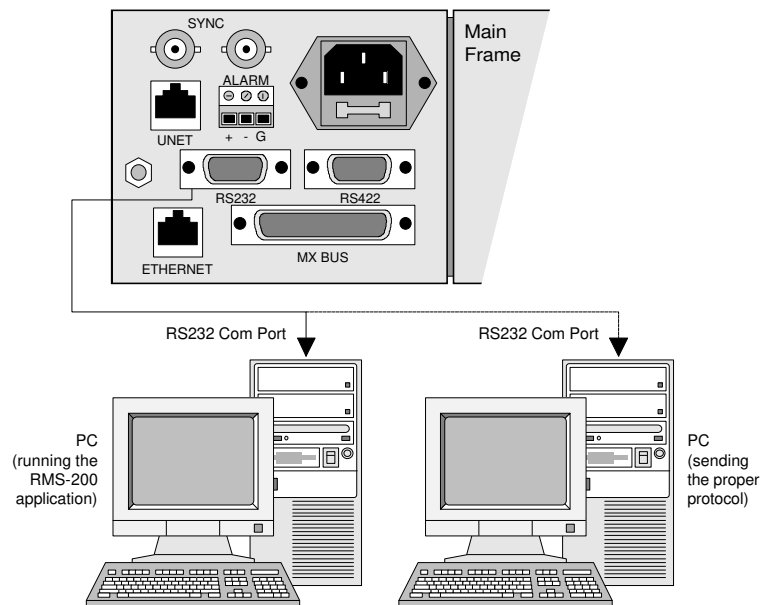
Use the following steps to install RS232 communications:

1. In the Control Block of your system's "**Main Frame**," locate the **RS232** connector.

2. Using a customer supplied **RS232 Cable**, connect the Main Frame's **RS232** connector to an open **RS232 Com Port** on the destination device (such as a PC, or another system with the ability to send the proper protocol).

   Only one external RS232 device can be connected. Refer to the destination device's installation manual for details on the specific requirements of the device's local RS232 port.

Note

> By default, the RS232 port is enabled on the UTAH-200, with the following parameters: Protocol (**RMS**), Baud Rate (**38400**), Data Bits (**8**), Stop Bits (**1**), Parity (**None**).

This completes the procedure for installing RS232 communications.

Please note:

- Refer to Appendix C "**Specifications**" for more information about the RS232 connector.

- Refer to Appendix D "**Remote Diagnostics**" for information about changing serial control parameters.

- Contact **Customer Support** for additional information about serial control protocols.

Installing RS422 Communications

RS422 is used for communicating with a PC (equipped with the RMS-200 application), or with other types of remote serial control devices. Use the following diagram for reference throughout the procedure:
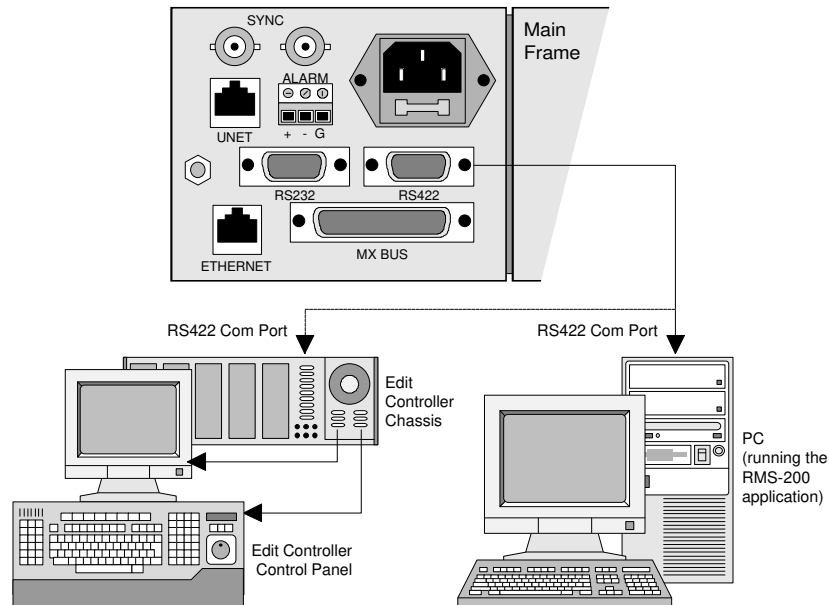
Use the following steps to install RS422 communications:

1. In the Control Block of your system's "**Main Frame**," locate the **RS422** connector.

2. Using a customer supplied **RS422 Cable**, connect the Main Frame's **RS422** connector to an open **RS422 Com Port** on the destination device (such as a PC or edit controller). Only one external RS422 device can be connected. Refer to the destination device's installation manual for details on the specific requirements of the device's local RS422 port.

Note

> By default, the RS422 port is enabled on the UTAH-200 with the following parameters: Protocol (**UDI**), Baud Rate (**9600**), Data Bits (**8**), Stop Bits (**1**), Parity (**None**), Take Echo (**On**), Change Echo (**On**), Refresh (**Off**), Xon/Xoff (**Off**).

Refer to Appendix C "**Specifications**" for more information about the RS422 connector. Refer to Appendix D "**Remote Diagnostics**" for information about changing serial control parameters.

This completes the procedure for installing RS422 communications.

Installing Ethernet

The UTAH-200 uses **Ethernet** to communicate with a PC equipped with the RMS-200 application, or to communicate with another device in your facility that uses Utah Scientific's proprietary RCP-3 Ethernet protocol.

There are two ways to install Ethernet:

- Using the **Point-to-point** method, the UTAH-200 is connected directly to the PC — there are no other connections.

- Using the **Network Hub** method, the UTAH-200 is connected to a network hub which allows it to communicate with other Ethernet nodes in your facility — one of which is the PC.

Both methods are discussed below.

- **Point-to-point Connection**

    Use the following diagram for reference:
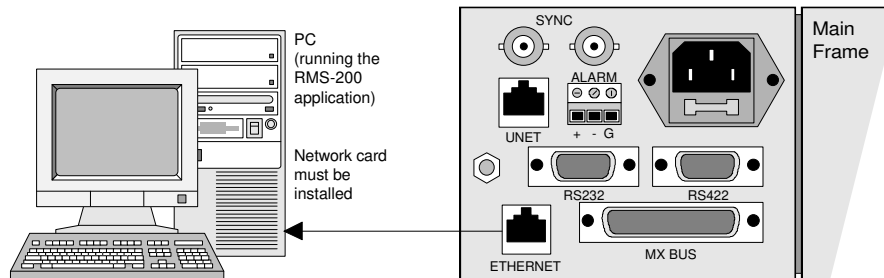
1. Ensure that your PC has a **Network Card** installed. If not, these cards are readily available from any computer dealer.

2. In the Control Block of your system's "**Main Frame**," locate the **Ethernet** connector.

3. Using a customer supplied "special" **Ethernet Cable**, connect the Main Frame's **Ethernet** connector to the **Ethernet** port on your PC's **Network Card**. The special cable is one in which the transmit and receive pairs are swapped at one end. In Chapter 8, refer to the "**Ethernet Connector Pinouts**" section for a cable pinout chart.

4. Ensure that both ends of the cable are secure.

This completes the procedure for installing point-to-point Ethernet cables. Refer to the "**Establishing Communications**" section in Chapter 3 for instructions on configuring your PC and the RMS-200 for Ethernet communications.

- **Network Hub Connection**

  Use the following diagram for reference:
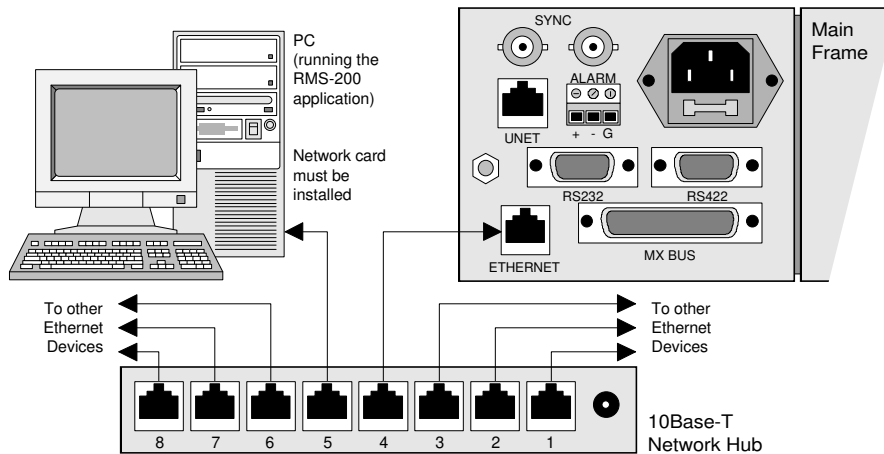
1. Ensure that your PC has a **Network Card** installed. If not, these cards are readily available from any computer dealer.

2. Ensure that a **10Base-T Network Hub** (with an open port) is available within your facility. If not, Network Hubs are readily available from any computer dealer.

3. In the Control Block of your system's "**Main Frame**," locate the **Ethernet** connector.

4. Using a customer supplied standard **Ethernet Cable**, connect the Main Frame's **Ethernet** connector to an open port on the hub.

5. If it is not *already* connected to a network hub within your facility, use a customer supplied standard **Ethernet Cable** to connect the **Ethernet** port on your PC's **Network Card** to an open port on the hub.

6. Ensure that all cables are secure.

Important

> If your PC is already connected to a different hub, consult with your facility's Network Administrator to ensure that your PC and the UTAH-200 are both using the same **Subnet Mask**.

This completes the procedure for installing network hub cables. Refer to the "**Establishing Communications**" section in Chapter 3 for instructions on configuring your PC and the RMS-200 for Ethernet communications.

Connecting the Alarm Circuit

The **Alarm** circuit is used for connecting each frame to your facility's alarm system. The circuit itself (which conforms to the SMPTE 269M standard) is a two-wire interface with an electrically isolated output.

- By default, the output is open during no-fault conditions.
- When a fault occurs, the output becomes low resistance (shorted), allowing current to flow in the fault indicator.

Use the following diagram for reference throughout the procedure:
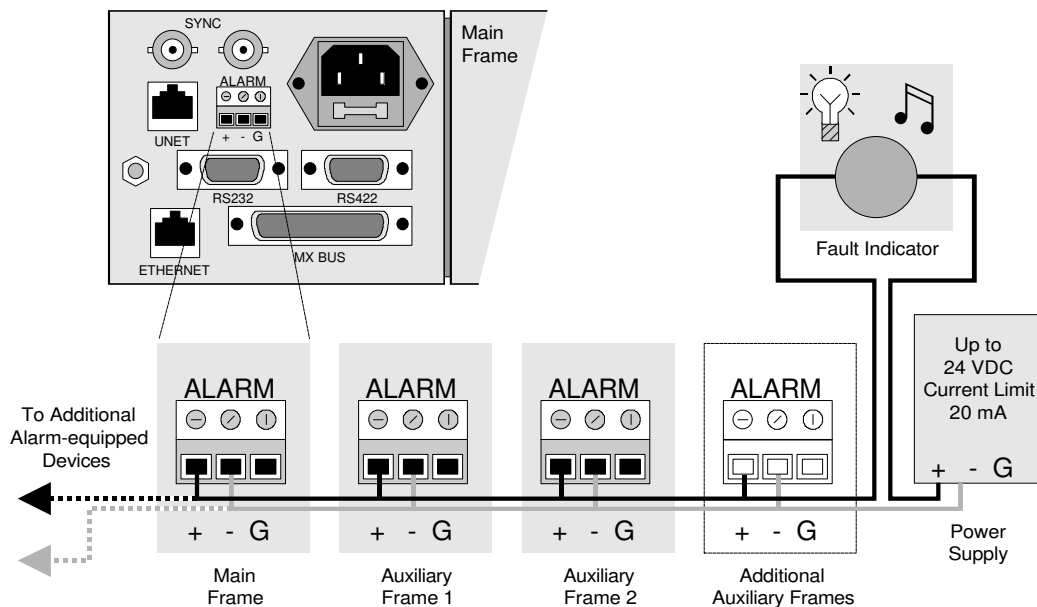
Use the following steps to connect each frame's alarm circuit:

1. In the Control Block of your system's "**Main Frame**," locate the **Alarm** connector.

2. Using a customer supplied cable (typically, twisted pair), connect the Main Frame's **Alarm+** terminal to the **Alarm+** terminals on each UTAH-200 frame in your system.

   Connect the Main Frame's **Alarm–** terminal to each frame's **Alarm–** terminal in the same manner. Be sure to connect all **+** and **–** terminals in parallel fashion as shown above.

3. Loop the **Alarm+** cable through a customer supplied fault indicator, such as a light or a buzzer.

4. Connect one end of the **Alarm+** cable to the **+** terminal of your customer supplied alarm power supply. Connect the **Alarm–** cable to the **–** terminal of your power supply in the same way. The power supply should be rated for up to 24 VDC @ 20 mA.

5. If there are additional SMPTE alarm-equipped devices in your facility, connect them in parallel fashion to the alarm chain as shown in the diagram.

Note

If your facility has an *existing* alarm circuit, add the UTAH-200 frames to the existing chain using the diagram above as an interconnection example.

This completes the procedure for installing the alarm circuit.

Connecting the Reference Signal

The reference or "sync" connection is required so that all switches (or **Takes**) performed by the UTAH-200 occur *in time* (in the vertical interval) with other devices in your facility — without visible "glitches" on screen. Please note:

- Use only a stable analog reference signal (such as **Black Burst**) that originates from your house sync generator.
- The house sync generator *must* feed the same reference to *all devices* in your entire video system.

Note

The UTAH-200 will operate without a reference sync input, but the switch point will then occur at a random point, potentially causing visible glitches to appear in the video.

Use the following diagram as a guide throughout the procedure:
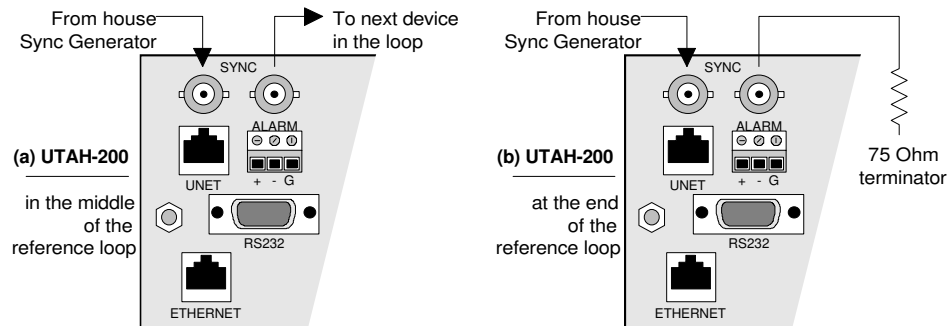
Use the following steps to connect video reference:

1. In the Control Block of your system's "**Main Frame**," locate the **Sync** connectors.
2. Connect an output from your house sync generator (or from the previous device in your facility's reference loop) to either **Sync** connector on the UTAH-200 main frame.

Note	Only the UTAH-200 "**Main Frame**" requires sync. All other auxiliary frames and control panels do *not* require sync, and in fact, do not have **Sync** connectors.

3. If the frame is in the *middle* of your reference loop, connect the open **Sync** connector to the next device's reference input, as shown above in the diagram's example (**a**). Ensure that the last device in the loop is terminated with a 75 Ohm terminator.

4. If the UTAH-200 frame is the *last device* in the loop, terminate the open **Sync** connector with a 75 Ohm terminator (customer supplied) as shown above in the diagram's example (**b**).

Setting Frame ID Switches

Every matrix board in each of your frames includes a pair of DIP switches. These switches are located on the board's associated audio and video backplanes. The following rules apply:

*   DIP switch settings are **backplane dependent**, not board dependent. In this way, you can move cards as required, without having to re-set any of the DIP switches.

*   The digital video backplane includes *one pair* of DIP switches, because the maximum number of digital video boards that can be housed in a bay is one.

*   The analog audio backplane includes *two pairs* of DIP switches, because the maximum number of analog audio boards that can be housed in a bay is two.

*   The digital audio backplane includes *two pairs* of DIP switches, because the maximum number of digital audio boards that can be housed in a bay is two.

*   Each pair of DIP switches are *identical* in their functionality, as listed below:

DIP Switch Functions

Position	Name	Description
Top Switch	Offset (Expansion) Address	Sets the associated board's starting base address number for inputs and outputs.
Bottom Switch	Router Level	*Primary function:* sets the associated board's unique signal level.
		Secondary function: If the signal level is 32x32, sets the associated board's expansion input offset (from the other board).

The following sections provide details about setting each DIP switch.

Offset (Expansion) Address DIP Switch

The figure below illustrates the **Offset Address** DIP switch.

Top Switch: Offset Address

(up position) ON **1**

(down position) OFF **0**

Switch #: 1 2 3 4 5 6 7 8

Output Offset   Input Offset
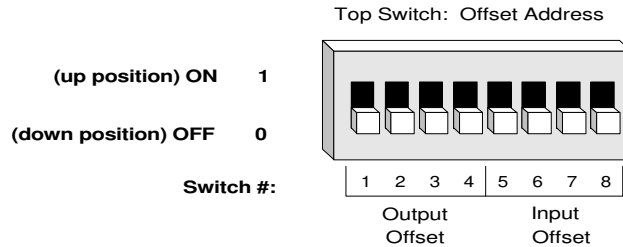
The table below lists the function of each switch:

Top DIP Switch Positions

Switch	Function	Description
1	Output Offset 128	Offsets board's base output by 128, from 0
2	Output Offset 64	Offsets board's base output by 64, from 0
3	Output Offset 32	Offsets board's base output by 32, from 0
4	Output Offset 16	Offsets board's base output by 16, from 0
5	Input Offset 128	Offsets board's base input by 128, from 0
6	Input Offset 64	Offsets board's base input by 64, from 0
7	Input Offset 32	Offsets board's base input by 32, from 0
8	Input Offset 16	Offsets board's base input by 16, from 0

Use the following steps to set a board's starting address:

1. If a board's outputs are to be used as outputs 0-15, set DIP switches 1-4 down (all off).
2. If a board's outputs are to be used as outputs 16-31, set DIP switches 1-3 down (off), and DIP switch 4 up (on).
3. If a board's inputs are to be used as inputs 0-15, set DIP switches 5-8 down (all off).
4. If a board's inputs are to be used as inputs 16-31, set DIP switches 5-7 down (off), and DIP switch 8 up (on).
5. Repeat for every board in each of your frames.

Note

> Individual switches within a group can be combined to form different offsets (e.g., switches 2 and 3 can be up [on] to form an output of 96).

Note	The remaining offset address positions are provided for compatibility with other UTAH routers, for example, if a UTAH-200 router was used in conjunction with a UTAH-300 router and SC-3 control system. Refer to the *SC-3 User's Guide* for complete details.

Router Level DIP Switch

The figure below illustrates the **Router Level** DIP switch.

Bottom Switch: Router Level, Expansion Offset
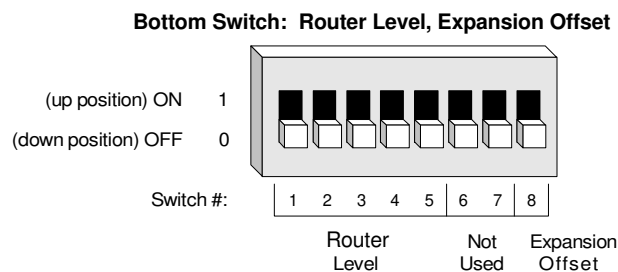
The table below lists the function of each switch:

Bottom DIP Switch Positions

Switch	Function	Description
		Switches 1-5 set a board's router level:
1	Level 16	Sets binary value to 16, router level to 17.
2	Level 8	Sets binary value to 8, router level to 9.
3	Level 4	Sets binary value to 4, router level to 5.
4	Level 2	Sets binary value to 2, router level to 3.
5	Level 1	Sets binary value to 1, router level to 2.
6	—	For future use.
7	—	For future use.
8	Expansion Offset	Sets a board's expansion offset.

Use the following steps to set a board's unique router level:

1. On paper, determine the number that you want to assign to each signal level. For example:

   ~   digital video: **router level 1**
   ~   analog audio channel 1: **router level 2**
   ~   analog audio channel 2: **router level 3**

2. For each board (particularly where a pair of boards are used for the same signal level), use DIP switches 1-5 to set the board's unique router level.

Remember that binary 0 (zero) is always router level 1 (one).

Router Level Examples

Level Name	Router Level	Switch Positions	
Digital Video	1	1-5 down	Binary 0
Analog Audio Ch. 1	2	1-4 down, 5 up	Binary 1
Analog Audio Ch. 2	3	1-3 down, 4 up, 5 down	Binary 2

3. Repeat step 2 for every board in each of your frames.

Note

> You can have a maximum of eight router levels in the UTAH-200 system (in the range **0** - **7**). The other router level positions are provided for compatibility with other UTAH routers. Refer to the *SC-3 User's Guide* for complete details.

Each board must know it relative offset in relation to other boards used for the same router level. This is particularly important with *pairs* of boards that are used for a 32x32 signal level.

DIP switch 8 is used to offset a board's associated expansion inputs from its base value.

DIP Switch 8 Positions, Expansion Input Offset

Switch Position	Description
0 (down)	Expansion inputs start at the base input value **plus** 16.
1 (up)	Expansion inputs start at the base input value **minus** 16.

Use the following steps to set a board's expansion offset:

1. If a board is used for inputs 0-15 for a particular signal level, set DIP switch 8 **down**.

2. If a board is used for inputs 16-31 for a particular signal level, set DIP switch 8 **up**.

3. Repeat steps 1 and 2 for every board in each of your frames.

Setting Control Panel ID Switches

One 8-position DIP switch is provided on the rear panel of each control panel for setting the panel's ID number. The figure below illustrates the DIP switch, and shows the value of each switch (in binary notation).
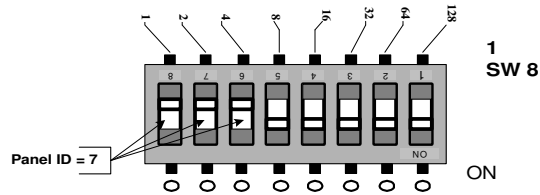
Dipswitch as it appears on the panel. To select a panel ID, switch is moved toward Numbered Silkscreen.

The following rules apply:

- Every control panel *must* have a unique ID number. This number allows it to be properly identified by both the controller and the RMS-200.

- ID numbers between 1 and 254 can be selected.

- ID number 0 and 255 are invalid — therefore, if *all* DIP switches are either up or down, you have set an invalid number.

- The numbers printed above each switch represent the value of that particular switch. To "build" an ID number:

  ~ To include the printed value, slide the switch **up**, towards the printed label.
  ~ To exclude the printed value, slide the switch **down**, away from the printed label.
  ~ **Add** the values together to obtain the desired ID. The table below provides several examples.

ID Number Examples

ID	Switch Positions
1	1 up, 2-8 down
2	1 down, 2 up, 3-8 down
3	1-2 up, 3-8 down
12	1-2 down, 3-4 up, 5-8 down
14	1 down, 2-4 up, 5-8 down
24	1-3 down, 4-5 up, 6-8 down

Once you have set the ID number, make a note of the number on your **Panel Information Chart**. Repeat the procedure for each control panel in your system. In chapter 4, refer to the "**Panel Information Chart**" section for a sample chart.

Installing Audio/Video Signals

This section provides instructions for installing audio and video signals from each of your facility's devices to (and from) the UTAH-200 router. Note the following important points:

- Routing Switchers have large numbers of inputs and outputs, and care is needed to plan your cabling. It is recommended that you make an "**installation chart**" of all of your devices (and all associated signals) on paper, prior to proceeding.

- The density of cables attached to each rear panel is very high. As a result, it is very important to:
  - ~ dress all cables properly for easy access
  - ~ label all cables accurately for easy identification
  - ~ provide a service loop in all cables for maintenance and to keep stress (and excess weight) off of the connectors

- As you map out your connection requirements (on paper), remember that some devices require a minimum number of connections while others require multiple connections. For example:
  - ~ An analog audio CD player only requires two signals connected (audio out L and R).
  - ~ A digital VTR may require up to 24 signals connected (Digital video in/out, composite analog video in/out, digital audio channels 1-4 in/out, analog audio channels 1-4 in/out, cue in/out, and timecode in/out).

The following installation procedures are covered in the next sections:

- Installing Video Inputs
- Installing Video Outputs
- Installing Video Monitor Outputs
- Audio Cable Recommendations
- Installing Analog Audio Inputs
- Installing Analog Audio Outputs
- Installing Analog Audio Monitor Outputs
- Installing Analog Audio Breakout Panels
- Installing Digital Audio Inputs
- Installing Digital Audio Outputs
- Installing Digital Audio Monitor Outputs
- Installing Digital Audio Breakout Panels
- Installing AES Reference
- Audio Connector Wiring Charts

Installing Video Inputs

This section provides guidelines for installing video inputs to the UTAH-200 routing switcher. Video cable specifications are listed below:

Input Signal	Recommended Cable Type	Maximum Cable Length	Termination Method
Digital Video	Belden 8281	1000 feet (360 Mb/s)	Internal 75Ω
Analog Video	Belden 8281	any pre-equalized length	Internal 75Ω

Note the following important points regarding input signal connection:

- Ensure that the video signal level frames are installed properly in your equipment rack, and clearly labeled on the rear panel. A system may have more than one video signal level installed (e.g., analog composite video plus digital video).

- Ensure that all video cables (both ends) are clearly labeled with the signal that it carries (e.g., **VTR1 Vid Out**).

- All UTAH-200 video inputs use BNC 75 Ohm single-ended connectors.

- Input connectors are arranged in two rows of eight connectors each, and numbered (from right to left) **0** through **15**, or **16** through **31** — as viewed from the rear of the frame.
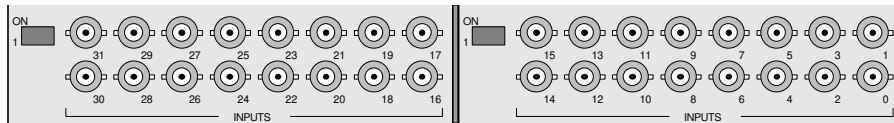
Install video input cables per the requirements of your installation chart:

- **If a Digital Video Signal Level is installed**:

  Connect video outputs from your digital source devices to the appropriate digital video input connectors. Connect one source output to one UTAH-200 input only.

- **If an Analog Video Signal Level is installed**:

  Connect video outputs from your analog source devices to the appropriate analog video input connectors. Connect one source output to one UTAH-200 input only.

Note	For details on the analog board's **Video Equalization** option, see the "**Video Equalization Option**" section in Appendix B.

- **Signal Timing**:

  For synchronous switching, all video signals should be timed to arrive *at the same time* at the UTAH-200's inputs.

Note

> All video inputs (except the Reference loop) are internally terminated (75Ω). It is not permissible to loop video inputs using a BNC "**T**" connector.

Installing Video Outputs

This section provides guidelines for installing video outputs from the UTAH-200 routing switcher. Note the following important points:

- Ensure that the video signal level frames are installed properly in your equipment rack, and clearly labeled on the rear panel. A system may have more than one video signal level installed (e.g., analog composite video plus digital video).

- Ensure that all video cables (both ends) are clearly labeled with the signal that it carries (e.g., **VTR1 Vid In**).

- All video outputs use BNC 75 Ohm single-ended connectors.

- Output connectors are arranged in two rows of eight connectors each, and numbered (from right to left) **0** through **15**, or **16** through **31** — as viewed from the rear of the frame.
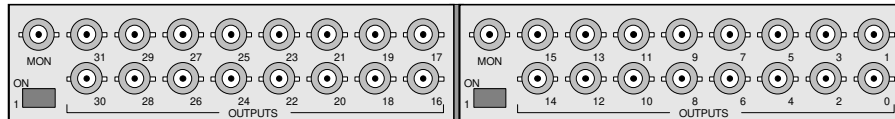
Install video output cables per the requirements of your installation chart:

- **If a Digital Video Signal Level is installed**:

  Connect outputs from the appropriate digital video output connectors to the digital video inputs on your destination devices. Connect one UTAH-200 output to one destination input only.

- **If an Analog Video Signal Level is installed**:

  Connect outputs from the appropriate analog video output connectors to the analog inputs on your destination devices. Connect one UTAH-200 output to one destination input only.

Note

> For details on the analog board's **Video Equalization** option, see the "**Video Equalization Option**" section in Appendix B.

Installing Video Monitor Outputs

Each video signal level in your system (both analog and digital) can be equipped with an optional monitor matrix. When installed, you can monitor that signal level's multiple outputs — without affecting the actual destinations.

The BNC **MON** connector is provided *as standard*, whether or not the optional monitor matrix board is installed in the chassis.
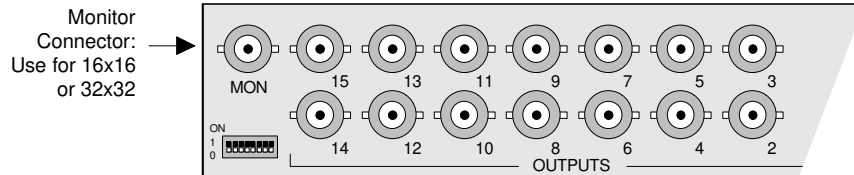
For installation, please note:

- All video monitor switching is controlled from the control panel's LCD display.

- If a 16x16 video signal level is installed *by itself* in a frame (a single video backplane), connect the video **MON** output to the video input of a destination video monitor. In this configuration, the **MON** output switches outputs **0**-**15**.

- If a 32x32 video signal level is installed (two video backplanes side-by-side), the second backplane includes a **MON** connector, but it is *unlabeled*.

  In this configuration, the monitor matrices are connected internally, but only the **MON** output on the *first backplane* is active. Connect the **MON** output (on the 0-15 backplane) to the input of a destination video monitor. Here, the **MON** output switches outputs **0**-**31**.

Ensure that the DIP switches are set correctly to properly identify the frame. Refer to the "**Setting Frame ID Switches**" for instructions.

Audio Cable Recommendations

Analog and digital audio cable specifications are listed below:

Signal	Recommended Cable	Max. Cable Length	Termination
Analog Audio	Belden 8451 (twisted pair)	n/a	Internal, optional 600Ω
Digital Audio	Belden 9180 (or better)	300 feet (balanced)	Internal
	Belden 8251 (or better)	1000 feet (unbalanced)	Internal

Installing Analog Audio Inputs

This section provides guidelines for installing analog audio inputs. Note the following points regarding analog audio input connection:

- Ensure that the audio signal level frames are installed properly in your equipment rack, and clearly labeled on the rear panel.

- Ensure that all audio cables (both ends) are clearly labeled with the signal that it carries (e.g., **VTR1 Ch1 Out**).

- Refer to the "**Audio Cable Recommendations**" section for cable information and specifications.

There are two ways to install your inputs:

- Inputs can be connected directly to the backplane. A connector kit (part number **65362-4**) consisting of eight 26-pin high-density male connectors and back shells is available from Utah Scientific. Please contact your Utah Scientific representative for details.

- Inputs can be connected to an optional **Analog Breakout Panel**. Refer to the "**Installing Analog Audio Breakout Panels**" section for full details.

Use the figure and table below for reference. All analog audio input connectors are 26-pin high-density female sub-miniature "D" connectors.

Slot	Connector	Inputs	Application
Lower	**J8** **J7**	0-7 8-15	Channel 1 (of a 16x16 stereo pair), channel 1 or 2 (inputs 0-15) in a 32x32 stereo pair.
Upper and Lower	**J4** **J3**	0-7 or 16-23 8-15 or 24-31	Channel 2 (of a 16x16 stereo pair), channel 1 or 2 (inputs 16-31) in a 32x32 stereo pair.

Note   Refer to the "**Audio Connector Wiring Charts**" section for input connector pinouts. Refer to Appendix C for a list of audio connector suppliers.

Installing Analog Audio Outputs

This section provides guidelines for installing analog audio outputs. Note the following important points regarding output signal connection:

- Ensure that the audio signal level frames are installed properly in your equipment rack, and clearly labeled on the rear panel.

- Ensure that all audio cables (both ends) are clearly labeled with the signal that it carries (e.g., **VTR1 Ch1 In**).

- Refer to the "**Audio Cable Recommendations**" section for cable information and specifications.

There are two ways to install your outputs:

- Outputs can be connected directly to the backplane. A connector kit (part number **65362-4**) consisting of eight 26-pin high-density male connectors and back shells is available from Utah Scientific. Contact your Utah Scientific representative for details.

- Outputs can be connected to an optional **Analog Breakout Panel**. Refer to the "**Installing Analog Audio Breakout Panels**" section for full details.

Use the figure and table below for reference. All analog audio output connectors are 26-pin high-density female sub-miniature "D" connectors.

Slot	Connector	Outputs	Application
Lower	**J6** **J5**	0-7 8-15	Channel 1 (of a 16x16 stereo pair), channel 1 or 2 (outputs 0-15) in a 32x32 stereo pair.
Upper and Lower	**J2** **J1**	0-7 or 16-23 8-15 or 24-31	Channel 2 (of a 16x16 stereo pair), channel 1 or 2 (outputs 16-31) in a 32x32 pair.

Note Refer to the "**Audio Connector Wiring Charts**" section for output connector pinouts. Refer to Appendix C for a list of audio connector suppliers.

Installing Analog Audio Monitor Outputs

Each analog audio signal level in your system can be equipped with an optional monitor matrix. When installed, you can monitor that signal level's multiple analog outputs — without affecting the destinations.

Upper monitor connector:
Use for 16x16 stereo (ch. 2)
or 32x32 mono (output 2)

Lower monitor connector:
Use for 16x16 stereo (ch. 1)
or 32x32 mono (output 1)
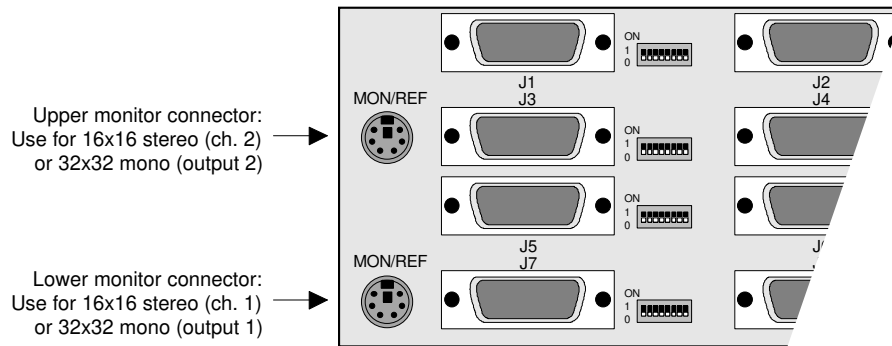
There are two ways to install your monitor outputs:

- An analog monitor can be connected directly to the backplane. The 6-pin circular mini-DIN **MON/REF** connector is provided *as standard*, whether or not the optional monitor matrix board is installed on the analog audio board.

- A monitor can be connected to an optional **Analog Breakout Panel**. Refer to the "**Installing Analog Audio Breakout Panels**" section for full details.

Refer to the "**Audio Connector Wiring Charts**" section for **MON/REF** connector pinouts.

Important

> The **MON/REF** connector provides three pins for the monitor connection and three pins for an AES reference input, which is used in conjunction with the **Digital Audio Board** *only*. The reference connection is *unused* in analog audio applications.

Please note the following important rules:

- All audio monitor switching is performed from the control panel's LCD display.

- The lower **MON** output (adjacent to **J7**) is used as follows:

    ~ If a single 16x16 analog audio board is installed in a bay, the lower **MON** output switches outputs **0**-**15**.

- ~ If two 16x16 analog audio boards are installed in a bay (for use as a 16x16 stereo pair), the lower **MON** output switches outputs **0**-**15** (channel 1).

- ~ If two 16x16 analog audio boards are installed in a bay (for use as channel 1 or 2 in a 32x32 stereo pair), the lower **MON** output switches outputs **0**-**31** (channel 1).

- The upper **MON** output (adjacent to **J3**) is used as follows:

  - ~ If a single 16x16 analog audio board is installed in a bay, the upper **MON** output is unused.

  - ~ If two 16x16 analog audio boards are installed in a bay (for use as a 16x16 stereo pair), the upper **MON** output switches outputs **0**-**15** (channel 2).

  - ~ If two 16x16 analog audio boards are installed in a bay (for use as channel 1 or 2 in a 32x32 stereo pair), the upper **MON** output *also* switches outputs **0**-**31** (channel 1).

For your configuration, connect the appropriate **MON** output(s) to the analog audio input of a destination analog mixer or power amp/speaker.

Installing Analog Audio Breakout Panels

This section provides guidelines for installing the optional **Analog Audio Breakout Panel** (part number **80317-1**). One panel provides connections for 16 inputs and 16 output (either 0-15 or 16-31). Use *two panels* for a full 32x32 level. The panel kit includes:

- 1 x Analog Audio Breakout Panel (1 RU), terminal block type
- 4 x 3-ft. audio interconnect cables (26-pin connectors)
- 1 x 3-ft. monitor interconnect cable

The figure below illustrates the rear of the Analog Breakout Panel. The table lists recommended connections.
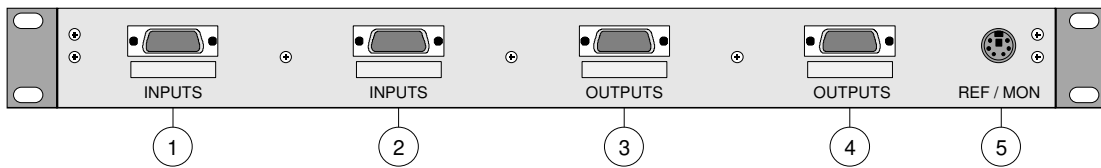
Rear Breakout Panel Connector	Connect to Backplane Connector:	Inputs	Outputs
For channel 1 (of a 16x16 stereo pair), or channel 1 or 2 (inputs 0-15) in a 32x32 stereo pair.			
1 **2**	**J8** **J7**	0-7 8-15	
For channel 2 (of a 16x16 stereo pair), or channel 1 or 2 (inputs 16-31) in a 32x32 stereo pair.			
1 **2**	**J4** **J3**	0-7 or 16-23 8-15 or 24-31	
For channel 1 (of a 16x16 stereo pair), or channel 1 or 2 (outputs 0-15) in a 32x32 stereo pair.			
3 **4**	**J6** **J5**		0-7 8-15
For channel 2 (of a 16x16 stereo pair), or channel 1 or 2 (outputs 16-31) in a 32x32 pair.			
3 **4**	**J2** **J1**		0-7 or 16-23 8-15 or 24-31
For monitor connections, refer to the "**Installing Analog Audio Monitor Outputs**" section for a list of important rules. Refer to the "**Audio Connector Wiring Charts**" section for pinouts.			
5	**MON (Lower)** **MON (Upper)**		0-15 or 0-31 Unused, 0-15 or 0-31

The figure below illustrates the front of the Analog Breakout Panel. The table lists recommended connections.

Front Breakout Panel Connector	Connect to Inputs:	Connect to Outputs:
1	0-3 or 16-19	
2	4-7 or 20-23	
3	8-11 or 24-27	
4	*12-15 or 28-31	
5		0-3 or 16-19
6		4-7 or 20-23
7		8-11 or 24-27
8		*12-15 or 28-31
9		Speaker/Amp
10		Unused

* **The Breakout Panel is very flexible, any number of Inputs or Outputs may be connected.**

Note	Refer to the "**Audio Connector Wiring Charts**" section for input and output connector pinouts.

Note the following general installation guidelines:

- Locate a convenient position in your equipment rack where you want to mount the Breakout Panel. Provide sufficient space for cables and connectors. Ensure that the panel's position is within three feet of the Analog Audio Backplane.

- Use the rectangular label areas on the front and rear of the Breakout Panel for input/output connector identification.

Installing Digital Audio Inputs

This section provides guidelines for installing digital audio inputs. Note the following points regarding digital audio input connection:

- Ensure that the audio signal level frames are installed properly in your equipment rack, and clearly labeled on the rear panel.

- Ensure that all audio cables (both ends) are clearly labeled with the signal that it carries (e.g., **VTR1 AES 1/2 Out**).

- Refer to the "**Audio Cable Recommendations**" section for cable information and specifications.

There are two ways to install your digital inputs:

- Inputs can be connected directly to the backplane. A connector kit (part number **65362-4**) consisting of eight 26-pin high-density male connectors and back shells is available from Utah Scientific. Please contact your Utah Scientific representative for details.

- Inputs can be connected to an optional **Digital Breakout Panel**. Refer to the "**Installing Digital Audio Breakout Panels**" section for full details.

Use the figure and table below for reference. All digital audio input connectors are 26-pin high-density female sub-miniature "D" connectors.
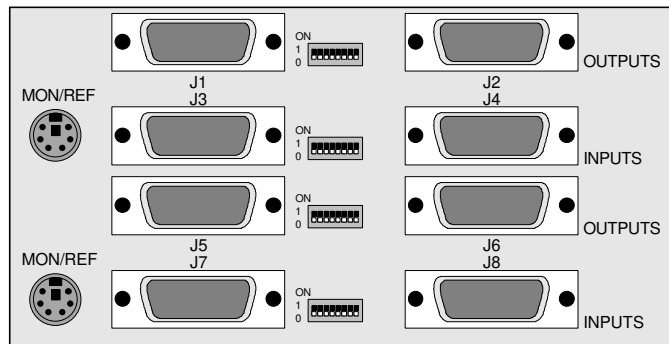
Slot	Connector	Inputs	Application
Lower	**J8** **J7**	0-7 8-15	AES inputs 0-15 (channels 1/2), 16x16 or 32x32
Upper and Lower	**J4** **J3**	0-7 or 16-23 8-15 or 24-31	AES inputs 16-31 (channels 1/2), AES inputs 0-15 (channels 3/4)

Note   Refer to the "**Audio Connector Wiring Charts**" section for input connector pinouts. Refer to Appendix C for a list of audio connector suppliers.

Installing Digital Audio Outputs

This section provides guidelines for installing digital audio outputs. Note the following important points regarding output signal connection:

- Ensure that the audio signal level frames are installed properly in your equipment rack, and clearly labeled on the rear panel.

- Ensure that all audio cables (both ends) are clearly labeled with the signal that it carries (e.g., **VTR1 Ch1 In**).

- Refer to the "**Audio Cable Recommendations**" section for cable information and specifications.

There are two ways to install your digital outputs:

- Outputs can be connected directly to the backplane. A connector kit (part number **65362-4**) consisting of eight 26-pin high-density male connectors and back shells is available from Utah Scientific. Contact your Utah Scientific representative for details.

- Outputs can be connected to an optional **Digital Breakout Panel**. Refer to the "**Installing Digital Audio Breakout Panels**" section for full details.

Use the figure and table below for reference. All digital audio output connectors are 26-pin high-density female sub-miniature "D" connectors.
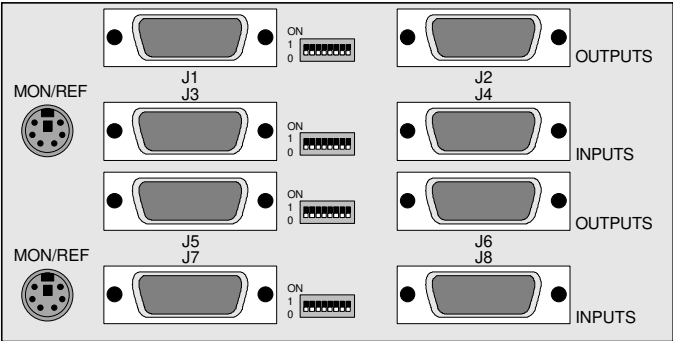
Slot	Connector	Outputs	Application
Lower	**J6** **J5**	0-7 8-15	AES outputs 0-15 (channels 1/2), 16x16 or 32x32
Upper and Lower	**J2** **J1**	0-7 or 16-23 8-15 or 24-31	AES outputs 16-31 (channels 1/2), AES outputs 0-15 (channels 3/4)

Note   Refer to the "**Audio Connector Wiring Charts**" section for output connector pinouts. Refer to Appendix C for a list of audio connector suppliers.

Installing Digital Audio Monitor Outputs

Each digital audio signal level in your system can be equipped with an optional monitor matrix. When installed, you can monitor that signal level's multiple digital outputs — without affecting the destinations.

Upper monitor connector:
Use for AES outputs 0-15
(16x16 configuration, ch. 3/4)
or AES outputs 0-31
(32x32 configuration, ch. 1/2)

Lower monitor connector:
Use for AES outputs 0-15
(16x16 configuration, ch. 1/2)
or AES outputs 0-31
(32x32 configuration, ch. 1/2)
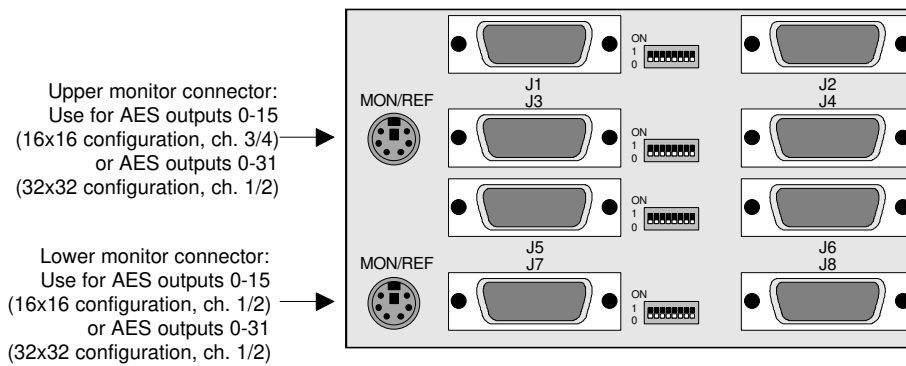
There are two ways to install your monitor outputs:

- A digital (or analog) monitor can be connected directly to the backplane. The 6-pin circular mini-DIN **MON/REF** connector is provided *as standard*, whether or not the optional monitor matrix board is installed on the digital audio board.

- A digital monitor *only* can be connected to an optional **Digital Breakout Panel** (the panel does not support the analog monitor output option). Refer to the "**Installing Digital Audio Breakout Panels**" section for additional details.

Important	The **MON/REF** connector (on both the backplane and Breakout Panel) provides three pins for the monitor connection and three pins for an AES reference input. Refer to the "**Audio Connector Wiring Charts**" section for connector pinouts.

Note	The monitor output is jumper-selectable between analog or digital audio. In Appendix B, refer to the "**Digital Audio Board**" section for instructions on setting the output format.

Please note the following important rules:

- All audio monitor switching is performed from the control panel's LCD display.

- The lower **MON/REF** output (adjacent to **J7**) is used as follows:

    ~ If a single 16x16 digital audio board is installed in a bay, the lower **MON/REF** output switches AES outputs **0**-**15** (channels 1/2).

    ~ If two 16x16 digital audio boards are installed in a bay (for use as two 16x16 levels), the lower **MON/REF** output switches AES outputs **0**-**15**.

    ~ If two 16x16 digital audio boards are installed in a bay (for use as a 32x32 level), the lower **MON/REF** output switches AES outputs **0**-**31** (channels 1/2).

- The upper **MON/REF** output (adjacent to **J3**) is used as follows:

    ~ If a single 16x16 digital audio board is installed in a bay, the upper **MON/REF** output is unused.

    ~ If two 16x16 digital audio boards are installed in a bay (for use as two 16x16 levels), the upper **MON/REF** output switches AES outputs **0**-**15** (channels 3/4).

    ~ If two 16x16 digital audio boards are installed in a bay (for use as a 32x32 level), the upper **MON/REF** output *also* switches AES outputs **0**-**31** (channels 1/2).

For your configuration, connect the appropriate **MON/REF** output(s) to the digital (or analog) audio input of a destination mixer or power amp/speaker. Be sure to set the desired audio output format (analog or digital) as required. In Appendix B, refer to the "**Digital Audio Board**" section for details.

Installing Digital Audio Breakout Panels

This section provides guidelines for installing the optional **Digital Audio Breakout Panel** (part number **80318-1**). One panel provides connections for 16 inputs and 16 output (either 0-15 or 16-31). Use *two panels* for a full 32x32 level. The panel kit includes:

- 1 x Digital Audio Breakout Panel (1 RU), terminal block type
- 4 x 3-ft. audio interconnect cables (26-pin connectors)
- 1 x 3-ft. monitor interconnect cable

Note

The **Digital Audio Breakout Panel** provides BNC input/output connectors only. The panel performs the required impedance transformation to 75Ω.

The figure below illustrates the rear of the Digital Breakout Panel. The table lists recommended connections.
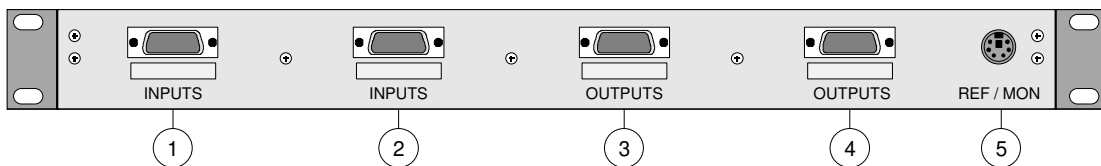
Rear Breakout Panel Connector	Connect to Backplane Connector:	Inputs	Outputs
For AES inputs 0-15 in a 16x16 or 32x32 level (channels 1/2)			
1 **2**	**J8** **J7**	0-7 8-15	
For AES inputs 16-31 (channels 1/2), or inputs 0-15 (channels 3/4).			
1 **2**	**J4** **J3**	0-7 or 16-23 8-15 or 24-31	
For AES outputs 0-15 in a 16x16 or 32x32 level (channels 1/2)			
3 **4**	**J6** **J5**		0-7 8-15
For AES outputs 16-31 (channels 1/2), or inputs 0-15 (channels 3/4).			
3 **4**	**J2** **J1**		0-7 or 16-23 8-15 or 24-31
For monitor connections, refer to the "**Installing Digital Audio Monitor Outputs**" section for a list of important rules. Refer to the "**Audio Connector Wiring Charts**" section for pinouts.			
5	**MON (Lower)** **MON (Upper)**		0-15 or 0-31 Unused, 0-15 or 0-31

The figure below illustrates the front of the Digital Audio Breakout Panel. The table lists recommended connections. Input and output numbers are shown in the figure for reference only — they do *not* appear on the panel silk-screen itself.
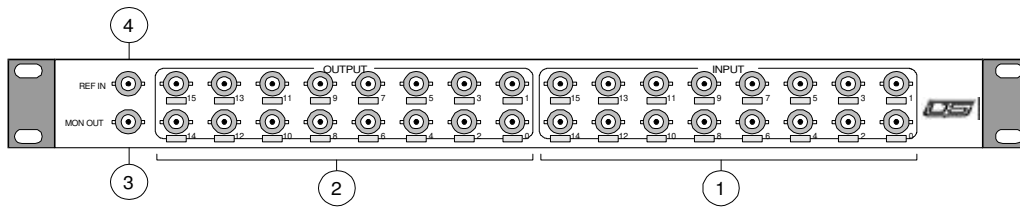
Front Breakout Panel Connector	Connect to Inputs:	Connect to Outputs:
(Group) 1	*0-15 or 16-31	
(Group) 2		*0-15 or 16-31
3		Speaker/Amp
4	AES Reference	

* The Breakout Panel is very flexible, any number of Inputs or Outputs may be connected.

Note the following general installation guidelines:

• Locate a convenient position in your equipment rack where you want to mount the Breakout Panel. Provide sufficient space for cables and connectors. Ensure that the panel's position is within three feet of the Analog Audio Backplane.

• Use the rectangular label areas on the front and rear of the Breakout Panel for input/output connector identification.

Note	A digital monitor *only* can be connected to the **Digital Breakout Panel** (the panel does not support the analog monitor output option). To use the analog output option, the **Digital Audio Backplane** is required. Refer to the "**Installing Digital Audio Monitor Outputs**" section for details.

For monitor connections, refer to the "**Installing Digital Audio Monitor Outputs**" section for a list of important rules. For the AES reference connection, refer to the "**Installing AES Reference**" section.

Installing AES Reference

This section provides guidelines for installing an AES reference input. The input is active *only* when the **Synchronous** version of the **Digital Audio Board** is installed, and when jumper **JP1** is installed on the **Synchronous** module. In Appendix B, refer to the "**Digital Audio Board**" section for instructions on setting the jumper position.

There are two ways to install an AES reference input:

- An AES reference can be connected directly to the backplane. Refer to the "**Audio Connector Wiring Charts**" section for **MON/REF** connector pinouts.

- An AES reference can be connected to the optional **Digital Breakout Panel** (BNC connection).

For details on audio/video devices capable of generating an AES reference timing signal, please contact Customer Support.

Audio Connector Wiring Charts

This section provides input and output wiring connector charts, which are *identical* for both and analog and digital audio backplanes.

- **Audio Input Connectors, 16x16 application**

Pin Arrangement for 26 pin High Density Female D-Sub Connector
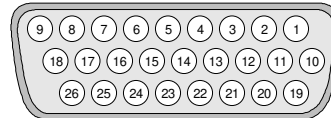
Pin #	J8	J7	J4	J3
1	INP 0+	INP 8+	INP 0+	INP 8+
2	INP 1+	INP 9+	INP 1+	INP 9+
3	INP 2+	INP 10+	INP 2+	INP 10+
4	INP 3+	INP 11+	INP 3+	INP 11+
5	INP 4+	INP 12+	INP 4+	INP 12+
6	INP 5+	INP 13+	INP 5+	INP 13+
7	INP 6+	INP 14+	INP 6+	INP 14+
8	INP 7+	INP 15+	INP 7+	INP 15+
9	SHIELD AC	SHIELD AC	SHIELD AC	SHIELD AC
10	SHIELD AC	SHIELD AC	SHIELD AC	SHIELD AC
11	INP 0–	INP 8–	INP 0–	INP 8–
12	INP 1–	INP 9–	INP 1–	INP 9–
13	INP 2–	INP 10–	INP 2–	INP 10–
14	INP 3–	INP 11–	INP 3–	INP 11–
15	INP 4–	INP 12–	INP 4–	INP 12–
16	INP 5–	INP 13–	INP 5–	INP 13–
17	INP 6–	INP 14–	INP 6–	INP 14–
18	INP 7–	INP 15–	INP 7–	INP 15–
19	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
20	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
21	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
22	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
23	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
24	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
25	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
26	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND

Note:

~ SHIELD GND connections are identical and provide metallic connections to case/signal ground.

~ SHIELD AC connections at pins 9 and 10 are supplementary capacitively coupled connections to case/signal ground. They provide an alternate shield connection to break ground loops on problematic inputs.

~ J4 and J3 are not used if only 1 card is installed.

- **Audio Input Connectors, 32x32 application**

Pin Arrangement for 26 pin
High Density Female D-Sub
Connector
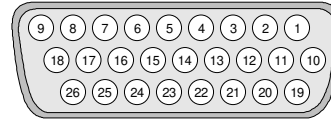
Pin #	J8	J7	J4	J3
1	INP 0+	INP 8+	INP 16+ (0+)	INP 24+ (8+)
2	INP 1+	INP 9+	INP 17+ (1+)	INP 25+ (9+)
3	INP 2+	INP 10+	INP 18+ (2+)	INP 26+ (10+)
4	INP 3+	INP 11+	INP 19+ (3+)	INP 27+ (11+)
5	INP 4+	INP 12+	INP 20+ (4+)	INP 28+ (12+)
6	INP 5+	INP 13+	INP 21+ (5+)	INP 29+ (13+)
7	INP 6+	INP 14+	INP 22+ (6+)	INP 30+ (14+)
8	INP 7+	INP 15+	INP 23+ (7+)	INP 31+ (15+)
9	SHIELD AC	SHIELD AC	SHIELD AC	SHIELD AC
10	SHIELD AC	SHIELD AC	SHIELD AC	SHIELD AC
11	INP 0–	INP 8–	INP 16– (0–)	INP 24– (8–)
12	INP 1–	INP 9–	INP 17– (1–)	INP 25– (9–)
13	INP 2–	INP 10–	INP 18– (2–)	INP 26– (10–)
14	INP 3–	INP 11–	INP 19– (3–)	INP 27– (11–)
15	INP 4–	INP 12–	INP 20– (4–)	INP 28– (12–)
16	INP 5–	INP 13–	INP 21– (5–)	INP 29– (13–)
17	INP 6–	INP 14–	INP 22– (6–)	INP 30– (14–)
18	INP 7–	INP 15–	INP 23– (7–)	INP 31– (15–)
19	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
20	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
21	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
22	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
23	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
24	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
25	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
26	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND

Note:

~ Inputs are numbered for a 32x32 matrix using two crosspoint modules with interconnect.

~ Numbers shown in parentheses show input assignments for an alternate level when the crosspoint modules are used independently.

~ SHIELD GND connections are identical and provide metallic connections to case/signal ground.

~ SHIELD AC connections at pins 9 and 10 are supplementary capacitively coupled connections to case/signal ground. They provide an alternate shield connection to break ground loops on problematic inputs.

• **Audio Output Connectors, 16x16 application**

Pin Arrangement for 26 pin
High Density Female D-Sub
Connector
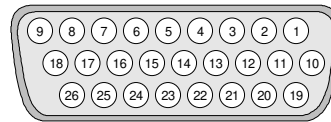
Pin #	J6	J5	J2	J1
1	OUT 0+	OUT 8+	OUT 0+	OUT 8+
2	OUT 1+	OUT 9+	OUT 1+	OUT 9+
3	OUT 2+	OUT 10+	OUT 2+	OUT 10+
4	OUT 3+	OUT 11+	OUT 3+	OUT 11+
5	OUT 4+	OUT 12+	OUT 4+	OUT 12+
6	OUT 5+	OUT 13+	OUT 5+	OUT 13+
7	OUT 6+	OUT 14+	OUT 6+	OUT 14+
8	OUT 7+	OUT 15+	OUT 7+	OUT 15+
9	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
10	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
11	OUT 0–	OUT 8–	OUT 0–	OUT 8–
12	OUT 1–	OUT 9–	OUT 1–	OUT 9–
13	OUT 2–	OUT 10–	OUT 2–	OUT 10–
14	OUT 3–	OUT 11–	OUT 3–	OUT 11–
15	OUT 4–	OUT 12–	OUT 4–	OUT 12–
16	OUT 5–	OUT 13–	OUT 5–	OUT 13–
17	OUT 6–	OUT 14–	OUT 6–	OUT 14–
18	OUT 7–	OUT 15–	OUT 7–	OUT 15–
19	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
20	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
21	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
22	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
23	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
24	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
25	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
26	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND

Note:

~ J2 and J1 are not used if only 1 card is installed.

- **Audio Output Connectors, 32x32 application**

Pin Arrangement for 26 pin
High Density Female D-Sub
Connector
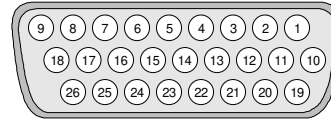
Pin #	J6	J5	J2	J1
1	OUT 0+	OUT 8+	OUT 16+ (0+)	OUT 24+ (8+)
2	OUT 1+	OUT 9+	OUT 17+ (1+)	OUT 25+ (9+)
3	OUT 2+	OUT 10+	OUT 18+ (2+)	OUT 26+ (10+)
4	OUT 3+	OUT 11+	OUT 19+ (3+)	OUT 27+ (11+)
5	OUT 4+	OUT 12+	OUT 20+ (4+)	OUT 28+ (12+)
6	OUT 5+	OUT 13+	OUT 21+ (5+)	OUT 29+ (13+)
7	OUT 6+	OUT 14+	OUT 22+ (6+)	OUT 30+ (14+)
8	OUT 7+	OUT 15+	OUT 23+ (7+)	OUT 31+ (15+)
9	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
10	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
11	OUT 0–	OUT 8–	OUT 16– (0–)	OUT 24– (8–)
12	OUT 1–	OUT 9–	OUT 17– (1–)	OUT 25– (9–)
13	OUT 2–	OUT 10–	OUT 18– (2–)	OUT 26– (10–)
14	OUT 3–	OUT 11–	OUT 19– (3–)	OUT 27– (11–)
15	OUT 4–	OUT 12–	OUT 20– (4–)	OUT 28– (12–)
16	OUT 5–	OUT 13–	OUT 21– (5–)	OUT 29– (13–)
17	OUT 6–	OUT 14–	OUT 22– (6–)	OUT 30– (14–)
18	OUT 7–	OUT 15–	OUT 23– (7–)	OUT 31– (15–)
19	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
20	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
21	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
22	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
23	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
24	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
25	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND
26	SHIELD GND	SHIELD GND	SHIELD GND	SHIELD GND

Note:

~ Outputs are numbered for a 32x32 matrix using two crosspoint modules with interconnect.

~ Numbers in parentheses show output assignments for an alternate level when the crosspoint modules are used independently.

~ SHIELD GND connections are identical and provide metallic connections to case/signal ground.

~ SHIELD GND connections at pins 9 and 10 are extra ground connections for over-all cable shields, etc.

- **MON/REF Connector**

Pin Arrangement for 6 pin
circular mini-DIN
Monitor/Reference Connector
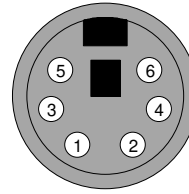
Pin #	AES Reference Input *	Monitor Output (Analog or Digital Format) **	Monitor Output (Analog Format) ***
1	SHIELD GND	n/c	n/c
2	n/c	SHIELD GND	SHIELD and signal return
3	– (Negative connection)	n/c	n/c
4	n/c	– (Negative connection)	Right channel output
5	+ (Positive connection)	n/c	n/c
6	n/c	+ (Positive connection)	Left channel output

Note

* **For use with the Digital Audio Board**:
110 ohm balanced interface (or bridging with appropriate jumper selection). Connection requires synchronous version of the Digital Audio Board. In Appendix B, refer to the "**Digital Audio Board**" section for instructions on setting the jumper position.

** **For use with the Digital Audio Board**:
`110 ohm balanced interface`. Digital format requires proper jumper selection. In Appendix B, refer to the "**Digital Audio Board**" section for instructions on setting the jumper position.

For use with the Analog Audio Board:
`Low impedance balanced interface.`

*** **For use with the Digital Audio Board**:
`Low impedance unbalanced interface.` Analog format requires proper jumper selection. In Appendix B, refer to the "**Digital Audio Board**" section for instructions on setting the jumper position.

Connecting and Disconnecting Power

Note the following points regarding system power:

- Each UTAH-200 frame has a self-contained AC power supply. One 6 foot **AC Power Cord** is supplied with each frame.

Important

> The **AC Power Cord** is the *only method* by which you can connect and disconnect chassis power. The chassis does not have a power switch, and is intended to be left *on* indefinitely. *In case of emergency, the user should have quick access to the AC Plug.*
>
> *If chassis power is DC (Telco) the user should have quick access to the DC Source power switch and / or AC Power Cord.*

Use the following diagrams for reference throughout the procedure:
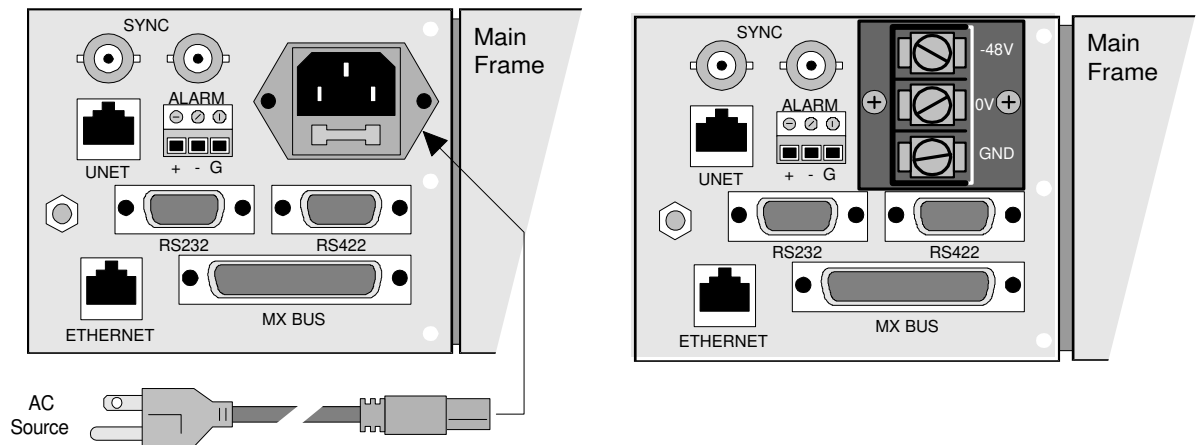
Use the following steps to connect system power:

1. In each frame's Control Block, locate the DC or AC **Power** connector.

2. Using an AC power cord, connect a stable power source to frame's **Power** connector.

   If the AC source's breaker is on, the UTAH-200 chassis should immediately power up.

3. To connect the **DC (Telco)** power block, confirm the DC power source is turned off or unplugged before connecting.

   First, connect the Ground (GND), then connect the 0 V(olt) and (-)48 V(olt) cables in sequence.

   Plug in and power up the DC Source.

4. Repeat steps 1 and 2 or 1 and 3 for each frame in your system.
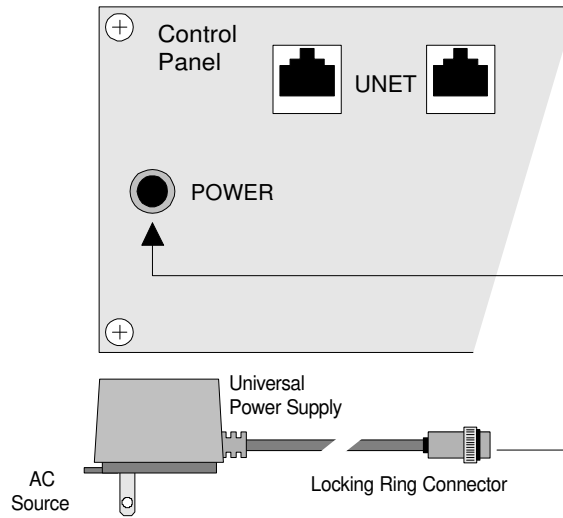
- Each standalone control panel requires a wall-mounted **Universal Power Supply** that connects to the panel with a DC power cord and locking connector. One **Universal Power Supply** is provided with each control panel.

  - The supply is rated at 12 VDC (.5 A)
  - The length of the DC cord is 5 feet.

Important

The **Universal Power Supply** and the associated **DC Power Cord** is the *only method* by which you can connect and disconnect control panel power. The control panel does not have a power switch, and is intended to be left *on* indefinitely. *In case of emergency, the user should have quick access to the power module*.

Use the following steps to connect control panel power:

1. On the rear of each control panel, locate the **Power** connector.

2. Connect a Universal Power Supply to a stable power source.

   Connect the supply's DC cable to the panel's **DC Power** connector, and secure the locking ring finger tight.

   If the AC source's breaker is on, the panel should immediately power up.

3. Repeat steps 2 and 3 for each control panel in your system.

Use the following steps to disconnect system power:

AC Powered Frames

1. In each frame's Control Block, locate the **AC Power** connector.

2. Carefully disconnect the AC power cord(s) in order to power down each UTAH-200 frame.

3. Repeat steps 1 and 2 for each frame in your system.

DC (Telco) Powered Frames

1. In each frame's Control Block, locate the DC (Telco) power connector.

2. Disconnect or power down the DC (-48 Volt) source.

3. Remove the -48 Volt, 0 Volt and Ground connections on each chassis in sequence.

4. Repeat steps 1 and 3 for each frame in your system.

Control Panels

1. On the rear of each control panel, locate the **Power** connector.

2. Unscrew the locking ring, and carefully disconnect the Universal Power Supply's DC cable.

3. Repeat steps 2 and 3 for each control panel in your system.

Checking and Replacing Fuses

If there are no LEDs lit inside the frame and there is no apparent power to the unit, this may indicate that a fuse has blown.

Use the following steps to check and replace fuses:

1. In each frame's Control Block, locate the **Power** connector.

2. Carefully disconnect the AC power cable in order to gain access to the fuse compartment. As a safety feature, the compartment can not be accessed with the AC cable connected.

3. Using a small screwdriver, open the compartment, remove the fuse and check it for damage.

4. If the fuse has blown, a spare is provided within the compartment's "pocket." Replace the blown fuse with the spare, and if desired place a *new* spare in the pocket.

5. Close the fuse compartment and reconnect the AC power cable in order to power up the frame.

The frame's fuse rating and size is listed below:

- 5 x 20mm, 5 AMP slow-blow (USI Part Number: **41907-0005**)

Hardware Checkout

Use the following chart to checkout your UTAH-200 routing switcher after installation. Note the following important points:

- For the **Video** and **Audio System** columns, note that each control panel will run with its default input and output names. You will not need to configure the RMS-200 for these steps.

- For the **Control System** column, you may *first* want to review the information provided in Chapter 5 "**Operations**," prior to performing this checkout procedure.

Installation	Power System	Video System	Audio System	Control System
Install all frames in the equipment racks. Interconnect all cables.	Remove the front panel from each chassis.	Monitor 1 output. Switch between 2 inputs and verify that the switch occurs in the Vertical Interval.	Sequentially route all inputs to one output (L & R), then verify that all inputs are functional.	From a single control panel, perform an ALL LEVEL TAKE.
Install all Control Panels and connect them to the controller.	Apply power to each chassis.	Route each input to a single output in sequence.	Sequentially route one input to all outputs (left and right channels), then verify each output.	Confirm that all levels have switched correctly.
	Check that the power light is illuminated on all Power Supplies	Route a single input to all outputs.	Route different inputs to each output.	From a single control panel, perform a BREAKAWAY TAKE.
	Check that no alarms are active.	Route a different input to each output.	Verify that the Monitor Matrix output is correct for each output signal.	Confirm that all levels have switched correctly.
	Re-install all front panels	Verify that the Monitor Matrix output is correct for each output signal.		Perform a TAKE from each control panel.

Checkout Complete

Installing the RMS-200

In This Chapter

This chapter provides instructions for installing the RMS-200 application. The following topics are discussed:

- About the RMS-200
- System Prerequisites
- A Word About Windows
- RMS-200 Installation
- Verifying the PC to Controller Connection
- Uninstalling the RMS-200
- Running the RMS-200
- Establishing Communications

About the RMS-200

The RMS-200 is a standard 32-bit Windows application that allows you to easily configure the UTAH-200 system (both the frames and all control panels) for day-to-day operation. The tool provides the following overall capabilities:

- Create or modify custom input, output and signal level names for the entire UTAH-200 system.

- Create custom sources and destinations (with intuitive alphanumeric names).

- Create unique source and destination configurations on a per-panel basis.

- Save and recall custom files (on disk) of your overall router configurations and individual remote panel configurations.

  – A file of input, output and signal level names is called a "**System Configuration**."
  – A file of control panel parameters is called a "**Panel Configuration**."

- Observe the router and monitor matrix performance, with automatic signal detection.

- Monitor and log system alarm conditions.

- Provide controller and panel software upgrades.

- Set up Ethernet or serial communications between the controller and the host PC (RS232 or RS422).

- Set up the controller's serial ports (RS232 or RS422) for communications with peripheral equipment — such as edit controllers and automation systems.

- Utilize on-line help and tool-tip help fields. The on-line help file includes the entire contents of the UTAH-200 User's Guide, with a complete index.

The RMS-200 runs as a "slave" application to the controller. With few exceptions, the RMS-200's screens always represent the precise configuration of signals that are attached to the UTAH-200 controller. The only typical exception is when you create a *new* configuration of inputs, outputs, or a new custom control panel configuration. Once you "upload" that configuration to the controller (or panel), both systems once again mirror each other.

System Prerequisites

The RMS-200 runs on the following platforms only:

- Windows 95
- Windows NT (version 4.0 or greater)

Your PC (customer supplied) must have the following minimum requirements for proper RMS-200 operation:

- 133 MHz Pentium (or higher)
- 15" SVGA monitor
- 65536 colors (minimum video card resolution)
- 32 megabytes of RAM (minimum)
- 1 GB (or larger) hard disk
- 1 3.5" floppy disk drive (high density)
- Ethernet adapter and/or serial interface

A Word About Windows

The RMS-200 application runs in the Windows 95 and Windows NT environments, and conforms to all standard Windows conventions. This guide assumes that you are comfortable with standard Windows-based procedures, such as using **Dialog Boxes**, using **Scroll Bars**, and navigating menus. These procedures will *not* be discussed in this guide.

If you are *not* familiar with Windows 95 or Windows NT operations, refer to your specific operating system's *User's Guide*, or to one of the many third-party books on the subject.

RMS-200 Installation

This section provides instructions for installing RMS-200 software. The procedure can also be used to re-install the software. Use the following steps to install the RMS-200 application:

1. Ensure that Window 95 or Windows NT version 4.0 (or higher) is running, and that all hardware installation procedures have been completed as outlined in Chapter 2.

Important

> Prior to running the setup program, it is *highly recommended* that you exit all Windows programs.

2. Unpack the RMS-200 3.5" floppy disks.
3. Insert disk #1 into your PC's floppy disk drive.
4. Click **Start**, then select **Run** to display the **Run Dialog**.
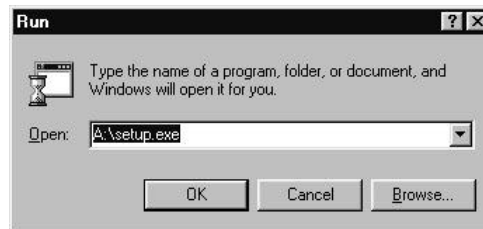
5. In the **Run Dialog**, type the correct path to your floppy drive followed by the setup command. For example: **A:\setup.exe**.
6. Click **OK**. After the InstallShield Wizard prepare the setup program, the **Welcome Dialog** appears.
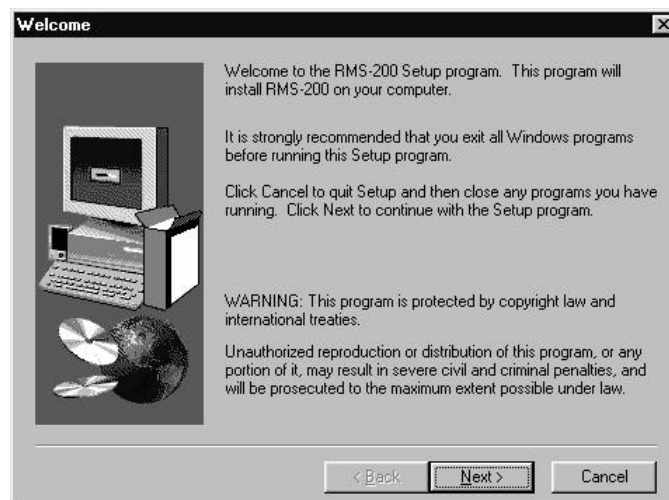
7. Click **Next** to display the **User Information Dialog**.
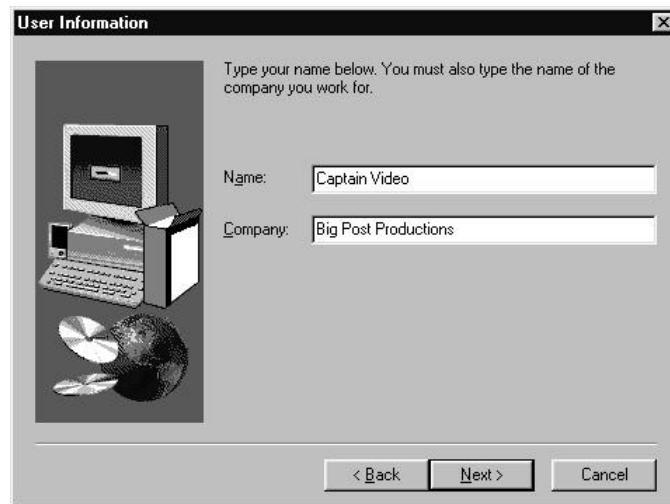
Enter your name and the name of your company in the **Name** and **Company** fields.

8. Click **Next** to display the **Choose Destination Dialog**.

Leave the default destination directory as is (recommended), or click **Browse** and select a different destination.

9. Click **Next** to display the **Select Program Folder Dialog**.
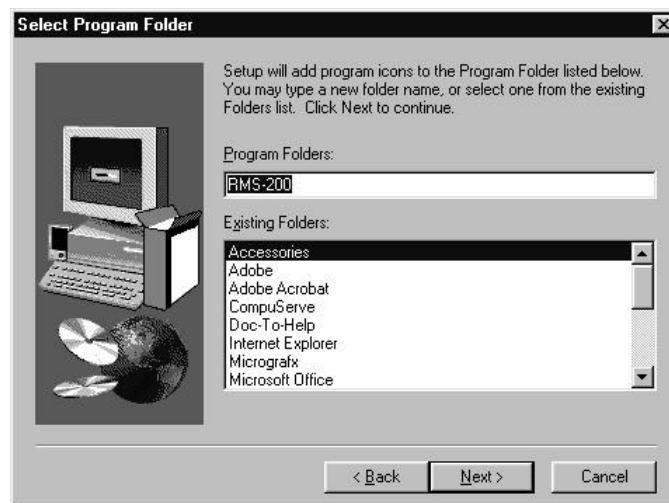
Leave the default folder **RMS-200** as is (recommended), or choose a different folder as desired.

10. Click **Next** to display the **Start Copying Files Dialog**.
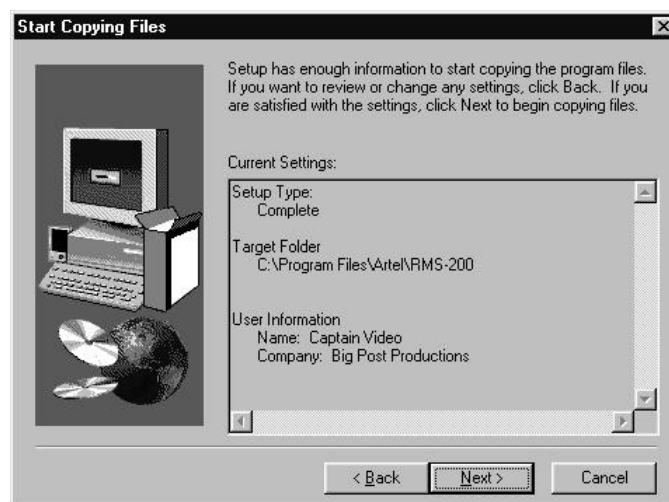
Confirm each of your settings, and if required, click **Back** to make any necessary changes.

11. Click **Next** to begin copying files from disk. When the **Next Disk Dialog** appears, insert Disk 2 and click **OK**.

12. After all files have been copied, the **Setup Complete Dialog** appears.

Check the desired options:

- Check "**View README**" to open the current set of release notes (recommended). These notes outline any last minute changes or updates to the RMS-200 program. If you wish to read the file later, the **Readme.txt** file is located in **C:\Program Files\Utah Scientific\RMS-200**.
- Check "**Launch Program**" to run the RMS-200 application immediately (upon completion of setup).

13. Click **Finish** to complete the setup procedure. Note that the open **RMS-200** folder remains on your desktop.
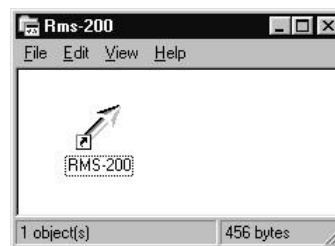
For convenience in running the application, drag the RMS-200 shortcut to your desktop, then close the folder.

14. Store the installation disks in a safe place for later use.

This completes the software installation procedure.

Verifying the PC to Controller Connection

RS232, RS422 or Ethernet can be used for PC-to-UTAH-200 controller communications. For your specific installation, locate the selected communications method below, then verify the connection between your PC and the UTAH-200:

- If you are using RS232 communications, ensure that the Main Frame's **RS232** port is connected to your PC. You can use any available **Com** port on your PC. In Chapter 2, refer to the "**Installing RS232 Communications**" section for details.

- If you are using RS422 communications, ensure that the Main Frame's **RS422** port is connected to your PC. You can use any available **Com** port on your PC. In Chapter 2, refer to the "**Installing RS422 Communications**" section for details.

- If you are using Ethernet communications, ensure that the Main Frame's **Ethernet** port is connected directly to your PC (for a point-to-point connection), or to a **Network Hub**. Your PC must have a Network Card installed. In Chapter 2, refer to the "**Installing Ethernet**" section for details.

Note

Communication parameters for the selected **Com** port (or **Ethernet** port) are set using the RMS-200 application. Refer to the "**Establishing Communications**" section for instructions.

This completes the connection verification procedure.

Uninstalling the RMS-200

If you wish to uninstall the **RMS-200** application, follow the standard Windows uninstall procedure:

1. Click **Start**, **Settings**, **Control Panel** to display the **Control Panel Dialog**.

2. Click the **Add/Remove Programs** icon to display the **Add/Remove Program Properties Dialog**.

3. In the list of programs, highlight **RMS-200**.

4. Click the **Add/Remove** button to remove the program and all of its components.

5. When the **Confirm File Deletion Dialog** appears, click **Yes**.

This completes the procedure for uninstalling the RMS-200 application.

Running the RMS-200

This section provides instructions for running the RMS-200 and establishing communications between your PC and the UTAH-200.

Note
> The procedure for establishing communications does not need to be repeated unless you change the communications method (for example, changing between serial and Ethernet), or change the **Com** port.

To run the RMS-200 application, use either the **Programs Menu** or the desktop shortcut:

- Using the **Programs Menu**:
    1. Click **Start**, and highlight the **Programs** topic.
    2. In the **Programs Menu**, highlight the **RMS-200** topic to display the **RMS-200 Menu**.
    3. In the **RMS-200 Menu**, click **RMS-200**.
- Using the **Desktop Shortcut**:
    1. Click the **RMS-200** shortcut.

Establishing Communications

This section provides instructions for establishing two different methods of communication:

- Serial Communications
- Ethernet Communications

Based on the method of interconnection that you have chosen between your PC and the UTAH-200, choose the appropriate section below.

Serial Communications

If you have interconnected your PC and the UTAH-200 using RS232 or RS422, use the following steps to establish communications:

1. Ensure that the UTAH-200 system is installed and running. If the system is not installed, refer to the "**Installing Hardware**" section in Chapter 2 for details.

2. Ensure that the RMS-200 is running, and that the **RMS-200 Main Window** is open on your desktop.

3. On the RMS-200's **Menu Bar**, click **Settings**, then click **Connection**.

4. The **Controller Communication Settings Dialog** appears. In the dialog, click the **Serial** radio button.
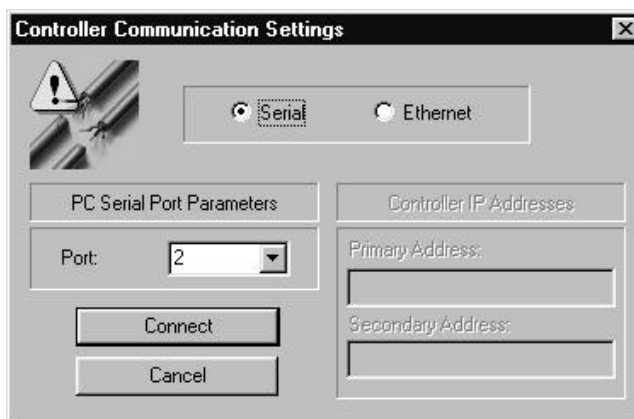
5. In the **PC Serial Port Parameters** section, select the number of the PC's **Com** port that is connected to the UTAH-200. This action *automatically* sets up the Com port for the proper parameters to match the default settings in the UTAH-200.

6. Click the **Connect** button to establish communications. The RMS-200's **Status View** will now update with the current configuration present in the UTAH-200 switcher.

This completes the steps for establishing serial communications. This procedure does not need to be repeated unless you change the communications settings from Serial to Ethernet.

Ethernet Communications

If you have interconnected your PC and the UTAH-200 using Ethernet, there are several steps required to establish communications:

- Set an IP Address for *each* controller (primary and backup) on your UTAH-200.

- Set network parameters on your PC.

- Enter IP addresses in the RMS-200's **Controller Communication Settings Dialog** for *each* controller on your UTAH-200.

Use the following steps to establish Ethernet communications:

1. Ensure that the UTAH-200 system is installed and running. If the system is not installed, refer to the "**Installing Hardware**" section in Chapter 2 for details.

2. Connect a **PC** (running terminal emulation software) or an actual **Terminal** to the **Diagnostic** serial port on the UTAH-200's *primary* controller card. Please note:

   • The diagnostic port (9-pin "D" female) is located inside the chassis — on the *front* of each controller card.
   • Typically, you will need to use a null modem adapter or cable to connect the diagnostic port to a terminal.
   • Set terminal parameters to 9600 baud, 8N1.
   • In Appendix D, refer to the "**Using the UTAH-200 Controller Diagnostic Port**" section for additional information on Terminal connections.

3. With the connection established, verify that you have a prompt (**->**) on the terminal's screen.

Important

> When choosing IP addresses, remember that the UTAH-200 and your PC must both be on the *same network*. A gateway can not be used. Consult with your facility's Network Administrator if you have questions regarding networks and gateways. Choose consecutive addresses for convenience, for example, **192.168.1.25** and **192.168.1.26**.

4. To enter the controller's IP address, type the following command after the prompt and press **ENTER**:

```
-> setipaddr
```

The following message appears:

```
Enter new IP address:
```

5. Type the new address and press **ENTER**.

6. To verify the new address, type the following command after the prompt and press **ENTER**:

```
-> getipaddr
```

The new address will be displayed on screen.

7. If the UTAH-200 has a second (backup) controller installed, connect the **PC** or **Terminal** to the **Diagnostic** serial port on the *secondary* controller card.

8. To set the IP address on the second controller card, repeat steps 3 through 6. The two addresses *must* be different.

9. Disconnect the terminal from the UTAH-200, and make a note of each IP address that you entered. These numbers will be used in step 21 below.

10. On your PC's desktop, right-click the **Network Neighborhood Icon**, and select **Properties** from the pop-up menu.

11. The **Network Dialog** appears. On the **Configuration Tab**, highlight your **TCP/IP Network Adapter** in the list of installed components. A sample list is shown below:
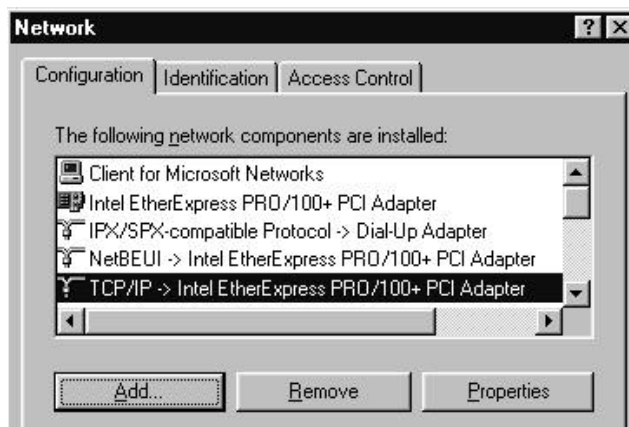
12. Click **Properties** to display the **TCP/IP Properties Dialog**. Ensure that the **IP Address Tab** is selected.

13. Click the **Specify an IP address** radio button. If your PC does not *already* have an IP address, click in the **IP Address** field and enter one now. Ensure that the PC and the UTAH-200 are both on the *same network*. A sample dialog is shown below:
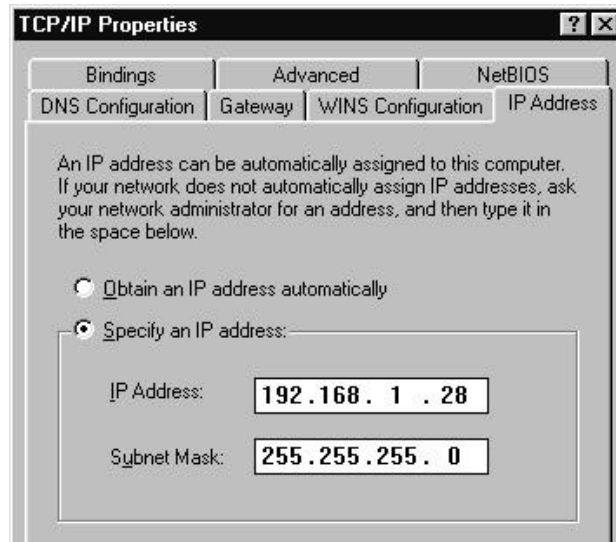
14. Click in the **Subnet Mask** field and enter **255.255.255.0**. This exact number is hard-coded into the UTAH-200's **Ethernet Board**, and it *must match* the Subnet Mask on the PC itself — thus ensuring a common network.

15. Click **OK** to accept the new data. For this specific PC-to-UTAH setup, you do not need to enter information on any other tab in the **TCP/IP Properties Dialog**.

Note

Remember that a gateway can not be used. Consult with your facility's Network Administrator if you have questions regarding networks and gateways.

16. In the **Network Dialog**, click **OK**.

17. Reboot your PC to ensure that your computer recognizes all new network settings.

18. Run the RMS-200 application, and make sure that the RMS-200's **Main Window** is open on your desktop.

19. On the RMS-200's **Menu Bar**, click **Settings**, then click **Connection** to display the **Controller Communication Settings Dialog**.

20. In the dialog, click the **Ethernet** radio button.

21. In the **Controller IP Addresses** section, enter the *exact* primary and (if applicable) secondary addresses that you programmed for the UTAH-200's primary (and secondary) controller boards. If you do not have a secondary controller installed, leave the **Secondary Address** field blank. Two sample IP addresses are shown below:
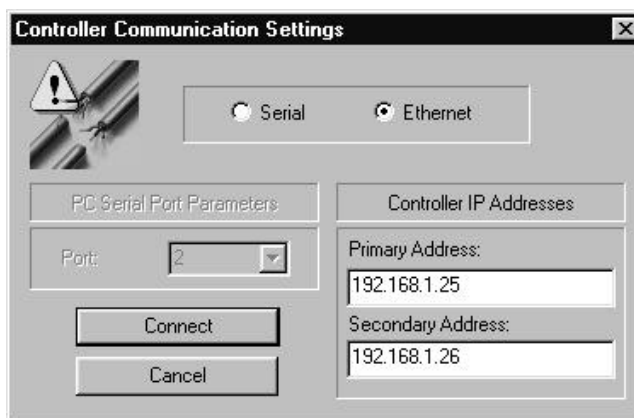
Note

> If you have a secondary controller installed in the UTAH-200, *both addresses* are required. If the RMS-200 loses communication with the primary controller, it automatically tries to re-establish communication with the secondary board using the secondary IP address.

22. Click the **Connect** button to establish communications. The RMS-200's **Status View** will now update with the current configuration present in the UTAH-200 routing switcher.

   Please note:

   - If the RMS-200 controller was on a network *before* you changed its IP address, it may take some time for the user's network servers to update themselves.

   - If you experience trouble communicating over the network, try rebooting the RMS-200 PC and the UTAH-200.

This completes the steps for establishing Ethernet communications. This procedure does not need to be repeated unless you change the communications settings from Ethernet to Serial.

System Configuration

In This Chapter

This chapter provides operating instructions for the RMS-200 application. You will learn how to create (or update) your custom source, destination, and signal level names.

The following major topics are discussed:

- RMS-200 Windows, Dialogs, and Views
- Menu Bar
- Tool Bar
- Status Bar
- Controller Communication Settings Dialog
- Controller Software Upgrade Utility Dialog
- Panel Software Upgrade Utility Dialog
- RMS-200 Views
- Status View
- Setup View
- Panels View
- RMS-200 Operations
- Clearing Locks and Protects
- Changing PC-to-Controller Communications
- Upgrading Controller Software
- Upgrading Control Panel Software
- System Error Log
- Keyboard Shortcuts

Note

Prior to proceeding, ensure that the RMS-200 application is running properly, and that communication is established with the UTAH-200. Refer to Chapter 3, "Installing the RMS-200" for instructions.

RMS-200 Windows, Dialogs, and Views

The figure below shows the RMS-200 application's **Main Window.**
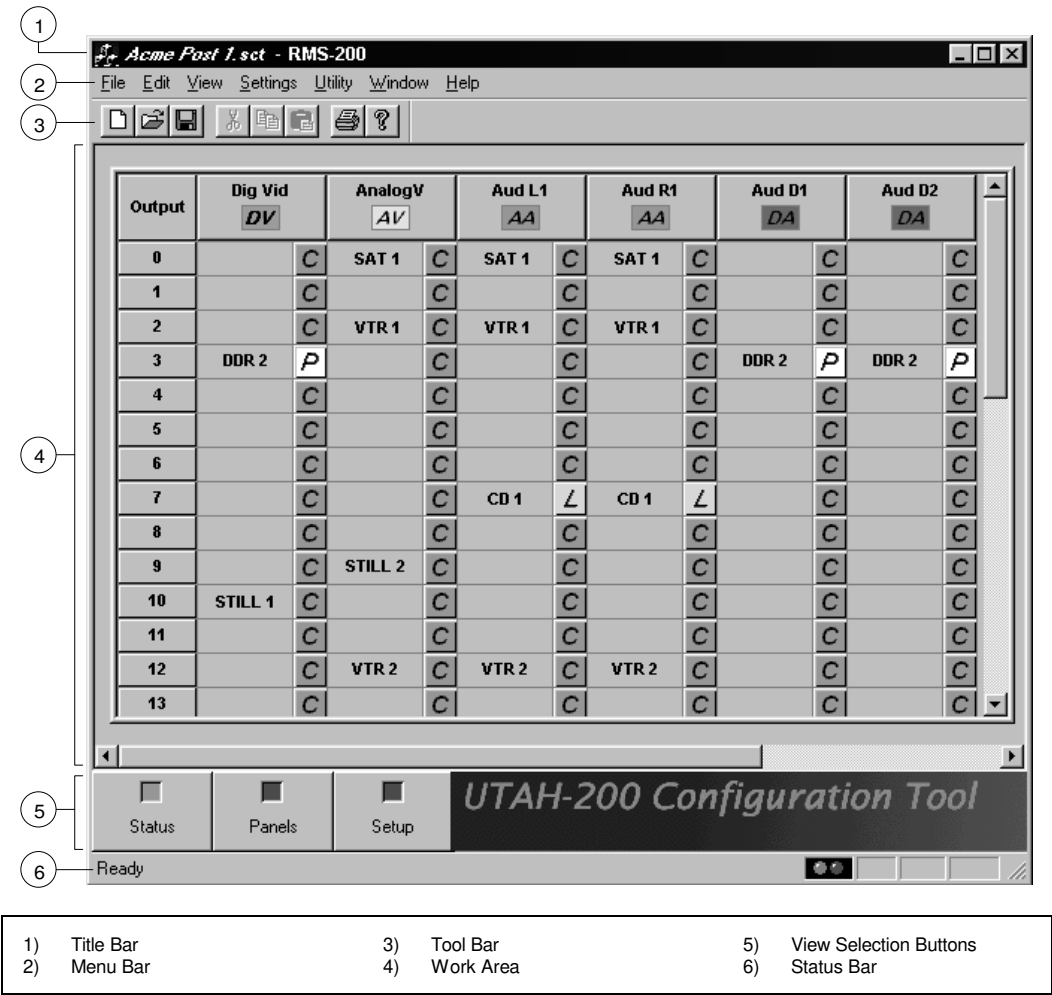
1) Title Bar	3) Tool Bar	5) View Selection Buttons
2) Menu Bar	4) Work Area	6) Status Bar

1) **Title Bar**

   The **Title Bar** always displays the name of the current System Configuration with which you are working — or, that currently resides in the Controller. If the configuration is *new* and has not yet been saved, the label **"Untitled"** appears.

2) **Menu Bar**

   The **Menu Bar** provides a list of RMS-200 functions that are directly accessible via pull-down menu.

All Windows 95 and NT conventions apply, providing multiple ways to select items. These menu conventions include:

- Point and click.
- Keyboard accelerators (e.g., pressing **ALT** followed by the underlined character).
- Pressing **ALT** and then using the cursor keys.

See the "**Menu Bar**" section for a description of all functions.

3) **Tool Bar**

The **Tool Bar** displays a series of dedicated buttons (or icons) that provide direct access to specific functions. Each button is a switch. Refer to the "**Tool Bar**" section for details.

4) **Work Area**

The **Work Area** is your primary working region for all configuration functions. This area switches between three different views, as defined by the **View Selection** buttons. Scroll bars appear as required, depending upon how you "size" the window.

5) **View Selection Buttons**

The three **View Selection** buttons switch the **Work Area** between the three views. The bright green square indicates the active button (and view):

- The **Status View** shows the current status of the router's outputs and monitor matrix. You can observe all functions as they occur, and even override selected functions if required. See the "**Status View**" section for details.

- The **Panels View** allows you to design or modify "**Panel Configurations**" — basically, files of custom control panel parameters. See the "**Panels View**" section for details.

- The **Setup View** allows you to design or modify "**System Configurations**" — basically, files of routing switcher input, output and signal level names. Refer to the "**Setup View**" section for details.

6) **Status Bar**

At the bottom of the window, the **Status Bar** displays mini "help" messages for various **Menu Bar** items. In addition, status panes at the far right of the bar indicate the condition of PC-to-controller communications. Refer to the "**Status Bar**" section for details.

Menu Bar

The **Menu Bar** provides a list of RMS-200 functions that are directly accessible via pull-down menus.

Each menu is described in detail below.

- **File Menu**

  The **File Menu** provides a standard set of items dealing with configuration files, printing, recent views, and exiting.

Note	All **Print** functions are currently not implemented.

The menu is *context sensitive*— it appears in one of three forms, depending upon the view that you have selected.

- When the **Status View** is selected, all file functions are grayed out, because the view deals with status only.
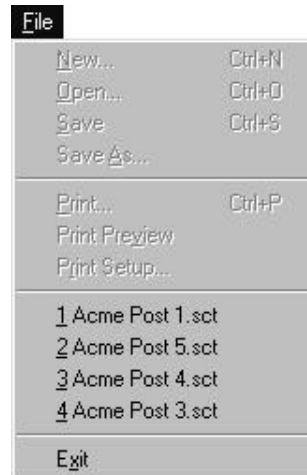
- Click **1**, **2**, **3**, or **4** to re-open one of 4 *most recently used* switcher configurations.

- Click **Exit** to exit the application. If the configuration has not been saved, you will be prompted to do so.

– When the **Setup View** is selected, all file functions deal with *system configurations*
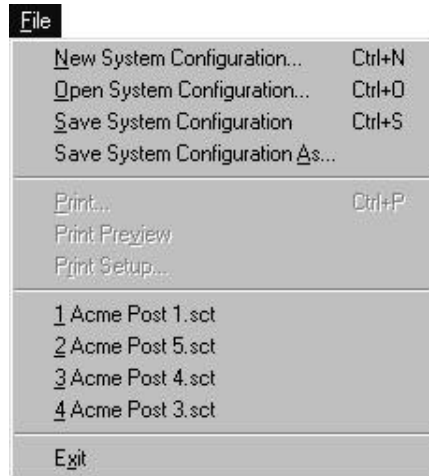
- Click **New System Configuration** to open a new, system configuration template. If the *current* configuration has not been saved to disk, you will be prompted to do so.

- Click **Open System Configuration** to open an existing system configuration. The **Open Dialog** appears and automatically filters the directory for files that end in **.sct** (Switcher Configuration Tool).

- Click **Save System Configuration** to save the current system configuration template.

- Click **Save System Configuration As** to save the system configuration with a new name.

- Click **Print** to print a pre-formatted system configuration table.

- Click **Print Preview** to display a full-screen preview of the printer output.

- Click **Print Setup** to set up your printing parameters.

- Click **1, 2, 3,** or **4** to re-open one of 4 *most recently used* switcher configurations.

- Click **Exit** to exit the application. If the system configuration has not been saved, you will be prompted to do so.

– When the **Panels View** is selected, all file
functions deal with *panel configurations*

```
File
  New Panel Configuration...      Ctrl+N
  Open Panel Configuration...     Ctrl+O
  Save Panel Configuration        Ctrl+S
  Save Panel Configuration As...

  Print...                        Ctrl+P
  Print Preview
  Print Setup...

  1 Acme Post 1.sct
  2 Acme Post 5.sct
  3 Acme Post 4.sct
  4 Acme Post 3.sct

  Exit
```
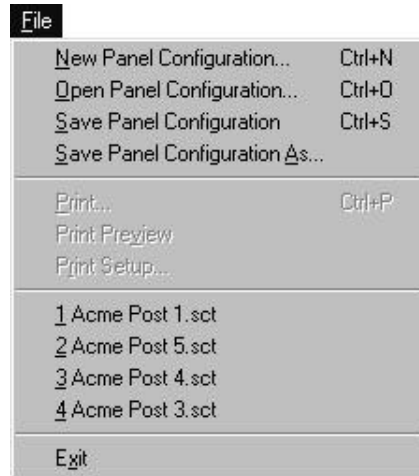
- Click **New Panel Configuration** to open a
  new, blank panel configuration
  template. If the *current* panel
  configuration has not been saved to
  disk, you will be prompted to do so.

- Click **Open Panel Configuration** to open an
  existing panel configuration. The **Open
  Dialog** appears and automatically
  filters the directory for files that
  end in **.xyp** (XY Panel).

- Click **Save** to save the current panel
  configuration.

- Click **Save As** to save the panel
  configuration with a new name.

- Click **Print** to print a pre-formatted
  panel configuration table.

- Click **Print Preview** to display a full-
  screen preview of the printer output.

- Click **Print Setup** to set up your printing
  parameters.

- Click **1, 2, 3,** or **4** to re-open one of 4
  most recently used configurations.

- Click **Exit** to exit the application. If
  the configuration has not been saved,
  you will be prompted to do so.

- **Edit Menu**

Edit

Undo	Ctrl+Z
Repeat	Ctrl+Y
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Clear	Delete

The **Edit Menu** provides a standard set of items that deal with configuration grid and table operations.

– Click **Undo** to undo the previous edit operation.

– Click **Repeat** to repeat the most recent edit operation.

– Click **Cut** to cut items from the selected grid cells.

– Click **Copy** to copy items from the selected grid cells.

– Click **Paste** to paste items into the selected grid cells.

– Click **Clear** to delete items from the selected grid cells.

- **View Menu**

View

✔ Toolbar
✔ Status Bar

The **View Menu** allows you to independently show or hide the toolbar and status bar. An item is visible when checked.

– Click **Toolbar** to show or hide the Tool Bar.

– Click **Status Bar** to show or hide the Status Bar (at the bottom of the window.

- **Settings Menu**

Settings

Connection...
Error Reporting...

The **Settings Menu** allows you to set communications parameters and the level of error reporting.

– **Connection** `Controller`
Communication Settings Dialog
you to set PC-to-controller communications.
See the "
Dialog" section for details.

– Click **Error Reporting** to display the **Error Reporting Settings Dialog** which allows you to set one of three levels of system error reporting. See the "**Error Reporting**" section for additional details.

• **Utility Menu**

```
Utility
  Upgrade Controller Software
  Upgrade Panel Software
```

The **Utility Menu** allows you to upgrade software.

– Click **Upgrade Controller Software** to display the **Controller Software Upgrade Dialog** which allows you to upgrade controller software from floppy disk. See the "**Controller Software Upgrade Dialog**" section for details.

– Click **Upgrade Panel Software** to display the **Panel Software Upgrade Dialog** which allows you to upgrade a specific control panel's software from disk. See the "**Panel Software Upgrade Dialog**" section for details.

• **Window Menu**

```
Window
  Status View
  Panels View
  Setup View
```

The **Window Menu** includes three entries that duplicate the functionality of the three **View Selection** buttons:

– Click **Status View** to display the **Status View.**

– Click **Panels View** to display the **Panels View.**

– Click **Setup View** to display the **Setup View.**

• **Help Menu**

```
Help
  Contents...
  About RMS-200...
```

The **Help Menu** provides two functions:

– Click **Contents** to display the on-line help file, which provides the entire contents of the UTAH-200 User's Guide plus a complete index.

– Click **About RMS-200** to display the **About RMS-200 Dialog** which shows the copyright and current RMS-200 software version. Click **Dismiss** to clear the dialog.
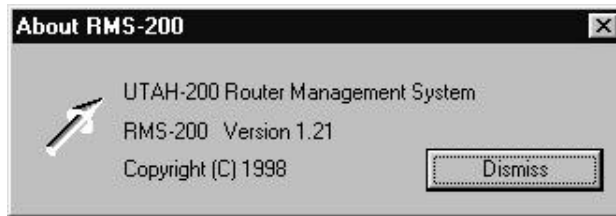
Tool Bar

The **Tool Bar** displays a series of dedicated buttons that provide direct access to specific RMS-200 functions. Each button is a switch. The **Tool Bar** can be enabled or disabled by clicking **View, Toolbar**.
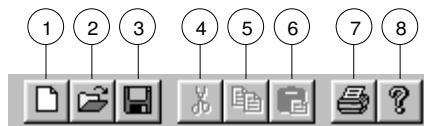
1)	New Configuration	4)	Cut	7)	Print
2)	Open	5)	Copy	8)	Help
3)	Save	6)	Paste		

1) **New**

   Click **New** to open a new, blank configuration template. This is identical to clicking **File, New Configuration**.

2) **Open**

   Click **Open** to open an existing configuration. This is identical to clicking **File, Open**.

3) **Save**

   Click **Save** to save the current configuration template. This is identical to clicking **File, Save**.

4) **Cut**

   Click **Cut** to cut items from the selected grid cells. This is identical to clicking **Edit, Cut**.

5) **Copy**

Click **Copy** to copy items from the selected grid cells. This is identical to clicking **Edit, Copy**.

6) **Paste**

   Click **Paste** to paste items into the selected
   grid cells. This is identical to clicking
   Edit, **Paste**.

7) **Print**

   Click **Print** to print out a pre-formatted table
   of the current configuration. This is
   identical to clicking **File**, **Print**.

8) **Help**

   Click **Help** to display the **About RMS-200 Dialog**
   This is identical to clicking **Help**, **About RMS-200**.

Status Bar

The **Status Bar** displays mini "help" messages for
various **Menu Bar** items. In addition, status LEDs
indicate the condition of PC-to-controller
communications and status panes indicate keyboard
status. The **Status Bar** can be enabled or disabled by
clicking **View**, **Status Bar**.

1) **Message Bar**

                     Menu Bar   **Message Bar**
   displays mini "help" messages and various

2) **Com Status LEDs**

           Com Status LEDs
   condition of PC-to-UTAH-200 controller
   communications (either serial or Ethernet).

   The Green LED (on the left) when lit
   indicates that the RMS-200 is communicating

   • The Red LED (on the right) when lit

   communicating with the controller.

3)

   The three **Status Panes** indicate various aspects
   of your keyboard's state:

   Left Pane: When **CAP**
   enabled.

   •   **NUM** appears, Num Lock

- Right Pane: When   appears, Scroll Lock is enabled.

Controller Communication Settings Dialog

Click **Settings, Connection** to display the **Controller Communication Settings Dialog** which allows you to set PC-to-controller communications. RS232, RS422 or Ethernet can be used.
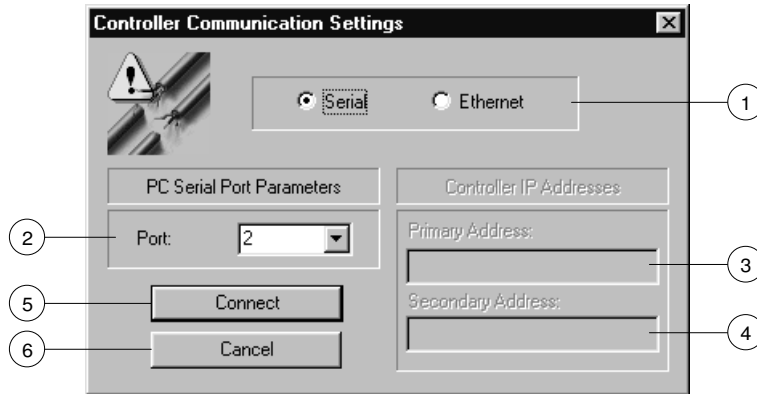
1)	Communication Selection	Primary IP Address	5)
2)	PC Serial Port Parameters Section	Secondary IP Address	6)

1) **Communication Selection**

    either the **Serial**   **Ethernet** radio

    that you want to configure. Once selected, the appropriate section below is activated and

2) **PC Serial Port Parameters Section**

    control is selected, the drop-down box in this section allows you to select the
    port that is connected to the UTAH-200.
    This action   sets up the port to match the UTAH-200's default settings.

    Primary IP Address

    When Ethernet
    field to enter the *exact*
    that you programmed for the UTAH-200's primary controller.

    Secondary IP Address

    When Ethernet control is selected, (and

    board installed), use this field to enter the *exact*
    for the UTAH-200's secondary controller. If you do not have a secondary controller

5) **Connect**

   ick **Connect** establish (or update)
   communications between the RMS-200 and the

6) **Cancel**

   Cancel to
   without making any changes to communication
   parameters.

UTAH 200 communications:

- *first run,* communication

  default values.

  ~
  installed and the settings match,
  communication is established.

  If the settings do not match or if
  communication can not be established, an

- When **Connect** is clicked, new parameters are
  automatically written to a special
  "initialization" file on your PC. These
  parameters are used to automatically connect
  your PC to the UTAH-200 — not only the first
  time **Connect** is clicked, but each subsequent
  time the RMS-200 is run.

- Provided that all cables are in place,
  connection is *automatic* each subsequent time
  the RMS-200 is run. When communications are
  established, the **Status View** updates with the
  current routing configuration in the UTAH-200
  switcher.

- The initialization file is only updated when
  you change parameters (for example, by
  changing between serial and Ethernet) and then
  click **Connect**. You do not need to access the
  dialog unless a change is required.

In Chapter 3, refer to the "**Establishing
Communications**" section for instructions on
establishing serial or Ethernet communications.

Controller Software Upgrade Dialog

Click **Utility, Upgrade Controller Software** to display the **Controller Software Upgrade Dialog** This dialog allows you to upgrade the controller's software from within the RMS-200 application.
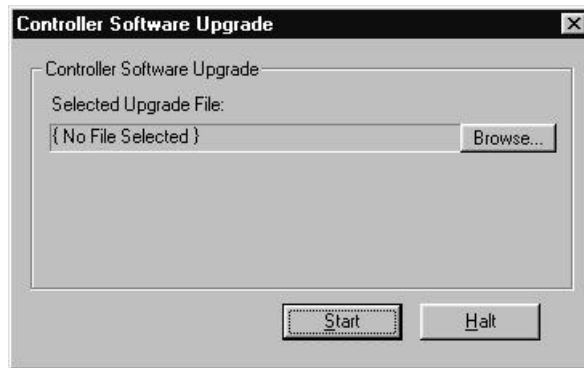
As required, software upgrades are provided to customers on floppy disks. These upgrades allow you to improve the operations of your system, without assistance from Customer Support.

- Click **Browse** to display a standard **Open Dialog.** This allows you to locate the floppy disk that contains the controller software upgrade file.

- Click **Start** to begin the software upgrade process, from floppy disk to the connected UTAH-200 controller. The upgrade process is automatic, and requires several minutes to complete. Once complete, a dialog notifies you of a successfully upgrade and the system is automatically re-booted.

- Click **Halt** to terminate the upgrade process in progress. The dialog clears, and controller software will *not* be upgraded. There is no "resume" function — the process must be repeated in order to properly upgrade controller software.

Panel Upgrade Utility Dialog

Click **Utility, Upgrade Panel Software** to display the **Panel Software Upgrade Dialog** This dialog allows you to upgrade a specific control panel's software from within the RMS-200 application.

```
┌─ Panel Software Upgrade ──────────────────────────── ☒ ┐
│  ┌─ Panel Software Upgrade ────────────────────────────┐ │
│  │  Selected Upgrade File:                             │ │
│  │  ┌────────────────────────────┐  ┌──────────┐       │ │
│  │  │ { No File Selected }       │  │ Browse...│       │ │
│  │  └────────────────────────────┘  └──────────┘       │ │
│  │                      Panel Number: ┌─────────┐       │ │
│  │                                    └─────────┘       │ │
│  │                                                      │ │
│  │                                                      │ │
│  │                                                      │ │
│  │                                                      │ │
│  │         ┌──────────┐       ┌──────────┐              │ │
│  │         │  Start   │       │  Halt    │              │ │
│  │         └──────────┘       └──────────┘              │ │
│  └──────────────────────────────────────────────────────┘ │
└───────────────────────────────────────────────────────────┘
```

- Click **Browse** to display a standard **Open Dialog.** This allows you to locate the floppy disk that contains the control panel software upgrade file.

- Click in the **Panel Number** field and type the ID number of the specific control panel that you want to upgrade.

- Click **Start** to begin the software upgrade process, from floppy disk to the connected UTAH-200 control panel. The upgrade process is automatic, and requires several minutes to complete. Once complete, a dialog notifies you of a successfully upgrade and the system is automatically re-booted.

- Click **Halt** to terminate the upgrade process in progress. The dialog clears, and control panel software will *not* be upgraded. There is no "resume" function — the process must be repeated in order to properly upgrade the control panel's software.

RMS-200 Views

This section provides detaileddescription of the three RMS-200 views:

- Status View
- Panels View
- Setup View

Standard View Rules

This section discusses several overall rules that apply to all three views.

- **Navigation**

  To navigate a matrix, the followingmethods can be used:

  - Click any **Setup View** or **Panels View** cell to select it. Once selected, you can enter or modify the data. In the Status View's **Output Section,** the only cells you can click are the **Locked** (*L*), **Protected** (*P*), and **Clear** (*C*) indicator cells — each of which is a *button*.

  - Use the four **Arrow** keys (on your keyboard) to move left, right, up, or down between cells.

  - Press **CTRL +** an **Arrow** key to move to the extreme left, right, top, or bottom of a row or column.

  - Press **Page Up** or **Page Down** to move up or down the matrix by a full page of rows.

- **Data Entry**

  To enter or modify the data in a valid "data entry" cell:

  - Click in the desired cell.

  - For **Device, Source,** and **Destination "Name" Cells,** begin typing (up to eight characters), or click and drag to highlight the letters that you want to change, and then type.

  - For **Assignment Cells** (on the **Input Assignments Tab** and **Output Assignments Tab)**, begin typing (up to two digits), or click and drag to highlight the digits that you want to change, and then type.

Status View

The **Status View** is the *default view* when you run the RMS-200. The view itself is composed of two individual sections, both of which are dynamic

tables that *change* as users route sources in the system.

- The **Output Section** (at the top) shows the current size and status of the router. You can monitor all **"Takes"** as they occur, and even override selected **"**protect**"** functions if required.

- The **Monitor Matrix Section** (at the bottom) shows the single output that is being selected on each level's monitor matrix. This section is *view only* — nothing can be changed.

There are two ways to select the **Status View:**

- Click the **Status View** button at the bottom of the **Window.**

- Click **Window, Status View** in the **Menu Bar.**

Both the **Output Section** and **Monitor Matrix Section** are discussed in detail below.

Output Section

At the top of the **Status View,** the **Output Section** shows the size and status of the router. A *sample* section is shown below.

	Routing Switcher Outputs		Matrix Cells			Protected Indication
1)	Routing Switcher Outputs	4)	Matrix Cells	7)		Protected Indication
2)	Routing Switcher Signal Levels	5)	Clear Indication			
3)	Scroll Bar	6)	Locked Indication			

1) **Routing Switcher Outputs**

The left-hand column lists all *physical* routing switcher outputs in order, from 0 to 31. When listings are made in the matrix, the column provides a simple way to identify outputs.

2) **Routing Switcher Signal Levels**

At the top of the matrix are column headings that indicate the exact types of signal levels present in your router. Up to eight signal levels may be installed. This information is provided *in real time* from the controller to the RMS-200.

Note

> The sample view (on the previous page) shows a UTAH-200 router with six signal levels: **Digital Video**, **Analog Video**, two **Analog Audio** signal levels and two **Digital Audio** signal levels.

The signal level names along the top are user-defined, and are entered in the **Setup View.** The two-letter symbols (below the names) are non-editable icons that indicate the installed levels:

- *DV*: Digital Video
- *AV*: Analog Video
- *DA*: Digital Audio
- *AA*: Analog Audio
- *HD*: High Definition

Below the heading, the matrix shows inputs that are assigned to outputs — for a specific signal level. Matrix updates occur in real time, allowing you to monitor "Takes" as they occur.

3) **Scroll Bar**

At the right of the matrix, a vertical scroll bar allows you to scroll through all 32 outputs and their associated assignments.

4) **Matrix Cells**

Each cell in the matrix is composed of two parts:

- On the left is a non-editable text field. This field is either blank (to indicated no assignment), or filled in (to indicate that an input is assigned to the specific output on the indicated signal level). Input names are derived from the **Input Assignment Table** on the **Setup View.**

- The right-hand button shows one of three labels: *C* (Clear), *L* (Locked), or *P* (Protected). See below for details.

When a cell is *not available* (that is, the output is physically not installed for the specific signal level), the cell is **black.**

Note

> The ability to display **black** cells (indicating *not available*) is not implemented at this time.

All standard rules for navigating the matrix apply. Refer to the previous "**Standard View Rules**" section for details.

5) **Clear Indication**

A green *C* indicates that the output for that specific cell is "clear" — it is neither protected nor locked. Please note:

- In this mode, *any user* can change the output's assignment from a control panel.

- When a *C* is shown, the RMS-200 user can take *no action*.

6) **Locked Indication**

A red *L* indicates that the output has been "locked" by a control panel user. In this mode, please note:

- The source-to-destination routing *cannot* be changed by anyone. For all user's, a warning appears on the LCD display if an attempt is made to change the routing.

- The assignment can be unlocked by *any user* from a control panel, but the "lock" indication serves as a warning that the routing should not be changed.

- When an *L* is shown, you can *clear* the lock by clicking the *L* button in the matrix. The *L* changes to a *C*.

7) **Protected Indication**

The yellow *P* indicates that the output has been protected by a control panel user. In this mode, please note:

- The source-to-destination routing can *only* be changed by the user at the originating panel (the panel on which the protect was entered). For all user's *except* the originating user, a warning appears on the LCD display if an attempt is made to change the routing.

- The routing assignment can only be unprotected by the originating user and the RMS-200 user.

- When a *P* is shown, you can *clear* the protect by clicking the *P* button in the matrix. The *P* changes to a *C*.

Monitor Matrix Section

At the bottom of the **Status View**, the **Monitor Matrix Section** shows the single output that is selected on each level's (optional) monitor matrix. A *sample* section is shown below.
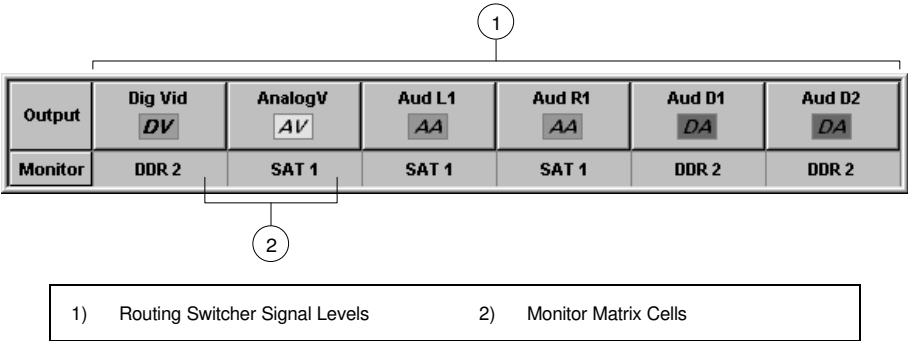
Output	**Dig Vid** *DV*	**AnalogV** *AV*	**Aud L1** *AA*	**Aud R1** *AA*	**Aud D1** *DA*	**Aud D2** *DA*
Monitor	DDR 2	SAT 1	SAT 1	SAT 1	DDR 2	DDR 2

1)	Routing Switcher Signal Levels	2) Monitor Matrix Cells

1) **Routing Switcher Signal Levels**

   At the top of the matrix are column headings that indicate the exact types of signal levels present in your router. These headings are identical to those in the **Output Section**.

2) **Monitor Matrix Cells**

   Each cell in the matrix shows the single source that is routed to that level's monitor output. Please note:

   • The matrix is *view only* — nothing can be changed.

   • When a particular level does not have a monitor matrix installed, the cell is **black**.

Note

> The ability to display **black** cells (indicating *not available*) is not implemented at this time.

Setup View

The **Setup View** provides your first level of router customization. It allows you to view, set up or modify "**System Configurations**" — basically, files of signal level names plus physical router assignments.

When communications are first established, the view displays information that is derived from the controller — signal level names, signal level types, physical routing switcher sizes, and input/output assignments.

There are two ways to select the view:

- Click the **Setup View** button at the bottom of the **Window.**
- Click **Window, Setup View** in the Menu Bar.

A *sample* view is shown below. Your *specific* view will differ — based on the number and type of signal levels that are installed in your router.

Signal Name	Signal Type		Physical Router Size	
			Inputs	Outputs
Dig Vid	**Digital Video**	*DV*	32	32
AnalogV	**Analog Video**	*AV*	16	16
Aud L1	**Analog Audio**	*AA*	16	16
Aud R1	**Analog Audio**	*AA*	16	16
Aud D1	**Digital Audio**	*DA*	32	32
Aud D2	**Digital Audio**	*DA*	32	32

Get Signal Name Table   Get Readback Info
Set Signal Name Table   ☑ Data Check

Get Input Table
Set Input Table
☑ Data Check

Get Output Table
Set Output Table
☑ Data Check

Device	Dig Vid *DV*	AnalogV *AV*	Aud L1 *AA*	Aud R1 *AA*	Aud D1 *DA*	Aud D2 *DA*
MON 0	0				0	0
MON 1		0	0	0		
SAT 1	1				1	1
SAT 2		1	1	1		
SAT 3	2	2	2	2	2	2
STILL 1	3					
STILL 2	4					
VTR 1		4	4	4		
VTR 2		5	5	5		
VTR 3		6	6	6		
AUX 1		3	3	3		
AUX 2		7	7	7		
AUX 3	7				7	7

⊞← Input Assignments   ⊞→ **Output Assignments**

1)   Signal Level Name Section   2)   Input/Output Assignment Section

1) **Signal Level Name Section**

   This section includes the **Signal Level Name Table** and four **Signal Level Function** buttons. Refer to the heading "**Signal Level Name Section**" for details.

2) **Input/Output Assignment Section**

   This section includes the **Input Assignment Table,** the **Output Assignment Table** and six **Assignment Function** buttons. Refer to the heading "**Input/Output Assignment Section**" for complete details.

Signal Level Name Section

The figure below illustrates the **Signal Level Name Section,** with a *sample* configuration entered in the array.

Signal Name	Signal Type		Physical Router Size	
			Inputs	**Outputs**
Dig Vid	**Digital Video**	*DV*	32	32
AnalogV	**Analog Video**	*AV*	16	16
Aud L1	**Analog Audio**	*AA*	16	16
Aud R1	**Analog Audio**	*AA*	16	16
Aud D1	**Digital Audio**	*DA*	32	32
Aud D2	**Digital Audio**	*DA*	32	32

a)	Signal Level Name Table	b)	Signal Level Function Buttons

a) **Signal Level Name Table**

The **Signal Level Name Table** includes four switcher data columns. When the RMS-200 first boots up, the table derives its data from the controller. During RMS-200 operations, you have the option of modifying signal level names as required. Column names and descriptions are listed below.

- **Signal Level Name Column**

  The **Signal Level Name Column** is an array of up to eight signal levels (displayed vertically) that match the number of installed signal levels in your switcher. The column allows you to name (or rename) each signal level in your routing switcher as desired.

  This is the *only column* in the **Signal Level Name Table** in which data is editable. Once a signal level name is entered, that name is used for headings throughout the RMS-200.

  When the RMS-200 is run for the first time, default names are listed. To change the name of a signal level, click in the desired cell. You can begin typing (up to eight characters), or you can click and drag to highlight the letters that you want to change.

  Press **Enter** to accept the new name.

If the name is longer than eight
characters, an alert dialog appears.

Press **Enter** to clear the dialog. The name
is automatically truncated to a length of
eight characters.

Important

> Once names are entered or modified, all
> associated RMS-200 column headings are
> changed. The new names are not permanently
> entered in the controller until **Send Signal
> Names** is clicked. If you have made a change
> but have not clicked **Send Signal Names,** the
> headings used in the three views *do not match*
> those that reside in the controller.

- **Signal Level Type Column**

  The **Signal Level Type Column** is an array of
  up to eight non-editable signal levels —
  one for each of the actual physical signal
  levels installed in your router. The two-
  letter symbols are non-editable icons that
  identify the installed signal levels.

- **Physical Router Size Column**

  The **Physical Router Size Column** displays the
  actual size of the installed input/output
  matrix for each signal level in your
  routing switcher. For any signal level,
  the UTAH-200 can accommodate matrices of
  16x16 or 32x32.

b) **Signal Level Function Buttons**

  Three of the four **Signal Level Function Buttons**
  allow you to update the **Signal Level Name Table**
  — both in the RMS-200 and in the controller.
  A fourth button allows you to validate the
  data in the table.

- **Get Readback Info**

  Click **Get Readback Info** to query the
  controller for readback information. Once
  queried, the controller sends the RMS-200 a
  list that includes the type of signal
  levels, the number of signal levels, and
  the number of inputs and outputs per level.

- **Get Signal Name Table**

  Click **Get Signal Name Table** to retrieve (and display) the current configuration of signal level names from the router. If you have made a change and want to "undo" it, you can restore names to their previous settings (provided that **Set Signal Name Table** has not been clicked).

- **Set Signal Name Table**

  Click **Set Signal Name Table** to send the current set of signal level names from the RMS-200 to the controller. Once clicked, the headings used in the three views precisely match those that reside in the controller. The new settings (in the controller) are stored in non-volatile memory until overwritten.

- **Data Check**

  Click **Data Check** to *validate* the data in the **Signal Level Name Table** The system checks for duplicate names which could potentially cause problems. If duplicate names are detected, the system highlights each duplicate cell in yellow in the **Signal Name Column**, as shown below.

Signal Name	Signal Type		Physical Router Size	
			Inputs	Outputs
Dig Vid	**Digital Video**	*DV*	32	32
AnalogV	**Analog Video**	*AV*	16	16
Aud L1	**Analog Audio**	*AA*	16	16
Aud R1	**Analog Audio**	*AA*	16	16
Aud L1	**Digital Audio**	*DA*	32	32
Aud D2	**Digital Audio**	*DA*	32	32

This action is an "alert" only. You can elect to leave the duplicate names, but it is *highly recommended* that you resolve the name conflict immediately. Simply enter new (non-conflicting) names in the normal manner, and click **Data Check** to clear the yellow highlights.

Input/Output Assignment Section

The **Input/Output Assignment Section** allows you to set up (and fully identify) your system's inputs and outputs. The data entered here is routed to the **Panels View** for further source and destination "customization" as required. That data, in turn, can end up as source/destination choices on each control panel's display.

The figure below illustrates the **Input/Output Assignment Section**, with a *sample* configuration entered in the array.

Device	Dig Vid DV	AnalogV AV	Aud L1 AA	Aud R1 AA	Aud D1 DA	Aud D2 DA
MON 0	0				0	0
MON 1		0	0	0		
SAT 1	1				1	1
SAT 2		1	1	1		
SAT 3	2	2	2	2	2	2
STILL 1	3					
STILL 2	4					
VTR 1		4	4	4		
VTR 2		5	5	5		
VTR 3		6	6	6		
AUX 1		3	3	3		
AUX 2		7	7	7		
AUX 3	7				7	7

Get Input Table
Set Input Table
☑ Data Check

Get Output Table
Set Output Table
☑ Data Check

⬚← Input Assignments   ⬚→ **Output Assignments**

a) Input/Output Assignment Area	c) Input Assignments Tab	e) Assignment Function Buttons
b) Scroll Bar	d) Output Assignments Tab	

a) **Input/Output Assignment Area**

Similar to a spreadsheet, the **Input/Output Assignment Area** is your *worksheet* for entering input and output names and physical connections. The area is composed of two individual matrices — one for inputs (the **Input Assignments Tab**), and one for outputs (the **Output Assignments Tab**).

Each matrix is an array of cells, of which there are two types:

• **Device Name Cells** (for custom names such as **VTR 1**, **Camera 4**, etc.) are located down the left-hand side. The cells accept *alpha-numeric* names, up to eight characters in length. (The UTAH-200 allows you to

work with convenient *names* for devices,
rather than *numbers*.)

- **Assignment Cells** (for physical input/output assignments) are located below the signal level column headings. These cells accept 2-digit *numeric* entries *only* (**0** to **31**).

  For both tabs, the following information must be entered for proper operation of the routing switcher:

- Enter the **Physical Connections** that are used for each actual device, for each specific signal level.
- Enter the **Custom Names** that you wish to associate with each physical set of inputs and outputs.

Note

> All standard rules for navigating each matrix apply. Refer to the previous "**Standard View Rules**" section for details.

b) **Scroll Bar**

   At the right of the matrix, a scroll bar allows you to scroll through all inputs and outputs assignments.

c) **Input Assignments Tab**

   Click the **Input Assignments Tab** to display the **Input Assignments** matrix. The matrix allows you to associate each router input with its *physical* rear-frame connection. The figure below illustrates a sample matrix:

Device	Dig Vid DV	AnalogV AV	Aud L1 AA	Aud R1 AA	Aud D1 DA	Aud D2 DA
DDR 1	0	0	0	0	0	0
DDR 2	1	1	1	1	1	1
STILL 1	2					
CD 1			2	2		
STILL 2	3					
CD 2			3	3		
SAT 1	4				4	4
SAT 2		4	4	4		
SAT 3	5	5	5	5	5	5
VTR 1		6	6	6		
VTR 2		7	7	7		
VTR 3		8	8	8		
MON 1		9			9	9

 - Input Assignments

- The "**Device**" column lists physical input devices that are connected to the router. These are names that you enter.
- The column headings to the right represent the number of signal levels installed in

your router. Column names are derived from
the **Signal Level Name Table**

- The input matrix is 64 rows in length. The numeric cell entries (below the headings) represent the frame's physical input connector numbers for each specific signal level. These are numbers that you enter.

  For example:

  ~ The device "**DDR 1**" has six outputs, each of which is connected to the router's input **0** on each of the six signal levels. Input **0** is *fully utilized* across all levels.

  ~ The device "**STILL 1**" has only one output, which is connected to the router's input **2** on the digital video signal level. Input **2** remains available on the other signal levels — for another physical device(s).

  ~ The device "**CD 1**" has two outputs, which are connected to the router's input **2** on the two analog audio signal levels. Input **2** remains available on the other levels — for yet another physical device(s).

d) **Output Assignments Tab**

   Click the **Output Assignments Tab** to display the **Output Assignments** matrix. The matrix allows you to associate each router output with its *physical* rear-frame connection. The figure below illustrates a sample matrix:

Device	Dig Vid DV	AnalogV AV	Aud L1 AA	Aud R1 AA	Aud D1 DA	Aud D2 DA
MON 0	0				0	0
MON 1		0	0	0		
SAT 1	1				1	1
SAT 2		1	1	1		
SAT 3	2	2	2	2	2	2
STILL 1	3					
STILL 2	4					
VTR 1		4	4	4		
VTR 2		5	5	5		
VTR 3		6	6	6		
AUX 1		3	3	3		
AUX 2		7	7	7		
AUX 3	7				7	7

◻→ Output Assignments

- The **"Device"** column lists physical router outputs that are connected to the inputs of

your devices. These are names that you enter.

- The column headings to the right represent the number of signal levels installed in your router. Column names are derived from the **Signal Level Name Table**

- The output matrix is 64 rows in length. The numeric cell entries (below the headings) represent the frame's physical output connector numbers for each specific signal level. These are numbers that you enter.

  For example:

  ~ The device "**MON 0**" is a digital audio/video monitor with three inputs, each of which is connected to the router's output **0** on the three digital signal levels. Output **0** is available on the other analog levels.

  ~ The device "**MON 1**" is an analog audio/video monitor with three inputs, each of which is connected to the router's output **0** on the three analog levels.

  ~ The device "**SAT 3**" is a satellite up-link with both analog and digital inputs. It is connected to the router's output **2** on each of the six signal levels. Here, output **2** is *fully utilized* across all levels.

e) **Assignment Function Buttons**

  Beside the **Input/Output Assignment Area** are two groups of buttons that allow you to update the assignment matrices (both in the RMS-200 and in the controller) and validate the data in each matrix. These buttons are necessary because once new entries are made (or modified), assignments *do not match* those that reside in the UTAH-200 controller.

  - **Get Input Table**

    Click **Get Input Table** to retrieve (and display in the input matrix) the current input assignments from the controller. If you have made a change to the input matrix and then want to "undo" it, you can restore assignments to their previous settings (provided that **Set Input Table** has not been clicked).

  - **Set Input Table**

    Click **Set Input Table** to send the current set of input assignments from the RMS-200 to the controller.

  - **Get Output Table**

    Click **Get Output Table** to retrieve (and display in the output matrix) the current output assignments from the controller. If

you have made a change to the output matrix and then want to "undo" it, you can restore assignments to their previous settings (provided that **Set Output Table** has not been clicked).

- **Set Output Table**

  Click **Set Output Table** to send the current set of output assignments from the RMS-200 to the controller.

- **Data Check**

  Two **Data Check** buttons are provided — one for the **Input Assignments** matrix and one for the **Output Assignments** matrix. Their functions are identical.

  Click **Data Check** to *validate* the data in the active matrix. Two different checks are performed:

  ~ The system checks for duplicate device names which could potentially cause problems. If duplicate names are detected, the system highlights each duplicate cell in yellow in the **Device Column.**

Device	Dig Vid DV	AnalogV AV	Aud L1 AA	Aud R1 AA
DDR 1	0	0	0	0
STILL 1	1	1	1	1
STILL 1	2			
CD 1			2	2

  This action is an "alert" only. You can elect to leave the duplicate names, but it is *highly recommended* that you resolve the conflict immediately. Simply enter new (non-conflicting) names and click **Data Check** to clear the yellow highlights.

  ~ The system also checks for multiple devices that are connected to the same input or output on a given level. If this condition is detected, the system highlights each duplicate assignment in the appropriate level column.

Device	Dig Vid DV	AnalogV AV	Aud L1 AA	Aud R1 AA
DDR 1	0	0	0	0
DDR 2	1	1	1	1
STILL 1	2			
CD 1			0	1

  This condition *must* be resolved immediately. Enter new (non-

conflicting) assignments and click **Data Check** to clear the yellow highlights.

Note the following important points regarding the
Assignment Area:

- Input and output devices are *not* numbered in the **"Device"** column, precisely because you can have more than 32 devices connected — up to 64 for each matrix. One device is *not restricted* to utilizing an entire signal level.
- Free inputs and outputs can be assigned to *any device* with the proper matching signal levels. If you have six signal levels, you have the freedom to assign one device (using all six signal levels), or six devices using one signal level each.
- When you assign your inputs and outputs in production, the matrix sorts out your requirements — *by name.*

Note

> Even though the UTAH-200 allows complete flexibility with input and output assignments, it is *highly recommended* that you connect devices to the matrix in an orderly fashion.

System Configuration Files

In the **Setup View**, the RMS-200 allows you to store and retrieve **"System Configuration"** files that contain signal level names, plus all current information in the **Input/Output Assignment Area**

These files can be opened, designed, and modified in the RMS-200, *whether or not* you send the new data to the controller (using the **Set Input Table** and **Set Output Table** buttons).

Refer to the **"RMS-200 Operations"** section for instructions on all configuration file functions.

Panels View

After setting up and identifying your system's inputs and outputs with the **Setup View,** the **Panels View** provides your *second level* of customization. The view allows you to design or modify **Panel Configurations"** — basically, files of custom control panel sources and destinations. There are two ways to select the view:

- Click the **Panels View** button at the bottom of the window.
- Click **Window, Panels View** in the Menu Bar.

A *sample* **Panels View** is shown below. Your *specific* view will differ.

Panel Number: 1

① Panel ID Section

Panel ID: Edit Suite 1 Panel

Set Panel ID   Get Panel ID

☑ Data Check   Get Src Table

Set Defaults   Set Src Table

Clear Display   Clear Table

②

Source	Dig Vid DV	AnalogV AV	Aud L1 AA	Aud R1 AA	Aud D1 DA	Aud D2 DA
DDR 1	DDR 1	DDR 1	DDR 1	DDR 1	DDR 1	DDR 1
DDR 2	DDR 2	DDR 2	DDR 2	DDR 2	DDR 2	DDR 2
STILL 1	STILL 1					
CD 1			CD 1	CD 1		
STILL 2	STILL 2					
CD 2			CD 2	CD 2		
CD 3			CD 3	CD 3		
SAT 1	SAT 1				SAT 1	SAT 1
SAT 2		SAT 2	SAT 2	SAT 2		
SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	SAT 3

③

☑ Data Check   Get Dst Table

Set Defaults   Set Dst Table

Clear Display   Clear Table

Destination	Dig Vid DV	AnalogV AV	Aud L1 AA	Aud R1 AA	Aud D1 DA	Aud D2 DA
MON 0	MON 0				MON 0	MON 0
MON 1		MON 1	MON 1	MON 1		
SAT 1	SAT 1	SAT 2	SAT 2		SAT 1	SAT 1
SAT 2	SAT 3	SAT 2	SAT 2	SAT 2		
SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	SAT 3
STILL 1	STILL 1					
STILL 2	STILL 2					
VTR 1		VTR 1	VTR 1	VTR 1		
VTR 2		VTR 2	VTR 2	VTR 2		
VTR 3		VTR 3	VTR 3	VTR 3		

1)	Panel ID Section	2)	Panel Source Section	3)	Panel Destination Section

1) **Panel ID Section**

Because up to 32 control panels can be connected to a Main Frame, the **Panel ID Section** allows you to select one panel (at a time) that you wish to configure or update. Refer to the heading **"Panel ID Section"** for details.

2) **Panel Source Section**

The buttons and source matrix in the **Panel Source Section** allow you to specify the exact sources that you want to appear on a selected panel. A data validation button is also provided. Refer to the heading "**Panel Source Section**" for details.

3) **Panel Destination Section**

The buttons and destination matrix in the **Panel Destination Section** allow you to specify the exact destinations that you want to appear on a selected panel. A data validation button is also provided. Refer to the heading "**Panel Destination Section**" for details.

Panel ID Section

The **Panel ID Section** allows you to select a panel to view, configure, name or update. The figure below illustrates the **Panel ID Section**, with a *sample* panel name entered in the **Panel Name Field**.

a)	Panel ID Selector	c) Panel ID Function Buttons
b)	Panel Name Field	

a) **Panel ID Selector**

The **Panel ID Selector** is the most important field in the entire view. It allows you to choose the control panel that you want to retrieve data from, or send modified information to.

- Click the small up/down buttons to select a panel ID number (from 1 to 254), or simply double-click the field and type the desired panel number. Once selected:
  - ~ To retrieve the name of the selected panel, click **Get Panel ID**.
  - ~ To send a new or modified name to the panel, click **Set Panel ID**.

~ To retrieve the source matrix from the
  selected panel, click **Get Src Table**.

~ To send a new or modified source matrix
  to the selected panel, click **Set Src
  Table**.

~ To retrieve the destination matrix from
  the selected panel, click **Get Dst Table**.

~ To send a new or modified destination
  matrix to the selected panel, click **Set
  Dst Table**.

Note	Panel ID numbers are based on physical DIP-switch settings on the rear of each control panel. These switches are set during system installation — once set, they should not need to be changed. Refer to the "**Setting Remote Panel ID Switches**" section in Chapter 2 for details.
	Even though you can only connect 32 panels to the UTAH-200, valid ID numbers range from 1 to 254. Your facility engineer should have a chart listing each panel's location and ID number.

b) **Panel Name Field**

The **Panel Name Field** allows you to enter a
custom name for each control panel, such as
Edit Suite 1 Panel or **Master Transmission Panel**.
Names can be up to 32 alpha-numeric characters
in length, and they can be sent to (or
retrieved from) the panel ID listed in the
Panel ID Selector.

c) **Panel ID Function Buttons**

• Click **Get Panel ID** to retrieve the name of
  the panel listed in the **Panel ID Selector**.
  The retrieved name appears in the **Panel
  Name Field**.

• Click **Set Panel ID** to send a new or modified
  name (as listed in the **Panel Name Field**) to
  the control panel listed in the **Panel ID
  Selector**. The name is stored *in the panel
  itself*, until changed.

Panel Source Section

The **Panel Source Section** allows you to set up *default*
and *custom* sources — *exactly* as you want them to
appear in a selected control panel's display.
Please note:

- Each control panel can be unique in its configuration of sources — they do *not* have to be identical.

- Sources do *not* have to follow the default assignments that are entered on the **Setup View.** You can "build" sources out of any set of valid inputs, and assign them custom names.

- The data shown in the matrix is derived from one of three areas:
    ~ From the selected panel (if **Get Src Table** is clicked).
    ~ From the current **Input Assignment Table** (if **Set Defaults** is clicked).
    ~ From a **Panel Configuration File**

- The data in the matrix can be edited and sent (uploaded) to a remote panel if desired, or stored in a file. If data is sent to a panel, it is stored *in the panel itself* until changed.

The figure below illustrates a sample **Panel Source Section.**

Source	Dig Vid DV	Analog V AV	Aud L1 AA	Aud R1 AA	Aud D1 DA	Aud D2 DA
DDR 1	DDR 1	DDR 1	DDR 1	DDR 1	DDR 1	DDR 1
DDR 2	DDR 2	DDR 2	DDR 2	DDR 2	DDR 2	DDR 2
STILL 1	STILL 1					
CD 1			CD 1	CD 1		
STILL 2	STILL 2					
CD 2			CD 2	CD 2		
CD 3			CD 3	CD 3		
SAT 1	SAT 1				SAT 1	SAT 1
SAT 2		SAT 2	SAT 2	SAT 2		
SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	SAT 3

Data Check   Get Src Table
Set Defaults   Set Src Table
Clear Display   Clear Table

a) Panel Source Function Buttons	b) Panel Source Matrix	c) Scroll Bar

a) **Panel Source Function Buttons**

The five **Panel Source Function Buttons** control a variety of source-related control panel functions:

- **Set Defaults**

    Click **Set Defaults** to copy the default list of names and signal level assignments from the **Input Assignments** matrix to the **Panel Source Matrix.**

    Once clicked, the **Panel Source Matrix** fills in with all the data from the **Input Assignments** matrix. You can leave your sources as is — or customize them. Refer to the "**Panel Source Matrix**" and "**Customizing Sources**" headings for details.

    If you are designing custom sources, this function can also be used to "undo" your entries, thus returning the matrix to the

source defaults from the **Input Assignments** matrix.

- **Get Source Table**

  Click **Get Src Table** to retrieve the current source matrix (from the selected control panel) back into the **Panel Source Matrix**— for viewing or modification.

  Similar to the **Set Source Defaults** function, this function can also "undo" entries in progress, but the restored defaults originate from the selected panel —*not* the **Input Assignments** matrix.

- **Set Source Table**

  Click **Set Src Table** to send a new or modified source matrix *back to* the control panel (that is listed in the **Panel ID Selector**). The new matrix is stored in the panel itself, until changed.

- **Clear Display**

  Click **Clear Display** to completely clear (erase) all cells in the **Panel Source Matrix.**

- **Clear Table**

  Click **Clear Table** to completely clear the **Panel Source Matrix** that currently resides in the selected control panel. Once clicked, the selected panel is *not functional*.

- **Data Check**

  Click **Data Check** to *validate* the data in the current **Panel Source Matrix** The system checks for duplicate names which could potentially cause problems. If duplicates are detected, the system highlights each duplicate cell in yellow in the **Source Column.** This action is an "alert" only. You can elect to leave the duplicate names, but it is *highly recommended* that you resolve the conflict immediately. Enter new (non-conflicting) names and click **Data Check** to clear the yellow highlights.

b) **Panel Source Matrix**

  The **Panel Source Matrix** is the area in which you can perform the following functions:

- verify default source settings
- rename existing sources
- modify existing sources
- design new sources
- determine what sources appear on selected panels

  Basically, when you punch up a source on a control panel, this matrix lets you select the inputs that you want to use (either default or

custom), and the names that you want to use
(either default or custom).

Please note:

- On the matrix, sources are built from inputs that are derived from the **Input Assignments** matrix (via **Set Defaults**), from the selected panel (via **Get Src Table**), or from a panel configuration file.

- The column headings represent the number of signal levels installed in your router.

- The source matrix is 64 rows in length, allowing you to use all of your defaults plus custom sources.

- The **"Source"** column initially lists the names assigned on the **Input Assignments** matrix, but you can change any name or enter a new one — to make operations more intuitive, and names more meaningful.

    For example:

    ~ If the playback source **VTR 1** is used for multiple purposes, you may wish to retain its default name.

    ~ If **VTR 2** is used for a *single purpose*, you may wish to customize its name, such as **SLO MO 2**, **MOVIE**, or **AIRCHECK**.

    ~ If **VTR 3** plays back dual-language programming, you may wish to design two unique sources such as **VTR3ENG** and **VTR3SPAN**.

Note

All standard rules for entering source names apply. Refer to the previous **"Standard View Rules"** section for details.

- Beneath the headings, each matrix cell is in fact a drop list that allows you to select *any valid source* for use — *on that specific signal level*. See the **"Customizing Sources"** section below for details.

c) **Scroll Bar**

At the right of the matrix, a scroll bar allows you to scroll through all sources in the list.

Customizing Sources

Each cell in the source matrix area is a "switch"
that allows you to select *any input* (from a list of
all valid inputs) for use on that signal level.
When a cell is selected, an arrow appears which when
clicked, reveals a drop-down box that includes *all
valid inputs* on that signal level.

Source	Dig Vid DV	AnalogV AV	Aud L1 AA
STILL 2	STILL 2		
CD 2			CD 2
SAT 1	SAT 1	VTR 1 ▼	
SAT 2			SAT 2
SAT 3	SAT 3		SAT 3

DDR 1
DDR 2
SAT 2
SAT 3
VTR 1
VTR 2
VTR 3
MON 1
TONE

Customizing a source is as simple as selecting the
desired input for that particular signal level. You
can also select "**blank**" if you want *nothing* to appear
on that signal level when the source is called up.

Please note:

- Typically, for default sources, *no change* is
  required for each source's inputs. The
  signals that comprise **VTR1**, for example,
  would not differ from the physical rear panel
  connections.

- For custom sources, you can "build" a group of
  inputs as required. For example:

  ~ A source called **TEST** could pull video from
    the color bar generator, and audio from the
    audio tone generator.

  ~ A source called **VTR3ENG** could pull video
    plus audio channels 1 and 2 from VTR 3.

  ~ A source called **VTR3SPAN** could pull video
    plus audio channels 3 and 4 from VTR 3.

In this manner, you have complete flexibility in
naming and designing custom sources. By using
custom names and custom sources, you can concentrate
on exactly what you need — intuitively, rather than
where certain signals originate from in a large and
complex matrix.

Refer to the "**RMS-200 Operations**" section for a step-
by-step procedure in designing custom sources.

Panel Destination Section

The **Panel Destination Section** allows you to set up *default* and *custom* destinations — *exactly* as you want them to appear in a selected control panel's display. Please note:

- Each control panel can be unique in its configuration of destinations — they do *not* have to be identical.

- Destinations do *not* have to follow the default assignments as entered on the **Setup View.** You can "build" destinations out of any set of valid outputs, and assign them custom names.

- The data shown in the matrix is derived from one of three areas:

    ~ From the selected control panel (**Get Dst Table**).
    ~ From the current **Output Assignment Table** (if **Set Defaults** is clicked).
    ~ From a **Panel Configuration File**

- The data in the matrix can be edited and sent (uploaded) to a remote panel if desired, or stored in a file. If data is sent to a panel, it is stored *in the panel itself,* until changed.

The figure below illustrates a sample **Panel Destination Section**

	Dig Vid DV	Analog V AV	Aud L1 AA	Aud R1 AA	Aud D1 DA	Aud D2 DA	
Destination							
MON 0	MON 0				MON 0	MON 0	
MON 1		MON 1	MON 1	MON 1			
SAT 1	SAT 1	SAT 2	SAT 2		SAT 1	SAT 1	
SAT 2	SAT 3	SAT 2	SAT 2	SAT 2			
SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	SAT 3	
STILL 1	STILL 1						
STILL 2	STILL 2						
VTR 1		VTR 1	VTR 1	VTR 1			
VTR 2		VTR 2	VTR 2	VTR 2			
VTR 3		VTR 3	VTR 3	VTR 3			

Function buttons: Data Check, Get Dst Table, Set Defaults, Set Dst Table, Clear Display, Clear Table

a) Panel Destination Function Buttons   b) Panel Destination Matrix   c) Scroll Bar

a) **Panel Destination Function Buttons**

   The five **Panel Destination Function Buttons** control a variety of output-related control panel functions:

   - **Set Defaults**

Click **Set Defaults** to copy the default list of names and signal level assignments from the **Output Assignments** matrix to the **Panel Destination Matrix**

Once clicked, the **Panel Destination Matrix** fills in with all the data from the **Output Assignments** matrix. You can leave your outputs as is — or customize them. Refer to the "**Panel Destination Matrix**" and "**Customizing Outputs**" headings for details.

If you are designing custom outputs, this function can also be used to "undo" your entries, thus returning the matrix to the defaults from the **Output Assignments** matrix.

- **Get Destination Table**

   Click **Get Dst Table** to retrieve the current output matrix (from the selected control panel) back into the **Panel Destination Matrix** — for viewing or modification.

   Similar to the **Set Dst Defaults** function, this function can also "undo" entries in progress, but the restored defaults originate from the selected panel — *not* the **Output Assignments** matrix.

- **Set Destination Table**

   Click **Set Dst Table** to send a new or modified output matrix *back to* the control panel (that is listed in the **Panel ID Selector**). The new matrix is stored in the panel itself, until changed.

- **Clear Display**

   Click **Clear Display** to completely clear (erase) all cells in the **Panel Destination Matrix.**

- **Clear Table**

   Click **Clear Table** to completely clear the **Panel Destination Matrix** that currently resides in the selected control panel. Once clicked, the selected panel is *not functional.*

- **Data Check**

   Click **Data Check** to *validate* the data in the current **Panel Destination Matrix.** The system checks for duplicate names which could potentially cause problems. If duplicates are detected, the system highlights each duplicate cell in yellow in the **Destination Column.** This action is an "alert" only. You can leave the duplicate names, but it is *highly recommended* that you resolve the conflict immediately. Enter new (non-conflicting) names and click **Data Check** to clear the yellow highlights.

b) **Panel Destination Matrix**

The **Panel Destination Matrix** is the area in which you can perform the following functions:

- verify default output settings
- rename or modify existing outputs
- design new outputs
- determine what outputs appear on selected panels

When you punch up an output on a control panel, this matrix assigns the outputs (either default or custom) that you want to route to the inputs of your destination devices, and the names that you want to use (either default or custom). Please note:

- On the matrix, destinations are built from outputs that are derived from the **Output Assignments** matrix (via **Set Defaults**), from the selected panel (via **Get Dst Table**), or from a panel configuration file.

- The column headings represent the number of signal levels installed in your router.

- The destination matrix is 64 rows in length, allowing you to use all of your defaults plus custom destinations.

- The "**Destination**" column initially lists the names assigned on the **Output Assignments** matrix, but you can change any name or enter a new one — to make panel operations more intuitive and meaningful.

  For example:

  ~ If destination **SAT 1** always receives inputs from multiple sources, you may wish to retain its name.

  ~ If the destination **MON 1** is always used for a *single purpose*, you may wish to customize its name, such as **CR MON** or **AIR MON**.

  ~ If **VTR 3** records dual-language programming, you may wish to name two unique destinations such as **VTR3ENG** and **VTR3SPAN**.

Note

All standard rules for entering destination names apply. Refer to the previous "**Standard View Rules**" section for details.

- Beneath the headings, each matrix cell is a "switch" that allows you to select *any valid destination* for use — *on that specific*

signal level. See the "**Customizing Destinations**" section below for details.

c) **Scroll Bar**

>At the right of the matrix, a scroll bar allows you to scroll through all sources in the list.

Customizing Destinations

Each cell in the destination matrix area is a "switch" that allows you to select *any output* (from a list of all valid *outputs*) for use on that signal level. When a cell is selected, an arrow appears which when clicked, reveals a drop-down box that includes *all valid outputs* on that level.

Destination	Dig Vid *DV*	AnalogV *AV*	Aud L1 *AA*	Aud R1 *AA*
MON 0	MON 0			
MON 1		MON 1	MON 1	MON 1
SAT 1	SAT 1			
SAT 2		SAT 2	SAT 2 ▾	SAT 2
SAT 3	SAT 3	SAT 3		SAT 3

MON 1
SAT 2
SAT 3
VTR 1
VTR 2
VTR 3
AUX 1
AUX 2

Customizing a destination is as simple as selecting the desired output signal for that particular signal level. You can also select "**Blank**" if you want *nothing* to be routed to that signal level when the destination is punched up. Please note:

- Typically, for default destinations, *no change* is required for each source's outputs. The signals that comprise the destination **VTR1**, for example, would not differ from the physical rear panel connections.

- For custom destinations, you can "build" a group of outputs as required. For example:

  ~ A destination called **VTR3ENG** could route signals to just the video, audio channel 1, and audio channel 2 inputs of VTR 3.

  ~ A destination called **VTR3SPAN** could route signals to just the video, audio channel 3, and audio channel 4 inputs of VTR 3.

  ~ A destination called **SAT3DIG** could route signals to a digital subset of the uplink's full array of inputs.

In this manner, you have complete flexibility in naming and designing custom destinations. By using custom names and outputs, you can concentrate on exactly what you need — intuitively.

Refer to the "**RMS-200 Operations**" section for a step-by-step procedure in designing custom destinations.

Panel Configuration Files

The system allows you to store and retrieve "**Panel Configuration**" files that contain panel names plus all current information in the **Panel Source Section** and **Panel Destination Section**

These files can be opened, designed, and modified in the RMS-200, whether or not you send the new data to the controller (using the **Set Panel ID**, **Set Src Table**, and **Set Dst Table** buttons).

Refer to the "**RMS-200 Operations**" section for instructions on all configuration file functions.

RMS-200 Operations

This section provides step-by-step procedures for using the RMS-200.

Important

Prior to proceeding with RMS-200 operations, ensure that you are thoroughly familiar with the material presented in the "**RMS-200 Windows, Dialogs, and Views**" section.

As a basic guideline, follow the steps listed below to set up your router, particularly with a first-time setup. Thereafter, you can use any RMS-200 function — individually or in combination — in any order required.

1. Complete your charts
2. Configure your signal level names
3. Set up your **Input Assignments** matrix
4. Set up your **Output Assignments** matrix
5. Save a **System Configuration** file
6. Configure your control panels
7. Save a **Panel Configuration** file

Completing Your Charts

Several written charts are important prerequisites for RMS-200 operations:

- The **Signal Level Chart** should include a list of your installed signal levels.
- The **Signal Information Charts** should include lists of all the inputs and outputs physically connected to the router.
- The **Panel Information Chart** should include a list of each control panel's location and (DIP Switch) ID.

Sample charts are provided below — one chart per page.

Tip

Please photocopy these charts as required. This step will prevent you from marking up the *User's Guide*, and will also allow you to revise and refine your charts before entering the information in the RMS-200.

Signal Level Chart

Fill in the chart below with the name of each installed signal level in your UTAH-200 router.

Installed Signal Level	Signal Level Description	Installed Signal Level	Signal Level Description
(example) 1	(example) Digital Video		
1		5	
2		6	
3		7	
4		8	

Input Signal Information Chart

One **Input Signal Information Chart** should be completed for *each signal level* in your system (e.g., digital video, digital audio, analog video, etc.). Copy the chart below as required.

- At the top of the chart, fill in the name of the signal level.

- The **Input Connector** column lists each physical input connector. Each specific signal level may have 16 or 32 inputs, depending upon your router's configuration.

- In the **Signal Description** column, make a list of each device that is physically connected to that router input. In the sample below, DVR 1 Video Out is connected to input 14.

Input Signal Level:	

Input Connector	**Signal Description**	**Input Connector**	**Signal Description**
(example) 14	(example) DVR1 Video Out		
0		16	
1		17	
2		18	
3		19	
4		20	
5		21	
6		22	
7		23	
8		24	
9		25	
10		26	
11		27	
12		28	
13		29	
14		30	
15		31	

Output Signal Information Chart

One **Output Signal Information Chart**should be completed for *each signal level*in your system (e.g., digital video, digital audio, analog video, etc.). Copy the chart below as required.

- At the top of the chart, fill in the name of the signal level.

- The **Output Connector** column lists each physical output connector. Each specific signal level may have 16 or 32 outputs, depending upon your router's configuration.

- In the **Signal Description** column, make a list of each device that is physically connected to that router output. In the sample below, output 14 is connected to DVR 1 Video In.

Output Signal Level:	

Output Connector	Signal Description	Output Connector	Signal Description
(example) 14	(example) DVR1 Video In		
0		16	
1		17	
2		18	
3		19	
4		20	
5		21	
6		22	
7		23	
8		24	
9		25	
10		26	
11		27	
12		28	
13		29	
14		30	
15		31	

Panel Information Chart

The **Panel Information Chart** should be completed for *all panels* in your system. Up to 32 panel can be connected to the system.

- In the **Panel ID** column, make a list of the physical **DIP Switch** settings for each panel in your system. DIP Switches are located on the rear panel of each control unit. Valid ID numbers range from **1** to **254**.

Note	Only authorized personnel (such as your facility engineer) should change DIP Switch settings.

- In the **Panel Location** column, make a list of the physical location of each corresponding panel. In the sample below, panel **5** (with Binary ID **00000101**) is located in Edit Suite 1.

Decimal ID	Binary ID (DIP Switch)	Panel Location	Decimal ID	Binary ID (DIP Switch)	Panel Location
(example) 5	00000101	Edit Suite 1			

Configuring Signal Level Names

This procedure allows you to name (or rename) each installed signal level in your routing switcher. This procedure should be performed in the following situations:

- For initial system setup
- When you install a *new signal level* in your router

Use the following steps to name your signal levels:

1. Ensure that your **Signal Level Chart** is filled out. Refer to the "**Signal Level Chart**" section for instructions.

2. With the RMS-200 running, click the **Setup View** button. At the top of the view, locate the **Signal Level Name Column**

Note	For a first-time router setup, default names are listed.

3. Click **Get Signal Name Table** to retrieve the current configuration of signal level names from the router.

4. Click in the cell for the signal level that you wish to name (or rename).

5. Type the desired name (up to eight characters in length), or click and drag to highlight the letters that you want to change.

6. To accept the name, press **Enter**, click in another cell, or press **Arrow Up** or **Arrow Down** (on your keyboard) to move to another cell. If the name is longer than eight characters, an alert dialog appears. Press **Enter** to clear the dialog and automatically truncate the name to a length of eight characters.

Important	Once names are entered or modified, all associated RMS-200 column headings are changed.

7. Repeat steps 4 through 6 for each signal level that you want to name (or rename).

8. Click **Data Check** to validate the data in the table. If the system highlights any duplicate names, rename them to resolve the conflict, and click **Data Check** to clear the highlights.

9. When all signal levels have been named, click **Set Signal Name Table** to permanently update the controller with the new set of signal level

names. These names remain in the controller's non-volatile memory until changed.

This completes the procedure for naming each installed signal level.

Setting Up the Input Assignments Matrix

This procedure allows you to name individual inputs,
and associate them with their *physical* rear-frame
connections. This procedure should be performed in
the following situations:

- For initial system setup
- When you connect new input devices to your
  router
- When you change existing input devices in your
  router

Use the following steps to set up your inputs:

1. Ensure that your **Input Signal Information Charts**
   are filled out completely (one for each
   installed signal level). Refer to the **"Input
   Signal Information Chart"** section for
   instructions.

2. With the RMS-200 running, click the **Setup View**
   button.

3. In the bottom half of the view, click the
   Input Assignments Tab to display the **Input
   Assignments** matrix.

4. Click **Get Input Table** to retrieve (and display)
   the current input assignments from the
   controller. For an *initial* setup, the cells
   will be filled with system default values.

5. In the left-hand **"Device"** column, click in the
   cell that you want to name (or change).

6. Using your first signal level chart, type the
   input device's name *only*, up to eight
   characters (e.g., **VTR1**, **STILL1**, etc.)

7. In the right-hand matrix area, locate the
   signal level column that corresponds to your
   first chart (e.g., **Dig Vid**, **Aud L1**, etc.)

8. In the cell adjacent to the source name (that
   you entered in step 6), type the number of the
   corresponding input connector. These cells
   accept 2-digit *numeric* entries *only* (from **0** to
   31).

   For example, if your chart lists ...

Input Connector	Signal Description
14	DVR1 Video Out

   ... enter **14** in the **Dig Vid** (digital video)
   column ...

Device	Dig Vid DV	AnalogV AV
DVR 1	14	

... indicating that the output of **DVR1** is physically connected to the router on input 14 — on the **Digital Video** signal level.

9. Repeat steps 5 through 8 for each remaining
   entry on the **Input Signal Information** chart.

10. Repeat steps 5 through 9 for each entry on
    each additional signal level's **Input Signal
    Information** chart.

11. Click the upper **Data Check** button to validate
    the data in the table. If the system
    highlights any duplicate names, or highlights
    multiple devices that are connected to the
    same input, resolve each conflict as
    necessary. Click **Data Check** to clear the
    highlights.

12. When all inputs have been named and associated
    with their physical connectors, click **Set Input
    Table** to permanently update the controller with
    the new data. This information remains in the
    controller's non-volatile memory until
    changed.

This completes the procedure for naming and
identifying individual routing switcher inputs.

Setting Up the Output Assignments Matrix

This procedure allows you to name individual
outputs, and associate them with their *physical* rear-
frame connections. This procedure should be
performed in the following situations:

- For initial system setup
- When you connect new output devices to your
  router
- When you change existing output devices in
  your router

Use the following steps to set up your outputs:

1. Ensure that your **Output Signal Information
   Charts** are filled out completely (one for each
   installed signal level). Refer to the "**Output
   Signal Information Chart**" section for
   instructions.

2. With the RMS-200 running, click the **Setup View**
   button.

3. Click the **Output Assignments Tab** to display the
   Output Assignments matrix.

4. Click **Get Output Table** to retrieve (and display)
   the current output assignments from the
   controller. For an *initial* setup, the matrix
   cells will be filled with system default
   values.

5. In the left-hand "**Device**" column, click in the
   cell that you want to name (or change).

6. Using the chart for your first signal level,
   type the output (destination) device's name

only, up to eight characters (e.g.,**VTR1, DDR2**, **STILL1,** etc.)

7. In the right-hand matrix area, locate the signal level column that corresponds to your first chart (e.g.**, Dig Vid, Aud L1,** etc.)

8. In the cell adjacent to the destination device's name (that you entered in step 6), type the number of the corresponding output connector. These cells accept 2-digit *numeric* entries *only* (from **0** to **31**).

   For example, if your chart lists ...

Output Connector	Signal Description
14	DVR1 Video In

   ... enter **14** in the **Dig Vid** (digital video) column ...

Device	Dig Vid *DV*	AnalogV *AV*
DVR 1	14	

   ... indicating that output connector 14 on the **Digital Video** signal level is physically connected to the input of **DVR1**.

9. Repeat steps 5 through 8 for each remaining entry on the **Output Signal Information** chart.

10. Repeat steps 5 through 9 for each entry on each additional signal level's **Output Signal Information** chart.

11. Click the lower **Data Check** button to validate the data in the table. If the system highlights any duplicate names, or highlights multiple devices that are connected to the same output, resolve each conflict as necessary. Click **Data Check** to clear the highlights.

12. When all outputs have been named and associated with their physical connectors, click **Set Output Table** to permanently update the controller with the new data. This information remains in the controller's non-volatile memory until changed.

This completes the procedure for naming and identifying individual routing switcher outputs.

Saving a System Configuration File

The RMS-200 allows you to save "**System Configuration**" files of your source, destination, and signal level names. These files protect your valuable setups, and also allow you to work with *multiple configurations* that can be opened, modified, saved, or uploaded to the routing switcher.

Use the following steps to save a system configuration file:

1. With your signal level names, input assignments, and output assignments complete, select the **Setup View** and click **File**, **Save System Configuration** on the **Menu Bar.**

2. One of two actions occur:

   - If an existing system configuration file was already open, the configuration is saved to disk with the current name.

   - If no system configuration file was open (and the **Title Bar** read "**Untitled**"), the **Save As Dialog** appears.

3. In the **Save As Dialog**, navigate to the folder where you want to store the system configuration file.

4. In the **File Name** text box, type the name of the file that you want to save (e.g., **Acme Post 1**, **Studio Config 3**, etc.).

5. Click **Save** to save the file to disk.

This completes the steps for saving a system configuration file to disk.

Configuring Control Panels

After setting up and identifying your system's signal levels, inputs and outputs, you need to design "**Panel Configurations**" for each control panel connected to the router. This procedure should be performed in the following situations:

- For initial system setup
- When you connect new input or output devices to your router
- When you change existing input or output devices
- When you add a new control panel to the router
- When you move a control panel from one location to another
- When a change is required to a panel's sources and destinations

Use the following steps to configure your control panels:

1. Ensure that your **Panel Information Chart** is filled out. See the "**Panel Information Chart**" section for instructions.

2. Ensure that all new or existing control panels are connected to the controller via **U-Net.**

3. With the RMS-200 running, click the **Panels View** button.

4. **Identify the panel to configure**

Click the **Panel ID Selector** and enter an ID number.

- If this is an initial system setup or the installation of a new panel, enter the ID number of the panel that you want to configure. Type the number or use the up/down buttons. Use your chart for reference.

- If you are configuring (or modifying) an existing panel, enter the ID number of the panel that you want to configure or modify. Click **Get Panel ID** to retrieve the name of the panel (from the panel itself).

5. **Name the panel**

   For initial setups, for the installation of a new panel or for changing an existing panel, click the **Panel Name Field**. Type a custom name, up to 32 alpha-numeric characters in length. Use your chart for reference. Click **Set Panel ID** to upload the new (or modified) name to the panel itself.

6. **Import default sources**

   - If this is an initial system setup or the installation of a new panel, ensure that the **Input Assignments Matrix** is set exactly as desired. Click **Set Defaults** to copy the default list of names and assignments from the **Input Assignments** matrix to the **Panel Source Matrix**.

   - If you are configuring (or modifying) an existing panel, click **Get Src Table** to retrieve the current source matrix (from the selected control panel) back into the **Panel Source Matrix**.

   In each case, the **Panel Source Matrix** fills in with source data.

7. **Set up the panel's sources**

   a. Review the list of sources in the **Source** column.

   b. If you wish to rename a source (with a more intuitive or meaningful name), click in the desired field in the **Source** column and type the new name. Press **Enter** to accept.

   c. If you wish to leave the input's signals in their *default* conditions, *no change* is required to the matrix cells adjacent to the source's name.

   d. If you wish to customize the source, click in the cell that corresponds to the signal that you wish to change.

      - Click the arrow to reveal the drop-down box.

      - In the box, select the *new input* to that signal level. You can also select **"blank"** — for *no input*.

      - Repeat as required on *all other signal levels* for the selected source.

   e. If you wish to create a brand new source:

- Click in a blank cell in the **Source** column, and enter the desired name. Press **Enter** to accept.

- For each signal adjacent to the new name, click in the cell in which you want to assign an input.

- Click the arrow to reveal the drop-down box.
- In the box, select the *new input*. You can also select "blank.".
- Repeat as required on *all other signal levels* for the new source.

f. If you wish to delete a source (so that it will *not* appear on the selected panel):

- In the **Source** column, click the cell that contains the name that you want to delete. Press **Delete** on the keyboard to clear the cell.
- Select each signal (adjacent to the deleted name) that contains an input assignment, and press **Delete** on the keyboard to clear the cell.

g. Click **Data Check** to validate the data in the table. If the system highlights any duplicate names, rename them to resolve the conflict, and click **Data Check** to clear the highlights.

h. When all modifications are complete, click **Set Src Table** to send a new or modified source matrix *back to* the selected control panel. The new matrix is stored in the panel itself, until changed.

8. **Import default destinations**

- If this is an initial system setup or the installation of a new panel, ensure that the **Output Assignments Matrix** is set exactly as desired. Click **Set Defaults** to copy the default list of names and assignments from the **Output Assignments** matrix to the **Panel Destination Matrix**

- If you are configuring (or modifying) an existing panel, click **Get Dst Table** to retrieve the current destination matrix (from the selected control panel) back into the **Panel Destination Matrix**

In each case, the **Panel Destination Matrix** fills in with output data.

9. **Set up the panel's destinations**

a. Review the list of destination in the **Destination** column.

b. If you wish to rename a destination (with a more intuitive name), click in the desired field in the **Destination** column and type the new name. Press **Enter** to accept.

c. If you wish to leave the destination's output signals in their *default* conditions,

no change is required to the matrix cells
adjacent to the destination's name.

d. If you wish to customize the destination, click in the cell that corresponds to the signal that you wish to change.

- Click the arrow to reveal the drop-down box.

- In the box, select the *new output* for that signal level. You can also select **"blank"** — for *no output*.

- Repeat as required on *all other signal levels* for the selected destination.

e. If you wish to create a brand new destination:

- Click in a blank cell in the **Destination** column, and enter the desired name. Press **Enter** to accept.

- For each signal adjacent to the new name, click in the cell in which you want to assign an output.

- Click the arrow to reveal the drop-down box.

- In the box, select the *new output* for that signal level. You can also select **"blank"**.

- Repeat as required on *all other signal levels* for the new destination.

f. If you wish to delete a destination (so that it will *not* appear on the selected panel):

- In the **Destination** column, click the cell that contains the name that you want to delete. Press **Delete** on the keyboard to clear the cell.

- Select each signal (adjacent to the deleted name) that contains an output assignment, and press **Delete** on the keyboard to clear the cell.

g. Click **Data Check** to validate the data in the table. If the system highlights any duplicate names, rename them to resolve the conflict, and click **Data Check** to clear the highlights.

h. When all modifications are complete, click **Set Dst Table** to send a new or modified destination matrix *back to* the selected control panel. The new matrix is stored in the panel itself, until changed.

10. Repeat steps 4 through 9 for all additional panels that you wish to design, update, or modify.

This completes the procedure for configuring your
control panels.

Saving a Panel Configuration File

The RMS-200 allows you to store and retrieve "**Panel Configuration**" files, each of which contains the following information:

- Panel number
- Panel ID (alpha-numeric)
- **Panel Source Section** data
- **Panel Destination Section** data

Files are *panel-specific*, based on the current panel (and its associated data) shown in the **Panels View.**

Use the following steps to save a panel configuration file:

1. With the current panel sections complete, select the **Panels View** and click **File, Save Panel Configuration** on the **Menu Bar.**

2. One of two actions occur:
   - If an existing panel configuration file was already open, the configuration is saved to disk with the current name.
   - If no panel configuration file was open, the **Save As Dialog** appears.

3. In the **Save As Dialog**, navigate to the folder where you want to store the panel configuration file.

4. In the **File Name** text box, type the name of the panel configuration file that you want to save. Panel configuration files have the default extension **.xyp.**

Tip

> Use a naming convention that identifies the panel by ID number or by location in your facility (e.g., **Panel6.xyp**, or **EditSuite1.xyp**, etc.).

5. Click **Save** to save the file to disk.

Clearing Locks and Protects

In the Status View's **Output Section**, routing switcher assignments can be locked or protected by users at control panels.

- A red *L* indicates that the output has been "locked" by a control panel user.
- A yellow *P* indicates that the output has been protected by a control panel user.

Use the following steps to clear *locked* or *protected* assignments.

1. With the RMS-200 running, click the **Status View** button.

2. To clear a lock, click the desired *L* button in the matrix. The *L* changes to a *C* when the routing assignment is clear, and the RMS-200 has been notified of the *clear*.

3. To clear a protect, click the desired *P* button in the matrix. The *P* changes to a *C* when the routing assignment is clear, and the RMS-200 has been notified of the *clear*.

This completes the procedure for clearing locks and protects.

Changing PC-to-Controller Communications

The **Controller Communication Settings Dialog** allows you to set (or change) PC-to-controller communications. You can utilize either RS232, RS422 or Ethernet communication protocols.

Refer to the "**Controller Communication Settings Dialog**" section for full details on the dialog and its section. In Chapter 3, refer to the "**Establishing Communications**" section for instructions on establishing (or changing) communications parameters.

Upgrading Controller Software

Use the following steps to upgrade your controller's software.

1. Ensure that you have the latest UTAH-200 controller software upgrade disk from Utah Scientific . If you do not, please contact Customer Support.

2. Click **Utility**, **Upgrade Controller Software** to display the **Controller Software Upgrade Dialog**

3. Click **Browse** to display the **Open Dialog**. Use standard dialog procedure to navigate to your PC's floppy drive.

4. In the floppy disk's directory, highlight the controller software upgrade file, and click **Open**. The **Open Dialog** clears.

5. In the **Controller Software Upgrade Dialog**, click **Start** to begin the software upgrade process. The upgrade process is automatic, and requires several minutes to complete.

   If required, click **Halt** to terminate the upgrade process in progress. There is no

"resume" function — the process must be
repeated in order to properly upgrade
controller software.

When the upgrade process has completed, a dialog
notifies you of a successfully upgrade and the
system is automatically re-booted. You can now use
the system with upgraded features and functions.

Upgrading Control Panel Software

Use the following steps to upgrade a specific control panel's software.

1. Ensure that you have the latest UTAH-200 control panel software upgrade disk from Utah Scientific . If you do not, please contact Customer Support.

2. With the RMS-200 running, click **Utility**, **Upgrade Panel Software** to display the **Panel Software Upgrade Dialog**.

3. Click in the **Panel Number** field and type the ID number of the specific control panel that you want to upgrade.

4. Click **Browse** to display the **Open Dialog**. Use standard dialog procedure to navigate to your PC's floppy drive.

5. In the floppy disk's directory, highlight the panel software upgrade file, and click **Open**. The **Open Dialog** clears.

6. In the **Panel Software Upgrade Dialog** click **Start** to begin the software upgrade process. The upgrade process is automatic, and requires several minutes to complete.

Note

> If required, click **Halt** to terminate the upgrade process in progress. There is no "resume" function − the process must be repeated in order to properly upgrade the control panel's software.

When the upgrade process has completed, a dialog notifies you of a successfully upgrade and the system is automatically re-booted. You can now use the control panel with upgraded features and functions.

7. Repeat the procedure from step 2 to upgrade additional control panels as required.

Error Reporting

The RMS-200 provides three levels of error reporting which are set using the **Error Reporting Settings Dialog.**
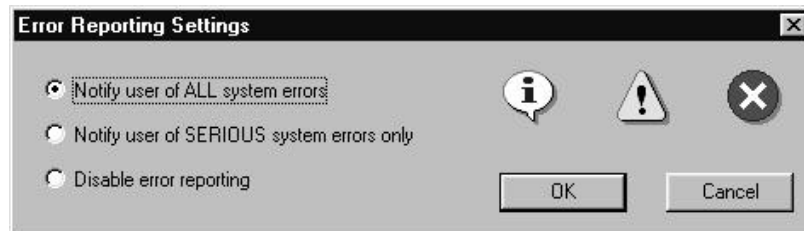
There are three levels of errors that the system will display and report:

- **Level 1** — Serious errors (as indicated by a white " **X** " in a red circle), are severe errors that render the system inoperable.

- **Level 2** — Minor errors (as indicated by the exclamation point in a yellow triangle), are non-catastrophic errors and cautions that should be fixed or dealt with immediately.

- **Level 3** — Notes (as indicated by the blue " **i** " in a bubble), are important points of information for reference only.

Use the following steps to set the level of error reporting:

1. In the **Menu Bar,** click **Settings, Error Reporting** to display the **Error Reporting Settings Dialog**

2. In the dialog, click the appropriate radio button to select the desired level of error reporting:

   - Click **Notify user of ALL system errors** to instruct the system to display *all types* of error messages — levels 1, 2, and 3.

   - Click **Notify user of SERIOUS system errors only** to instruct the system to display serious errors (level 1) only.

   - Click **Disable error reporting** to inhibit all error reporting.

3. Click **OK** to accept the new settings.

RMS-200 Error Log

The RMS-200 application automatically creates an error log file name **Ut200Err.txt**. This file contains error ID's, a string that identifies the error, and two hexadecimal words.

The format of a typical line in the file is:

```
[06/23/98 10:01:55]   CT ERROR: Controller communications lost 0x00000000 0x00000000
```

The fields are as follows:

1. Date and time stamp provided from the PC's clock that is running the RMS-200. This time is stamped upon receipt of the error itself, which *may or may not* reflect upon the actual time that the error was generated in the UTAH-200.

2. Error ID tag, in the form **XX ERROR**. The label XX can be one of the following codes:

Error ID Codes

ID Code	Description
AN	U-Net error, a panel related error
CT	Configuration Tool error – RMS-200 related error
DG	Diagnostic error
FL	Flash memory error
MX	MX bus error
RD	Redundancy Error
SP	Serial Port manager error
SR	Serial port error
SY	System error
UD	UDI error

3. Two data words related to the error. These words are designed for engineering and customer support use only

Keyboard Shortcuts

The following table lists keyboardshortcuts for
most **Menu Bar** items:

Shortcut	Description
File Menu	
ALT + F	Activates the File Menu.
CTRL + N	Opens a new blank configuration template
CTRL + O	Opens an existing system configuration
CTRL + S	Saves the current system configuration to disk
CTRL + P	Opens the Print Dialog
Edit Menu	
ALT + E	Activates the Edit Menu.
CTRL + Z	Undo the last edit operation
CTRL + Y	Repeat the most recent edit operation
CTRL + X	Cut selected grid cells
CTRL + C	Copy selected grid cells
CTRL + V	Paste selected grid cells
Delete	Clear selected grid cells
View Menu	
ALT + V	Activates the View Menu.
Settings Menu	
ALT + S	Activates the Settings Menu.
Window Menu	
ALT + W	Activates the Window Menu.
Help Menu	
ALT + H	Activates the Help Menu.

Operations

In This Chapter

This chapter provides comprehensive operating instructions for the UTAH-200 routing switcher. All procedures are accomplished through a simple control panel with an integral LCD display, soft keys, buttons and a scroll knob. Whether the control panel is mounted on the main frame or installed as a standalone unit (for example, in an edit suite), all operating procedures are identical.

The following topics are discussed:

- Control Panel Overview
- Features and Functions
- User Interface
- Menu Tree
- Operations
- Basic Rules
- Startup Screen and Main Menus
- All Follow Take Menu
- Breakaway Take Menu
- Direct Take Mode
- Toggle Mode
- Destination Monitor Menu
- Lock-Protect Menu
- Setup Options Menu
- Using the Panel Information Menu
- Using the Error Message Menu
- Panel Error Messages
- Reset Panel Software
- Clear Panel Software

Control Panel Overview

All UTAH-200 control panels send and receive commands across the **U-Net** bus from the controller (main frame). In addition to the ability to program input-to-output routes, each panel has the ability to display status and matrix information, control monitor outputs, plus provide information on breakaway, lock, and protect status.

Note

> Even though the operations of each control panel are identical, remember that source and destination name tables may differ from panel to panel. These panel assignments are determined by the RMS-200 application. Refer to Chapter 4 for details.

Features and Functions

Each control panel includes the following functions:

- **Function Driven** — using only 7 buttons, a scroll knob, and a clear graphic display, all operations are simple, easy to learn, and *task-oriented*. Inputs and outputs are clearly identified by an 8-character alphanumeric name (which you can define with the RMS-200). Each panel supports up to 64 sources and 64 destinations.

  Refer to Chapter 4 for instructions on defining your source and destination names.

- **All Follow Takes** — a "take" is the most basic of routing switcher functions. You select a source, select a destination, and then press **Take** to instantly route the source to the input of the selected destination device.

  An "all follow take" simply means that *all assigned signal levels* switch simultaneously — and no signal levels are broken away.

  Each UTAH-200 panel provides a simple menu for performing "all follow takes," up to the maximum of eight installed signal levels.

- **Destination Monitor Takes** — each installed signal level includes its own monitor output that allows you to check individual input-to-output assignments across the matrix (without affecting the actual destinations).

  Each UTAH-200 panel provides full control of the destination monitor, either in a *manual* or *auto-switching* mode.

- **Protect and Lock** — users can initiate "protects" and "locks" as required from each panel.

    ~ A "lock" is a special mode that alerts all users that a route is in use. When a route is locked, a lock icon appears on screen, and the source-to-destination assignment *cannot* be changed by anyone. The assignment, however, can be unlocked (cleared) by *any user*.

    ~ A "protect" is another special mode that also alerts all users that a route is in use. When a route is protected, a lock icon appears, but the source-to-destination assignment can only be changed by the *originating user*. Similar to locks, the assignment can be unprotected (cleared) by *anyone*.

- **Breakaway Takes** — a "breakaway" take is one in which a subset of all installed signal levels are sent to a destination, or signal levels from more than one source are sent to the destination. Each panel supports the ability to program "breakaway takes," on any combination of installed signal levels.

- **Direct Takes** — a simple menu is provided that allows the user to select one of four *favorite* sources, with single-button simplicity. New *favorites* can be programmed with ease.

- **Panel Information** — a basic "Status" screen is provided which displays a variety of panel-specific information including the software version, U-Net node and status, and the panel's specific ID number.

- **Toggle Mode** — primarily a maintenance function, toggle mode allows the user to perform a take, and then when a *second* take is sent, the panel alternates between them continuously. This action continues until **Menu** or **Cancel** is pressed.

- **Error Reporting** — a variety of icons indicate specific error messages. In addition, a special **Error/Warning** screen is available for more detailed error messages.

- **Flash Memory Upgrades** — the firmware for each control panel can be updated from the RMS-200. Refer to Chapter 4 for panel upgrade details.

User Interface

The figure below illustrates each control panel's user interface:
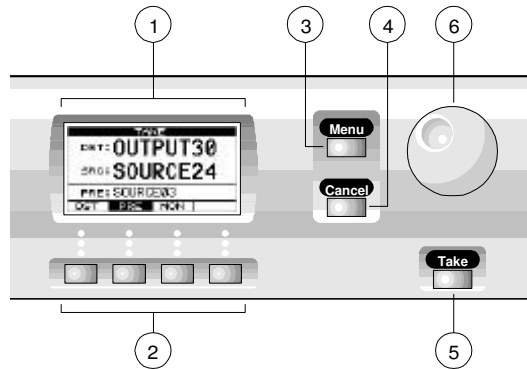
1) Display	3) Menu Button	5) Take Button
2) Soft Keys	4) Cancel Button	6) Scroll Knob

1) **Display**

   The LCD display shows all system operating modes and routing options. Please note:

   • Buttons (or *labels*) on the display's bottom row are activated by pressing the corresponding Soft Key below. These labels change depending upon the selected mode. When a label is selected, its name is *highlighted* in reverse characters — white letters on a black background.

   • When a specific source, destination, or option has been selected to be changed, its name *blinks* slowly to indicate that a choice is pending.

2) **Soft Keys**

   The four Soft Key buttons correspond to labels that appear on the display's bottom line. Pressing a Soft Key *highlights* the corresponding label, and activates the selected function or switches to the selected menu.

Important

In this chapter, display commands are referred to by their *actual label names*, and not by the soft key that is pressed (below the display). For example, the phrase "... press **DST** ..." will be used, rather than "... press **Soft key #1** ... "

3) **Menu Button**

Press **Menu** to return the display to either "**Main Menu 1**" or "**Main Menu 2**" — the one *last selected*. When pressed, any pending operation is canceled. The button is always backlit.

4) **Cancel Button**

The **Cancel** button has two functions, depending upon the selected menu:

- On all menus, press **Cancel** to halt a procedure in progress. When pressed, the specific menu item stops blinking, and the menu itself remains at the current level.

- On the many **Options** "sub" menus, press **Cancel** to return to the **Options Menu**. Changes in options are not accepted.

Note that the **Cancel** button is always backlit.

5) **Take Button**

Press **Take** to accept (and activate) any *pending* audio/video routing assignment. The **Take** button flashes *only* when an assignment is pending. Once the button is pressed, the flashing stops and the lamp is off.

6) **Scroll Knob**

The **Scroll Knob** has several functions, depending upon the selected menu:

- On **Main Menu 1** or **2**, rotating the knob moves the highlight *horizontally*, allowing you to view a mini "help" line for each **Main Menu** icon.

- On all other menus, any time there is a list on the display or a selection that can be changed, rotating the **Scroll Knob** moves through a list of choices — allowing you to quickly find the desired source, destination, or option.

Important

As you scroll through destinations and preselect sources, the change is made for *all screens* in the system. For example, if you select **Dst 12** on the **Take Menu** and switch to the **Breakaway Take Menu**, **Dst 12** appears there by default.

Menu Tree

The figure below illustrates a simplified *menu tree* for navigating the UTAH-200 control panel. Use this diagram for reference throughout the operating procedures in this chapter.
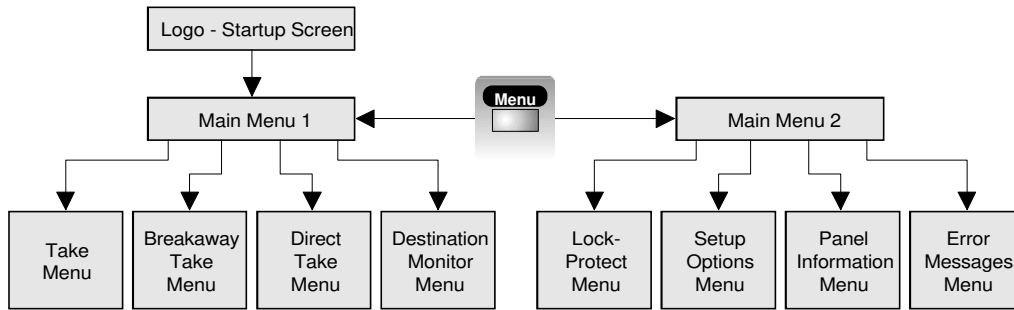
Note	Remember that all signal level names, plus source and destination names (as shown on the display) are configured with the RMS-200. See chapter 4 for details.

Operations

This section provides comprehensive operating instructions for the UTAH-200 routing switcher. The following topics are discussed:

- Basic Rules
- Startup Screen and Main Menus
- All Follow Take Menu
- Breakaway Take Menu
- Direct Take Menu
- Toggle Mode
- Destination Monitor Menu
- Lock-Protect Menu
- Setup Options Menu
- Using the Panel Information Menu
- Using the Error Message Menu
- Panel Error Messages
- Reset Panel Software
- Clear Panel Software

Note	In this section, the four Soft Keys will *not* be shown in any illustration. When a command is listed, it is assumed that you press the soft key directly below the corresponding label on the display's bottom line.

Basic Rules

The following basic rules are covered in this section:

- Arrows and Lists
- Locks and Protects

Arrows and Lists

Up and **Down Arrows** are used on the display to indicate specific information about *lists*. These arrows appear *beside* a list, depending upon the selected mode.

The following rules apply:

- Arrows appear any time there is a list that is *longer* than can be shown in the display's available lines.

- If there is more scrollable list information above the available display lines, an Up Arrow is shown ($\uparrow$).

- If there is more information below the available display lines, a Down Arrow is shown ($\downarrow$).

- If you have reached the top or bottom of a scrollable list, a black box is shown *without an arrow*.

Locks and Protects

Note the following basic rules regarding locks and protects.

- If a **Lock Icon** 🔒 appears after a destination name, it indicates that the destination is locked or protected — on one or more signal levels. To obtain full details about the lock or protect, you *must* go to the **Lock-Protect Menu**.

- If a **Lock** is in effect, the route can not be changed by anyone unless it is first unlocked (on the **Lock-Protect Menu**). Any panel can unlock the route.

- If a **Protect** is in effect, the route can only be changed from the panel on which the protect was initiated, or if the route is first unprotected (from any panel). Any panel can unprotect the route.

Startup Screen and Main Menus

The figure below illustrates the **Startup Screen**. This screen appears when the system powers up, or anytime that a control panel is reset.

Startup Screen

- To switch to **Main Menu 1**, press *any soft key* or rotate the **Scroll Knob**:
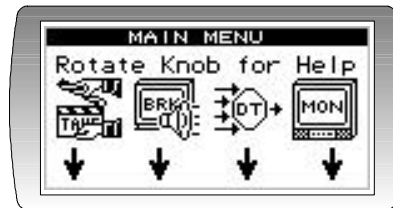
Main Menu 1

- To switch to **Main Menu 2**, press **Menu**:
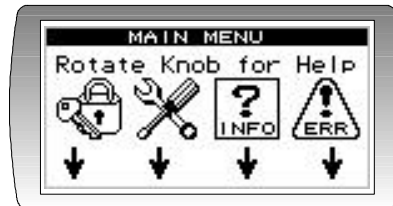
Main Menu 2

- To return to **Main Menu 1**, press **Menu** again.

On **Main Menu 1** and **2**, the large icons represent primary system menus that you can access.

- To display mini "help" messages for each icon, rotate the **Scroll Knob**. When an icon is highlighted, the label "**Rotate Knob for Help**" is replaced with a help message that names the associated menu.

The table below lists all icons, their names, and their associated help messages.

Icon Names and Help Messages

Icon	Icon Name	Help Message
	Take	All Follow Take Menu
	Breakaway	Breakaway Take Menu
	Direct	Direct Take Menu
	Monitor	Destination Monitor
	Lock	Lock-Protect Menu
	Options	Setup Options Menu
	Info	Panel Information
	Messages	Panel Error Messages

- On the display, **Arrows** below each icon indicate the soft key which when pressed, accesses the desired menu:

  On **Main Menu 1**:

  ~ Press **Take** to access the **Take Menu**.
  ~ Press **Breakaway** to access the **Breakaway Take Menu**.
  ~ Press **Direct** to access the **Direct Take Menu**.
  ~ Press **Monitor** to access the **Destination Monitor Menu**.

  On **Main Menu 2**:

  ~ Press **Lock** to access the **Lock-Protect Menu**.
  ~ Press **Options** to access the **Setup Option Menu**.
  ~ Press **Info** to access the **Panel Information Menu**.
  ~ Press **Messages** to access the **Panel Messages Menu**.

Important

> You do *not* have to highlight an icon to access the desired menu. Simply press a soft key to jump directly to a menu.

All Follow Take Menu

An "all follow take" allows you to switch *all assigned signal levels* of a selected source to a selected destination. From **Main Menu 1**, press **Take** to display the **All Follow Take Menu**.
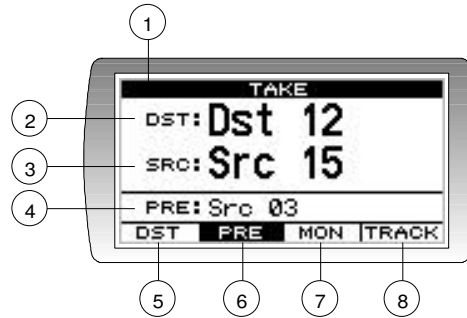
1)	Menu Name	4)	Preselect Line
2)	Destination Line	5)	Scroll Destination
3)	Source Line	6)	Scroll Preselect

7)	Destination Monitor Take
8)	Auto Tracking

1) **Menu Name** — the top line names the current menu.

2) **Destination Line** — shows the currently selected destination.

   - When **DST** is pressed and the **Destination Line** is scrolled, the **Source Line** automatically follows, indicating the current source attached to the selected destination.

   - If a **Lock Icon** appears after the destination name, it indicates that the destination is locked or protected — on one or more signal levels. To obtain full details about the lock or protect, you must go to the **Lock-Protect Menu**.

3) **Source Line** — shows the source name that is currently attached to the selected destination. Source names are configured with the RMS-200.

   - When the **Source Line** is blank, there is no source attached to the selected destination.

   - If the **Breakaway Icon <BrkAway>** appears on the **Source Line**, it indicates that one (or more) of the signal levels routed to the selected destination are broken away. To obtain full details about the breakaway signal levels, you must go to the **Breakaway Take Menu**.

4) **Preselect Line** — indicates the preselected source.

- When the **All Follow Take Menu** is first accessed, the **Preselect Line** *does not flash*. It shows the most recently preselected source, which may *or may not* match the source shown on the **Source Line**.

- When **PRE** is pressed or the **Scroll Knob** is rotated, the **Preselect Line** indicates the new pending source (for the selected destination). In this situation, the **Preselect Line** flashes and the **Take** button flashes, indicating that a Take is pending.

    Once **Take** is pressed, the source-to-destination route is electronically switched, **Preselect Line** stops flashing, the **Take** button stops flashing, and the preselected source name switches to the **Source Line**.

- When **Auto Tracking** is enabled, the **TRACK** label appears in reverse characters on the right side of the **Preselect Line**. In this mode, as you rotate the knob, the system automatically "takes" each new source that you select — the **Preselect Line** *does not* flash. Refer to the **Auto Tracking** item below for further details.

5) **Scroll Destination** — press **DST** to highlight the label, and scroll through destinations on the **Destination Line**. As the **Scroll Knob** is rotated, the destination changes and the associated source (on the **Source Line**) follows.

6) **Scroll Preselect** — press **PRE** to highlight the label, and scroll through pending sources on the **Preselect Line**. As the **Scroll Knob** is rotated, the **Preselect Line** flashes as new pending sources are shown.

7) **Destination Monitor Take** — press **MON** to momentarily highlight the label, and send the currently displayed destination to the attached video and/or audio monitor (using the UTAH-200 monitor matrix).

- Once **MON** is pressed, the destination is routed to the monitor(s), and the highlight immediately returns to the previously selected label (**DST** or **PRE**).

- If the label **MON** *does not appear* on the **All Follow Take Menu**, it indicates that destination monitor functionality has been disabled on this panel. This function can be enabled in the **Setup Options Menu**, provided that the menu is not password protected.

Refer to Chapter 2 for information about installing video monitor and audio monitor outputs.

8) **Auto Tracking** — press **TRACK** to momentarily highlight the label, and toggle the **Track Icon** on or off — on the right side of the **Preselect Line**.

- When the **Track Icon** is enabled, auto tracking is on. In this mode, as you rotate the knob, the system automatically "takes" each source that you select — eliminating the need to scroll, preselect, and press **Take**. Each new source is displayed on both the **Preselect Line** and **Source Line** as you scroll, and the **Preselect Line** *does not* flash.

- When the **Track Icon** is disabled, auto tracking is off. In this mode, you must preselect and take each desired source.

Note that the **TRACK** button itself can be displayed or hidden using the **Setup Options Menu**. Refer to the "**Setup Options Menu**" section for instructions.

Programming an All Follow Take

Three "all follow take" procedures are provided in this section:

- Retain current destination, select new source
- Select new destination, select new source
- Retain current destination, auto track new source

Retain Current Destination, Select New Source

Use the following steps to retain the current destination and program a new "all follow" source:

1. From **Main Menu 1**, press **Take** to display the **All Follow Take Menu**.

2. Ensure that **Auto Tracking** is off.

3. Press **PRE**. The **Preselect Line** flashes and **Take** flashes.

4. Rotate the **Scroll Knob** to choose a new source.

5. Press **Take** to complete the new source-to-destination route. The **Preselect Line** stops flashing, the **Take** button stops flashing, and the new source name switches to the **Source Line**.

Select New Destination, Select New Source

Use the following steps to select a new destination and program a new "all follow" source:

1. From **Main Menu 1**, press **Take** to display the **All Follow Take Menu**.

2. Ensure that **Auto Tracking** is off.

3. Press **DST**.

4. Rotate the **Scroll Knob** and choose a new destination. The **Destination Line** changes as you scroll (and the **Source Line** follows with each destination's associated source).

5. Press **PRE**. The **Preselect Line** flashes and **Take** flashes.

6. Rotate the **Scroll Knob** to choose a new source.

7. Press **Take** to complete the new source-to-destination route.

Retain Current Destination, Auto Track New Source

Use the following steps to retain the current destination and program a new "all follow" source — using the auto track method:

1. From **Main Menu 1**, press **Take**.

2. Press **TRACK** to enable **Auto Tracking**. The **Track Icon** appears on the right side of the **Preselect Line**.

3. Press **PRE**.

4. Rotate the **Scroll Knob** to choose a new source. As you rotate, the system automatically "takes" each source that you select, and displays it on both the **Preselect** and **Source** lines.

All Follow Take Notes

Note the following important points regarding "all follow" takes:

- Only "all follow takes" and "destination monitor takes" can be performed from the **All Follow Take Menu**.

- When you press **PRE**, the **Preselect Line** and **Take** button will *not flash* if the preselected source matches the source on the **Source Line**.

- Press **Cancel** at any time to cancel a pending take. The **All Follow Take Menu** remains on screen.

- Press **Menu** at any time to cancel a pending take and return to **Main Menu 1**.

- Press **MON** at any time to monitor the source attached to the current destination, using the monitor matrix.

- If the destination shows a **Lock Icon**, all basic rules for **Locks** and **Protects** apply. Refer to the "**Basic Rules**" section for additional details. Please note:

  ~ If you *do* attempt to change the route with a **Lock** in effect, no action will occur on the display.

  ~ If you *do* attempt to change the route with a **Protect** in effect (and you are not the initiating panel), no action will occur on the display.

  ~ If you attempt to change the route with a **Protect** in effect (and you *are* the initiating panel), the "take" is accepted.

Breakaway Take Menu

A "breakaway" take is one in which a *subset* of all assigned signal levels (or signal levels from more than one source) are sent to a destination. From **Main Menu 1**, press **Breakaway** to display the **Breakaway Take Menu**.
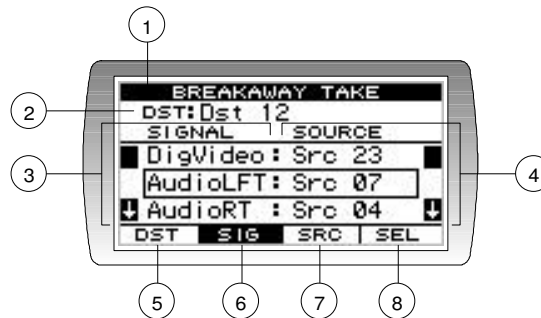
1) Menu Name	4) Source Column	7) Scroll Sources
2) Destination Line	5) Scroll Destination	8) Select Signal Level
3) Signal Level Column	6) Scroll Signal Levels	

1) **Menu Name** — the top line names the current menu.

2) **Destination Line** — shows the currently selected destination.

   • When **DST** is pressed and the **Destination Line** is scrolled, the *entire breakaway table* automatically follows, indicating the current source (and all associated breakaway assignments) attached to the selected destination.

   • If a **Lock Icon** appears after the destination name, it indicates that one or more signal levels on the selected destination are locked or protected. To obtain full details you must go to the **Lock-Protect Menu**.

3) **Signal Level Column** — shows all signal levels that are available for the selected destination, and allows you to select a specific signal level to break away.

   • When **SIG** is pressed, the entire **Signal Level Column** moves vertically when the knob is rotated. By placing a signal level in the center box, a new breakaway source can be assigned. All rules for **Up** and **Down Arrows** apply.

   • Not all signal levels are shown for each destination. For example, a VTR may be configured to show *all* available signal levels. However, a video-only destination will typically *not* show the audio signal levels.

4) **Source Column** — indicates the sources attached to the adjacent signal levels (for the selected destination), and allows you to select a new source to break away.

- When **SEL** is pressed, the source label in the center box changes to flashing dashes (**- - - - -**).

- With dashes in view, pressing **SRC** replaces the dashes with the flashing source list, allowing you to rotate the **Scroll Knob** and select the new breakaway source. When a source label is flashing, the **Take** button flashes to indicate that a new route is pending.

- If you press **SEL** to display dashes, then press **SIG** to select another signal level, and then press **SEL** *again*, you can select *multiple signal levels* to break away. Flashing dashes appear in the **Source Column** for all selected signal levels.

- If you press **SRC** *without* first pressing **SEL** or **SIG**, flashing dashes appear for *all available signal levels*. This easy shortcut allows you to break away *all signal levels* (and it saves you from repeatedly pressing **SIG**, **SEL** etc.).

Once **Take** is pressed, the new breakaway route is electronically switched, the selected source(s) in the **Source Column** stop flashing, the **Take** button stops flashing, and the new breakaway assignments appear in the column.

Important

When you press **Take**, *all signal levels and sources* in the entire breakaway table are switched to the selected destination.

5) **Scroll Destination** — press **DST** to highlight the label, and scroll through destinations on the **Destination Line**. As the **Scroll Knob** is rotated, the destination changes and the entire breakaway table follows with each destination's associated sources and breakaway signal levels (if present).

6) **Scroll Signal Levels** — press **SIG** to highlight the label and scroll the **Signal Level Column**. By placing a signal level in the center box, a new breakaway source can be assigned to it (by pressing **SEL**, **SRC**, and selecting a source with the knob).

7) **Scroll Sources** — press **SRC** to highlight the label, and select a new source for all signal levels that have been selected (those with flashing dashes).

- As you rotate the **Scroll Knob**, the flashing source list scrolls in each selected field in the **Source Column**, allowing you to select a new breakaway source. The **Take** button flashes to indicate a pending route.

- If you press **SRC** *without* first pressing **SEL** for any signal levels, flashing dashes appear for *all available signal levels*.

8) **Select Signal Level** — press **SEL** to momentarily highlight the label, and "select" the signal level in the center box for modification.

- If the source in the center box was *not* flashing, its label changes to flashing dashes (**- - - - -**). You can now select a new source for that signal level by pressing **SRC**.

- If the center box shows flashing dashes, pressing **SEL** *de-selects* the source, and cancels any pending Take for that level. The current status reappears and does not flash.

- If the center box shows a flashing source name, pressing **SEL** *de-selects* the source, and returns the center box to flashing dashes — allowing you to select another source, or press **SEL** *again* to completely deselect the line.

Programming a Breakaway Take

Five "breakaway take" procedures are provided in this section:

- Retain destination, break away one signal level
- Select new destination, break away one signal level
- Break away multiple signal levels to the same source
- Break away multiple signal levels to different sources
- Break away all signal levels except one

Retain Destination, Break Away One Signal Level

Use the following steps to retain the current destination and break away one signal level:

1. From **Main Menu 1**, press **Breakaway** to display the **Breakaway Take Menu**. **SIG** is highlighted by default.

2. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically. Place the signal level that you want to break away in the center box.

3. Press **SEL**. In the **Source Column**, the source label in the center box changes to flashing dashes.

4. Press **SRC**.

5. Rotate the **Scroll Knob** until you see the source appear (in the center box) that you want to assign to the selected signal level.

6. Press **Take** to complete the new breakaway route.

Select New Destination, Break Away One Signal Level

Use the following steps to select a new destination and break away one signal level:

1. From **Main Menu 1**, press **Breakaway** to display the **Breakaway Take Menu**.
2. Press **DST**.
3. Rotate the **Scroll Knob** to scroll the *entire breakaway table*, until you find the desired destination.
4. Press **SIG**.
5. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically. Place the signal level that you want to break away in the center box.
6. Press **SEL**. In the **Source Column**, the source label in the center box changes to flashing dashes.
7. Press **SRC**.
8. Rotate the **Scroll Knob** until you see the source appear (in the center box) that you want to assign to the selected signal level.
9. Press **Take** to complete the new breakaway route.

Break Away Multiple Signal Levels to the Same Source

Use the following steps to select a new destination and break away multiple signal levels — to the same source:

1. From **Main Menu 1**, press **Breakaway** to display the **Breakaway Take Menu**.
2. Press **DST**.
3. Rotate the **Scroll Knob** to scroll the *entire breakaway table*, until you find the desired destination.
4. Press **SIG**.
5. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically. Place the signal level that you want to break away in the center box.
6. Press **SEL**. In the **Source Column**, the source label in the center box changes to flashing dashes.
7. Repeat steps 5 through 6 for all additional signal levels that you want to break away. Multiple signal levels will now have flashing dashes.
8. Press **SRC**.
9. Rotate the **Scroll Knob** until you see the flashing source appear for all selected signal levels.
10. Press **Take** to complete the new breakaway route.

Break Away Multiple Signal Levels to Different Sources

Use the following steps to select a new destination and break away multiple signal levels — to different sources:

1. From **Main Menu 1**, press **Breakaway** to display the **Breakaway Take Menu**.

2. Press **DST**.

3. Rotate the **Scroll Knob** to scroll the *entire breakaway table*, until you find the desired destination.

4. Press **SIG**.

5. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically. Place the signal level that you want to break away in the center box.

6. Press **SEL**. In the **Source Column**, the source label in the center box changes to flashing dashes.

7. Press **SRC**.

8. Rotate the **Scroll Knob** until you see the source appear (in the center box) that you want to assign to the selected signal level.

9. Repeat steps 4 through 8 for all additional signal levels that you want to break away. Multiple signal levels will now have flashing sources.

10. Press **Take** to complete the new breakaway route.

Break Away All Signal Levels Except One

Use the following steps to break away all signal levels — except one:

1. From **Main Menu 1**, press **Breakaway** to display the **Breakaway Take Menu**.

2. Press **DST**.

3. Rotate the **Scroll Knob** to scroll the *entire breakaway table*, until you find the desired destination.

4. Press **SRC**. In the **Source Column**, *all available source names* are replaced with flashing dashes.

5. Rotate the **Scroll Knob** until you see the flashing source appear that you want to assign to all signal levels.

6. To remove a signal level from the "all select," press **SIG**.

7. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically, and place the signal level that you want deselect in the center box.

8. Press **SEL** *once* to return the source to flashing dashes, or *twice* to completely deselect the line.

9. Repeat steps 7 through 8 for additional signal levels that you want to deselect.

10. Press **Take** to complete the new breakaway route.

Breakaway Take Notes

Note the following important points regarding "breakaway" takes:

- Typically, only "breakaway takes" can be performed from the **Breakaway Take Menu**. You can, however, perform an "all follow take" if you break away all signal levels, select a new source, and press **Take**.

- Press **Cancel** at any time to cancel a pending take. All flashing lines are cleared, and the **Breakaway Take Menu** remains on screen.

- Press **Menu** at any time to cancel a pending take and return to **Main Menu 1**.

- If the destination shows a **Lock Icon**, all basic rules for **Locks** and **Protects** apply. Refer to the "**Basic Rules**" section for additional details. Please note:

  ~ If you *do* attempt to change the route with a **Lock** in effect, the system will accept new breakaway routes on all unlocked signal levels, but no action will occur on any locked signal level.

  ~ If you *do* attempt to change the route with a **Protect** in effect (and you are not the initiating panel), the system will accept new breakaway routes on all unprotected signal levels, but no action occurs on any protected signal level.

  ~ If you attempt to change the route with a **Protect** in effect (and you *are* the initiating panel), the system will accept all new breakaway routes.

Direct Take Menu

A "direct" take is a source that is chosen (via soft key) from the **Direct Take Menu**. This menu allows you to program and select one of four *favorite* sources, with single-button simplicity. From **Main Menu 1**, press **Direct** to display the **Direct Take Menu**.
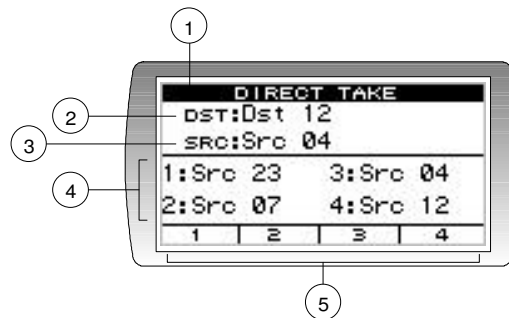
1) Menu Name	3) Source Line	5) Direct Take Soft Keys
2) Destination Line	4) Direct Take Source Box	

1) **Menu Name** — the top line names the current menu.

2) **Destination Line** — shows the currently selected destination. When the menu is first accessed, and when you are *not* using the **Scroll Knob** to program a favorite source, the knob (by default) is used to scroll through destinations — which then appear on this line.

3) **Source Line** — shows the source name that is currently attached to the selected destination. As you scroll through destinations, this line is automatically updated.

   • When the **Source Line** is blank, there is no source attached to the selected destination.

   • If the **Breakaway Icon <BrkAway>** appears on the line, one (or more) of the signal levels routed to the selected destination are broken away. To obtain full details, go to the **Breakaway Take Menu**.

4) **Direct Take Source Box** — this area lists the four favorite sources that you have programmed. Each source is derived from the same list of sources used on the **All Follow Take** and **Breakaway Take** menus. Each source is numbered, and each can be accessed *directly* by pressing the corresponding soft key. You do not have to press **Take**.

5) **Direct Take Soft Keys** — the four numbered **Direct Take Soft Keys** correspond to the numbered sources in the **Direct Take Source Box**. Pressing a soft key routes that source to the selected destination — instantly, without pressing **Take**.

Programming a Direct Take Source

Use the following steps to program up to four "direct take" sources:

1. From **Main Menu 1**, press **Direct** to display the **Direct Take Menu**.

2. Press and hold the **Cancel** button, and while holding, press the soft key of the source that you want to program (**1** through **4**). For example, to program "favorite" source 2, press and hold **Cancel**, then press soft key **2**.

   In the **Direct Take Source Box**, the selected source *flashes* to indicate that the placeholder is in "program" mode.

3. Rotate the **Scroll Knob** until the desired source appears in the flashing placeholder.

4. Accept the new source or cancel:

   • To accept the new favorite source, press the corresponding soft key. This action *sets* the new source, and the placeholder immediately stops flashing. The new source is now available for a direct take.

   • To cancel the new source, press **Cancel**. The placeholder reverts to the previous source, and the placeholder stops flashing.

5. To program additional favorite sources, repeat from step 2.

Note

> Once you exit the **Direct Take Menu**, the last four sources that you programmed remain in memory until changed.

Performing a Direct Take

Use the following steps to perform a direct take:

1. From **Main Menu 1**, press **Direct** to display the **Direct Take Menu**.

2. Rotate the **Scroll Knob** to select the desired destination.

3. Press a **Direct Take Soft Key** (**1** through **4**) to route that source to the selected destination.

Toggle Mode

The **Toggle Mode** is primarily a maintenance function that allows you to toggle rapidly between two takes. When you initiate the mode, the panel alternates between the two continuously. This action then continues until you cancel it manually, or until another user on another panel cancels it.

The mode is typically used by engineering personnel for color-matching cameras, phasing two sources, or matching video levels between sources (e.g., between a VTR and house bars).

Please note:

- The **Toggle Mode** can be activated on both the **All Follow Take** and **Breakaway Take** menus — but *only* on those two menus. There is no specific toggle menu for the function.

- Use the **Toggle Setup Menu** to set the delay between takes, between .25 and 5.0 seconds, in quarter-second intervals. Refer to the "**Setup Options Menu**" section for details.

Performing an All Follow Take Toggle

Use the following steps to activate the **Toggle Mode** between two "All Follow Take" sources:

1. Program the first "All Follow Take" in the normal manner. Refer to the "**Programming an All Follow Take**" section for instructions.

2. Program the second "All Follow Take" in the normal manner — to the same destination as the first take. Instead of pressing **Take** to conclude the procedure, *press and hold* **Take** for two seconds. This action places the system in the **Toggle Mode**.

   Once the mode is activated, the system switches between both sources continuously (at the current toggle rate), and the following actions occur:

   - The **Source Line** switches between the two selected sources.
   - A small flashing " **T** " is displayed in the upper right corner of the screen, as shown below:
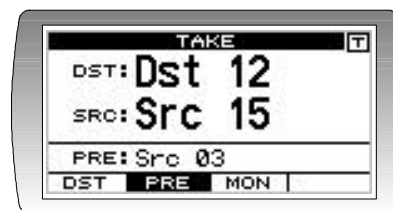
The flashing **T** plus the switching source labels are your *only* indications that the system is in **Toggle Mode**. Refer to the "**Toggle Mode Notes**" section for additional information about the flashing **T**.

3. To cancel the **Toggle Mode**, use one of the following methods:

- Press **Cancel**.
- Press **Take**.
- Press **Menu**.
- On the *initiating* panel, send a normal take (or a breakaway take) to the current destination.
- On any other panel, send a normal take (or a breakaway take) to the destination that is currently in toggle mode. Note that the source you select must be *different* from those that are currently toggling.

Performing a Breakaway Take Toggle

Use the following steps to activate the **Toggle Mode** between two "breakaway take" sources:

1. Program the first "Breakaway Take" for one or more signal levels in the normal manner. Refer to the "**Programming a Breakaway Take**" section for instructions.

2. Program the second "Breakaway Take" in the normal manner — to the same destination, and using the same signal level(s) as the first breakaway take. Instead of pressing **Take** to conclude the procedure, *press and hold* **Take** for two seconds.

   This action places the system in the **Toggle Mode** for the selected signal level(s), and the following actions occur:

   - The **Source Line(s)** in the **Source Column** switch between the two selected sources.
   - A small flashing " **T** " is displayed in the upper right corner of the screen.

   The flashing **T** plus the switching source labels are your *only* indications that the system is in **Toggle Mode**. See the "**Toggle Mode Notes**" section for more details about the flashing **T**.

3. To cancel the **Toggle Mode**, use one of the following methods:

   - Press **Cancel**.
   - Press **Take**.
   - Press **Menu**.
   - On the *initiating* panel, send a normal take (or a breakaway take) to the current destination.
   - On any other panel, send a normal take (or a breakaway take *on the same signal level*) to the destination that is currently in the toggle mode. The source you select must be *different* from those that are currently toggling.

Toggle Mode Notes

Note the following important points regarding **Toggle Mode**:

- "**Locks**" and "**Protects**" apply in the normal manner. Refer to the "**Lock-Protect Menu**" section for full details.

- If the system does not enter the **Toggle Mode**, the mode *itself* may be disabled on the **Toggle Setup Menu**. Refer to the "**Setup Options Menu**" section for details.

- The flashing **T** tells you that *this* is the panel that activated the **Toggle Mode**. If you are using another panel and scroll to a destination that exhibits switching source labels but no flashing **T**, then that panel did *not* initiate the **Toggle Mode**.

- If the **Toggle Mode** is active in breakaway mode on a specific signal level, you can perform *another* breakaway take to a signal level that is not toggling — without affecting the levels that *are* toggling. This action can be performed on any other panel except the initiating one.

- Refer to the "**Setup Options Menu**" section for details on setting the toggle interval.

Destination Monitor Menu

Each UTAH-200 panel provides full control of the destination monitor, either in a *manual* or *auto-switching* mode. When you perform a "**Destination Monitor Take**," you are sending a specific destination to the destination monitor (without affecting the actual destination itself).

Simultaneously, you are also obtaining status information (both visual and on the display) regarding that destination's source. The *optional* destination monitor is used.

Note

> A "**Destination Monitor Take**" can in fact switch *several signal levels* (depending on the number of individual signal level monitor matrices installed), but there is only *one* destination monitor output path — and it can be switched by *any user* from any control panel.

From **Main Menu 1**, press **Monitor** to display the **Destination Monitor Menu**.

- If the **Destination Monitor Menu** is currently disabled, the following screen appears:

This screen indicates that the **Destination Monitor Menu** has been disabled from *this panel's* **Setup Options Menu**. The **Destination Monitor Menu** can be only re-enabled under the following two conditions:

~ If the **Setup Options Menu** is *not* password protected.

~ If *you* have password access to the **Setup Options Menu** and it is password protected.

Refer the "**Setup Options Menu**" section for further details.

- If the **Destination Monitor Menu** is not disabled, the **Destination Monitor Menu** appears. This menu is *almost identical* to the **All Follow Take Menu**.
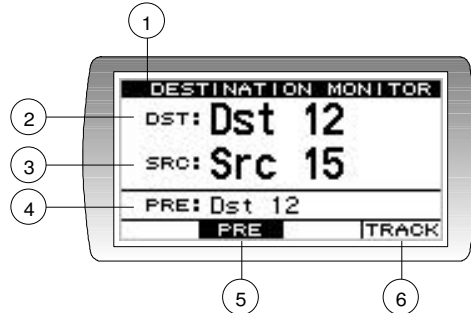
1)	Menu Name	3)	Source Line	5)	Scroll Destination
2)	Destination Line	4)	Preselect Line	6)	Auto Tracking

1) **Menu Name** — the top line names the current menu.

2) **Destination Line** — shows the destination currently on the destination monitor.

- When you first access the **Destination Monitor Menu**, the destination that was *last switched* to the destination monitor is shown. This switch could have occurred from *any panel*.

- If a **Lock Icon** appears after the destination name, it indicates that the destination is locked or protected — on one or more signal levels. To obtain full details about the lock or protect, you must go to the **Lock-Protect Menu**.

- If the **Breakaway Icon <BrkAway>** appears on the **Destination Line**, the control panel that *last switched* the destination monitor is using a destination that *does not match* any of the destination configurations on your current panel. Remember that special destinations can be designed with the RMS-200, and these can be sent to *any panel*.

3) **Source Line** — shows the source name that is attached to the destination currently on the destination monitor. Source names are configured with the RMS-200.

- When the **Source Line** is blank, there is no source attached to the selected destination.

- If the **Breakaway Icon <BrkAway>** appears on the **Source Line**, it indicates that one (or more) of the signal levels routed to the destination monitor are broken away. To obtain full details about the breakaway signal levels, you must go to the **Breakaway Take Menu**.

4) **Preselect Line** — indicates the preselected destination.

- When the **Destination Monitor Menu** is first accessed, the **Preselect Line** *does not flash*. It shows the most recently preselected destination.

- When the **Scroll Knob** is rotated, the **Preselect Line** flashes and indicates the new pending destination. In this situation, the **Take** button also flashes, indicating that a destination monitor "Take" is pending.

  Once **Take** is pressed, the new destination is switched to the destination monitor, the **Preselect Line** stops flashing, the **Take** button stops flashing, the preselected destination name switches to the **Destination Line**, and the attached source appears on the **Source Line**.

5) **Scroll Destination** — the **PRE** button is always highlighted on the **Destination Monitor Menu**, indicating that you can immediately use the **Scroll Knob** to preselect a new destination. As the knob is rotated, the pending destination on the **Preselect Line** flashes, and the **Take** button flashes.

6) **Auto Tracking** — press **TRACK** to momentarily highlight the label, and toggle the **Track Icon** on or off — on the **Preselect Line**.

- When the **Track Icon** is enabled, auto tracking is on. As you rotate the knob, the system automatically "takes" each selected destination to the destination monitor, eliminating the need to scroll, preselect, and press **Take**. The attached source is automatically displayed on the **Source Line**.

- When the **Track Icon** is disabled, auto tracking is off. In this mode, you must preselect and take each desired destination monitor selection.

Programming a Destination Monitor Take

Two "destination monitor" procedures are provided in this section:

- Switch one destination to the destination monitor
- Enable auto tracking and switch the destination monitor

Switch One Destination to the Destination Monitor

Use the following steps to switch a destination to the destination monitor:

1. From **Main Menu 1**, press **Monitor** to display the **Destination Monitor Menu**. The **PRE** button is highlighted by default.

2. Rotate the **Scroll Knob** to select a new destination. The destination on the **Preselect Line** flashes, and the **Take** button flashes to indicate that a new destination is pending.

3. When you reach the desired destination label, press **Take**. The
    new destination is switched to the destination monitor.

4. Repeat steps 2 and 3 as required to view additional destinations
    on the destination monitor.

Enable Auto Tracking and Switch Destination Monitor

Use the following steps to enable auto tracking and switch one (or more)
destinations to the destination monitor:

1. From **Main Menu 1**, press **Monitor** to display the **Destination
    Monitor Menu**. The **PRE** button is highlighted by default.

2. If the **Track Icon** is *already enabled*, no action is necessary. If
    the **Track Icon** is off, press **TRACK** to enable the icon.

3. Rotate the **Scroll Knob** to select a new destination. As you
    scroll, each destination is automatically "taken" to the monitor.
    Simultaneously, each new destination and associated source are
    automatically switched to the **Source** and **Destination** lines,
    respectively. You *do not* have to press **Take**.

Destination Monitor Notes

Note the following important points regarding the **Destination Monitor
Menu**:

• Press **Cancel** at any time to cancel a pending destination
   monitor take. All flashing lines are cleared, and the **Destination
   Monitor Menu** remains on screen.

• Press **Menu** at any time to cancel a pending change and return
   to **Main Menu 1**.

Lock-Protect Menu

"**Locks**" and "**Protects**" are special modes that alert users that routes are in use. The **Lock-Protect Menu** allows you to view complete details about any destination Lock or Protect, and also allows you to initiate and clear Locks and Protects as needed.

When a **Lock Icon** appears on any menu in the system, it indicates that a Lock or Protect is in effect on that destination — even if only one signal level is locked or protected. The **Lock-Protect Menu** is the only menu where you can obtain full details about the signal levels involved.

The table below summarizes the differences between locks and protects:

Lock-Protect Summary

Type of Protection	Who Can Initiate Lock-Protect	Who Can Change Route	Who Can Clear Route
Lock	Any user at any control panel (except at the RMS-200).	The route can not be changed from any panel.	If the Lock-Protect Menu is enabled, any user (including RMS-200 user). If the Lock-Protect Menu is disabled, only the user with password, plus RMS-200 user.
Protect	Any user at any control panel (except at the RMS-200).	The route can only be changed at the panel on which the protect was initiated.	If the Lock-Protect Menu is enabled, any user (including RMS-200 user). If the Lock-Protect Menu is disabled, only the user with password, plus RMS-200 user.

From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Lock** to display the **Lock-Protect Menu**.

- If the **Lock-Protect Menu** is currently disabled, the following screen appears:

```
LOCK - PROTECT

    -Disabled-
```

This screen indicates that the menu has been disabled from *this panel's* **Setup Options Menu**.

The **Lock-Protect Menu** can be only re-enabled under the following two conditions:

~ If the **Setup Options Menu** is *not* password protected.
~ If *you* have password access to the **Setup Options Menu** and it is password protected.

Refer the "**Setup Options Menu**" section for further details.

• If the **Lock-Protect Menu** is not disabled, the **Lock-Protect Menu** appears. Note that this menu is *almost identical* to the **Breakaway Take Menu** in layout and functionality.
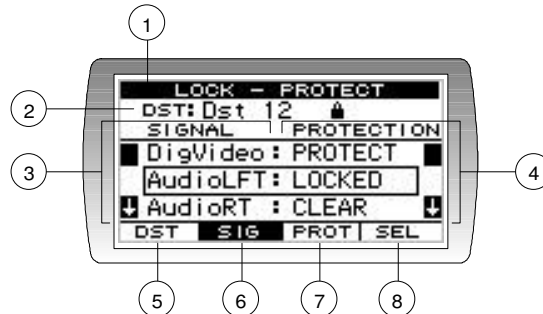
1)	Menu Name	4)	Protection Column	7)	Scroll Protection
2)	Destination Line	5)	Scroll Destination	8)	Select Signal Level
3)	Signal Level Column	6)	Scroll Signal Levels		

1) **Menu Name** — the top line names the current menu.

2) **Destination Line** — shows the currently selected destination.

   • When **DST** is pressed and the **Destination Line** is scrolled, the *entire lock-protect table* automatically follows, indicating the current source (and all associated protection assignments) attached to the destination.

   • If a **Lock Icon** appears after the destination name, it indicates that one or more signal levels on the selected destination are locked or protected. Details are provided in the table below the label **PROTECTION**.

3) **Signal Level Column** — shows all signal levels that are available for the selected destination, and allows you to select a specific signal level to lock, protect, or clear.

   • When **SIG** is pressed, the entire **Signal Level Column** moves vertically. By placing a signal level in the center box, you can change its protection status. All rules for **Up** and **Down Arrows** apply. Refer to the "**Basic Rules**" section for details.

- Remember that not all signal levels are shown for each destination. For example, a VTR may be configured to show *all* available signal levels. However, a video-only destination will typically *not* show audio signal levels.

4) **Protection Column** — indicates the protection status of each adjacent signal level (for the selected destination), and allows you to lock, protect or clear individual signal levels.

   One of five types of labels can be shown for a signal level:

   ~ **CLEAR** — indicates that the signal level is clear. No locks or protects are assigned to the signal level.

   ~ **PROTECT** — indicates that a protect is in effect for the adjacent signal level, and the protect was assigned on *this panel*.

   ~ **LOCKED** — indicates that a lock is in effect for the signal level, and the lock was assigned on *this panel*.

   ~ **PROT-###** — indicates that a protect is in effect for the signal level, and the protect was assigned on *the panel whose number is indicated* (e.g., **PROT-123**).

   ~ **LOCK-###** — indicates that a lock is in effect for the signal level, and the lock was assigned on *the panel whose number is indicated* (e.g., **LOCK-045**).

- When **SEL** is pressed, the label in the center box (in the **Protection Column**) changes to flashing dashes (**- - - - -**).

- With dashes in view, pressing **PROT** allows you to rotate the **Scroll Knob** and select the new protection state. When a label is flashing, the **Take** button flashes to indicate that a new assignment is pending.

- If you press **SEL** to display dashes, then press **SIG** to select another signal level, and then press **SEL** *again*, you can select *multiple signal levels* to change. Flashing dashes appear in the **Protection Column** for all signal levels selected in this manner.

- If you press **PROT** *without* first pressing **SEL** or **SIG**, flashing dashes appear for *all available signal levels*. This easy shortcut allows you to change the state of *all signal levels* (and it saves you from repeatedly pressing **SIG**, **SEL** etc.).

Once **Take** is pressed, all new protection assignments are electronically switched, the selections in the **Protection Column** stop flashing, the **Take** button stops flashing, and the new protection assignments appear in the column.

5) **Scroll Destination** — press **DST** to highlight the label, and scroll through destinations on the **Destination Line**. As the **Scroll Knob** is rotated, the destination changes and the entire lock-protect table follows with each destination's associated protection assignments.

6) **Scroll Signal Levels** — press **SIG** to highlight the label, and scroll the **Signal Level Column** vertically. By placing a signal level in the center box, a new protection state can be assigned to it (by pressing **SEL**, **PROT**, and selecting a protection state with the knob).

7) **Scroll Protection** — press **PROT** to highlight the label, and choose a new protection state for all signal levels that have been selected (those with flashing dashes).

   - As you rotate the **Scroll Knob**, the flashing protection list scrolls in each selected field in the **Source Column**, allowing you to select a new state. The **Take** button flashes to indicate a pending route.

     The three available choices are:

     ~ **CLEAR** — clears the assigned signal level(s).

     ~ **PROTECT** — places a protect on the signal level(s).

     ~ **LOCKED** — places a lock on the signal level(s).

   - If you press **PROT** *without* first pressing **SEL** for any signal level, flashing dashes appear for *all available signal levels*.

8) **Select Signal Level** — press **SEL** to momentarily highlight the label, and "select" the signal level in the center box for modification.

   - If the source in the center box was *not* flashing, its label changes to flashing dashes (**- - - - -**). You can now select a new protection state for that signal level by pressing **PROT**.

   - If the center box shows flashing dashes, pressing **SEL** *de-selects* the protection state, and cancels any pending Take for that signal level. The current status appears and does not flash.

   - If the center box shows a flashing protection state, pressing **SEL** *de-selects* the state, and returns the center box to flashing dashes — allowing you to select another state, or press **SEL** *again* to completely deselect the line.

Programming Locks and Protects

Five "lock-protect" procedures are provided in this section:

- Retain destination, change one signal level's protection state
- Select new destination, change one signal level's state
- Change multiple signal levels to the same protection state
- Change multiple signal levels to different protection states
- Change all signal levels' protection state except one

Retain Destination, Change One Signal Level's State

Use the following steps to retain the current destination and change one signal level's protection state:

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Lock** to display the **Lock-Protect Menu**. **SIG** is highlighted by default.

2. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically. Place the signal level that you want to change in the center box.

3. Press **SEL**. In the **Protection Column**, the label in the center box changes to flashing dashes.

4. Press **PROT**.

5. Rotate the **Scroll Knob** until you see the protection state appear (**CLEAR**, **PROTECT**, or **LOCKED**) that you want to assign to the selected signal level.

6. Press **Take** to complete the assignment.

Select New Destination, Change One Level's State

Use the following steps to select a new destination and change one signal level's protection state:

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Lock** to display the **Lock-Protect Menu**.

2. Press **DST**.

3. Rotate the **Scroll Knob** to scroll the *entire lock-protect table*, until you find the desired destination.

4. Press **SIG**.

5. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically. Place the signal level that you want to change in the center box.

6. Press **SEL**. In the **Protection Column**, the label in the center box changes to flashing dashes.

7. Press **PROT**.

8. Rotate the **Scroll Knob** until you see the protection state appear (**CLEAR**, **PROTECT**, or **LOCKED**) that you want to assign to the selected signal level.

9. Press **Take** to complete the new assignment.

Change Multiple Signal Levels to Same Protection State

Use the following steps to select a new destination and change multiple signal levels to the protection state:

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Lock** to display the **Lock-Protect Menu**.

2. Press **DST**.

3. Rotate the **Scroll Knob** to scroll the *entire lock-protect table*, until you find the desired destination.

4. Press **SIG**.

5. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically. Place the signal level that you want to change in the center box.

6. Press **SEL**. In the **Protection Column**, the label in the center box changes to flashing dashes.

7. Repeat steps 5 and 6 for all additional signal levels that you want to change. Multiple levels will now have flashing dashes.

8. Press **PROT**.

9. Rotate the **Scroll Knob** until you see the protection state appear (**CLEAR**, **PROTECT**, or **LOCKED**) that you want to assign to all selected signal levels.

10. Press **Take** to complete the new assignment.

Change Multiple Signal Levels To Different States

Use the following steps to select a new destination and change multiple signal levels to different protection states:

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Lock** to display the **Lock-Protect Menu**.

2. Press **DST**.

3. Rotate the **Scroll Knob** to scroll the *entire lock-protect table*, until you find the desired destination.

4. Press **SIG**.

5. Rotate the **Scroll Knob** to move the **Signal Level Column**. Place the signal level that you want to change in the center box.

6. Press **SEL**. In the **Protection Column**, the label in the center box changes to flashing dashes.

7. Press **SRC**.

8. Rotate the **Scroll Knob** until you see the protection state appear (**CLEAR**, **PROTECT**, or **LOCKED**) that you want to assign to the selected signal level.

9. Repeat steps 4 through 8 for all additional signal levels that you want to change. Multiple levels will now have flashing labels.

10. Press **Take** to complete the new assignment.

Change All Signal Levels' Protection State Except One

Use the following steps to change the protection state of all signal levels — except one:

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Lock** to display the **Lock-Protect Menu**.

2. Press **DST**.

3. Rotate the **Scroll Knob** to scroll the *entire lock-protect table*, until you find the desired destination.

4. Press **PROT**. In the **Protection Column**, *all available labels* are replaced with flashing dashes.

5. Rotate the **Scroll Knob** until you see the flashing protection state appear (**CLEAR**, **PROTECT**, or **LOCKED**) that you want to assign to all signal levels.

6. To remove a signal level from the "all select," press **SIG**.

7. Rotate the **Scroll Knob** to move the **Signal Level Column** vertically, and place the level that you want deselect in the box.

8. Press **SEL** *once* to return the label to flashing dashes, or *twice* to completely deselect the line.

9. Repeat steps 7 and 8 for other levels that you want to deselect.

10. Press **Take** to complete the new assignment.

Lock-Protect Notes

Note the following important points regarding the **Lock-Protect Menu**:

- Press **Cancel** at any time to cancel a pending change in the lock-protect status. All flashing lines are cleared, and the **Lock-Protect Menu** remains on screen.

- Press **Menu** at any time to cancel a pending change and return to **Main Menu 1**.

- Even though *anyone* can change the state of a lock or protect, if the label in the protection column indicates that the lock or protect was assigned on a *different panel* (e.g., **PROT-###** or **LOCK-###**), it is recommended that you contact the user of that particular panel to determine if the state can be changed.

Setup Options Menu

The **Setup Options Menu** allows you to configure seven different panel-specific options:

- Reset default tables
- Enable/disable **Lock-Protect Menu** access
- Enable/disable **Destination Monitor Menu** access
- Select default destination
- Enable/disable password protection, set password
- **Toggle Mode** setup
- Enable/disable **Track** option

From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Options** to display the **Setup Options Menu**.

- If the **Setup Options Menu** is password protected, the **Enter Password Menu** appears:

```
  ENTER PASSWORD
Turn knob to change
password, right arrow
to advance.

  Password: ___

        +    +   DONE
```

All passwords are composed of three alpha-numeric characters, using **0**-**9** and **A**-**Z**, in all upper case characters.

- To enter a password and access the **Setup Options Menu**:

  1. Rotate the **Scroll Knob** to select the first character. The cursor under the first character's position flashes.

  2. Once the first character is selected, press → to advance to the next character.

  3. Repeat step 2 for the third character. If required, press ← to go back to the first or second characters.

  4. Press **DONE** to accept the password.

     ~ If the password is correct, the **Setup Options Menu** appears.

     ~ If the password is incorrect, the **Incorrect Password Menu** is displayed for three seconds, after which the system returns to **Main Menu 2**.

- If the **Setup Options Menu** is *not* password protected, or if you entered the correct password on the **Enter Password Menu**, the **Setup Options Menu** appears:

| 1) | Menu Name | 2) | Option List | 3) | Select Option |

1) **Menu Name** — the top line names the current menu.

2) **Options List** — shows a list of all available system options. Rotate the **Scroll Knob** to move the list vertically.

   All rules for **Up** and **Down Arrows** apply. Refer to the "**Basic Rules**" section for details.

3) **Select Option** — when the desired option is in the center box, press **SEL** to switch to that option's specific menu.

   - Select **Default Tables** to show the **Default Tables Menu**.

   - Select **Enable (Disable) Lock/Protect** to display the **Lock/Protect Option Menu**. Note that the label changes depending on the current state of the option.

   - Select **Enable (Disable) Monitor** to show the **Monitor Option Menu**. Note that the label changes depending on the current state of the option.

   - Select **Default Destination** to display the **Default Destination Menu**.

   - Select **Password Setup** to show the **Password Setup Menu**.

   - Select **Toggle Setup** to show the **Toggle Setup Menu**.

   - Select **Take Menu Tracking** to show the **Track Option Menu**.

The following section provide operating instructions for each system option. In each procedure, it is assumed that password protection is off.

Reset Default Tables

The **Default Tables Menu** allows you to set all source and destination names to their default values (e.g., **SRC 01**, **DST 01**, etc.). When **YES** is pressed, all custom names in this control panel (as programmed by the RMS-200) are overwritten with default names.

Use the following steps to reset default tables.

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Options** to display the **Setup Options Menu**.

2. Rotate the **Scroll Knob**, and place the **Default Tables** option in the center box.

3. Press **SEL** to display the **Default Tables Menu**:

```
┌─────────────────────────┐
│    DEFAULT TABLES       │
│                         │
│  Set all Panel          │
│  specific data to       │
│  default values?        │
│                         │
│          │ YES │ NO     │
└─────────────────────────┘
```
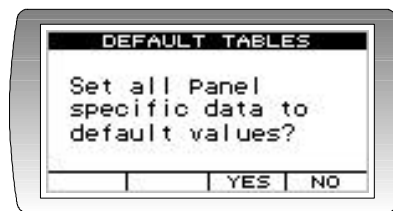
4. Select the desired option:

   • Press **YES** to reset all names to their default values. Once pressed, all options are reset and the system returns to the **Setup Options Menu**.

   • Press **NO** to cancel the procedure. The system returns to the **Setup Options Menu**.

Enable/disable Lock-Protect Menu Access

The **Lock/Protect Option Menu** allows you to enable or disable access to the **Lock-Protect Menu** on *this panel* only.

Use the following steps to enable or disable **Lock-Protect Menu** access.

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Options** to display the **Setup Options Menu**.

2. Rotate the **Scroll Knob**, and place the lock/protect option in the center box.

   - If the option is currently enabled, the label reads **Disable Lock/Protect**.

   - If the option is currently disabled, the label reads **Enable Lock/Protect**.

3. Press **SEL** to display the **Lock/Protect Option Menu**:
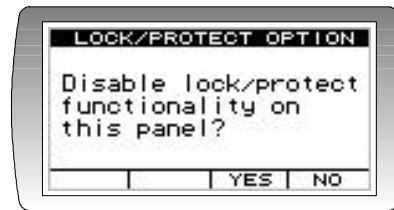
The label on the menu will reflect the current setting.

   - If the option is currently enabled, the label reads **Disable Lock/Protect functionality ...** .

   - If the option is currently disabled, the label reads **Enable Lock/Protect functionality ...** .

4. Select the desired option:

   - Press **YES** to enable or disable the option.

     ~ When Lock/Protect functionality is disabled, all users can not access the **Lock-Protect Menu**, and the **Disabled Menu** is shown.

     ~ When Lock/Protect functionality is enabled, all users have access to the **Lock-Protect Menu**.

     Once pressed, the option is switched and the system returns to the **Setup Options Menu**. In addition, the label (on both the **Options Menu** and the **Lock/Protect Option Menu**) changes to its opposite state.

   - Press **NO** to cancel the procedure. The system returns to the **Setup Options Menu**.

Enable/disable Destination Monitor Menu Access

The **Monitor Option Menu** allows you to enable or disable access to the **Destination Monitor Menu** on *this panel* only.

Use the following steps to enable or disable **Destination Monitor Menu** access.

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Options** to display the **Setup Options Menu**.

2. Rotate the **Scroll Knob**, and place the monitor option in the center box.

   - If the option is currently enabled, the label reads **Disable Monitor**.

   - If the option is currently disabled, the label reads **Enable Monitor**.

3. Press **SEL** to display the **Monitor Option Menu**:
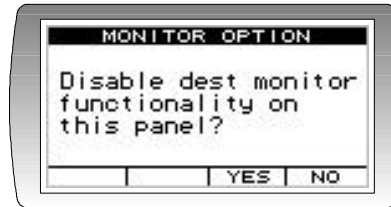
   The label on the menu will reflect the current setting.

   - If the option is currently enabled, the label reads **Disable dest monitor functionality ...** .

   - If the option is currently disabled, the label reads **Enable dest monitor functionality ...** .

4. Select the desired option:

   - Press **YES** to enable or disable the option.

     ~ When Destination Monitor functionality is disabled, all users can not access the **Destination Monitor Menu**, the **Disabled Menu** is shown, and the **MON** label does not appear on the **All Follow Take Menu**.

     ~ When Destination Monitor functionality is enabled, all users have access to the **Destination Monitor Menu**.

     Once pressed, the option is switched and the system returns to the **Setup Options Menu**. In addition, the label (on both the **Options Menu** and the **Monitor Option Menu**) changes to its opposite state.

   - Press **NO** to cancel the procedure. The system returns to the **Setup Options Menu**.

Select Default Destination

The **Default Destination Menu** allows you to select the destination that you want to appear *each time* the panel is powered up or reset.

Use the following steps to set the default destination.

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Options** to display the **Setup Options Menu**.

2. Rotate the **Scroll Knob**, and place the **Default Destination** option in the center box.

3. Press **SEL** to display the **Default Destination Menu**, which lists the current default destination in the center section.

```
┌──────────────────────────┐
│ ▌DEFAULT DESTINATION▐     │
│ Turn knob to select      │
│ default destination.     │
│ Press SET to accept.     │
│                          │
│   Current default:       │
│       Dst 01             │
│              │    │  SET  │
└──────────────────────────┘
```
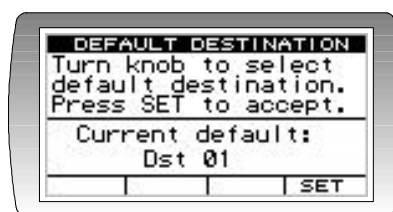
4. Rotate the **Scroll Knob** to select a new default destination. The label changes to "**New default**" as you scroll, and each available destination is listed below the label.

5. Confirm or cancel the new default destination:

   • When the desired destination appears, press **SET** to display the **Destination Confirmation Menu**.

```
┌──────────────────────────┐
│ ▌DEFAULT DESTINATION▐     │
│                          │
│ Default destination:     │
│       Dst 12             │
│                          │
└──────────────────────────┘
```

   This screen shows the new destination, and confirms that it is ready for use. The system returns to the **Setup Options Menu**.

   • Press **Cancel** to return to the **Setup Options Menu** without making any changes. The previous default destination is retained.

Enable/disable Password Protection, Set Password

The **Password Setup Menu** allows you to enable or disable password protection of the **Setup Options Menu**, and also allows you to set (or change) the desired password. Both functions are panel-specific — they only affect the panel that you are currently using.

Use the following steps to change password options.

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Options** to display the **Setup Options Menu**.

2. Rotate the **Scroll Knob**, and place the **Password Setup** option in the center box.

3. Press **SEL** to display the **Password Setup Menu**:

```
┌─────────────────────────┐
│    PASSWORD SETUP       │
│ Turn knob to select     │
│ new options password.   │
│ Press SET to accept.    │
│                         │
│ Status: On              │
│ Current password: AAA   │
│  OFF  │  ←  │  →  │ SET  │
└─────────────────────────┘
```

- The **Status Line** indicates the current state of password protection (**On** or **Off**). Please note:

  ~ If password protection is **On**, the left-hand soft key label reads **OFF** — the opposite of the current state.

  ~ If password protection is **Off**, the left-hand soft key label reads **ON** — the opposite of the current state.

- The **Current Password Line** shows the panel's current password. Note that the system's default password is **AAA**.

4. If you want to change the password only, continue with step 7.

5. If you want to change the password protection state, press **ON** or **OFF**, as appropriate. The **Status Line** label changes to the new state — and the soft key label changes to the opposite state.

6. You now have three options:

- If you want to accept the new state but *do not* want to set a new password, press **Set**. The **Password Confirmation Menu** is displayed for two seconds, then the system returns to the **Setup Options Menu**. The old password is retained and the new protection state is accepted.

  ~ If you change the protection state to **OFF**, the confirmation menu reads "**Password disabled**."

  ~ If you change the state to **ON**, the menu reads "**Password enabled**" followed by the current password.

- To cancel the procedure at this point, press **Cancel**. The system returns to the **Setup Options Menu**, the current password is left as is, and *no changes* are made to the protection state.

- If you *do* want to set a new password, continue with step 7.

7. To set a new password, rotate the **Scroll Knob** to select the first character. The label changes to "**New password**" as soon as you scroll the knob.

Note	Remember that all passwords are composed of three alpha-numeric characters, using **0**-**9** and **A**-**Z**, in all upper case characters.

8. Once the character is selected, press → to advance to the next character. Rotate the **Scroll Knob** to select.

9. Repeat step 8 for the third character. If required, press ← to go back to the first or second characters.

10. Confirm or cancel the new password (and the new protection state, if it was changed):

- When the password is complete, press **SET** to display the **Password Confirmation Menu** (for two seconds).


```
PASSWORD SETUP

Password enabled: E2S
```

This screen shows the new password and confirms that it is ready for use. If you also changed the password protection state, that option is also activated. The system then returns to the **Setup Options Menu**.
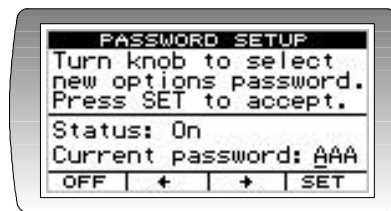
- Press **Cancel** to return to the **Setup Options Menu** without making any changes. The previous password is retained (and no changes will be made to the password protection state).

Toggle Mode Setup

The **Toggle Setup Menu** allows you to enable or disable the overall **Toggle Mode**, and also allows you to change the toggle interval (the delay between successive takes). Both functions are panel-specific — they only affect the panel that you are currently using.

Use the following steps to change toggle options.

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Options** to display the **Setup Options Menu**.

2. Rotate the **Scroll Knob**, and place the **Toggle Setup** option in the center box.

3. Press **SEL** to display the **Toggle Setup Menu**:

```
┌──────────────────────────┐
│      TOGGLE SETUP         │
│ Turn knob to select       │
│ new delay. Press SET      │
│ to accept.                │
│ Status: On                │
│ Current delay:1.0 s       │
│  OFF  │      │      │ SET  │
└──────────────────────────┘
```

- The **Status Line** indicates the current state of the **Toggle Mode** (**On** or **Off**). Please note:

    ~   If the mode is **On**, the left-hand soft key label reads **OFF** — the opposite of the current state.

    ~   If the **Toggle Mode** is **Off**, the left-hand soft key label reads **ON** — the opposite of the current state.

- The **Current Delay Line** shows the panel's current toggle interval.

4. If you want to change the delay only, continue with step 7.

5. If you want to change the **Toggle Mode** state, press **ON** or **OFF**, as appropriate. The **Status Line** label changes to the new state — and the soft key label changes to the opposite state.

6. You now have three options:

- If you want to accept the new state but *do not* want to set a new delay, press **Set**. The **Toggle Confirmation Menu** is displayed for two seconds, then the system returns to the **Setup Options Menu**. The old delay interval is retained and the new **Toggle Mode** state is accepted.

    ~   If you change the state to **OFF**, the confirmation menu reads "**Toggle disabled**."

    ~   If you change the state to **ON**, the menu reads "**Toggle enabled**" followed by the current delay.

- To cancel the procedure at this point, press **Cancel**. The system returns to the **Setup Options Menu**, the current delay is left as is, and *no changes* are made to the **Toggle Mode** state.

- If you *do* want to set a new delay, continue with step 7.

7. To set a new delay interval, rotate the **Scroll Knob**. The available range is between .25 and 5.0 seconds, in quarter-second intervals.

   - Rotate the knob clockwise to increase the delay.

   - Rotate the knob counter-clockwise to decrease the delay.

8. Confirm or cancel the new delay (and the new **Toggle Mode** state, if it was changed):

   - When the desired delay is shown, press **SET** to display the **Toggle Confirmation Menu** (for two seconds).

```
          TOGGLE SETUP

Toggle enabled:2.0 s
```

   This screen shows the new delay and confirms that it is ready for use. If you also changed the **Toggle Mode** state, that option is also activated. The system then returns to the **Setup Options Menu**.
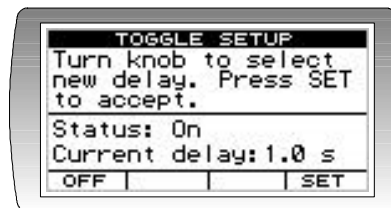
   - Press **Cancel** to return to the **Setup Options Menu** without making any changes. The previous delay interval is retained (and no changes will be made to the **Toggle Mode** state).

Enable/disable Track Option

The **Track Option Menu** allows you to enable or disable the **Auto Tracking** mode on the **All Follow Take Menu**. When the mode is enabled, the system automatically "takes" each source that you select as you rotate the knob — eliminating the need to press **Take**. The setup option for **Auto Tracking** is panel-specific — it only affects the panel that you are currently using.

Use the following steps to change the auto tracking option.

1. From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Options** to display the **Setup Options Menu**.

2. Rotate the **Scroll Knob**, and place the **Take Menu Tracking** option in the center box.

3. Press **SEL** to display the **Track Option Menu**:

```
╔════════════════════════╗
║     TRACK OPTION       ║
╠════════════════════════╣
║                        ║
║ Disable the TRACK      ║
║ button on the TAKE     ║
║ menu?                  ║
║                        ║
╠═══════════╤══════╤═════╣
║           │ YES  │ NO  ║
╚═══════════╧══════╧═════╝
```
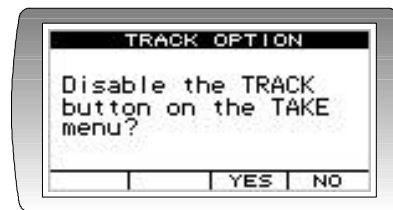
The label on the menu reflects the current setting.

• If the option is currently enabled, the label reads **Disable the TRACK button ...** .

• If the option is currently disabled, the label reads **Enable the TRACK button ...** .

4. Select the desired option.

• If the option is currently enabled:

~ Press **YES** to disable the **Auto Tracking** button on the **All Follow Take Menu**.

~ Press **NO** to keep the **Auto Tracking** button enabled.

The **Track Confirmation Menu** is displayed. After two seconds, the system returns to the **Setup Options Menu**.

• If the option is currently disabled:

~ Press **YES** to enable the **Auto Tracking** button on the **All Follow Take Menu**.

~ Press **NO** to keep the **Auto Tracking** button disabled.

The **Track Confirmation Menu** is displayed. After two seconds, the system returns to the **Setup Options Menu**.

• Press **Cancel** to return safely to the **Setup Options Menu**. The previous track option remains in effect.

Using the Panel Information Menu

The **Panel Information Menu** allows you to verify important information about the current control panel, such as its U-Net address, ID and software version.

From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Info** to display the **Panel Information Menu**.
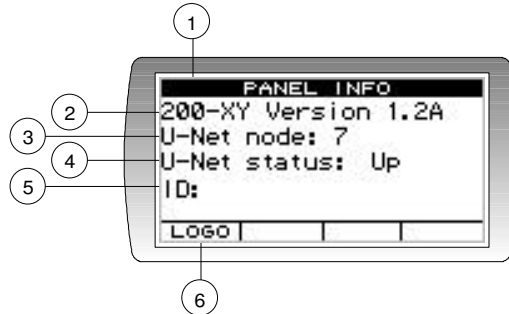
1)	Menu Name	3)	U-Net Node	5)	Panel ID
2)	Software Version	4)	U-Net Status	6)	Goto Logo

1) **Menu Name** — the top line names the current menu.

2) **Software Version** — lists the current software version running on the control panel. New versions can be uploaded from the RMS-200. In Chapter 4, refer to the "**Upgrading Control Panel Software**" section for instructions.

3) **U-Net Node** — displays the current DIP switch settings for this control panel (in decimal notation).

4) **U-Net Status** — displays the state of U-Net communications for this control panel.

   • The label **Up** indicates that communications are normal.

   • The label **Down** indicates that there is a problem with communications. Check all U-Net cabling first, then refer to Appendix A "**Troubleshooting**" for further information.

5) **Panel ID** — displays the panel's alphanumeric ID, as set with the RMS-200. In Chapter 4, refer to the "**Configuring Control Panels**" section for instructions.

6) **Goto Logo** — press **LOGO** to return to the **Startup Screen**.

Using the Error Message Menu

When an error occurs as indicated by the flashing **Error Icon** "**E**" in the **Menu Name** bar, the **Error Message Menu** allows you to view the type of error, and gain additional information about the error itself.

From **Main Menu 1**, press **Menu** to display **Main Menu 2**. Press **Messages** to display the **Error Message Menu**.
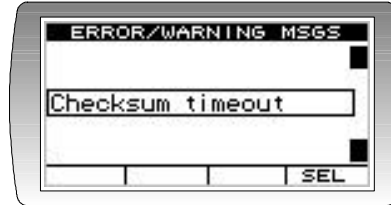
The **Error Message Menu** displays a scrolling list of errors that have occurred on the current panel (since the last reset or power-up), and also clears any **E** icons that may occur. Use the following steps to obtain additional information about an error:

1. If a flashing **E** appears in the **Menu Name** bar, from **Main Menu 1** press **Menu** to display **Main Menu 2**. Press **Messages** to display the **Error Message Menu**.

   This action clears the flashing **E**.

2. Rotate the **Scroll Knob** and place the desired error in the center box.

3. Press **SEL** to display an error-specific menu, a sample of which is shown below:
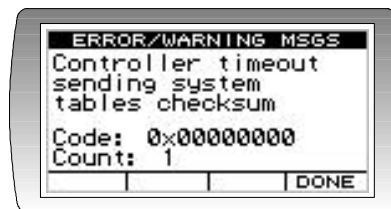
   The specific error screen provides additional information about the error, along with a **Code** (for engineering use only), and a **Count** that indicates the number of times that the error has occurred.

4. Press **DONE** to return to the **Setup Options Menu**.

Refer to the "**Panel Error Messages**" section for additional information.

Error Message List

The table below lists possible error and warning messages, as indicated by the flashing **Error Icon** "**E**".

Error Messages

Error Message	Description
Checksum timeout	Controller timed out sending system tables checksum.
System table timeout	Controller timed out downloading system tables.
Checksum error	Bad system tables checksum, tables may be invalid.
Panel table timeout	Controller timed out downloading panel table.
Take failure	Take failure because the output is protected or locked.

Panel Error Messages

A variety of important panel error messages and special screens can appear, depending upon the condition of the panel:

- Panel Errors
- U-Net Errors
- Toggle Mode Indication
- Panel Program Errors

Each message is detailed in the following sections.

Panel Errors

When a panel error occurs, a flashing **Error Icon** "**E**" appears in the **Menu Name** bar — on *every* menu. A sample is shown below:
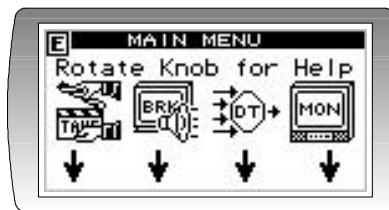
The **E** indicates there is an error message that the user can read by going to the **Panel Information Menu**. When the user has entered that menu, the flashing **E** will clear. Refer to the "**Using the Error Message Menu**" section for more information.

U-Net Errors

When a U-Net error occurs, a flashing **U-Net Error Icon** "**U**" appears in the **Menu Name** bar — on every menu. A sample is shown below:
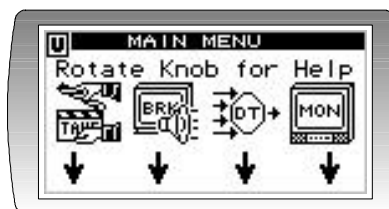
The **U** indicates that the controller has stopped communicating or the U-Net cable has been disconnected. Please note:

- The **U** will *not clear* from the display until the U-Net communications problem is fixed. In this condition (with a **U** showing), you will *not* be able to switch the routing switcher from the panel.

- If there is a case when both the **U** and **E** need to be displayed, the **U** takes priority. Once the U-Net communications problem has been fixed, the **E** will be displayed.

With a **U** showing, check all U-Net cabling first, and then refer to Appendix A "**Troubleshooting**" for further information.

Toggle Mode Indication

When the system is in **Toggle Mode**, either on the **All Follow Take Menu** or the **Breakaway Take Menu**, a small flashing " **T** " is displayed in the upper right corner of the screen, as shown below:
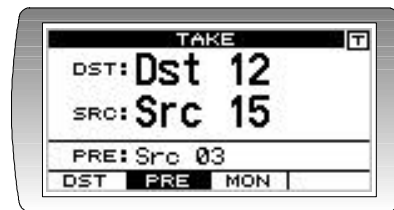
The flashing **T** indicates that *this* is the panel that activated the mode. If you are using another panel and scroll to a destination that exhibits switching source labels but no flashing **T**, then that panel did *not* initiate the mode. Refer to the "**Toggle Mode**" section for additional details.

Panel Program Errors

When the control panel is powered on or restarted, the system checks for valid software in the panel's memory. If valid software is *not found*, the **Software Download Menu** appears.
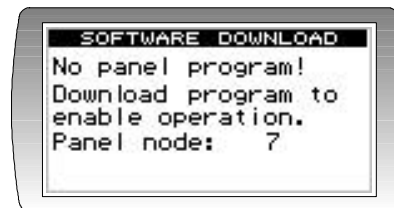
This menu indicates that the user must download new panel software from the RMS-200. The panel can not be used until valid software is downloaded. In Chapter 4, refer to the "**Upgrading Control Panel Software**" section for instructions.

Reset Panel Software

The **Panel Reset** function allows you to reset the software program, if required.

Use the following steps to reset the program:

1. Press all the following keys at the same time — and then *release them*:

   - **MENU**
   - **CANCEL**
   - **TAKE**

Clear Panel Software

The **Clear Panel** function allows you to completely clear the software program in memory, if required.

Caution

> Use caution when performing this function. Once performed, the panel *can not be used* until new software is downloaded from the RMS-200.

Use the following steps to clear a control panel's software:

1. Press all the following keys at the same time — and then *release them*:

   - **MENU**
   - **CANCEL**
   - **TAKE**
   - the *left most soft key* under the display

2. Once pressed and released, the **Clear Panel Program Menu** appears.


```
CLEAR PANEL PROGRAM
You are about to
permanently disable
panel operation until
a flash upgrade is
performed.
     Continue?
YES  |     |     | NO
```
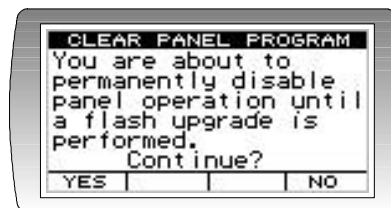
3. Press **YES** to clear the panel program, or **NO** to cancel the procedure safely without clearing the program.

Appendix A. Troubleshooting

In This Appendix

This appendix is designed to help the user to diagnose problems to the *subsystem level*. Having isolated the problem to the subsystem level, it is then possible to diagnose to the *board level*.

Subsystem Level Troubleshooting

A routing system is typically comprised of several subsystems:

- Video system
- Audio system
- Control system
- Power system

Fault finding is simplified by first isolating the problem to one of these subsystems. For example, if the audio system is working normally but the video system is not, the problem is probably confined to the video system.

Note	With the exception of a system using Digital Video with embedded audio, audio signals are switched through a different matrix than the video signals.

Main Troubleshooting Table

The following table provides an indication of what subsystems should be reviewed for common problems. Please note:

- The numbers shown in the four **Subsystem Table Reference** columns indicate specific troubleshooting problems that are found in the four individual **Subsystem Tables**.

- For example, a **1** listed under the **Video** column refers to problem number 1 in the "**Video Subsystem Table**" on the following page. Here you will find a list of *specific checks* that will assist with troubleshooting the problem.

Main Troubleshooting Table

Problem	Subsystem Table Reference			
	Video	**Audio**	**Power**	**Control**
No Video or Audio outputs	1	1	1, 2	1
Video and Audio outputs are present but neither can be switched	2, 3	2, 3		1, 2, 6
No Video output, Audio functions normally	1, 2, 3		1	2
No Audio output, Video functions normally		1, 2, 3	2	2
Video switches normally but audio does not switch		2, 3		2
Audio switches normally but the video does not switch	2, 3			2
Flash on video when switching	4			
Cannot access inputs 16-31 on any outputs of video level	5			
Audio signal level incorrect		4		
Video signal level incorrect	7			
Video signal anomaly	5, 6, 8			
Video monitor matrix not functional	9			
Audio monitor matrix not functional		5		
Control panel does not function				1, 2, 3
Control via serial port not functional				4
Ethernet control port not functional				5
Alarm port active			3	6
No "green light" in RMS-200			3, 4	4, 5
Undefined level types in RMS-200				1, 2, 4

Video Subsystem Troubleshooting Table

Use the following table to troubleshoot specific video subsystem problems. The numbers in the left-hand column indicate specific references from the **Video** column in the **Main Troubleshooting Table**.

Video Subsystem Troubleshooting Table

	Problem	Check
1	No video output	• Control cable connected, or internal controller functional ? • Different input works on output bus ? • Other outputs functional ?
2	Unable to select a specific input	• Control panel programming correct ? • Output signal level locked or protected ?
3	Unable to select any input	• Control cable connected ? • Control panel defective ? • Controller failure ?
4	Video flash when switching between inputs	• Input sources timed correctly ? • Input reference signal present and timed ? • Input reference correct standard ? • Correct video standard jumper set on controller board ?
5	Inputs 16 - 31 inaccessible	• Expansion matrix crosspoint cards present? • Expansion interface board installed ?
6	Sync missing on video output (analog)	• Sync present on selected input ? • Normal DC level on input ?
7	Video output level incorrect	• Input level correct ? • Output terminated at destination (analog) ? • Input/output compensation jumpers correctly set ? Refer to the "**Video Equalization Option**" section in Chapter 7 for details.
8	Sparkles on video output (digital)	• Input signal amplitude too low ? • Cable length > 300 meters on input ?
9	Monitor Matrix not functional	• Monitor matrix option installed ? • Selected correctly on control panel ?

Audio Subsystem Troubleshooting Table

Use the following table to troubleshoot specific audio subsystem problems. The numbers in the left-hand column indicate specific references from the **Audio** column in the **Main Troubleshooting Table**.

Audio Subsystem Troubleshooting Table

	Problem	Check
1	No audio output	• Control cable connected, or internal controller functional ? • Different input works on output bus ? • Other outputs functional ?
2	Unable to select a specific input	• Control panel programming correct ? • Output signal level locked or protected ?
3	Unable to select any input	• Control cable connected ? • Control panel defective ? • Controller failure ?
4	Output level incorrect (analog)	• Input level correct ? • Input termination in correct position ? • Output termination in correct position ?
5	Monitor Matrix not functional	• Monitor matrix option installed ? • Selected correctly on control panel ?

Power Subsystem Troubleshooting Table

Use the following table to troubleshoot specific power subsystem problems. The numbers in the left-hand column indicate specific references from the **Power** column in the **Main Troubleshooting Table**.

Power Subsystem Troubleshooting Table

	Problem	Check
1	No video output	• Power applied to video frame ? • Warning indicators on the front of each power supply ? • Control cable between chassis connected ?
2	No audio output	• Power applied to audio frame? • Warning indicators on the front of each power supply ? • Control cable between chassis connected ?
3	Alarm active	• Voltage alarm active (LED on) ? • Fan alarm active (LED on) ? • Temperature alarm active (LED on) ?
4	Controller power	• Power applied to controller frame ?

Power Supply Alarms

Power supply alarms are indicated by red LEDs on the front of each power supply module. They consist of voltage, fan, and temperature alarms.

- The voltage alarm indicates that one of the supply voltages is either too high or too low.

- The fan alarm indicates that the fan has stalled.

- The temperature alarms indicates that the temperature is elevated in the power supply. This may be caused by dirt or dust blocking the air way, a defective cooling fan, or by operation in extreme temperatures.

Note

Optional redundant power supplies may be fitted to most UTAH-200 systems. In this configuration, the failure of a power supply should not affect normal system operations, but users would be *unaware* of the power supply failure. Thus, it is *highly advisable* to utilize the alarm output provided at the rear of the chassis.

Control Subsystem Troubleshooting Table

Use the following table to troubleshoot specific control subsystem problems. The numbers in the left-hand column indicate specific references from the **Control** column in the **Main Troubleshooting Table**.

Control Subsystem Troubleshooting Table

	Problem	Check
1	No control of any level	• Internal controller operating ? (see below) • External controller connected ? • Control panels connected ? (see below) • MX bus terminated ? (see below) • U-Net terminated ? (see below) • Competed controller software upgrade ?
2	No control of individual signal level or levels.	• MX bus cable connected ? (see below) • MX bus correctly terminated ? (see below) • Is non functional signal level address set correctly ? (see below). • Control panel programmed correctly ? (see "Operations") • Output locked or protected on that level ? (see "Operations")
3	Control panel not functional	• Panel address set to unique number ? • Completed panel software upgrade ?
4	Serial control port not functional	• Communications baud rate incorrect ? • Serial control Protocol incorrect ? • Serial control cable wired correctly ?
5	Ethernet port not functional	• Ethernet option fitted ? • Connected to PC directly by null cable ? • Connected to network via gateway ?
6	Alarm active	• Active CPU indicator extinguished ? • Heartbeat indicator extinguished ? • MX activity light does not flash ?

System Controller Alarms

System controller alarms are indicated by LEDs on the front of each controller card.

- Either an active LED (**DS4**) or standby LED (**DS5**) should be lit on each controller card. If only one controller is present (non redundant system), the active LED (**DS4**) should be illuminated.

- The heartbeat LED (**DS6**) indicates that the processor is communicating with the vital parts of the system and is running the application software.

- The MX LEDs indicates communication with the crosspoint matrix. The transmit LED (**DS8**) will flash whenever communication is being made from the controller to the matrix. The receive LED (**DS7**) will flash whenever communication is being received by the controller from the matrix.

- U-Net is used for communication between the controller and the control panels. The U-Net data and U-Net transmit enable LEDs (**DS9** and **DS10**) indicate when information is exchanged between the system controller and a control panel.

- If the active LED (**DS4**) is on and the U-Net transmit enable LED (**DS10**) is off, this indicates that a controller software upgrade has failed and the controller is waiting for a valid controller software upgrade to be uploaded.

Please note the following additional points regarding the controller:

- The UTAH - 200 can be used with either an internal controller or an external system controller such as the SC-2 or SC-3.

- If used with an SC-2 or SC-3 system controller consult the appropriate controller manual for details about the controller card.

- The total MX bus cable length must be less than 300 feet and must be terminated at the last chassis.

Control Panel Troubleshooting

If your control panel does not control any of the matrix, check that power is applied to the panel.

- Panels communicate to the controller by a special network known as U-Net. Panels are connected together daisy chain style to the controller. Removing a panel physically from the network will break the chain and disconnect panels downstream from the controller.

- U-Net uses unshielded twisted pair cable. It requires two twisted pairs terminated in an RJ 45 connector. The maximum length of any segment is 1000 feet and must be terminated at the last control panel in each segment. Refer to the Appendix C "**U-Net Cabling**" for details.

- The panel may be communicating to the controller correctly, but the required signal level matrix may not be responding. Check the DIP switch setting on the rear panel of the non functional *router* level.

- Confirm that the control panel address is a unique number. Each panel address is set by a rear panel DIP switch and must be a unique address. This control panel address is read when the control panel is powered up.

Appendix B. Hardware Specifics

In This Appendix

This appendix provides detailed information and specifications on the following internal circuit boards:

- Controller Board
- Analog Audio Board
- Analog Video Board
- Digital Audio Board
- Digital Video Board
- Ethernet Board

Controller Board

This section provides connector, jumper, and LED data for the **Controller** (CPU) **Board**. Up to two Controller Boards can be installed in the Main Frame — each is identical.

The figure below illustrates the front end of the Controller Board.
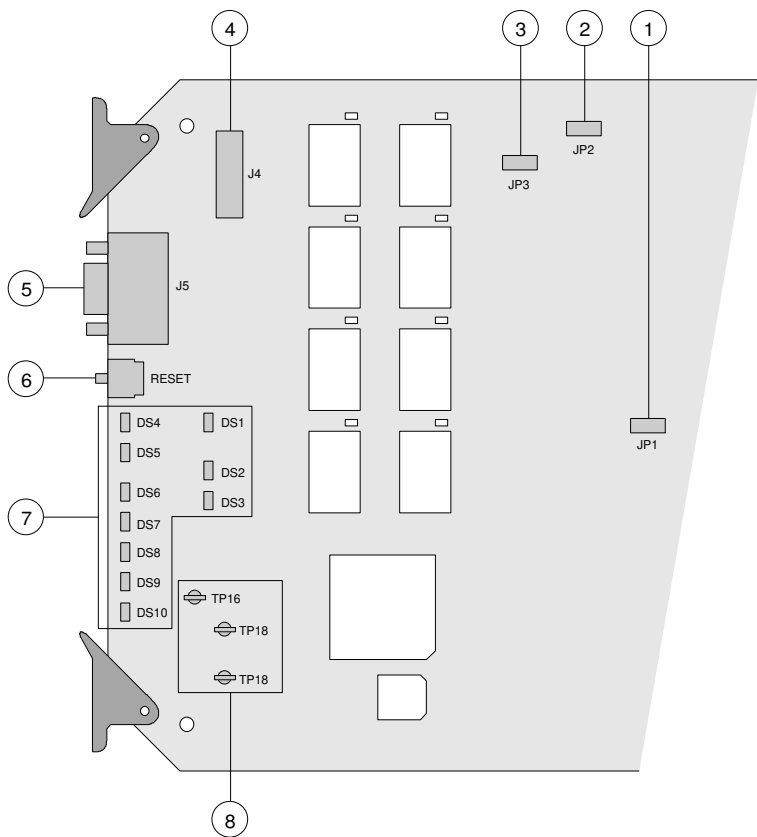
1)	**JP1** PAL/NTSC	4)	**J4** Control Panel	7)	Status LEDs
2)	**JP2** No Function	5)	**J5** Diagnostic Port	8)	Test Points
3)	**JP3** Watchdog Timer	6)	Reset Switch		

1) **JP1 PAL/NTSC**

Jumper **JP1** allows you to switch the system's line standard between 525 (NTSC) and 625 (PAL).

Important   Jumper **JP1** *must* be set for either NTSC or PAL. Even if there is no sync source connected to the **SYNC** connector on the **Main Frame**, this jumper *must* be installed.

The table below lists jumper positions:
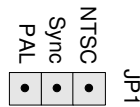
JP1 PAL/NTSC

Jumper Pins	Specification
NTSC-Sync	Line standard set to NTSC (525)
PAL-Sync	Line standard set to PAL (625)

2) **JP2 No Function Assigned**

Jumper **JP2** is not used, and there is no function assigned to it. A jumper (shunt) should be installed.

Note

> Additional jumpers (if present) on the Controller Board are not functional, or are for factory use only

3) **JP3 Watchdog Timer**

During normal operations, the microprocessor constantly writes to a special memory address, and toggles the state of the watchdog timer. If microprocessor gets lost (or stuck), the watchdog timer issues a hardware reset command — provided the watchdog is enabled. If the watchdog is disabled, the system will not be reset when a fault occurs. The table below lists jumper positions:
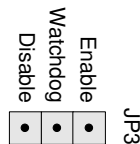
JP3 Watchdog Timer

Jumper Pins	Specification
Enable-Watchdog	Watchdog Timer enabled
Disable-Watchdog	Watchdog Timer disabled

4) **J4 Control Panel**

Connector **J4** is a 16-pin header that provides power and U-Net connections to the control panel via ribbon cable.

J4 Connector Pinouts

Pin #	Signal	Pin #	Signal
1	Ground	9	VCC
2	Ground	10	VCC
3	U-Net D+	11	VCC
4	U-Net D-	12	VCC
5	VCC	13	U-Net TE+
6	VCC	14	U-Net TE-
7	no connection	15	Ground
8	VCC	16	Ground

5) **J5 Diagnostic Port**

Connector J5 is a standard RS-232 port used for system diagnostics. Connector pinouts are listed below:

J5 Connector Pinouts

Pin #	Signal	Pin #	Signal
1	Ground	6	DTR
2	TX	7	CTS
3	RX	8	RTS
4	DSR	9	no connection
5	Ground		

6) **Reset Switch**

This switch is a momentary push-button. Press to reset the Controller Board.

7) **Status LEDs**

The table below provides a description of each status LED.

Controller Board Status LEDs

LED	Label	Description
DS1	Sync	Indicates that a proper sync source has been connected to the board.
DS2	—	No function assigned.
DS3	—	No function assigned.
DS4	Active	This green LED indicates that the board is active and controlling.
DS5	Standby	Specifically for dual-controller systems (redundant boards), this yellow LED indicates that the board is on standby, and ready to take over if required.
DS6	Heartbeat	This LED flashes at approximately half-second intervals, each time the watchdog timer is toggled. This condition indicates that the board is running properly.
DS7	MX Read	Indicates (when lit) that a readback command has been issued on the MX bus.
DS8	MX Active	Indicates (when lit) that the MX bus is active.
DS9	U-Net	This LED (when dimly lit), indicates U-Net activity. If there is problem with the U-Net, the LED will be brightly lit, or off.
DS10	U-Net TXen	The U-Net Transmit Enable LED (when brightly lit) indicates that the board is transmitting on the U-Net. If the LED is flashing, there is a U-Net problem and the controller is trying to reconfigure the U-Net. Note that a single flash may occur any time you add or remove a control panel.

8) **Test Points**

The table below provides a description of each test point.

Test Points

TP	Label	Description
TP1	Gnd	Ground
TP2	Gnd	Ground
TP3	MX STB	MX Bus Strobe
TP4	nAS	Address Strobe
TP5	nDSACK1	Data Acknowledge
TP6	nDSACK0	Data Acknowledge
TP7	nAVEC	Interrupt Auto Vector
TP8	nWR	Read/Write
TP9	nIPL0	Interrupt Priority Level
TP10	nIPL1	Interrupt Priority Level
TP11	nIPL2	Interrupt Priority Level
TP12		Not Used
TP13		Not Used
TP14	nRESET	Reset
TP15	Gnd	Ground
TP16	U-Net Data	U-Net Data can be tested at this position.
TP17	Gnd	Voltage can be measured between TP17 and TP18.
TP18	VCC	Voltage can be measured between TP17 and TP18. **Note:** VCC can not be adjusted.

Note Additional test points on the UTAH-200 Controller Board are for factory use only.

Analog Audio Board

This section provides data for the 16x16 **Analog Audio Board**. Up to two boards can be installed in each bay of any frame — each board is identical. The figure below illustrates a simplified top view.
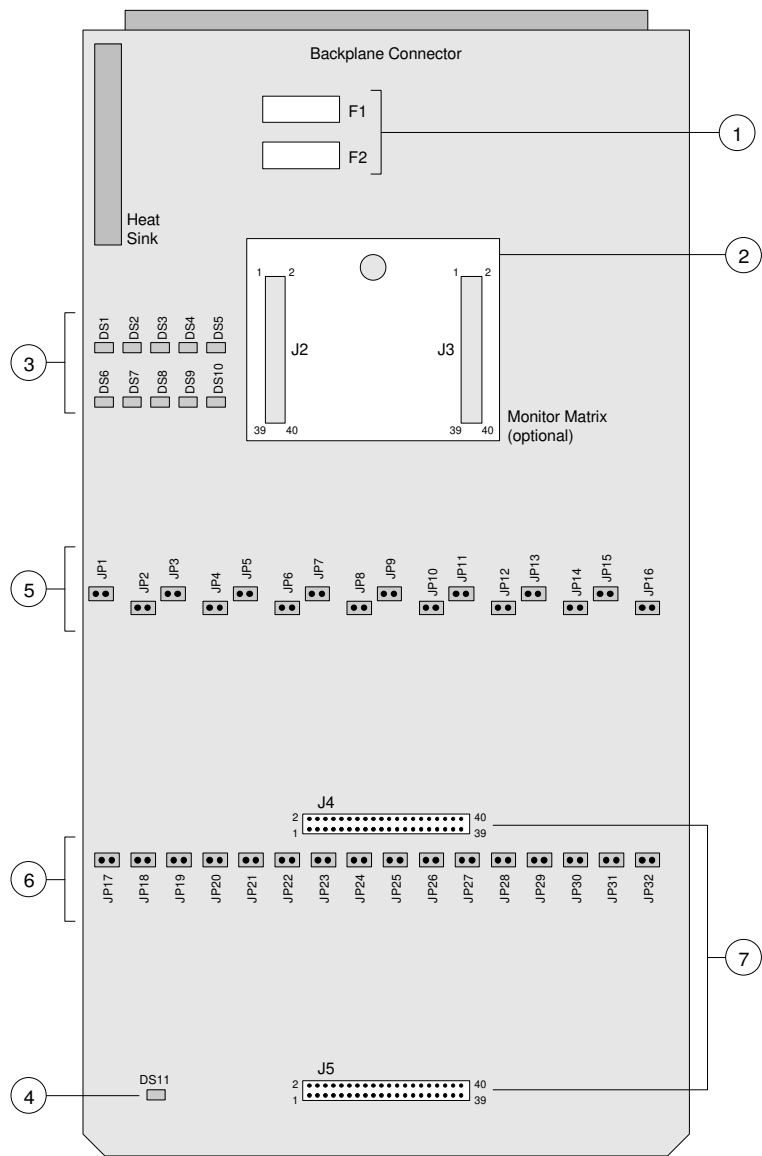
1)	Fuses	4)	Error LED	7)	Expansion Connectors
2)	Monitor Matrix Board (optional)	5)	Output Gain Jumpers		
3)	Status LEDs	6)	Input Termination Jumpers		

1) **Fuses**
   - **F1** +12 Volt Input
   - **F2** -12 Volt Input

2) **Monitor Matrix Board** (optional)

   The optional **Monitor Matrix Board** (a piggyback board) connects in this position, using **J2** and **J3**.

3) **Status LEDs**

   The table below provides a description of each status LED.

   - During normal operations, all LEDs are off.
   - If a fault occurs, a selected LED lights, and similarly causes LED **DS11** to light.

Analog Audio Board Status LEDs

LED	Description	LED	Description
DS1	-6.8V High	DS6	-6.8V Low
DS2	Vcc High	DS7	Vcc Low
DS3	+5.0V High	DS8	+5.0V Low
DS4	+6.0V High	DS9	+6.0V Low
DS5	+6.8V Low	DS10	+6.8V Low

4) **Error LED**
   - During normal operations, LED **DS11** is off.
   - **DS11** lights only when one of the ten status LEDs is lit.

5) **Output Gain Jumpers**

   Jumpers **JP1** through **JP16** are 2-pin output gain jumpers for channels 0-15 (or 16-31) , respectively:

   - **Open** (jumper off): Normal, feed high impedance load.
   - **Closed** (jumper on): Optional, feed 600Ω load.

6) **Input Termination Jumpers**

   Jumpers **JP17** through **JP32** are 2-pin input termination jumpers for channels 0-15 (or 16-31) , respectively:

   - **Open** (jumper off): Normal, high impedance bridging input.
   - **Closed** (jumper on): Optional, 600Ω matching input.

7) **Expansion Connectors**
   - **J4** — accepts 40-pin ribbon cable from companion module (**J5**) in 32x32 configuration.
   - **J5** — accepts 40-pin ribbon cable from companion module (**J4**) in 32x32 configuration.

Analog Video Board

This section provides data for the 16x16 **Analog Video Board**. Up to two boards can be installed in each frame — each board is identical. Note that the matrix size and the rear-panel layout are the same as the **Digital Video Board**. The figure below illustrates a simplified top view.
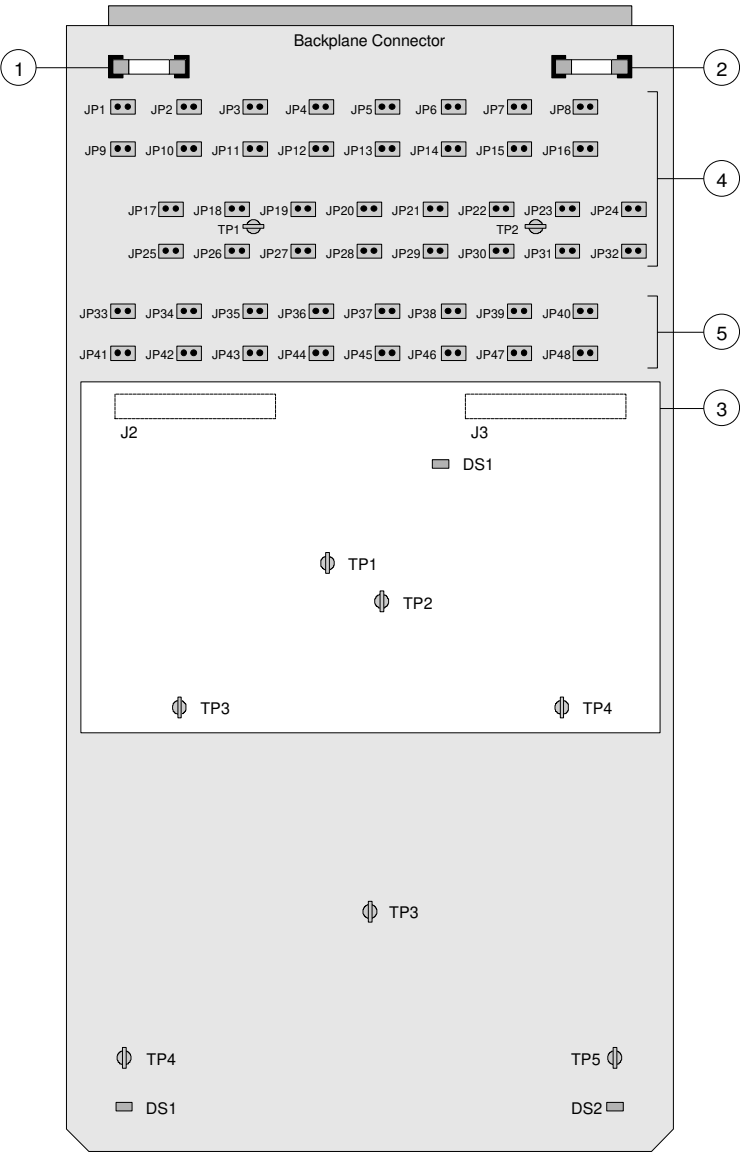
1)	-5V Fuse	3)	Optional Monitor Matrix	5)	Output Compensation Jumpers
2)	+5V Fuse	4)	Input Compensation Jumpers		

1) **-5V Fuse** (8 Amp, 125V Fast Blow)

2) **+5V Fuse** (8 Amp, 125V Fast Blow)

3) **Analog Video Monitor Matrix Board** (optional)

   The optional **Analog Video Monitor Matrix Board** (a piggyback) connects in this position, using **J2** and **J3**.

4) **Input Gain Compensation Jumpers**

   An array of 32 jumpers are provided for setting input equalization (**JP1** through **JP32**) — two jumpers are required per input. Input equalization is an optional feature. Refer to the "**Video Equalization Option**" for details.

5) **Output Gain Compensation Jumpers**

   An array of 16 jumpers are provided for setting output equalization (**JP33** through **JP48**) — one jumper is required per output. Output equalization is an optional feature. Refer to the "**Video Equalization Option**" for details.

Note	A previous version of the **Analog Video Board** did not include the arrays of input and output equalization jumpers. If you wish to equalize your composite signals and do not have the proper version of the board, please contact Customer Support.

The table below describes each **Analog Video Board** status LED.

- During normal operations, all LEDs are off.

- If a fault occurs, both LEDs light, indicating that one or both of the associated fuses has blown. In this condition, the SMPTE alarm is also triggered.

Analog Video Board Status LEDs

LED	Description
DS1	-5V
DS2	+5V

The table below describes the **Analog Video Monitor Matrix Board** status LED.

Analog Video Monitor Matrix Board Status LED

LED	Description
DS1	No video on output

The table below describes each **Analog Video Board** test point.

Analog Video Board Test Points

TP	Label	Description
TP1	Gnd	Ground
TP2	Gnd	Ground
TP3	Gnd	Ground
TP4	VEE	-5V
TP5	VCC	+5V

The table below describes each **Analog Video Monitor Matrix Board** test point.

Analog Video Monitor Matrix Board Test Points

TP	Label	Description
TP1	Gnd	Ground
TP2	Mux Out	Output of the 16x1 matrix
TP3	Gnd	Ground
TP4	Gnd	Ground

Note   If you upgrade a frame (in the field) by adding a second **Analog Video Board**, the **Analog Input Interface Board** must be installed. Refer to the "**Analog Input Interface Board**" section for details.

Analog Format Configurations

The **Analog Video Board** can be used for a variety of analog formats, depending upon how you configure your analog video levels:

- For *composite analog video*, use the board in a normal 16x16 or 32x32 configuration.

- For *Y/C component analog video*:

    ~ For a 16x16 Y/C level, use two 16x16 boards in one frame — one board for Y, the other for C.

    Do not install the **Analog Input Interface Board** between the boards. To ensure that the boards switch in tandem, set the **Starting Address DIP Switch** on each board to the same address, and set each **Signal Level DIP Switch** to the same level and expansion offset.

~ For a 32x32 Y/C level, use two 16x16 boards for Y (in one frame) and two 16x16 boards for C (in a second frame).

Install the **Analog Input Interface Board** between each pair of similar signals. Set the **Starting Address DIP Switches** as you would for normal 32x32 levels, with one set to **0-15**, and the other set to **16-31**. To ensure that the boards switch in tandem, set the **Signal Level DIP Switch** on each board to the same level and expansion offset.

- For *RGB* or *Y/R-Y/B-Y component analog video*:

  ~ For a 16x16 RGB or Y/R-Y/B-Y level, use three 16x16 analog video boards in 1.5 frames — one board for R(Y), one for G(R-Y), and one for B(B-Y).

  Do not install the **Analog Input Interface Board** between the boards. To ensure that the boards switch in tandem, set the **Starting Address DIP Switch** on each board to the same address, and set the **Signal Level DIP Switch** on each board to the same level and expansion offset.

  ~ For a 32x32 RGB or Y/R-Y/B-Y level, use two 16x16 boards for R(Y) in frame 1, two 16x16 boards for G(R-Y) in frame 2, and two 16x16 boards for B(B-Y) in frame 3

  Install the **Analog Input Interface Board** between each pair of similar signals. Set the **Starting Address DIP Switches** as you would for normal 32x32 levels, with one set to **0-15**, and the other set to **16-31**. To ensure that all boards switch in tandem, set each **Signal Level DIP Switch** to the same level and expansion offset.

Caution

> For proper switching in the above configurations, all boards must be installed at all times. If a component is removed (e.g., the Y board), the system will still recognize the remaining C board as a valid level, and perform the switch — even though the signal is incomplete.

Analog Input Interface Board

If two 16x16 analog video matrices are installed in a frame, the **Analog Input Interface Board** spans the fronts of both analog video matrix boards, as illustrated below.

Analog Input Interface Board   Lock-down Screw
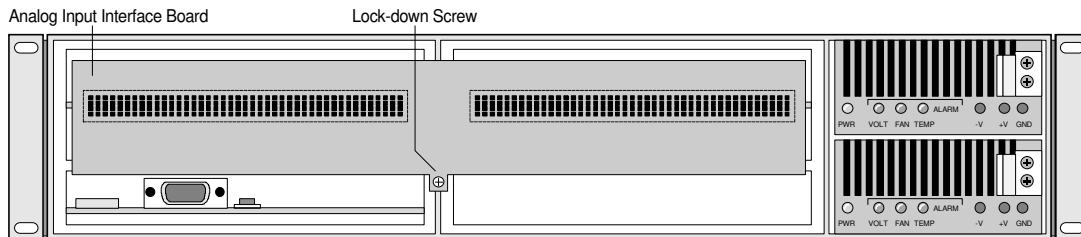
The **Analog Input Interface Board** connects the two boards' inputs together, forming a 32x32 matrix. Factory-installed 32x32 analog video matrices already have the **Analog Input Interface Board** installed. If you are upgrading a frame (in the field) from a 16x16 to a 32x32 analog video matrix, refer to the "**Analog Video Field Upgrade**" section.

Analog Video Field Upgrade

Use the steps below to upgrade a frame (in the field) from a 16x16 to a 32x32 analog video matrix.

Caution

Follow static precautions at all times when handling the equipment.

1. Ensure that the frame *already* includes a second video backplane. This guarantees that the frame is factory configured to accept a second analog video board.

2. If it does not include a second video backplane, please contact **Utah Scientific Customer Support** for instructions.

3. Power down the unit.

4. With the front panel removed, unpack the **Analog Video Board** and the accompanying **Analog Input Interface Board**.

5. Install the new **Analog Video Board** in the open bay's slot, and ensure that it is seated properly.

6. Place the **Analog Input Interface Board** across the fronts of both video matrix boards, and carefully line up the connectors and pins.

7. With the board properly lined up, connect the **Analog Input Interface Board** to the two matrix boards.

8. Attach the lock-down screw to secure the **Analog Input Interface Board**.

9. Replace the front panel, and power up the unit. Attach video inputs and outputs as required, and proceed with system checkout in the normal manner.

Video Equalization Option

The UTAH-200's excellent frequency response can be adversely affected in analog video applications by the use of long cable runs. To properly compensate, optional external **Video Equalizers** are available, each of which is a passive unit that plugs directly into the UTAH-200 input and output BNC connectors. They provide an effective way of equalizing cable losses for up to 200 feet on inputs or outputs (400 feet total).

Analog Video EQ Module - Side View

Analog Video EQ Module
Top View
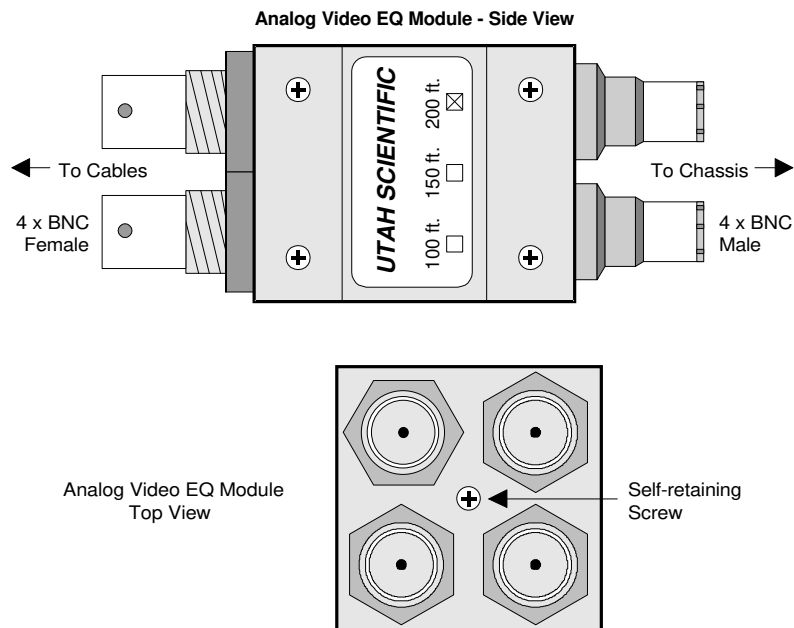
As shown above, each equalizer is a small cubic assembly that provides equalization for four *adjacent* inputs or outputs. Input connectors are slip-on male BNCs for easy installation and removal from the chassis, and a single screw is used to secure the unit to the chassis. Output connectors are standard BNCs. No external source of power is required.

Because the units are external, equalization is independent of the UTAH-200. Thus, if you need to exchange a video board or change cables, the UTAH-200 can remain in service. The equalizers can be used on both inputs and/or outputs, allowing the system to have pre or post equalization (or both).

Each **Video Equalizer** is designed for use with **Belden 8281** cable (or equivalent). Use with other cables having different loss characteristics may result in a less than optimum response. Three different types of **Video Equalizers** are available to accommodate various cable lengths from 100 feet to 200 feet.

Analog Video Equalizer Models

Part Number	Equalizer Type
80315-11	100 ft.
80315-15	150 ft.
80315-21	200 ft

Note that the specific type of each equalizer is indicated on the unit's side label.

Note

> Please contact **Utah Scientific Customer Support** for details on obtaining **Video Equalization** modules for your system.

Equalizer Module Installation

Use the following steps to install one or more **Video Equalizer** modules for your **Analog Video Board**:

1. Ensure that you have the proper **Video Equalizer** modules for your specific lengths of cable. Check each module's side label to be certain.

2. On the rear of the chassis, ensure that the input or output ports requiring equalization are grouped together in *blocks of four*. (For example: inputs **0** through **3**, or **8** through **11**.)

3. Remove any cables that are currently connected to the target input or output ports. Ensure that the cables are properly labeled for reconnection (in step 5).

4. Push the modules onto the appropriate groups of four adjacent connectors, and secure them with the self-retaining screws.

5. Re-attach the cables to the input BNC connectors on the equalizer modules.

6. To set the gain compensation jumpers, remove the **Analog Video Board** from the chassis. Use the tables on the following page to determine the correct set of jumpers that need to be installed for input or output equalization.

Please note:

- For each **input circuit** that you want to equalize, two jumpers must be installed.
- For each **output circuit** that you want to equalize, one jumper must be installed.
- For circuits that *do not* require equalization, do not install any jumpers.

Use the following tables to identify the proper locations where jumpers should be installed. Use the figure at the beginning of the "**Analog Video Board**" section for reference.

Input Gain Compensation Jumpers (Two jumpers required per input)

To Equalize Input:	Install Jumpers at:	To Equalize Input:	Install Jumpers at:
0	**JP1** and **JP9**	8	**JP5** and **JP13**
1	**JP17** and **JP25**	9	**JP21** and **JP29**
2	**JP2** and **JP10**	10	**JP6** and **JP14**
3	**JP18** and **JP26**	11	**JP22** and **JP30**
4	**JP3** and **JP11**	12	**JP7** and **JP15**
5	**JP19** and **JP27**	13	**JP23** and **JP31**
6	**JP4** and **JP12**	14	**JP8** and **JP16**
7	**JP20** and **JP28**	15	**JP24** and **JP32**

Output Gain Compensation Jumpers (One jumper required per output)

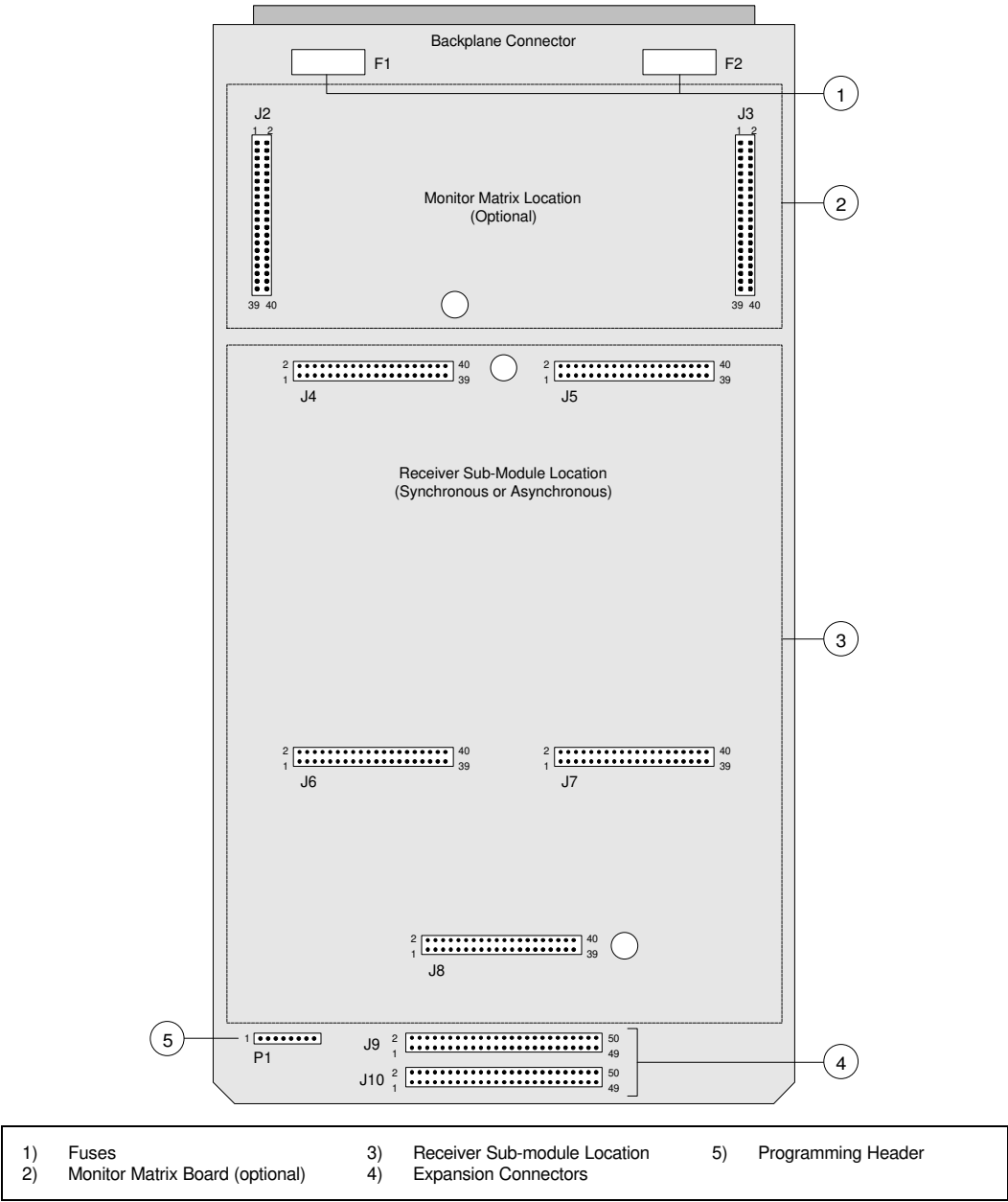| To Equalize Output:	Install Jumpers at:	To Equalize Output:	Install Jumpers at:
0	**JP33**	8	**JP37**
1	**JP41**	9	**JP45**
2	**JP34**	10	**JP38**
3	**JP42**	11	**JP46**
4	**JP35**	12	**JP39**
5	**JP43**	13	**JP47**
6	**JP36**	14	**JP40**
7	**JP44**	15	**JP48**

7. Install jumpers per your specific requirements. Remember:

    • A total of eight jumpers must be installed to *fully install* an input equalization module (two jumpers per input).

    • A total of four jumpers must be installed to *fully install* an output equalization module (one jumper per output).

8. Re-install the **Analog Video Board** in the chassis.

9. Test all input and output channels to ensure that the gain setting is correct for each channel:

    • If an output port is found to be about 6dB high or 6dB low (regardless of which input is selected), then the output gain jumper for that channel is incorrectly set.

    • If an input port has a gain error of 6dB, the corresponding jumpers are not correctly set.

Note

Because there are two gain jumpers associated with each input, it is possible that one set of outputs (e.g., **0**-**15**) is at the correct level, and the other set is incorrect. Be sure to check all output ports with each input to ensure that *all jumpers* are correctly installed on the **Analog Video Board**.

Digital Audio Board

This section provides data for the 16x16 **Digital Audio Board**. Up to two boards can be installed in each bay of any frame. Each *carrier* board is identical, but the receiver sub-module can be a **Synchronous** or **Asynchronous** version.   The figure below illustrates a simplified view.

1) Fuses	3) Receiver Sub-module Location	5) Programming Header
2) Monitor Matrix Board (optional)	4) Expansion Connectors	

1) **Fuses**

   - **F1**, 5x20mm, 1A Slo-Blo, -5 Volt Input
   - **F2**, 5x20mm, 5A Slo-Blo, +5 Volt Input

2) **Monitor Matrix Board** (optional)

   The optional **Monitor Matrix Board** (a piggyback board) connects in this position, using **J2** and **J3**. Refer to the "**Digital Audio Monitor Matrix Board**" section for additional details and jumper positions.

3) **Receiver Sub-module Location**

   The base carrier board must be equipped with one of two receiver sub-modules, which connect in this position:

   - The **Synchronous** receiver sub-module accepts a default AES/EBU reference of 48 kHz, or the board can be factory configured for 44.1 kHz. Refer to the "**Synchronous Receiver Sub-module**" section for jumper positions, LED indications and additional information.

   - The **Asynchronous** receiver sub-module accepts AES/EBU digital audio signals that are arbitrary in sampling rate, up to a maximum of 100 kHz. Refer to the "**Asynchronous Receiver Sub-module**" section for LED indications and additional information.

4) **Expansion Connectors**

   Two connectors are provided for interconnecting a second 16x16 **Digital Audio Board**, for purposes of configuring a full 32x32 digital audio routing matrix.

   - **J9** — accepts 50-pin ribbon cable from companion module (**J10**) in a 32x32 configuration.

   - **J10** — accepts 50-pin ribbon cable from companion module (**J9**) in a 32x32 configuration.

5) **Programming Header**

   Connector **P1** is used for programming the board's logic circuits, and is designed for factory use only.

Synchronous Receiver Sub-module

The **Synchronous** receiver sub-module requires that *all* input sources are synchronized to a common reference. The board accepts a default 48 kHz AES/EBU reference, or it can be factory configured for 44.1 kHz. The sample rate and frame synch pulses are extracted from the reference. The figure below illustrates a simplified top view:
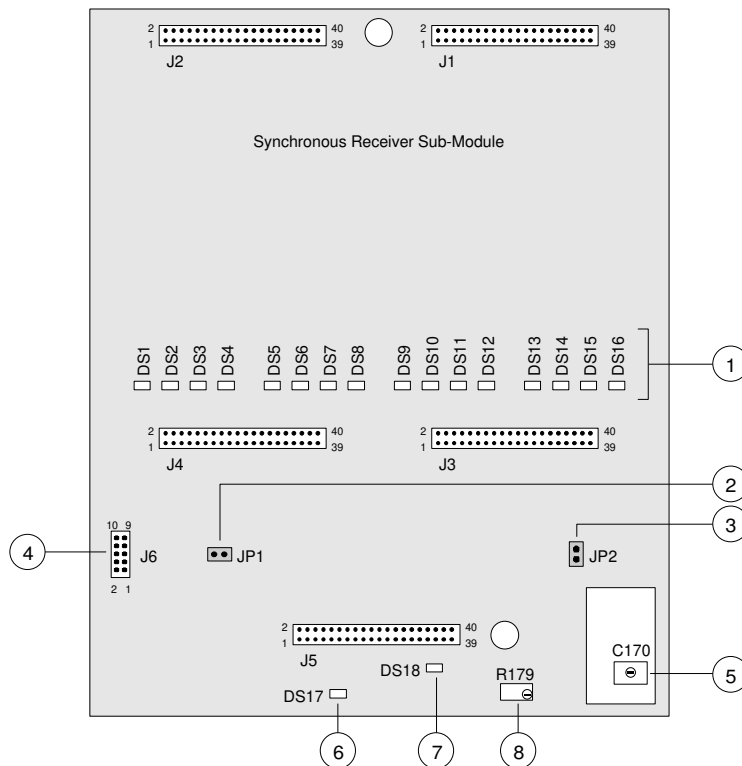
1)	Valid AES Signal LEDs	4)	Programming Header	7)	PLL Sync LED
2)	AES Reference Jumper	5)	VCO Calibration Trimmer	8)	Phase Calibration Trimmer
3)	Reference Termination Jumper	6)	Reference LED		

1) **Valid AES Signal LEDs**

   Sixteen green LEDs are provided (**DS1** through **DS16**) for monitoring the status of inputs 0 through 15, respectively.

   - **ON**: An LED is lit when a valid signal is detected at the corresponding input — when the input's sample rate matches that of the reference.

   - **OFF**: An LED is off when no input signal is present, when the signal does not match the reference sample rate, or when no suitable AES reference is applied to the module.

2) **AES Reference Jumper**

Jumper **JP1** selects the source of the external AES reference:

- • **ON**: With the jumper on, the reference is derived from the reference input (default configuration as shipped).

- • **OFF**: With the jumper off, reference is derived from the channel **0** (zero) input signal, and the standalone reference input is ignored.

In Chapter 2, refer to the "**Installing AES Reference**" section for additional information.

3) **Reference Termination Jumper**

Jumper **JP2** provides an option for the AES reference input.

- • **ON**: With the jumper on, the reference input terminates the applied signal with a 110Ω load (default configuration).

- • **OFF**: With the jumper off, the reference input provides a high impedance bridging load to the applied signal.

4) **Programming Header**

Connector **J6** is used for programming the board's logic circuits, and is designed for factory use only.

5) **VCO Calibration Trimmer**

Trimmer **C170** is contained inside a shielded enclosure that houses the board's VCO (voltage controlled oscillator). Factory calibration supports a standard 48 kHz sampling rate. However, as an ordered option or as part of a field re-calibration, **C170** can be adjusted to support a 44.1 kHz sample rate.

Important

Adjustment of **C170** is recommended only for qualified technical personnel. For assistance with field re-calibration, please contact **Utah Scientific** Customer Support.

6) **Reference LED**

Green LED **DS17** lights when a valid AES reference signal is applied to the *selected* reference input (either the AES reference input port or channel **0**). If the reference does not match the sub-module's audio sampling rate, the LED will be turned off.

7) **PLL Sync LED**

Green LED **DS18** lights when the sub-module's PLL (phase-locked-loop) is synchronized to the applied AES reference. The LED will be off *only* when the module attempts to lock to a defective external reference, or when there is a calibration or hardware fault in the module.

8) **Phase Calibration Trimmer**

Potentiometer **R179** is used to calibrate the phase of the output signals from the router matrix. Phase is trimmed so that the outputs match the phase of the applied reference input. This adjustment is designed for factory use only.

Asynchronous Receiver Sub-module

The **Asynchronous** receiver sub-module accepts AES/EBU signals that are arbitrary in sampling rate, up to a maximum of 100 kHz. Switching is synchronized to the vertical interval of the system's video reference, but *not* to an audio reference. The figure below illustrates a top view:
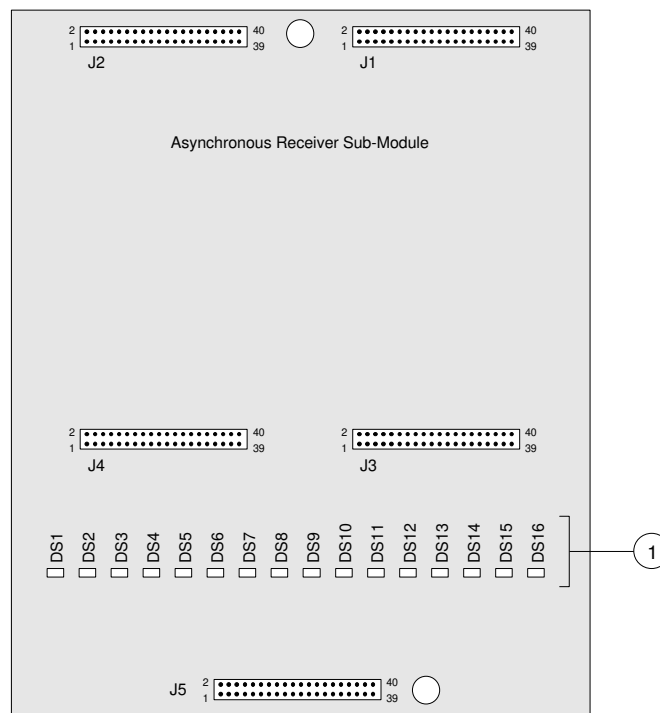

1)   Signal Present LEDs

1) **Signal Present LEDs**

Sixteen green LEDs are provided (**DS1** through **DS16**) for monitoring the status of inputs 0 through 15, respectively.

- **ON**: An LED is lit when a valid AES signal is detected at the corresponding input.

- **OFF**: An LED is off when no input signal is present.

Digital Audio Monitor Matrix Board

The optional **Digital Monitor Matrix Board** allows you to monitor the signal level's multiple digital outputs without affecting destinations. The output is jumper-selectable between analog or digital audio. The figure below illustrates a simplified top view:
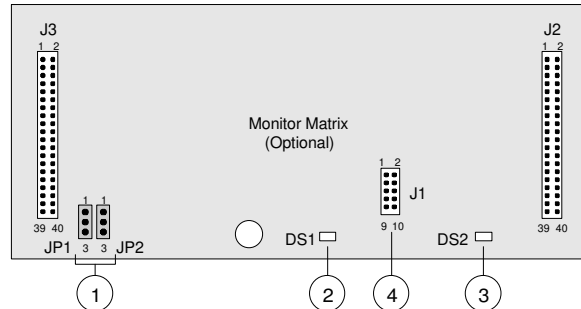
1)	Monitor Format Selection Jumpers	3) De-emphasis LED	4) Programming Header
2)	Output Fault LED		

1) **Monitor Format Selection Jumpers**

Jumpers **JP1** and **JP2** are used to configure the monitor matrix output as either digital or analog. Both jumpers must be changed together, as a pair.

- **Digital Output**: With the jumpers connecting pins **1** and **2** *at both jumper locations*, a digital output is available at the backplane (or the **Digital Breakout Panel**) monitor connector.

- **Analog Output**: With the jumpers connecting pins **2** and **3** *at both jumper locations*, a baseband stereo analog signal is available at the backplane monitor connector only (the **Digital Breakout Panel** does not support the analog monitor output option).

Note

In a 32x32 application using two **Digital Audio** carrier assemblies (each fitted with a monitor matrix), one monitor output can be set for analog while the other can be set for digital. You can also set both for digital or analog, as required.

In Chapter 2, refer to the "**Installing Digital Audio Monitor Outputs**" section for additional information.

2) **Output Fault LED**

Red LED **DS1** allows the monitor matrix output to be used as a diagnostic tool for fault detection on the main output matrix:

- **ON**: When lit, one of three potential error conditions exist in the selected output: a parity error, bi-phase coding error, or the inability to phaselock. The latter condition includes a range of errors such as insufficient amplitude, insufficient "eye-pattern" opening, or excessive jitter.

- **OFF**: There are no errors in the selected matrix output.

3) **De-emphasis LED**

Red LED **DS2** is a diagnostic tool for the board's D/A (digital-to-analog) converter. The D/A supports no de-emphasis and "50/15 µs" de-emphasis modes, but does not support the "J17" de-emphasis mode.

- **ON**: When lit, the signal being monitored contains the "J17" indication flag. Analog audio from the D/A will be available, but with an inappropriate frequency response.

- **OFF**: The signal being monitored does not contains the "J17" indication flag.

4) **Programming Header**

Connector **J1** is used for programming the board's logic circuits, and is designed for factory use only.

Digital Video Board

This section provides data for the 16x16 **Digital Video Board**. Up to two boards can be installed in each frame — each board is identical. The figure below illustrates a simplified top view.

| 1) Carrier Board | 2) Crosspoint Board | 3) Monitor Matrix Board (optional) |
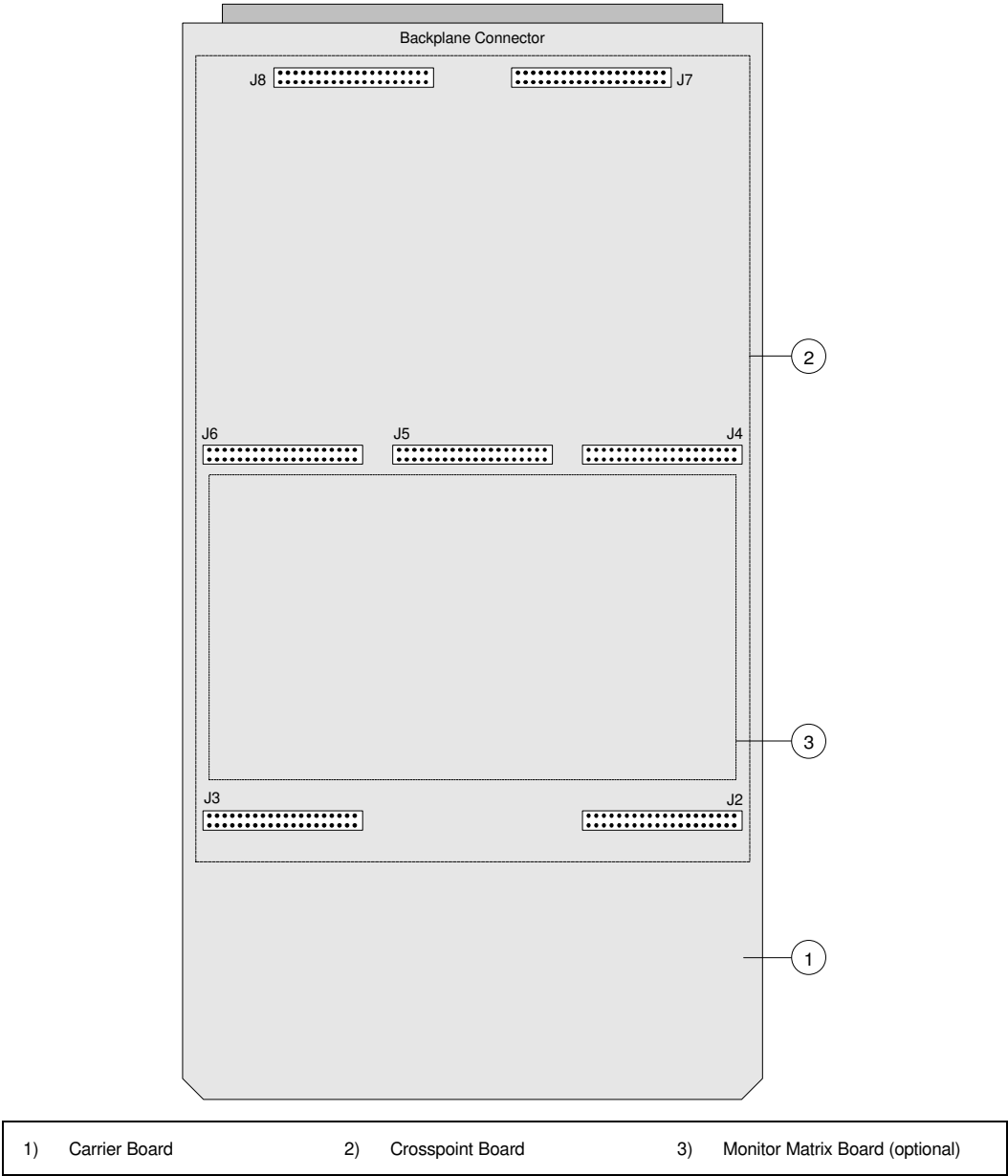
In its standard configuration, the **Digital Video Board** is comprised of two boards (**Carrier** and **Crosspoint**). With the optional **Monitor Matrix Board** installed, the **Digital Video Board** is a stack of three circuit boards (**Carrier**, **Crosspoint**, and **Monitor Matrix**).

1) **Carrier Board**

The **Carrier Board** includes 7 connectors (**J2** - **J8**) that support the **Crosspoint Board** above.

2) **Crosspoint Board**

The **Crosspoint Board** (a piggyback board) includes 2 connectors (**J1** - **J2**, not) that support the optional **Monitor Matrix Board** above. The **Crosspoint Board** also includes an array of jumpers for each output circuit (see below).

3) **Monitor Matrix Board** (optional)

The optional **Monitor Matrix Board** (a piggyback board) connects in this position, using **J1** and **J2**.

Crosspoint Board Jumpers

The underside of the **Crosspoint Board** includes an array of 16 jumpers (small circuit boards) that select between "data reclock enable" and "reclock bypass."

1) Jumper Board	2) Data Reclock Enable	3) Reclock Bypass
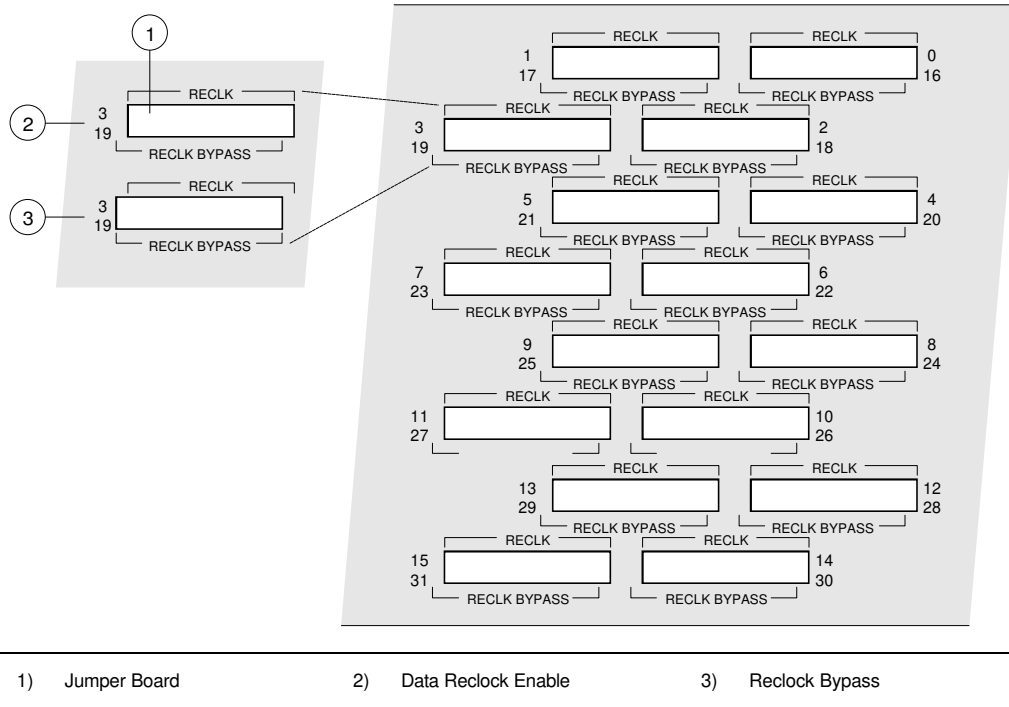
1) **Jumper Board**

   Each **Jumper Board** is actually a small reversible circuit board. Jumpers are provided for outputs **0**-**15** (or **16**-**31**). To change a jumper's position, gently remove the board and reinstall it between the desired set of brackets.

2) **Data Reclock Enable**

   When the jumper board is positioned between the brackets labeled **RECLK**, that output is set to enable data reclocking.

   Note   **RECLK** is the default jumper position as shipped.

3) **Reclock Bypass**

   When the jumper board is positioned between the brackets labeled **RECLK BYPASS**, that output is set to bypass the reclocking device.

Input Terminator Board

If a 16x16 video matrix is the only video matrix installed in a frame, an **Input Terminator Board** is installed across the front of the video matrix board, as illustrated below:

Input Terminator Board
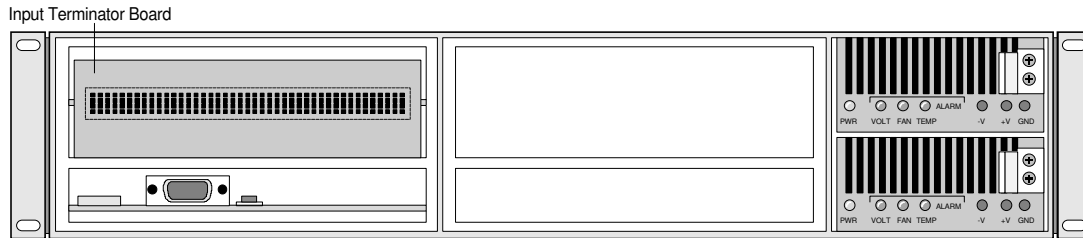
Note	If you upgrade a frame (in the field) by adding a second **Digital Video Board**, the **Input Terminator Board** must be removed, and the **Digital Input Interface Board** installed in its place. Refer to the "**Digital Input Interface Board**" section for details.

Digital Input Interface Board

If two 16x16 digital video matrices are installed in a frame, the **Digital Input Interface Board** spans the fronts of both video matrix boards, as illustrated below.

Digital Input Interface Board   Lock-down Screw
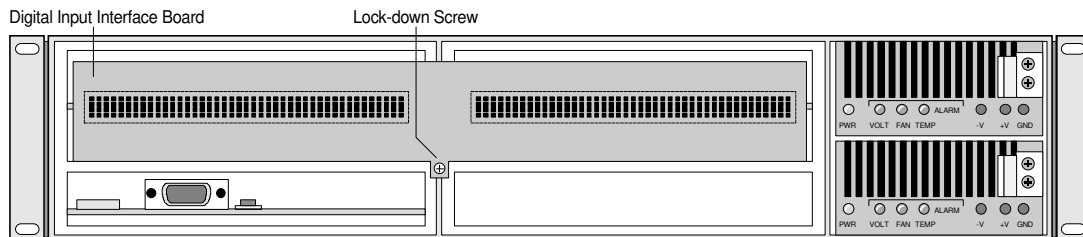
The **Digital Input Interface Board** interconnects the two boards' inputs together, forming a 32x32 matrix.

Factory-installed 32x32 digital video matrices already have the **Digital Input Interface Board** installed. If you are upgrading a frame (in the field) from a 16x16 to a 32x32 digital video matrix, refer to the "**Digital Video Field Upgrade**" section for instructions.

Digital Video Field Upgrade

Use the steps below to upgrade a frame (in the field) from a 16x16 to a 32x32 digital video matrix.

Caution

> Follow static precautions at all times when handling this equipment.

1. Ensure that the frame *already* includes a second video backplane. This guarantees that the frame is factory configured to accept a second digital video board.

    If it does not include a second video backplane, please contact **Utah Scientific Customer Support** for instructions.

2. Power down the unit.

3. With the front panel removed, carefully remove the **Input Terminator Board** from the front of the installed video matrix and store it in a safe place.

4. Unpack the **Digital Video Board** and the accompanying **Digital Input Interface Board**.

5. Install the new **Digital Video Board** in the open bay's slot, and ensure that it is seated properly.

6. Place the **Digital Input Interface Board** across the fronts of both video matrix boards, and carefully line up the connectors and pins.

7. With the board properly lined up, connect the **Digital Input Interface Board** to the two matrix boards.

8. Attach the lock-down screw to secure the **Digital Input Interface Board**.

9. Replace the front panel, and power up the unit. Attach video inputs and outputs as required, and proceed with system checkout in the normal manner.

Ethernet Board

This section provides data for the optional **Ethernet Board**, which is designed for PC-to-UTAH-200 communications — specifically, for running the RMS-200 application or other network applications. The board is a "daughter card" that mounts on the **Controller Board**, and when installed, the RJ-45 **Ethernet** connector on the rear of the **Main Frame** is active.

Each **Controller Board** in the frame can have an **Ethernet Board** installed, which then provides you with backup Ethernet capability, in addition to backup CPU capability.

The figure below illustrates a simplified top view.
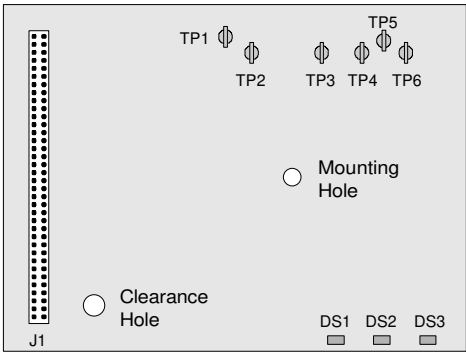
The table below describes each **Ethernet Board** status LED.

Ethernet Board Status LEDs

LED	Color	Label	Description
DS1	Yellow	RX	Lights when data is received from the Ethernet. Flashes during normal operation.
DS2	Yellow	TX	Lights when data is transmitted on the Ethernet. LED is off most of the time, but lights when data is sent.
DS3	Green	LINK	Lights to indicate that there is a valid connection to an Ethernet network. The LED is *on solid* on the active controller board, and *off* on the standby (backup) controller board.

The table below provides a description of each test point.

Ethernet Board Test Points

TP	Label	Description
TP1	TXD	Transmit Data
TP2	RXC	Receive Data
TP3	nXRDY	not Transmit Ready (data cycle acknowledgment)
TP4	nE_IRQ	not Ethernet Interrupt Request (active low interrupt)
TP5	nADS	not Address Strobe (data bus access)
TP6	CA	Channel Attention

Note   Test points are present on the board (as holes), but physically not installed.

Ethernet Field Upgrade

Use the steps below to upgrade a frame (in the field) for Ethernet communications. Remember that the **Ethernet Board** is installed as a "daughter card" on the controller board.

Caution   Follow static precautions when handling this equipment.

1. Power down the unit.
2. Unpack the **Ethernet Board**.
3. With the front panel removed, carefully remove the **Controller Board** from the frame.
4. Locate connector **J1** on the **Ethernet Board**, and align it with header **J3** on the **Controller Board**. Ensure that the component sides of *each board* are facing each other. This orientation is *required* due to limited clearance.

Important   The two connectors (**J1** and **J3**) are not polarized or keyed, therefore care must be taken to ensure that the connectors are installed correctly.

- Ensure that the single mounting hole near the center of the **Ethernet Board** aligns with the matching "Mounting Hole" on the **Controller Board**.

- Ensure that component **C56** on the **Controller Board** is completely visible through the "Clearance Hole."

Use the figure below to properly orient the two boards.

- Ensure that the component sides face each other.
- Ensure that the mounting holes align.
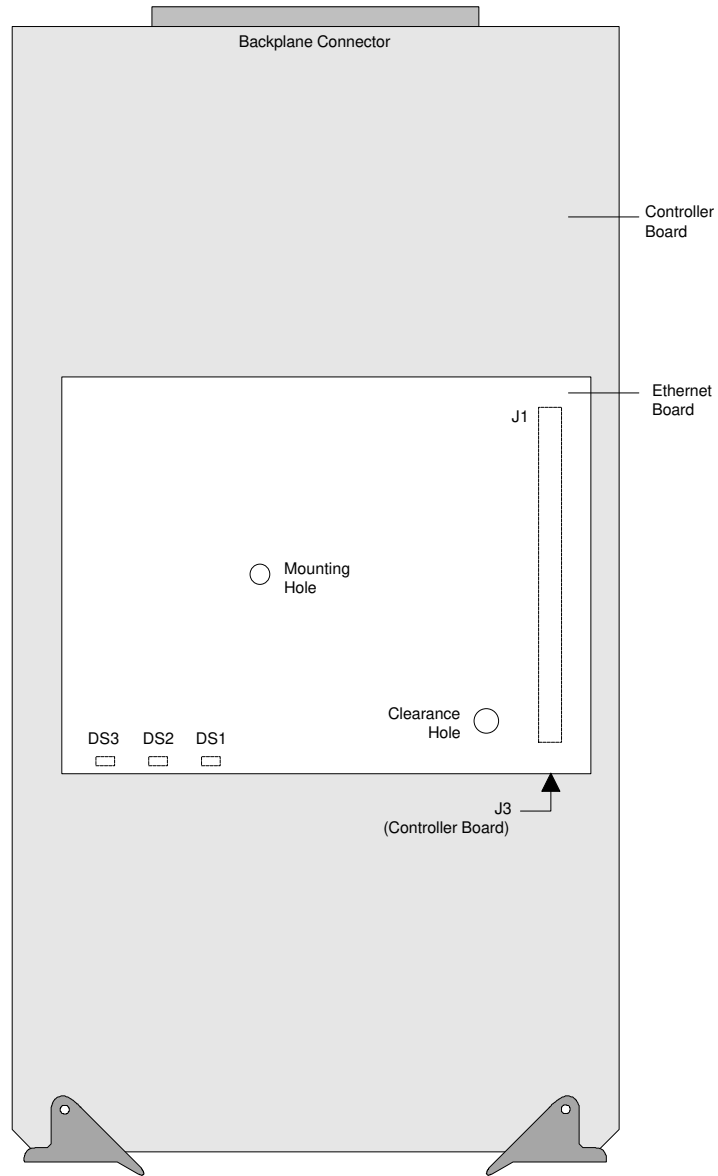
5. Connect the two boards with the proper orientation. Secure them with a 4/40 x 1/4" screw, through the **Controller Board**'s mounting hole into the 3/8" standoff on the **Ethernet Board**.

6. Re-install the Controller Board in the frame.

7. If you have an optional backup controller installed in your system (and you have purchased a second **Ethernet Board**), repeat the procedure from step 2 for the second board.

8. Replace the front panel, and power up the unit.

In Chapter 3, refer to the "**Establishing Communications**" section for instructions on establishing Ethernet communications, and configuring the Ethernet IP address.

Appendix C. Specifications

In This Appendix

This appendix provides detailed lists of all system audio, video, control, physical, power, and regulatory specifications. Chassis connector pinout data is also included.

The following specifications are listed:

- Reference
- Analog Video
- Analog Audio
- Audio Connector Suppliers
- Digital Video
- Digital Audio
- Control
- Power
- Alarms
- Physical
- Regulatory
- U-Net Cabling

All specifications are subject to change without notice.

Reference

The following table lists system reference specifications:

Reference Specifications

Parameter	Specification
Reference Video	Looping input
	525 line NTSC or 625 line PAL
Max. signal level:	2.0 v p-p (internal controller only)
Min. signal level:	0.67 v p-p
Input return loss:	Better than 40 dB at 4.43 MHz, terminated in 75Ω
Switching point:	All video and audio switches will occur in accordance with SMPTE RP 168

Analog Video

The following table lists system analog video specifications:

Analog Video Specifications

Parameter	Specification
Frequency response	DC to 5 MHz ± .05dB
	DC to 30 MHz ± .1dB
Differential gain	.15%
Differential phase	.15 degrees
Gain	Unity ± .25dB
Output DC	50 mv
Crosstalk	5 MHz -60dB
Input/Input phase scatter	± 2 degrees

Analog Audio

The following table lists system analog audio specifications:

Analog Audio Specifications

Parameter	Specification
Frequency response	20 Hz to 20 kHz ± 0.05dB, 200 kHz, -3 dB
Max. input level	24 dBu
Input impedance	200 KΩ, strappable to 600Ω
THD @ 24 dBu, 20 Hz to 20 kHz	.05%
IMD @ 24 dBu, 20 Hz to 20 kHz	.05%
Hum and noise, 20 Hz to 15 kHz	-85 dBu
Crosstalk @ 20 KHz	-90 dB
Gain Uniformity	± 0.05 dB
CMR @50/60 Hz	70 dB
Common Mode Voltage Range	± 10V (DC plus peak AC)
DC on output	± 65 mV

Analog Audio Connector Suppliers

All chassis analog audio input connectors are 26-pin high-density female
sub-miniature "D" type. Mating connectors are the equivalent males.
The following table lists manufacturers and part numbers.

Analog Audio Connector Supplier Specifications

Manufacturer	Part Number	Contact
Advanced-Connectek USA Inc.	DH-26PK-SFG-T	(714) 573-1920
Conec Corp.	CDS26LFHDSN 163A16609X	Ontario, Canada 905-790-2200
		American Conec Corporation 102 Pheasant Wood Court Morrisville, NC 27560 (919) 460-8800

Note	A connector kit (part number **65362-4**) consisting of eight 26-pin high-density male connectors and back shells is available from Utah Scientific. Please contact your Utah Scientific representative for details.

Digital Video

The following table lists system digital video specifications:

Digital Video Specifications

Parameter	Specification
Jitter and all other specs.	Conforms to SMPTE 259M
Data rates	143, 177, 270, and 360 Mb/s
Input return loss	>15 dB, 6 MHz - 360 MHz
Input equalization up to 360 Mb/s	1000 ft. for 8281 cable
Signal level	800 mV $\pm$ 10 %
Output return loss	>15 dB, 6 MHz - 360 MHz
Output Reclocked	Auto or jumper-selectable bypass

Digital Audio

The following table lists system digital audio specifications:

Digital Audio Specifications

Parameter	Specification
Input Impedance, Balanced	$110\Omega \pm 20\%$, 100 kHz to 6.0 MHz
Input level minimum:	200 mVPP w/ > 50% Eye Pattern Opening
Input level maximum:	7 VPP
Common Mode Range:	$\pm$ 7V (DC + Peak Signal)
Common Mode Rejection:	> 30 dB, DC to 6.0 MHz
Output Impedance, Balanced	$110\Omega \pm 20\%$, 100 kHz to 6.0 MHz
Output Amplitude:	2.8 VPP into 110Ω
Nominal Rise/Fall Times:	25 nsec
Common Mode Rejection:	> 30 dB, DC to 6 MHz
Asynchronous Version	
Sample Rate:	8 kHz to 100 kHz
Synchronous Version	
Sample Rate:	48 kHz $\pm$ 400 ppm or 44.1 kHz $\pm$ 400 ppm
Intrinsic Jitter:	< 0.025 UI Peak, w/700 Hz HPF
Output Phasing, DARS Input:	$\pm$ 2.5% ($\pm$9°) of Frame Interval

Control

The following table lists system control specifications:

Control Specifications

Parameter	Specification
Panel control	1 U-Net communications port
Router control	1 MX Bus port
Serial control	1 RS232 port, 1 RS422 port
Sync	2 BNC
Ethernet	10Base-T

Power

The following table lists system power specifications:

Input Power Specifications

Parameter	Specification
AC supply	
Input power consumption:	120 W
Voltage:	90 - 240 VAC universal power supply
Frequency:	50 - 60 Hz
Redundancy:	Dual redundant power supplies (optional)
DC supply input voltage:	-36 V to -72 V DC
Standalone Control Panel AC Supply	
Voltage:	117-234 VAC, 30W
Panel input:	12V DC

Alarms

The following table lists system alarm specifications:

Alarm Specifications

Parameter	Specification
Primary alarm	ANSI / SMPTE 269M Fault reporting
	(Relay contact closure)
Connector type	3 terminal barrier strip
Maximum current	20 mA

Physical

The following table lists system physical specifications:

Physical Specifications

| Parameter	Specification
Width	EIA RS-310 - D 92 19" rack mount standard
Height	2 RU (3.5")
Depth	18" Max.
Weight	15 lb. Max.
Mounting	Front mount rack ears
	Optional Center mount rack adapter
System connectors	All connectors rear panel mounted
Cooling	Fan
Temperature Range	10 - 40 degrees Celsius
Humidity Range	0 - 90% (non condensing)

Regulatory

The following table lists system regulatory specifications:

Physical Specifications

| Parameter	Specification
EMC	EN50 081-1 (EN50 022 Class A)
Susceptibility	EN50 082 (IEC 801-3, IEC 801-4)
Safety	EN60 950, UL 1950, CSA 022.2 No. 234
Shock / Vibration	MI L Std. 810E, method 514.4
	(cargo truck 500/500 miles)

U-Net Cabling

This section provides information and specifications for U-Net cabling. The figure below illustrates an RJ-45 jack and its associated pins.
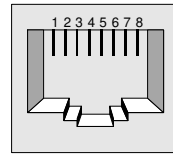
RJ-45 (U-Net) Female Connector

The figure below shows the standard wiring diagram for a standard "straight-through" Ethernet cable.
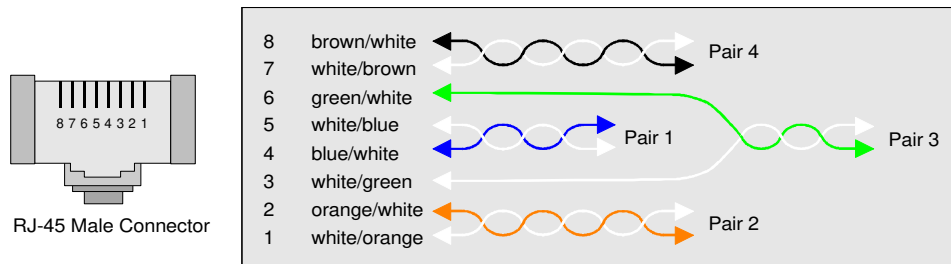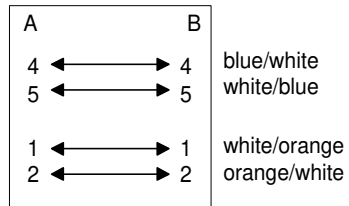

Standard Ethernet Cable Pairs

Important

It is imperative that wires in each of the pairs (1 and 2) remain in that pair in order to retain the balance properties of the cable.

- Pair 2, which resides on pins 1 and 2 of the RJ-45 jack, should occupy the white/orange and orange/white wires of the cable.

- Pair 1, which resides on pins 4 and 5, should occupy the white/blue and blue/white wires.

Category 5 UTP cable should be used as the cable grade. All wires must be connected at both ends of the cable. Failure to adhere to these guidelines will result in faulty U-Net communications.

UTAH-200 control panels are connected to the controller using a standard four pair straight-through Ethernet cable. Even though the cable for Ethernet and U-Net are the same, the actual pairs that are utilized for communications are different.

The U-Net cable utilizes pairs 1 and 2, as shown below. The pinout is also shown.

```
      A              B
  4 ◄────────► 4      blue/white
  5 ◄────────► 5      white/blue

  1 ◄────────► 1      white/orange
  2 ◄────────► 2      orange/white
```

U-Net Cable Pairs and Pinout

Up to 32 control panels can be connected to the UTAH-200 controller in a daisy-chain topology. The maximum cable length (for the entire chain) is 1000 feet. Refer to the "**Interconnecting Control Panels**" section in Chapter 2 for control panel connection instructions.

Pinouts

This section provides pinouts for the following connectors on the rear panel of the **Main Frame** and **Auxiliary Frames**:
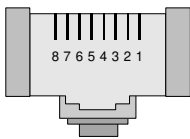
- U-Net
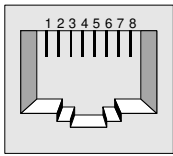- SMPTE Alarm
- RS422
- RS232
- Ethernet
- MX Bus

Please note:

- For specific pinouts of connectors on the **Controller Board**, refer to the "**Controller Board**" section in Appendix B, "**Hardware Specifics**."

- For pinouts of the audio input and output connectors on the Analog Audio Backplane, refer to the "**Installing Audio Inputs**" and "**Installing Audio Outputs**" sections in Chapter 2, "**Hardware Installation**."

U-Net Connector Pinouts

The table below lists pinouts for the **RJ-45** U-Net connector.
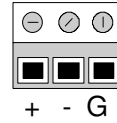
Male on Cable   Female on Chassis

U-Net Connector Pinouts

Pin #	Signal	Pin #	Signal
1	U-Net TE+	5	U-Net D+
2	U-Net TE-	6	Ground
3	Ground	7	Ground
4	U-Net D-	8	Ground

SMPTE Alarm Connector Pinouts

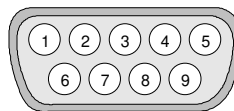The table below lists pinouts for the SMPTE Alarm connector.
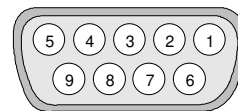

SMPTE Alarm Connector Pinouts

Pin #	Signal	Pin #	Signal
1	Ground	3	ALM+
2	ALM-		

RS422 Connector Pinouts

The table below lists pinouts for the RS422 connector.

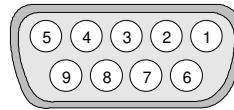Male on Cable   Female on Chassis

RS422 Connector Pinouts

Pin #	Signal	Pin #	Signal
1	Ground	6	Ground
2	RS422 TX+	7	RS422 TX-
3	RS422 RX-	8	RS422 RX+
4	Ground	9	Ground
5	no connection		

RS232 Connector Pinouts

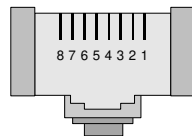The table below lists pinouts for the RS232 connector.
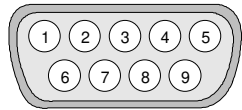
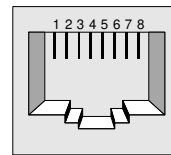Male on Cable   Female on Chassis

RS232 Connector Pinouts

Pin #	Signal	Pin #	Signal
1	Ground	6	RS232 DTR
2	RS232 TX	7	RS232 CTS
3	RS232 RX	8	RS232 RTS
4	RS232 DSR	9	no connection
5	Ground		

Ethernet Connector Pinouts

The table below lists pinouts for the **RJ-45** Ethernet connector when a **Network Hub** is used. Both ends of the cable are wired in an identical manner.
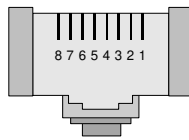

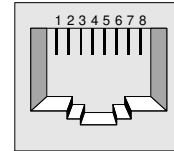Male on Cable   Female on Chassis

Ethernet Connector Pinouts — Network Hub Wiring

Pin #	Signal	Pin #	Signal
1	TX+	5	Ground
2	TX-	6	RD-
3	RD+	7	Ground
4	Ground	8	Ground

The table below lists pinouts for the **RJ-45** Ethernet connector when
Point-to-point "hubless" wiring is used (e.g., with the UTAH-200
connected directly to the PC — and no other connections). Both ends of
the cable are wired differently, with the transmit and receive pairs
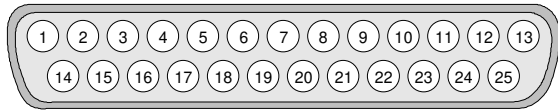swapped at one end..

Male on Cable   Female on Chassis

Ethernet Connector Pinouts — Point-to-point Wiring

Pin #	Signal	Pin #	Signal
Cable End "A"		**Cable End "B"**	
1	TX+	1	RD+
2	TX-	2	RD-
3	RD+	3	TX+
4	Ground	4	Ground
5	Ground	5	Ground
6	RD-	6	TX-
7	Ground	7	Ground
8	Ground	8	Ground

MX Bus Connector Pinouts

The table below lists pinouts for the MX Bus connector.

Male on Cable
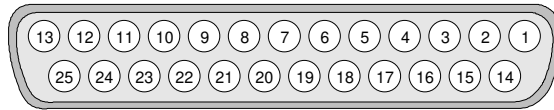
Female on Chassis

MX Bus Connector Pinouts

Pin #	Signal	Pin #	Signal
1	MXSTB OUT	14	Ground
2	MXDO	15	Ground
3	MXD1	16	Ground
4	MXD2	17	Ground
5	MXD3	18	Ground
6	MXD4	19	Ground
7	MXD5	20	Ground
8	MXD6	21	Ground
9	MXD7	22	Ground
10	no connection	23	Ground
11	no connection	24	Ground
12	no connection	25	Ground
13	+5V		

Appendix D. Remote Diagnostics

In This Appendix

This appendix provides important information about UTAH-200 remote system diagnosis.

Using the UTAH-200 Controller Diagnostic Port

This section provides details about the UTAH-200's diagnostic commands.

- The diagnostic serial port (9-pin "D" female) is located inside the chassis on the front of each controller card.

- Once connected to a terminal (9600 baud 8N1), the user can enter "**help**" to get the following list of commands:

UTAH-200 Diagnostic Commands

Command	Definition
SetIPAddr	Set IP address
GetIPAddr	Get IP address
GetAlarms	Get alarms *
EnableRMSSerial	Enable GUI serial port
DisableRMSSerial	Disable GUI serial port
EnableUDI	Enable UDI serial port
DisableUDI	Disable UDI serial port

*   This command has not been implemented.

The following section outlines the prompts associated with the serial enable/disable commands.

EnableRMSSerial

- Enter RMS serial port number (1 for RS232 port, 2 for RS422 port)

DisableRMSSerial

- Enter RMS serial port number (1 for RS232 port, 2 for RS422 port)

EnableUDI

- Enter UDI serial port number (1 for RS232 port, 2 for RS422 port)
- Enter baud rate:
- Enter character size (0 = 7E2, 1 = 8N1):
- Echo takes? (y/n):
- Echo changes? (y/n):
- Refresh? (y/n):
- Enable XON/XOFF? (y/n):

DisableUDI

- Enter UDI serial port number (1 for RS232 port, 2 for RS422 port)

Note that these commands are not case sensitive. The message "**Not allowed in standby mode**" appears if the serial cable is connected to the standby controller in a redundant system. The user should move the serial cable to the connector on the active board and re-enter the desired command.