

Installation, Configuration, and Operation Manual

Panacea[™] Series Frame and Modules

May 2011

Edition W

P-FR MAN



imaginecommunications.com

Publication Information

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Panacea Series Frame and Modules

Installation, Configuration, and Operation Manual

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About this Manual

Panacea is the remedy that the industry has long sought for the frustrating compromises traditionally associated with meeting small routing needs: Economical or flexible? Compact or multiformat? Affordable solution for today's routing requirements or sizeable investment into future-proofed technology? You couldn't have it all — until now.

The exciting Panacea product line encompasses an entirely new family of routing switchers.

- It's today's routing platform for tomorrow's next generation requirements.
- It's a future-proofed, economical and compact, easy to use, multi/mixed-format router, offering flexible configurations/options for utility and on-air applications.
- It's a piece of "glue" that fits your small routing needs today and provides you with the tools you need to embrace the future.

The Panacea routing switcher series is designed to add a new tier of up to 32×32 routing matrices.

Manual Information

This manual details the features, installation, operation, maintenance, and specifications for the Panacea frame and system configuration.

Intended Audience

This manual is written for technicians and operators responsible for installation, setup, maintenance, and/or operation of the product, and is useful to operations personnel for purposes of daily operation and reference.

Revision History

Table P-1 Revision History of Manual

Edition	Date	Comments
А	May 2003	Initial production release
В	June 2003	Corrected settings shown for NO/NC jumpers for the alarm port

Edition	Date	Comments
С	July 2003	Added instructions for installing a Panacea power supply mounting tray Added instructions for installing a Panacea integrated power supply
D	September 2003	Updated "Servicing a Panacea Product" information Added instructions for installing an enhanced resource module Updated instructions for replacing a fan module
E	October 2003	Added information about menu selections for Menu F, Menu H, Menu M, and Menu R Added information about timing mode options, and about simple and advanced matrix partitioning modes
F	June 2004	Added information concerning GVG ASCII and GVG SMPTE serial protocols Updated RS-422 serial control port pin assignments table Updated DIP switch information to show multi-matrix addressing mode
G	September 2004	Updated DIP switch information to show IP mode for enhanced modules Updated SET FIRSTLEVEL, SET FIRSTDESTINATION, AND SET FIRSTSOURCE commands
Н	October 2004	Updated SET SLEWRATE commands for both standard and enhanced modules Updated SHOW SLEWRATE command for enhanced modules
1	January 2005	Added integrated power supply specification information and DC power supply information
J	September 2005	Removed integrated power supply information Added module information in lieu of separate module-specific manuals Updated commands section into tabular format Added information concerning SNMP Agent for Panacea routers
К	October 2005	Added special instructions for dual matrix, same-signal format routing switchers
L	November 2005	Added section on troubleshooting communications issues
M	February 2006	Added information concerning AES asynchronous, synchronous, and cross-fade switching Added initial setup guide for protocol translation

 Table P-1
 Revision History of Manual (Continued)

Edition	Date	Comments
N	March 2006	Moved SNMP information to the Simple Network Management Protocol for Panacea and Edge Products Installation and Configuration Manual
0	June 2006	Removed initial setup guide for protocol translation
Ρ	October 2006	Add instructions for P-SCQ/P-HSCQ clean switch reclock mode setup and autotiming
Q	December 2006	Updated alarm information
R	June 2008	Added 3 Gb product information
S	April 2009	Added relay bypass information for P-HSCQ
Т	October 2009	Added information concerning use of Navigator software application
U	April 2010	Clarified use of XON/XOFF software flow control for enhanced resource module serial control
\vee	February 2011	Updated list of Terminal Commands and added Protocol Menu commands.
W	May 2011	Edits to DIP switch information in Chapter 3, Configuration and Chapter 6, Troubleshooting Communications Issues.

 Table P-1
 Revision History of Manual (Continued)

Applications The Panacea platform is ideal for space-constrained operations demanding full local and remote control capabilities in a routing solution.

Panacea products are perfect for

- Television production facilities
- Cable operators
- Production and post-production facilities
- Outside broadcast vans/trucks
- DBS satellite operations
- Webcasters
- Telcos where professional end-users require a small, flexible, high quality routing matrix with the ability to mix and match signal formats and/or signal processing functions within the same frame

Writing Conventions

To enhance your understanding, the authors of this manual have adhered to the following text conventions:

Table P-2	Writing	Conventions
-----------	---------	-------------

Term or Convention	Description
Bold	Indicates dialog boxes, property sheets, fields, buttons, check boxes, list boxes, combo boxes, menus, submenus, windows, lists, and selection names
Italics	Indicates E-mail addresses, the names of books or publications, and the first instances of new terms and specialized words that need emphasis
CAPS	Indicates a specific key on the keyboard, such as ENTER, TAB, CTRL, ALT, or DELETE
Code	Indicates variables or command-line entries, such as a DOS entry or something you type into a field
$>$ or \rightarrow	Indicates the direction of navigation through a hierarchy of menus and windows
hyperlink	Indicates a jump to another location within the electronic document or elsewhere
Internet address	Indicates a jump to a Web site or URL
	Indicates important information that helps to avoid and troubleshoot problems
To perform a procedure	Indicates the introduction to a procedure or series of procedural steps

Obtaining Documents

The installation and operation manuals for most Harris BCD products are included on your Documentation and Product Resources DVD as individual Adobe Acrobat PDF files. Most of the software applications contained on the DVD include Online Help (electronic documents integrated into their respective software applications). While working in the application, you can open the Online Help and print out individual topics. The most up-to-date documentation and software is always available on our website.

Unpacking/Shipping Information

Unpacking a Product

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This product was carefully inspected, tested, and calibrated before shipment to ensure years of stable and trouble-free service.

- 1 Check equipment for any visible damage that may have occurred during transit.
- 2 Confirm that you have received all items listed on the packing list.

- **3** Contact your dealer if any item on the packing list is missing.
- **4** Contact the carrier if any item is damaged.
- **5** Remove all packaging material from the product and its associated components before you install the unit.

Keep at least one set of original packaging, in the event that you need to return a product for servicing.

Product Servicing

The Panacea product line is not designed for extensive field service; however, some field service changes can be done on-site. The following list provides the types of field service changes allowable for a Panacea product. You can perform these field service changes yourself; instructions for performing these changes can be found on the indicated pages:.

- Installing an enhanced resource card in place of a standard resource card (pages 189– 193)
- Changing a fan module (not applicable in all formats) (pages 203–205)
- Installing an optional power supply mounting tray (pages 195–201)

You can perform these field service changes yourself; instructions for performing these changes are included with the equipment.

 Installing an optional integrated power supply mounting bracket assembly and integrated power supply

A Field Service representative must perform the following field services changes. (Alternatively, you may return your Panacea product to the Customer Service department for upgrade.) Contact your Customer Service representative for more information about these field service changes.

- Adding a local control panel
- Adding an optional submodule (for example, SDI reclocker submodule)

All other hardware upgrades, modifications, or repairs require you to return your Panacea product to the service center.

Product, Compliance, and Safety Standards

There are three different types of standards listed: product standards, compliance standards, and safety standards.

Product Standards

Analog Audio

ANSI/SMPTE RP120-

For Analog Audio Inter-Modulation Testing (IMD)

Analog Video

SMPTE170M

Composite Analog Video Signal-NTSC for Studio Applications

SMPTE240M

Signal Parameters 1125-Line High-Definition Production Systems

ITU-R BT.470-6

Conventional Television System

SMPTE PR168

Definition of Vertical Interval Switching Point for Synchronous Video Switching

Serial Digital Video

SMPTE 259M

SMPTE Standard for Television - 10-Bit 4:2:2 Component and 4fsc Composite Digital Signals - Serial Digital Interface

SMPTE 292M

SMPTE Standard for Television - Bit-Serial Digital Interface for High Definition Television Systems

SMPTE 344M

SMPTE Standard for Television - 540 Mb/s Serial Digital Interface

DVB-ASI

Digital Video Broadcasting Interfaces for CATV/SMATV Headends and Similar Professional Equipment

Clean/Quiet Switch

SMPTE 259M

SMPTE Standard for Television - 10-Bit 4:2:2 Component and 4f_{sc} Composite Digital Signals - Serial Digital Interface

SMPTE 272M

SMPTE Standard for Television - Formatting AES/EBU and Auxiliary Data into Digital Video Ancillary Data Space

SMPTE 292M

SMPTE Standard for Television - Bit-Serial Digital Interface for High Definition Television Systems

SMPTE 299M

SMPTE Standard for Television - 24-bit Digital Audio Format for HDTV Bit-Serial Interface

SMPTE 344M

SMPTE Standard for Television - 540 Mb/s Serial Digital Interface

DVB-ASI

Digital Video Broadcasting Interfaces for CATV/SMATV Headends and Similar Professional Equipment

AES Audio

Balanced Configuration

AES3-2003

AES Recommended Practice for Digital Audio Engineering — Serial Transmission Format for Two-Channel Linearly Represented Digital Audio Data

Unbalanced Configuration

AES3id-2001

AES Information Document for Digital Audio Engineering — Transmission of AES3 Formatted Data by Unbalanced Coaxial Cable

SMPTE 276M-1995

SMPTE Standard for Television — Transmission of AES-EBU Digital Audio Signals Over Coaxial Cable

Compliance Standards

Appendix A, Safety Precautions, Certifications and Compliances, contains compliance and safety standards.

Restriction on Hazardous Substances (RoHS) Directive

Directive 2002/95/EC—commonly known as the European Union (EU) Restriction on Hazardous Substances (RoHS)—sets limits on the use of certain substances found in electrical and electronic equipment. The intent of this legislation is to reduce the amount of hazardous chemicals that may leach out of landfill sites or otherwise contaminate the environment during end-of-life recycling. The Directive, which took effect on July 1, 2006, refers to the following hazardous substances:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr-V1)
- Polybrominated Biphenyls (PBB)
- Polybrominated Diphenyl Ethers (PBDE)

In accordance with this EU Directive, all products sold in the European Union will be fully RoHS-compliant and "lead-free." (See our website for more information on dates and deadlines for compliance.) Spare parts supplied for the repair and upgrade of equipment sold before July 1, 2006 are exempt from the legislation. Equipment that complies with the EU directive will be marked with a RoHS-compliant symbol, as shown in **Figure P-1**.



Figure P-1 RoHS Compliance Symbol

Waste from Electrical and Electronic Equipment (WEEE) Directive

The European Union (EU) Directive 2002/96/EC on Waste from Electrical and Electronic Equipment (WEEE) deals with the collection, treatment, recovery, and recycling of electrical and electronic waste products. The objective of the WEEE Directive is to assign the responsibility for the disposal of associated hazardous waste to either the producers or users of these products. Effective August 13, 2005, producers or users are required to recycle electrical and electronic equipment at end of its useful life, and must not dispose of the equipment in landfills or by using other unapproved methods. (Some EU member states may have different deadlines.)

In accordance with this EU Directive, companies selling electric or electronic devices in the EU will affix labels indicating that such products must be properly recycled. (See our website for more information on dates and deadlines for compliance.) Contact your local sales representative for information on returning these products for recycling. Equipment that complies with the EU directive will be marked with a WEEE-compliant symbol, as shown in **Figure P-2**.



Figure P-2 WEEE Compliance Symbol

Safety Standards

Carefully review all safety precautions to avoid injury and prevent damage to this product or any products connected to it. You will find a complete list of safety precautions in **Appendix A**. Any user-serviceable components (such as fuses or batteries) are only replaceable by those components listed in the manual.

IMPORTANT! Only qualified personnel should perform service procedures.

Safety Terms and Symbols in this Manual



WARNING: Statements identifying conditions or practices that may result in personal injury or loss of life. High voltage is present.



CAUTION: Statements identifying conditions or practices that can result in damage to the equipment or other property.

1 Introduction

Panacea Frame Information

The Panacea family of routers is available in 1RU and 2 RU frame sizes. They share a wide array of routing matrices and provide hooks for redundant power, control, and extended processing modules. The frame architecture provides both front and rear rack attachment capabilities, which allows for complementary front-racked local control in the same rack space, as well as more flexible systemization.

Product Description

Both frame sizes include a power supply, a resource module, a serial control port, a looping coaxial (X-Y) control port, and a looping sync input. Either frame may be equipped with an optional local control panel.



Figure 1-1 Panacea Frame Architecture

All of the control modules attach to the inside of the front panel of the frame's metal work. When attached, they provide control and monitoring communications; access to the communication connectors (X-Y, serial, and Ethernet); reference timing information; and get necessary power through a connector to the module interconnect. All control and monitoring of the core routing module is through a "get and set" protocol using a parallel data and addressing scheme (see **Figure 1-2**).



Figure 1-2 Control/Communications Architecture

Main Features

All products in the Panacea series have following features:

- Include matrix sizes from 8×8 up to 16×16 audio/video routing in a 1RU frame and matrix sizes from 8×8 up to 32×32 audio/video routing in a 2RU frame (the 2RU frame allows for a single 32× module or multiple 16× or 8× modules)
- Support a wide variety of supported signal types:
 - Analog audio
 - Analog video
 - □ AES audio
 - Standard definition serial digital video
 - High definition serial digital video
- Allow "mix-and-match" of different signal types in the same 2RU frame
- Provide optional clean switching of S and HS video
- Provide optional quiet switching of AES/EBU signals
- Allow control via local panel, RS-232/RS-422, X-Y, or IP/Ethernet

- Incorporate signal diagnosis capabilities (signal presence, error detection, and so forth)
- Come with several power supply choices:
 - **D** Standard single or redundant AC desktop power supply
 - Optional hot-swappable internal AC or DC power supply with redundancy available in 2RU frames

Frame Sizes and Types

The Panacea series has two frame sizes: 1RU (see **Figure 1-3**) and 2RU (see **Figure 1-4**). The 2RU size can accommodate any two 1RU back panels of any signal format or combination of signal formats, and has different options available for customizing. (Some aspects of frame customization and matrix size specifics are discussed in detail in each signal format's individual manual). **Table 1-1** on page 13 provides dimensions, module and signal capacity, standard equipment, and options for both 1RU and 2RU frame sizes.



Figure 1-3 Panacea 1RU Frame



Figure 1-4 Panacea 2RU Frame

 Table 1-1
 Dimensions, Module and Signal Capacity, Standard Equipment, and Options

Architecture	1RU	2RU
Dimensions		
Width	19 in. (48.3 cm)	19 in (48.3 cm)
Depth	5.25 in. (13.3 cm)	5.25 in. (13.3 cm)
Height	1.75 in. (44 cm)	3.5 in. (88 cm)
Cabinet Size	19 in. (48.3 cm)	19 in. (48.3 cm)
Matrix Module Capacity	1	2 1RU units or 1 2RU unit
Signal Capacity	No. Matrix Sizes	
One signal type	Yes	Yes
Two signal types	No	Yes
Standard Equipment		
Desktop power supply	1	1

Architecture	1RU	2RU
Logic control module	1	1
Upgrade Options		
Redundant desktop power supply	Yes	Yes
Integrated AC power supply	Yes	Yes
Integrated DC power supply	Yes	Yes
Redundant integrated AC power supply	No	Yes
Redundant integrated DC power supply	No	Yes
Fan module (HS, S, A2 only)	1	1

 Table 1-1
 Dimensions, Module and Signal Capacity, Standard Equipment, and Options (Continued)

Frame Modules

Note: Information on specific Panacea modules starts on page 22

The module types installed in the Panacea frame are as follows:

- Core Routing Module (BP Back Panel)
- Module Interconnect (MI)
- Resource Module
- Power Supply Module
- Fan Module

The frame's modular components are highlighted in Figure 1-1 on page 11.

The frame supports deeper module sizes for future extended functionality. Also, the supported matrices co-reside within the frame, thus allowing for an integrated solution (for example, 8×8 SDI and 8×8 AES within the same 2RU frame, built and configured before shipping).

A power/alarm LED and a link LED are present on all control modules.

- The power/alarm LED is illuminated green when power is present. If the power LED is not lit, one or more of the supply rails on the module is invalid.
- The link LED is illuminated yellow when an Ethernet connection is made and maintained.



Note: While the link LED is on each frame, it is active only on a frame with an enhanced resource module for Ethernet communications.

The location of these LEDs is shown in Figure 1-3 on page 13 and Figure 1-4 on page 13.

Core Routing Module (BP – Back Panel)



Figure 1-5 Core Routing Module

The core routing module (back panel) combines input, output, control, and switching circuitry for base functionality. This architecture allows for reduced component usage.

Module Interconnect (MI)



Figure 1-6 Module Interconnect

The module interconnect (MI) provides communications, power conversion, and reference conditioning for both the resource module and the core router module. It also provides control connectivity between the resource module and the core routing module. The MI monitors and controls the single relay alarm for power loss, fan failure, or other alarms.

Flash Memory Module



Figure 1-7 Flash Memory Module

The flash memory module houses the operating system software for Panacea series products. It includes the software necessary for updating protocols.

Resource Module



Figure 1-8 Resource Module

The resource module provides control and monitoring communications; access to the communication connectors (X-Y, serial, and Ethernet); reference timing information; and gets necessary power through a connector to the MI module. All control and monitoring to the core routing section of the core routing module is through a "get and set" protocol using a parallel data and addressing scheme. While advanced communications and associated control applications enable complete configuration, all configurable items are accessible through the serial port interface.

A local or remote control panel can also be attached to either the standard resource module or the enhanced resource module. (The P16SCQ/P16HSCQ clean/quiet switch product has its own control panel, the R(PL)CP-32×8CQp. See page 47 for more information about this control panel.)

The resource module is available in two options: standard and enhanced.

Standard Resource Module

The standard resource module provides basic switching, monitoring, and configuring of each core routing module. This control is through a non-specific protocol supporting physical destination to source routing (port-to-port routing in some applications), partitioning, and simple alarm monitoring. All information from each supported module is available through the serial port.

Enhanced Resource Module

The enhanced resource module provides the same basic switching, monitoring, and configuration that the standard resource module provides, but with the addition of Ethernet connectivity and extended control and monitoring features. Some of these features include software partitioning, telnet, and real-time alarm/signal monitoring. This control uses the same non-specific protocol supporting physical destination to source routing, partitioning, and simple alarm monitoring for core functionality. All information from each supported module is still available through the serial port, but further information is present to applications interfacing with the Ethernet domain.

The enhanced resource module can be installed at the manufacturing facility; however, you can replace a standard resource module with an enhanced resource module yourself, if desired. See **Appendix G**, *Enhanced Resource Module Installation* for enhanced module installation instructions.

Power Supply Module

Desktop Power Supply Module





Each Panacea router comes with a desktop power supply module as a standard feature. The power supply module is equipped with a universal input. The universal AC input version operates from 100 VAC through 240 VAC, which it converts to a 15V DC rail providing 70 W (for 1RU) or 130 W (for 2RU) of output power. This efficiently supports the core routing module, the standard, or the enhanced resource module, and any control panel that may be present. Because all frames have at least two power supply connectors, and because all necessary current sharing components are located internally to the frame, all you have to do is plug in a second desktop power supply for redundancy.

The Panacea desktop power supply module has a thermostatically controlled cooling fan built into it. The cooling fan turns on and off automatically to control the power supply's operating temperature.

Optional Power Supply Mounting Tray



Figure 1-10 Power Supply Mounting Tray

The Panacea product line includes an optional power supply mounting tray, which allows you to mount up to seven 1RU desktop power supplies or up to five 2RU desktop power supplies. You can mount a combination of 1RU and 2RU power supplies on the same tray. This power supply mounting tray can be forward- or rear-mounted into a regular frame rack. You can install the power supply mounting tray yourself, if desired. See **Appendix H**, *Power Supply Mounting Tray Installation* for instructions.

Optional Integrated Power Supply Mounting Bracket Assembly and Integrated Power Supply (AC or DC)



Figure 1-11 Integrated Power Supply Mounting Bracket Assembly and Integrated Power Supplies (2RU Version Shown)

The integrated power supply mounting bracket assembly extends the frame by attaching to the metalwork and aligning with the power connector used for the desktop power supplies. It can house any combination of the two available integrated power supplies (AC or DC). These two separate power supplies are equipped with either universal AC (90 VAC to 264 VAC) inputs or with DC (-42 VDC to -60 VDC) inputs. This allows you to have up to two¹ integrated, hot-swappable power supplies for mission-critical applications. The power supply module supplies 105 W at 15 VDC. Usually, it is installed at the manufacturing facility; however, you can install or replace the Power supply mounting bracket assembly and integrated power supply yourself, if desired. (Installation instructions and specifications are included as part of the power supply bracket assembly package.)

Fan Module



Figure 1-12 Fan Module (1RU Fan Module Assembly Shown)

The fan module is only necessary in with certain formats (for example, analog audio and HS). It is installed at the manufacturing facility; however, you can replace the fan module yourself if desired. See **Appendix I**, *Fan Module Replacement* for instructions.

Control Features

The Panacea series modular routing switchers are compatible with all existing Harris routers and control panels. Panacea frames include the following control options:

¹ Only one integrated supply is available in a 1RU frame.

- A standard serial port for communication to/from from computers and automation systems (configurable for RS-232 or RS-422)
- One looping coaxial (X-Y) port for connecting to remote control panels and other routers
- Support for up to 115K baud serial communications
- One loop-through port for the connection for a synchronization signal
- An Ethernet port (available with enhanced resource module only)
- A local control panel (LCP) option
- A software-based control system

Front Panel Options

A Panacea frame can be configured with any one of the following front panel styles:

- A blank front with green power indicator LED (standard); the LED is illuminated if power is applied to frame (a link LED is also present, but only enabled with enhanced Ethernet communications)
- An optional local control panel¹

(Some Panacea front panel units do not have supporting hinges. Consequently, if the front panel face plate is removed and not handled properly, it can fall with sufficient force to dislocate and/or damage the ribbon cable attached to the resource module connector. When removing the front panel, hold the face plate firmly to ensure that it does not become damaged.)

Figure 1-13 shows examples of the front panel options available for the 1RU frame. **Figure 1-14** shows an example of the front panel options available for the 1RU P16SCQ/ P16HSCQ clean/quiet switch. **Figure 1-15** shows examples of the front panel options for the 2RU frame.

Blank front panel with power LED (standard)



Figure 1-13 1RU Front Panel Options

¹ You may use any Harris control panels except the ABAp panel series, 12×2HADESC2, and 32×8p. Additionally, the P16SCQ/P16HSCQ clean/quiet switch product has its own control panel, the R(PL)CP-32X8CQp. Visit our Web site or see your dealer for more information about the programmable panel series.

Blank front panel with power LED (standard)





Figure 1-14 1RU P16SCQ/P16HSCQ Clean/Quiet Switch Front Panel Options

Blank front panel with power LED (standard)

PANACEA		POWERI
		UP LINK
Ð	5	ARRIS *

Local control front panel (optional)

PANACEA 32X32		÷ 0
		2
		HARRIS Q

Figure 1-15 2RU Front Panel Options¹

Software-Based Control Systems

Configuration Modes

The Panacea standard module can be configured in these modes:

- DIP switch mode² for basic matrix switching on the X-Y bus with Harris protocol
- Program mode² for using other protocols, matrix partitioning, non-typical offsetting, or a variety of starting levels

The Panacea enhanced module can be configured in these modes:

- DIP switch mode for basic matrix switching on the X-Y bus with Harris protocol
- Program mode for using other protocols, matrix partitioning, non-typical offsetting, or a variety of starting levels

The enhanced module uses two sub-modes under Program mode: simple partitioning mode³ and advanced partitioning mode³.

- Simple partitioning mode is used when customizing a Panacea router using terminal commands.
- Advanced partitioning mode is used when customizing a Panacea router using software such as RouterMapper.

These modes allow the Panacea to be a part of any signal routing system.

¹ The P16SCQ/P16HSCQ clean/quiet switch is not available as a 2RU model.

² See page 92 for a more detailed explanation of DIP switch and Program modes.

³ See page 61 for a more detailed explanation of simple and advanced partitioning modes.

Configuration Utility

The configuration utility for programming the Panacea for operation is RouterMapper[™], an easy-to-use Windows[®]-based application for programming RouterWorks[®], other router frames, control panels, and the Opus[™] master controller.

Control Software

There are several options available to control your Panacea system:

- Navigator[™], an application that allows you to easily create custom browser pages that represent your network and its various environments around the world.
- RouterWorks, a Windows[®]-based 32 bit control system. RouterWorks uses a graphic user interface to improve the manageability and ease of use of the control system.

For more information on installing your Panacea system, see **Chapter 2**. For more information on configuring your Panacea system, see **Chapter 3**. For more information on operating your Panacea system, see **Chapter 4**.

Panacea Module Information

The Panacea product line consists of expandable, modular routing switchers with the capability to meet the multiple format signal switching requirements of today's market. Panacea routing switchers are available in these formats:

- Analog audio
- Analog video
- Standard definition/multirate
- Clean/quiet switch
- AES audio

Each module format is described below. Any specialized installation procedures are described in **Chapter 2**. Any specialized configuration procedures are described in **Chapter 3**. All module specification information is contained in **Chapter 7**.

The Panacea product line is not designed for extensive field service. See *Product Servicing* on page 5 for the types of allowable field service changes. Any other upgrades or modifications to this product, except for software enhancements, must be done at the service center.

Analog Audio Routing Switchers

The Panacea analog audio routing switcher features high impedance (> $20K\Omega$) or 600Ω balanced inputs, and 66Ω or 600Ω balanced outputs terminated using standard DB-25 connectors in blocks of eight channels. While economical, the Panacea analog audio router boasts many features found in more expensive models, including professional audio quality specifications, stereo output signal presence detection, loss of power alarms and GPI contact closure, a number of different matrix sizes available in both 1RU and 2RU configurations, support for married stereo or dual monaural breakaway control, and the ability to mix different signal formats in the 2RU frame. See **Table 1-2** on page 23 for a list of the matrix options available for this Panacea product.

Matrix Sizes

Matrix Size	Functionality	1RU Frame	2RU Frame
8×8	Dual mono or married stereo	Yes	Yes
2×8 (DA)	With auto-changeover	Yes	Yes
2×16 (DA)	With auto-changeover	Yes	Yes
16×1	Dual mono or married stereo with four copies of the output	Yes	Yes
16×4	Dual mono or married stereo	Yes	Yes
16×8	Dual mono or married stereo	Yes	Yes
16×16	Dual mono or married stereo	Yes	Yes
32×1	Dual mono or married stereo with four copies of the output	No	Yes
32×4	Dual mono or married stereo	No	Yes
32×16	Dual mono or married stereo	No	Yes
32×32	Dual mono or married stereo	No	Yes

Table 1-2 Analog Audio Matrix Sizes

Major Components

Core Routing Module

The analog audio core routing module board contains a 16×16 (or a 32×32) crosspoint matrix board, with a separate back panel PCB with the input receivers, and output drivers. See page 15 for more information about the core routing module.

Module Interconnect

The module interconnect provides communications, power conversion, and reference conditioning for both the logic control module and the core router module. It also provides control connectivity between the control module and the core router module. This module monitors and controls the single relay alarm for power loss or fan failure. The Alarm jumper, which sets the normally open/normally closed operation of the alarm port, is located on the module interconnect. See page 15 for more information about the module interconnect.

Back Panel

The analog audio back panel I/O modules use up to 16 D-Type 25-pin connectors. **Figure 1-16** on page 23 shows the back panel input modules for analog audio sources.



Figure 1-16 Analog Audio Back Panel I/O Modules (P-16×16A2 shown)

Monitoring and Control

The Panacea analog audio routing switcher can be monitored and controlled through any one of various means. It can be controlled locally via the front panel control option or remotely via serial, X-Y, or Ethernet with a variety of software packages, including RouterWorks[®], Navigator™, and Pilot™. The various monitoring and control options provide a means to manage the switching of video and/or audio signals through this product as well as communicate the status of the input and output signals. The monitoring/ alarm capabilities of this product enable you to act accordingly as the result of an alarm condition, should one arise. See page 66 for alarm configuration details.

Power Conversion and Distribution

The external power supply converts 100VAC through 240VAC to +15VDC, which is then supplied to the MI module. The +15V is applied to DC-DC converters on the P-A2-SB module, which produces the +17V, +12V, +5V, -17V, -12V, and -5V rails required by the core routing module.

A green LED on the front of the logic control module indicates that power is present in the Panacea frame, but does not guarantee that all rails are present and within required voltage limits.

Control and Communications

The logic interface circuit allows the Panacea analog audio routing switcher module to communicate with the Panacea system controller. In addition to addressing the crosspoint matrix, the logic interface circuit also provides the system controller with information about the system status. Matrix size, module type, firmware revision level, input signal presence, and other information is provided to the system controller through the logic interface. Information about the core routing module can be viewed with a terminal or computer connected to the Panacea system controller via the serial port.

Signal Flow

Figure 1-17 on page 25 shows a signal flow diagram for the analog audio routing switcher.



Configuration Information

The analog audio module requires no additional procedures for configuring DIP switches and the alarm port beyond those described for frame configuration. Frame DIP switch and alarm port configuration is described on page 65 - 70. There are special configuration procedures for configuring the stereo ("married)/dual mono ("independent") matrix mode jumpers; see page 74 for details.

Installation Information

All internal modules are installed at the manufacturing facility.

Special Instructions for Dual Matrix, Same-Signal Format Panacea Routing Switchers

Matrix Partitioning

Panacea dual matrix routing switchers with the same format (for example, two 16×16 stereo audio matrices in a single 2RU frame) are partitioned from larger Panacea back panel configurations prior to shipment. The two matrices are automatically assigned to levels 0 and 1. You can change the starting level in Panacea routing switchers as follows:

- If your Panacea uses a standard resource card (P-RESL), the level setting is always consecutive for each matrix within the same frame. The starting level setting can be changed via the SET FIRSTLEVEL terminal command (see SET FIRSTLEVEL on page 151).
- If your Panacea uses an enhanced resource card (Ethernet-enabled P-RESH), the levels can be "married" via the SET FIRSTLEVEL and SET MPPARM terminal commands (see SET FIRSTLEVEL on page 172 and SET MPARM on page 165).

Model Numbers and Descriptions

 Table 1-3 provides the model numbers and descriptions for all analog audio dual matrix,

 same-signal format Panacea routing switchers.

Model Number	Description
P16×16A2A2xx	16×16 dual stereo audio routing switcher
P8×8A2A2xx	8×8 dual stereo audio routing switcher
P16×1A2A2xx	16×1 dual stereo audio routing switcher
P16×4A2A2xx	16×4 dual stereo audio routing switcher
P16×8A2A2xx	16×8 dual stereo audio routing switcher

Table	1-3	Analog Audic	Signal	Formats
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Analog Video Routing Switchers

Main Features

Supports a wide bandwidth (greater than 200 MHz)

- Provides excellent video performance
- Allows minimum propagation delay
- Includes a wide range of applications (see Table 1-4)

Matrix Sizes

Table 1-4 Analog Video Matrix Sizes

Matrix Size	1RU Frame	2RU Frame
8×8	Yes	Yes
16×1	Yes	Yes
16×4	Yes	Yes
16×8	Yes	Yes
16×16	Yes	Yes
32×1	No	Yes
32×4	No	Yes
32×8	No	Yes
32×16	No	Yes
32×32	No	Yes

Major Components

Core Routing Module

The analog video core routing module board contains a 16×16 (or a 32×32) crosspoint matrix, input receivers, and output drivers. See page 15 for more information about the core routing module.

Module Interconnect

The module interconnect provides communications, power conversion, and reference conditioning for both the logic control module and the core router module. It also provides control connectivity between the control module and the core router module. This module monitors and controls the single relay alarm for power loss or fan failure. The Alarm jumper, which sets the normally open/normally closed operation of the alarm port, is located on the module interconnect. See page 15 for more information about the module interconnect.
Back Panel

The analog video back panel I/O modules use up to 32 BNC connectors for inputs and up to 32 for outputs. These BNCs are positioned as shown **Figure 1-18** on page 28.



Figure 1-18 Analog Video Back Panel I/O Module Pin Connectors (P-32×32V shown)

Signal Data Rate

Panacea analog video routing switchers are capable of switching composite and component analog video RF, IF, and other signals within the amplitude and bandwidth limitation.

Switching Point

The Panacea analog video routing switcher has a sync input on the rear panel. A video reference signal can be fed to this module so that synchronous switching can be achieved. It is possible for the user to set a variable time delay before the switching is made so that critical switching occurs at the proper interval. The sync signal can be NTSC or PAL.

Monitoring and Control

The Panacea analog video routing switcher can be monitored and controlled through any one of various means. It can be controlled locally via the front panel control option or remotely via serial, X-Y, or Ethernet with a variety of software packages, including RouterWorks[®], Navigator[™], and Pilot[™]. The various monitoring and control options provide a means to manage the switching of video and/or audio signals through this product as well as communicate the status of the input and output signals. The monitoring/ alarm capabilities of this product enable you to act accordingly as the result of an alarm condition, should one arise. See page 66 for alarm configuration details.

Power Conversion and Distribution

The external power supply converts 100VAC through 240VAC to +15VDC, which is then supplied to the MI module. The +15V is applied to DC-DC converters, which produces the +5V and +3.3V rails required by the core routing module.

A green LED on the front of the logic control module indicates that power is present in the Panacea frame, but does not guarantee that all rails are present and within required voltage limits.

Control and Communications

The logic interface circuit allows the Panacea analog video routing switcher module to communicate with the Panacea system controller. In addition to addressing the crosspoint matrix, the logic interface circuit also provides the system controller with information about the system status. Matrix size, module type, firmware revision level, input signal presence, and other information is provided to the system controller through the logic interface. Information about the core routing module can be viewed with a terminal or computer connected to the Panacea system controller via the serial port.

Signal Path

Each signal path consists of an input buffer, crosspoint matrix, and output drivers. The input buffer provides an excellent return loss. The 16×16 analog video crosspoint IC supplies the matrix (single in 1RU, 4 in 2RU). The driver amplifier delivers analog video to a 75Ω coaxial cable.

Signal Flow

Figure 1-19 shows a signal flow diagram for the analog video routing switcher.



Figure 1-19 Signal Flow Diagram of the Analog Video Routing Switcher

Configuration Information

The analog video module requires no additional procedures for configuring DIP switches and the alarm port beyond those described for frame configuration. Frame DIP switch and alarm port configuration is described on page 65 - 70.

Installation Information

All internal modules are installed at the manufacturing facility.

Special Instructions for Dual Matrix, Same-Signal Format Panacea Routing Switchers

Matrix Partitioning

Panacea dual matrix routing switchers with the same format (for example, two 16×16 analog video matrices in a single 2RU frame) are partitioned from larger Panacea back panel configurations prior to shipment. The two matrices are automatically assigned to levels 0 and 1. You can change the starting level in Panacea routing switchers as follows:

- If your Panacea uses a standard resource card (P-RESL), the level setting is always consecutive for each matrix within the same frame. The starting level setting can be changed via the SET FIRSTLEVEL terminal command (see SET FIRSTLEVEL on page 151).
- If your Panacea uses an enhanced resource card (Ethernet-enabled P-RESH), the levels can be "married" via the SET FIRSTLEVEL and SET MPPARM terminal commands (see SET FIRSTLEVEL on page 172 and SET MPARM on page 165).

Model Numbers and Descriptions

Table 1-5 provides the model numbers and descriptions for all analog video dual matrix,same-signal format Panacea routing switchers.

Model Number	Description
P16×16VVxx	16×16 dual analog video routing switcher
P8×8VVxx	8×8 dual analog video routing switcher
P16×1VVxx	16×1 dual analog video routing switcher
P16×4VVxx	16×4 dual analog video routing switcher
P16×8VVxx	16×8 dual analog video routing switcher

 Table 1-5
 Analog Video Signal Formats

Serial Digital Video Routing Switchers (3 Gb/HS/S/R)

The Panacea multirate and standard definition serial digital video routing switcher is available with clean switch and reclocking options. You can determine the format by the way the router part number is configured:

- 3 Gb serial digital video routing switchers include an "3Gb/s" sticker next to the part number (for example, P16×16HSI **3Gb/s**)
- Multirate serial digital video routing switchers include an "HS" suffix in the part number (for example, P8×8HS)
- Standard definition serial digital video routing switchers include an "S" suffix in the part number (for example, P8×8S)
- 3 Gb, multirate, or standard definition serial digital video routing switchers with a reclocking option include an "R" suffix in the part number (P16×1HSR; P16×1SR; P16×16HSR 3Gb/s)

The 3 Gb/HS/S/R serial digital video routing switcher can accommodate an external sync input on the rear panel so that synchronous switching can be achieved. The sync signal can be NTSC or PAL.

The 3 Gb/HS/S/R can be monitored and controlled locally or remotely.

- It can be controlled locally via the front panel control option.
- It can be controlled remotely via serial, Harris X-Y coax control, or Ethernet.

The 3 Gb/HS/S/R is capable of operating on a range of all SMPTE-defined standard and high definition data rates. See **Table 1-9** on page 38 for a list of data rates for 3 Gb/HS/S/R serial digital video routing switchers

The 3 Gb/HS/S/R is offered in a one-rack unit (1RU) and a two-rack unit (2RU) frame. (For those applications that require larger matrices, consider using the Integrator Series routing switcher system.) The supported matrix sizes are listed in **Table 1-7** on page 34 and **Table 1-6** on page 32.

Multiple copies of the output(s) are available on some matrix options. For example, in a 1RU, you can select a 16×4 to operate as a normal 16×4, as a 16×2 with dual outputs, or as a 16×1 with quad outputs. Similarly, in the 2RU frame, you can select a 32×4 to operate as a normal 32×4, as a 32×2 with dual outputs, or as a 32×1 with quad outputs.

Submatrices, Separate Mode, and Married Mode

You can partition 3 Gb/HS/S/Rs into smaller submatrices. For example, you can partition a 32×4 into two 16×2s, four 8×1s, dual 32×2s, or quad 32×1s. When you partition a routing matrix, you can also select the submatrices to function as separate or married units.

- When you set the submatrices to perform in separate mode, the individual submatrices are operated and controlled as smaller, separate routers.
- When you set the submatrices to perform in married mode, the individual submatrices operate in unison. This means when an input or output is selected on any one of the submatrices, the corresponding input or output is selected on all submatrices. This mode of operation can be very convenient when routing component video, for example. It is also possible to mix and match signal formats. This way, a video matrix and an audio matrix can be housed in the same frame. Multiformat configurations can only be achieved in a 2RU frame. When configured as a multiformat product the maximum matrix size for each format is 32×4.

Main Features

- High quality multirate and standard definition serial digital video routing with enhanced control and monitoring capabilities
- Reclocking available as an option
- Multi-format matrix configurations
- Supported signal types (270 Mb/s to 2.97 Gb/s):
 - □ SMPTE 259M 143, 177, 270, and 360 Mb/s
 - □ SMPTE 344M 540 Mb/s
 - □ SMPTE 292M 1.485 Gb/s
 - □ SMPTE 424M 2.97 Gb/s
- Standards of operation
 - **□** 525 60/1.001
 - **a** 625 50
 - □ 720p 60/1.001
 - □ 720p 60

- □ 1080i 50
- **1**080i 60/1.001
- □ 1080i 60
- □ 1080p 30/1.001
- □ 1080p 60/1.001
- (HS/S) Reclock SMPTE 259M, SMPTE 344M, and SMPTE 292M bit rates
- (3 Gb) Reclock 270 Mb/s, 1.485 Gb/s, and 2.97 Gb/s bit rates
- Bypass operation for signals at non-traditional video rates
- Auto equalize all inputs up to 2.97 Gb/s
- BOS/Pilot integrated control capabilities
- Remote control via Ethernet (available with enhanced module only)
- Remote monitoring and configuration
- NTSC/PAL/HD analog reference acceptable for switching
- High quality wideband video routing with enhanced control and monitoring capabilities

Matrix Sizes

Table 1-6 Standard Definition (S) Matrix Sizes

Name	Reference	Configurable as
P8×85	8×8 standard serial digital video router	8×8 2-4×4 4-2×2
P8×8SR	8×8 standard serial digital video router with reclocking	8×8 2-4×4 4-2×2
P16×1S	16×1 standard serial digital video router	16×1
P16×1SR	16×1 standard serial digital video router with reclocking	16×1
P16×4S	16×4 standard serial digital video router	16×4 2-8×2 4-4×1 16×2 (dual output) 16×1 (quad output)
P16×4SR	16×4 standard serial digital video router with reclocking	16×4 2-8×2 4-4×1 16×2 (dual output)
P16x8S	16×8 standard serial digital video router	16×8 2-8×4 4-4×2 8-2×1
P16×8SR	16×8 standard serial digital video router with reclocking	16×8 2-8×4 4-4×2 8-2×1

Name	Reference	Configurable as
P16×165	16×16 standard serial digital video router	16×16 2-8×8 4-4×4 8-2×2
P16×16SR	16×16 standard serial digital video router with reclocking	16×16 2-8×8 4-4×4 8-2×2
P32×1S	32×1 standard serial digital video router	32×1
P32×1SR	32×1 standard serial digital video router with reclocking	32×1
P32×4S	32×4 standard serial digital video router	32×4 2-16×2 4-8×1 32×2 (dual output) 32×1 (quad output)
P32×4SR	32×4 standard serial digital video router with reclocking	32×4 2-16×2 4-8×1 32×2 (dual output) 32×1 (quad output)
P32×85	32×8 standard serial digital video router	32×8 2-16×4 4-8×2 8-4×1
P32×8SR	32×8 standard serial digital video router with reclocking	32×8 2-16×4 4-8×2 8-4×1
P32×165	32×16 standard serial digital video router	32×16 2-16×8 4-8×4 8-4×2 16-2×1

Table 1-6 Standard Definition (S) Matrix Sizes (Continued)

Table 1-6 Standard Definition (S) Matrix Sizes (Co	(Continued)
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Name	Reference	Configurable as
P32×16SR	32×16 standard serial digital video router with reclocking	32×16 2-16×8 4-8×4 8-4×2 16-2×1
P32×32S	32×32 standard serial digital video router	32×32 2-16×16 4-8×8 8-4×4 16-2×2
P32×32SR	32×32 standard serial digital video router with reclocking	32×32 2-16×16 4-8×8 8-4×4 16-2×2

Iddle I-7 IVIUIUI dle (ID) IVIdui X SIZE	Table 1-7	Multirate	(HS)	Matrix	Sizes
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Name	Reference	Configurable as
P8×8HS	8×8 multirate serial digital video router	8×8 2-4×4 4-2×2
P8×8HSR	8×8 multirate serial digital video router with reclocking	8×8 2-4×4 4-2×2
P16×1HS	16×1 multirate serial digital video router	16×1
P16×1HSR	16×1 multirate serial digital video router with reclocking	16×1
P16×4HS	16×4 multirate serial digital video router	16×4 2-8×2 4-4×1 16×2 (dual output) 16×1 (quad output)
P16×4HSR	16×4 multirate serial digital video router with reclocking	16×4 2-8×2 4-4×1 16×2 (dual output) 16×1 (quad output)
P16×8HS	16×8 multirate serial digital video router	16×8 2-8×4 4-4×2 8-2×1
P16×8HSR	16×8 multirate serial digital video router with reclocking	16×8 2-8×4 4-4×2 8-2×1

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Name	Reference	Configurable as	
P16×16HS	16×16 multirate serial digital video router 2-8×8 4-4×4 8-2×2		
P16×16HSR	16×16 multirate serial digital video router16×16with reclocking2-8×84-4×44-4×48-2×2		
P32×1HS	32×1 multirate serial digital video router	32×1	
P32×1HSR	32×1 multirate serial digital video router with reclocking	32×1	
P32×4HS	32×4 multirate serial digital video router	32×4 2-16×2 4-8×1 32×2 (dual output) 32×1 (quad output)	
P32×4HSR	32×4 multirate serial digital video router with reclocking	32×4 2-16×2 4-8×1 32×2 (dual output) 32×1 (quad output)	
P32×8HS	32×8 multirate serial digital video router	32×8 2-16×4 4-8×2 8-4×1	
P32×8HSR	32×8 multirate serial digital video router with reclocking	32×8 2-16×4 4-8×2 8-4×1	
P32×16HS	32×16 multirate serial digital video router	32×16 2-16×8 4-8×4 8-4×2 16-2×1	

 Table 1-7
 Multirate (HS) Matrix Sizes (Continued)

Name	Reference	Configurable as
P32×16HSR	32×16 multirate serial digital video router with reclocking	32×16 2-16×8 4-8×4 8-4×2 16-2×1
P32×32HS	32×32 multirate serial digital video router	32×32 2-16×16 4-8×8 8-4×4 16-2×2
P32×32HSR	32×32 multirate serial digital video router with reclocking	32×32 2-16×16 4-8×8 8-4×4 16-2×2

 Table 1-7
 Multirate (HS) Matrix Sizes (Continued)

Table 1-8 Multirate (3 Gb/s) Matrix Sizes

Name	Reference	Configurable as
P8×8HS 3Gb/s	8×8 multirate serial digital video router	8×8 2-4×4 4-2×2
P8×8HSR 3Gb/s	8×8 multirate serial digital video router with reclocking	8×8 2-4×4 4-2×2
P16×4HS 3Gb/s	16×4 multirate serial digital video router	16×4 2-8×2 4-4×1 16×2 (dual output) 16×1 (quad output)
P16×4HSR 3Gb/s	16×4 multirate serial digital video router with reclocking	16×4 2-8×2 4-4×1 16×2 (dual output) 16×1 (quad output)
P16×16HS 3Gb/s	16×16 multirate serial digital video router	16×16 2-8×8 4-4×4 8-2×2
P16×16HSR 3Gb/s	16×16 multirate serial digital video router with reclocking	16×16 2-8×8 4-4×4 8-2×2
P32×4HS 3Gb/s	32×4 multirate serial digital video router	32×4 2-16×2 4-8×1 32×2 (dual output) 32×1 (quad output)

Name	Reference	Configurable as
P32×4HSR 3Gb/s	32×4 multirate serial digital video router with reclocking	32×4 2-16×2 4-8×1 32×2 (dual output) 32×1 (quad output)
P32×32HS 3Gb/s	32×32 multirate serial digital video router	32×32 2-16×16 4-8×8 8-4×4 16-2×2
P32×32HSR 3Gb/s	32×32 multirate serial digital video router with reclocking	32×32 2-16×16 4-8×8 8-4×4 16-2×2

 Table 1-8
 Multirate (3 Gb/s)
 Matrix Sizes (Continued)

Major Components

Core Routing Module

The 3 Gb/HS/S/R serial digital video routing switcher supports SMPTE 259M and SMPTE 344M for standard definition signal formats; SMPTE 292M for 720p or 1080i high definition signal formats; and SMPTE 424M for 1080p high definition signal formats. The module contains a 16×16 (or a 32×32) crosspoint matrix. Reclocking is automatic for all standard definition and high definition clock rates in units that contain the optional reclocking submodule. The system controller automatically detects the presence, position, and matrix size of each module. See page 15 for more information about the core routing module.

Input Equalization

The back panel I/O and crosspoint module offers automatic input equalization. There is one cable equalizer IC for each BNC input. The equalizer circuit automatically compensates for cable loss and provides a differential signal that is routed to the crosspoint IC. The equalizer IC can automatically recover a 3 Gb signal from up to 328 ft (100 m); a high definition signal from up to 360 ft (110 m) or a standard definition signal from up to 1100 ft (335 m) of Belden 1694 cable (minimum). Longer cable runs may be possible over cable types with lower losses.

Output Driver

The output driver delivers serial digital video data to a 75Ω coaxial cable and controls the slew rate into the required range.

Module Interconnect

The module interconnect provides communications, power conversion, and reference conditioning for both the logic control module and the core router module. It also provides control connectivity between the control module and the core router module. This module monitors and controls the single relay alarm for power loss or fan failure. The Alarm jumper, which sets the normally open/normally closed operation of the alarm port, is located on the module interconnect. See page 15 for more information about the module interconnect.

Back Panel

The back panel I/O module has 8, 16, or 32 equalizers; and 1, 4, 8, 16, or 32 output drivers, depending on the desired configuration. Each input and output cell is connected to a coaxial cable through on-board BNC connectors. This interface module is mounted to the back of the Panacea frame to allow interfacing to other broadcast equipment.



Figure 1-20 Back Panel I/O Module Connectors (P-32×32HS shown)

Reclocking Submodule (Optional)

Reclocking Submodule¹

The Panacea 3 Gb/HS/S/R serial digital video routing switcher is capable of sensing and reclocking all SMPTE-defined standard and high definition data rates. These rates include 143², 177², 270, 360², 540² Mb/s; and 1.485 and 2.97 Gb/s. If the module does not recognize the data rate of the input signal, it automatically goes into Bypass mode and output the input signal without reclocking. If desired, the user may set this module to Bypass mode, where it routes any of the input signals to the output(s) without reclocking, regardless of the data rate of the input signal.

Data Rates

The 3 Gb/HS/S/R is capable of sensing, switching, and reclocking all SMPTE-defined standard and high definition data rates. (See **Table 1-9** for the data rates supported by each format.) If the module does not recognize the data rate of the input signal, it automatically goes into Bypass mode and route the input signal without reclocking. If desired, you may set this module to Bypass mode where it routes any of the input signals to the output(s) without reclocking, regardless of the data rate of the input signal.

Table 1-9Data Rates for 3 Gb, High Definition (HS) and Standard Definition (S) SerialDigital Video Routing Switchers

Data Rate	3 Gb/s Serial Digital Video Routing Switcher	High Definition (HS) Digital Video Routing Switcher	Standard Definition (S) Digital Video Routing Switcher
143 Mb/s ²	•	•	•
177 Mb/s ²	•	•	•
270 Mb/s	•	•	•
360 Mb/s ²	•	•	•

¹ The P-32×32HS/S uses two reclocking submodules.

² In pass-thru mode for 3 Gb/s.

Data Rate	3 Gb/s Serial Digital Video Routing Switcher	High Definition (HS) Digital Video Routing Switcher	Standard Definition (S) Digital Video Routing Switcher
540 Mb/s ²	•	•	•
1.485 Gb/s	•	•	
2.977 Gb/s	•		

Table 1-9Data Rates for 3 Gb, High Definition (HS) and Standard Definition (S) SerialDigital Video Routing Switchers

Sync Input Signal

The 3 Gb/HS/S/R has a sync input on the rear panel. A video reference signal can be fed to this module so that synchronous switching can be achieved. (It is possible for the user to set a variable time delay before the switch is made so that critical switching occurs at the proper interval.) The sync signal can be NTSC, PAL, or trilevel.

Monitoring and Control

The 3 Gb/HS/S/R can be monitored and controlled through any one of various means. It can be controlled locally via the front panel control option or remotely via serial, X-Y, or Ethernet with a variety of software packages, including RouterWorks®, Navigator™, and Pilot™. The various monitoring and control options provide a means to manage the switching of video and/or audio signals through this product as well as communicate the status of the input and output signals. The monitoring/alarm capabilities of this product enable you to act accordingly as the result of an alarm condition, should one arise. See page 66 for alarm configuration details.

Power Conversion and Distribution

The Panacea external power supply converts 100VAC through 240VAC to +15VDC, which is then supplied to the MI module. The +15V is applied to DC-DC converters, which produces the +5V and +3.3V rails required by the core routing module.

A green LED on the front of the logic control module indicates that power is present in the Panacea frame, but does not guarantee that all rails are present and within required voltage limits.

A soft start circuit is provided to minimize the rush circuit during power-up.

Control and Communications

The logic interface circuit allows the Panacea serial digital video routing switcher module to communicate with the Panacea system controller. In addition to addressing the crosspoint matrix, the logic interface circuit also provides the system controller with information about the system status. Matrix size, module type, firmware revision level, input signal presence, and other information is provided to the system controller through the logic interface. Information about the core routing module can be viewed with a terminal or computer connected to the Panacea system controller via the serial port.

Signal Flow

Figure 1-25 is a signal flow diagram of the serial digital video routing switcher.



Figure 1-21 Signal Flow Diagram of 3 Gb/HS/S/R Routers

Configuration Information

The 3 Gb/HS/S/R module requires no additional procedures for configuring DIP switches and the alarm port beyond those described for frame configuration. Frame DIP switch and alarm port configuration is described on page 65 - 70.

Installation Information

All internal modules are installed at the manufacturing facility.

Special Instructions for Dual Matrix, Same-Signal Format Panacea Routing Switchers

Matrix Partitioning

Panacea dual matrix routing switchers with the same format (for example, two 16×16 HD and SDI matrices in a single 2RU frame) are partitioned from larger Panacea back panel configurations prior to shipment. The two matrices are automatically assigned to levels 0 and 1. You can change the starting level in Panacea routing switchers as follows:

- If your Panacea uses a standard resource card (P-RESL), the level setting is always consecutive for each matrix within the same frame. The starting level setting can be changed via the SET FIRSTLEVEL terminal command (see SET FIRSTLEVEL on page 151).
- If your Panacea uses an enhanced resource card (Ethernet-enabled P-RESH), the levels can be "married" via the SET FIRSTLEVEL and SET MPPARM terminal commands (see SET FIRSTLEVEL on page 172 and SET MPARM on page 165).

Model Numbers and Descriptions

Table 1-10 provides the model numbers and descriptions for all 3 Gb/HS/S/R dual matrix, same-signal format Panacea routing switchers.

Model Number	Description
P16×16HSHSxx	16×16 dual HD & SDI routing switcher
P8×8HSHSxx	8×8 dual HD & SDI routing switcher
P16×1HSHSxx [*]	16×1 dual HD & SDI routing switcher
P16×4HSHSxx	16×4 dual HD & SDI routing switcher
P16×8HSHSxx [*]	16×8 dual HD & SDI routing switcher

Table 1-10 HS/S Signal Formats

* Not available for 3 Gb

Model Number	Description
P16×16SSxx	16×16 dual SDI routing switcher
P8×8SSxx	8×8 dual SDI routing switcher
P16×1SSxx	16×1 dual SDI routing switcher
P16×4SSxx	16×4 dual SDI routing switcher
P16×8SSxx	16×8 dual SDI routing switcher

Clean/Quiet Switch Routing Switchers (P16SCQ/P16HSCQ)

The Panacea clean/quiet switch offers clean HD-SDI and/or SDI video routing with quiet embedded audio routing by ensuring that all source changes occur without any glitches or audible artifacts. The Panacea clean/quiet switch combines power and ease of use to provide an excellent master control backup or direct-to-tape router; it is available with 16 inputs and 8 outputs (2 clean outputs and 6 auxiliary outputs). In addition, five transition choices have been added to provide flexible and smooth changes between source materials. The P16SCQ/P16HSCQ can be monitored and controlled locally or remotely.

- It can be controlled locally via the PLCP-32×8CQp control panel option.
- It can be controlled remotely via the RCP-32×8CQp control panel, serial, Harris X-Y coax control, or Ethernet.

P16SCQ and PH16SCQ modules are offered in a one-rack unit (1RU) frame. The supported matrix sizes are listed in **Table 1-12** on page 43.

Important Information about Panacea Clean/Quiet Switch Devices



CAUTION

You *must* autotime all sources after making any adjustment to parametric transition settings and clicking "SET." (See *Setting Up the Clean Switch Autotiming* on page 80.) Settings are maintained unless autotiming is run after parametric transition settings are adjusted for video or audio and set.

The Panacea clean/quiet switch *requires* all connected sources to be timed within 1 line of each other upstream of the device in order to perform "Clean" video and "Quiet" audio switching.

If your Panacea clean/quiet switch device is switched to an empty source (or to a source that is out of time with respect to the other sources), and then switched back to an in-time source, you can expect a "noisy" switch for both video and audio on the return switch. This is because the criteria are not met for a "Clean and Quiet" switch to happen. (See **Setting Up the Clean Switch Autotiming** on page 80.) The subsequent switch likely also exhibits noise. Once the device is again switching between timed sources, Clean and Quiet operation is resumed. *Make every effort not to switch to sources with no signal presence*.

You should perform auto timing under the following circumstances:

- Whenever the Panacea clean/quiet unit is power cycled
- Whenever additional sources are added you must enable the source in auto timing user interface and run auto timing
- Whenever upstream equipment is power cycled or rebooted, or changes are made to signal format

Data Rates and Sync Signals

- The P16SCQ is capable of operating on a range of all SMPTE-defined standard data rates. See Table 1-13 on page 46 for the data rates supported by the P16SCQ.
- The P16HSCQ is capable of operating on a range of all SMPTE-defined data rates. See
 Table 1-13 on page 46 for the data rates supported by the P16HSCQ.

The P16SCQ/P16HSCQ router requires an external sync input on the rear panel so that synchronous switching can be achieved. The sync signal can be NTSC, PAL or trilevel (1080i 50/59.9/60 or 720p 59.9/60).

Submatrices, Independent Mode, and Married Mode

You can partition P16SCQ/P16HSCQ matrices into smaller submatrices to allow for simultaneous SD and HD clean/quiet switching. For example, you can partition a P16HSCQ into two 8×4s. When you partition a routing matrix, you can also select the submatrices to function as separate or married units.

- When you set the submatrices to perform in separate mode, the individual submatrices are operated and controlled as smaller, separate routers on separate control levels.
- When you set the submatrices to perform in married mode, the individual submatrices operate in unison and on the same control level. This means when an input or output is selected on any one of the submatrices, the corresponding input or output is selected on all submatrices. This mode of operation can be very convenient when mixing and matching signal formats. This way, an SD video matrix and an HD video matrix can be housed in the same frame.

Matrix Sizes

Name	Reference	Configurable as
P16SCQ	16×2 standard serial digital video router with clean switch and embedded audio quiet switch with 6 aux. (non-clean, non-reclocking) outputs	16×2 clean/quiet with 6 aux outputs
P16HSCQ	16×2 multirate serial digital video router with clean switch and embedded audio quiet switch with 6 aux. (non-clean, non-reclocking) outputs	16×2 clean/quiet with 6 aux outputs

Table 1-12 Clean/Quiet Switch Matrix Sizes

Main Features

- A 1RU, or two 1RU clean switch routers in a 2RU Panacea frame
- Input/output and crosspoint module/back panel
- Multi-format matrix configurations
- Power conversion and distribution, sync separation, and communication interconnect
- Reclocker/retime submodule (clean switch) for two clean outputs
- Six additional aux outputs that are not clean or reclocked for monitoring or aux uses
- Control and communications submodule
- External power supply
- Optional local or remote control panel
- Control via local or remote panel, RS-232/RS-422, X-Y, or IP/Ethernet

P16SCQ-Specific Features

- High quality SQ digital video routing with enhanced control and monitoring capabilities.
- Supported signal types SMPTE 259M -270Mb/s
- Standards of operation¹

¹ Other standards using the same data rate will be passed but switching may not be clean.

- **u** 525/59.9
- **625/50**
- Reclock SMPTE 259M bit rates (220 Mb/s)
- Auto equalize all inputs up to 540 Mb/s (only switch 270 Mb/s cleanly)
- NTSC/PAL/trilevel reference are acceptable for switching

P16HSCQ-Specific Features

- High quality HSQ/SQ digital video routing with enhanced control and monitoring capabilities.
- Supported signal types
 - □ SMPTE 259M -270Mb/s
 - □ SMPTE 292M 1.485 Gb/s
- Standards of operation¹
 - **□** 525 60/1.001
 - **a** 625 50
 - □ 1080i 50
 - □ 1080i 60/1.001
 - **□** 1080i 60
 - **a** 720p 60/1.001
 - □ 720p 60
- Reclock both SMPTE 259M and SMPTE 292M bit rates
- Auto equalize all inputs up to 1.5 Gb/s
- Control via local or remote panel, RS-232/RS-422, X-Y, or IP/Ethernet
- NTSC/PAL/trilevel reference are acceptable for switching (60 Hz operation requires a HD reference)
- Features Relay Bypass mode, which routes inputs 1 and 9 to outputs PGM1A and PGM2A, respectively, in the event of power loss to the frame

Major Components

Core Routing Module

The P16SCQ is designed to handle SMPTE 259M for standard definition signal formats, and the P16HSCQ is designed to handle SMPTE 259M and SMPTE 292M for 720p or 1080i high definition signal formats. The system controller automatically detects the presence, position, and matrix size of each module. See page 15 for more information about the core routing module.

Input Equalization

The back panel I/O and crosspoint module offers automatic input equalization. There is one cable equalizer IC for each BNC input. The equalizer circuit automatically compensates for cable loss and provides a differential signal that is routed to the crosspoint IC. The equalizer IC can automatically recover a high definition signal from up to 360 ft (110 m) or a standard definition signal from up to 1100 ft (335 m) of Belden 1694 cable (minimum). Longer cable runs may be possible over cable types with lower losses.

Crosspoint Matrix

The basic module is a crosspoint matrix, used to provide two dual, clean outputs to the clean switch module. This provides the "Program1" (PGM1) and "Program2" (PGM2) busses for the two outputs of the product.

In addition, the crosspoint matrix provides six auxiliary outputs to the output panel without reclocking, for monitoring and auxiliary uses.

Output Driver

The output driver delivers serial digital video data to a 75Ω coaxial cable and controls the slew rate into the required range. (Slew rate settings are applicable to aux outputs only.)

Module Interconnect

The module interconnect (MI) provides communications, power conversion, and reference conditioning for both the logic control module and the core router module. It also provides control connectivity between the control module and the core router module. This module monitors and controls the single relay alarm for power loss or fan failure. The Alarm jumper, which sets the normally open/normally closed operation of the alarm port, is located on the module interconnect. See page 15 for more information about the module interconnect.

Back Panel

The back panel I/O module has 16 input equalizers and output drivers. Each input and output cell is connected to a coaxial cable through on-board BNC connectors.

Tip: Panacea clean/quiet switch routers with relay bypass capability have part numbers that end in "-RB." The input BNCs on the back panels for the P16SCQ-RB/P16HSCQ-RB are labeled differently from those for the P16SCQ/P16HSCQ. See **Figure 1-22** and **Figure 1-23**.







Figure 1-23 P16SCQ-RB/P16HSCQ-RB Back Panel I/O Module Connectors

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A relay bypass is provided to bypass the router in the event of power failure. Inputs 1 and 9 are bypassed to program outputs 1 and 2. This allows the router to be partitioned into dual 8×1s, with the first input on each partition having a relay bypass in-line. This interface module is mounted to the back of the Panacea frame to allow interfacing to other broadcast equipment.





Data Rates

The P16SCQ/P16HSCQ is capable of sensing, switching, and reclocking all SMPTE-defined standard and high definition data rates on the two clean/quiet outputs. See **Table 1-13** for the data rates supported by each format. If the module does not recognize the data rate of the input signal, it automatically goes into Bypass mode and route the input signal without reclocking. (If desired, you may set this module to Relay Bypass mode, where it routes inputs 1 and 9 to the two clean/quiet output(s) without reclocking, regardless of the data rate of the input signal.)

Table 1-13 Data Rates for Standard Definition (P16SCQ) and High Definition (P16HSCQ)Clean/Quiet Switch Routing Switchers

Routing Switcher	Format	Frame Rate
P16SCQ P16SCQ-RB	270 MB/s	525/59.9 Hz
		625/50 Hz
P16HSCQ	270 MB/s	525/59.9 Hz
P16HSCQ-RB		625/50 Hz
	1.485 Gb	720p/59.9 Hz
		720p/60 Hz
		1080i/50 Hz
		1080i/59.9Hz
		1080i/60 Hz

Sync Input Signal

The P16SCQ/P16HSCQ has a sync input on the rear panel. A video reference signal can be fed to this module so that synchronous switching can be achieved. The sync signal can be NTSC, PAL, or trilevel.

Monitoring and Control

The P16SCQ/P16HSCQ can be monitored and controlled through any one of various means. It can be controlled locally via the front panel control option or remotely via serial, X-Y, or Ethernet with a variety of software packages including RouterWorks[®], Navigator™, and Pilot™. The various monitoring and control options provide a means to manage the switching of video and/or embedded audio signals through this product as well as communicate the status of the input and output signals. The monitoring/alarm capabilities of this product enable you to act accordingly as the result of an alarm condition, should one arise. See page 66 for alarm configuration details.

Power Conversion and Distribution

The Panacea external power supply converts 100VAC through 240VAC to +15VDC, which is then supplied to the MI module. The +15V is applied to DC-DC converters, which produces the +5V and +3.3V rails required by the core routing module.

A green LED on the front of the logic control module indicates that power is present in the Panacea frame, but does not guarantee that all rails are present and within required voltage limits.

A soft start circuit is provided to minimize the rush circuit during power-up.

Control Panel

The optional R(PL)CP-32X8CQp control panel has 32 source buttons and 8 destination buttons. It is available in both a local and a remote control version. A variety of video transitions with variable transition rates are available through the control panel, including crossfade, "V" fade, cut-fade, fade-cut, and cut. The fade rate of the transitions can be configured for full customization (as either fast or slow) for control panel access to transition duration. The configuration of the fast and slow transition duration is set in video frame lengths through RouterMapper. See the *PLCP32×8CQp/RCP-32×8CQP Control Panel Installation, Configuration, and Operation Manual* for more information about the clean/quiet switch remote control panel.

Signal Flow

Figure 1-25 is a signal flow diagram of the P16SCQ/P16HSCQ clean switch serial digital video routing switcher.

Configuration Information

The clean/quiet switch module requires no additional procedures for configuring DIP switches and the alarm port beyond those described for frame configuration. Frame DIP switch and alarm port configuration is described on page 65 – 70. There are special configuration procedures for setting up the clean switch; see page 78 – 87 for details.

The clean/quiet switch module operates in Program mode only. See page 92 for more information about Program mode.



Figure 1-25 Signal Flow Diagram of P16SCQ/P16HSCQ Clean Switch Serial Digital Video Routers

Installation Information

All internal modules are installed at the manufacturing facility.

Figure 1-26 shows the relay bypass cable configuration. Table 1-14 shows bypass mode maximum cable lengths.



Figure 1-26 Relay Bypass Cable Configuration

Table 1-14Bypass Mode Maximum Cable Lengths $(L1 + L2 \le 328 \text{ ft } [100 \text{ m}])$

	If L1 equals	L2 must equal
Harris HD pathological signal	82 ft (25 m)	246 ft (75 m) or less
	164 ft (50 m)	164 ft (50 m) or less
	246 ft (75 m)	82 ft (25 m) or less

Serial Digital (AES) Audio Routing Switchers

The Panacea AES audio routing switcher is an AES-EBU digital audio routing switcher module. The AES audio routing switcher features 75 Ω BNC input/output interfaces for digital audio installations wired using standard 75 Ω coaxial cable, as well as 110 Ω DB-25 I/ O interfaces for installations wired using shielded, twisted pair cables. It is one of many I/O modules available for use with the Panacea routing system.

P-04Q Submodule Option

The P-04Q is an optional submodule that mounts onto Panacea AES matrix modules to improve the quality of the switch on the first four outputs. The P-04Q eliminates loss of lock in downstream equipment by providing a continuous output. Rather than simply switch the signals, it switches the Samples used to produce the output stream. The outputs are reclocked and realigned to conform to AES-11. Jitter is not passed from input to output; rather, jitter on the output depends on the jitter on the reference signal. This option also improves the audible quality of the switch by performing a cross-fade from the initial source to the final source. The cross-fade may be enabled or disabled.

The P-04Q is only operational with a DARS reference.

AES Switching Fundamentals

An AES signal is a data stream which carries digitized audio samples for two channels of audio. The smallest element in the AES stream is known as an AES frame. Each frame carries a single sample from each of the two channels A (left) and B (right).

There are three options for switching AES digital audio: asynchronous, synchronous, and cross-fade. Each method has its advantages and disadvantages, as described in the following sections.

Asynchronous Switching

Asynchronous switching is the simplest and most economical form of AES routing. In an asynchronous router, switching occurs with no consideration for AES framing. An asynchronous router does not process or buffer the incoming signals. Crosspoints switch as soon as requested, usually at the same time as a video switcher in an associated level.

Because the switch is not timed to occur on an AES frame boundary, the switch corrupts at least one AES sample in the output stream. The corrupted sample causes downstream devices (devices that accept the output of the router) to temporarily lose lock which may cause a pop. Asynchronous switching is only recommended in environments where switches are not performed live and where the downstream devices can handle framing errors gracefully.

Synchronous Switching

A synchronous router provides input buffering and special timing control circuitry so that switching between two sources occurs on an AES frame boundary. The timing buffers are used to frame align all incoming signals. The timing control circuitry delays the requested switch until the next AES frame boundary, thus ensuring that no samples are corrupted. The output signal never loses framing, ensuring that downstream equipment do not lose lock.

Synchronous routers, however, may still cause a pop if the level of the two signals being switched does not match near the switch point.

Synchronous routers typically cost 50% more than an equivalently sized asynchronous router. Manufacturers of synchronous routers have for many years been promoting the synchronous router as a quiet switch. It is important to note that, although a synchronous router produces uncorrupted output streams, it does not guarantee quiet, pop-free switching.

Synchronous and Quiet Switching Through the Use of Cross-Fade Processing

To guarantee a quiet switch, additional processing of the AES signal is required. The Synchronous Quiet Switch (SQS) combines frame-aligned switching with cross-fade processing to guarantee a synchronous, quiet, pop-free switch.

As shown in **Figure 1-27** and Figure 1-28 on page 51, the SQS uses timing buffers to align the two data streams for frame-aligned, synchronous switching. The Cross-Fade mixer gradually reduces the amplitude of the previously connected signal as it simultaneously increases the amplitude of the new signal being selected. During this cross-fade portion of the switch, the output of the switcher is a combination, or "mix," of the previous and new selections.



Figure 1-27 SQS Signal Flow Diagram

The top portion of **Figure 1-28** shows how a simple synchronous switch would have created a pop due to amplitude and phase differences in the previous and new selections. The bottom portion of **Figure 1-28** shows how the crossfade mixer in the SQS manipulates the amplitudes of the two signals over a short period of time, and how the resulting "mixed" output is free of pop-causing transients. The effect is that the actual switch occurs over an extended period of time, as determined by the fade duration. You can select the cross-fade duration (selection ranges from 5.5 mSec to 500 mSec).

Synchronous Switch



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Main Features

The Panacea family of routers is housed in one of two frame sizes: 1RU and 2RU. The supported AES audio matrix sizes are listed in **Table 1-15**. In the Panacea AES line of routers, these matrix sizes are available in both a coaxial and a balanced interface.

Matrix Size	1RU Frame	2RU Frame
8×8	Yes	Yes
16×1	Yes	Yes
16×2 [*]	Yes	Yes
16×4	Yes	Yes
16×8	Yes	Yes
16×16	Yes	Yes
32×1	No	Yes
32×2 [*]	No	Yes
32×4	No	Yes
32×8	No	Yes
32×16	No	Yes
32×32	No	Yes

 Table 1-15
 AES Audio Matrix Sizes

* This routing matrix is set up via the 16×4 or 32×4 routing switcher, with the quiet switch allowing you to set up a 16×2 or 32×2 with dual outputs.

The basic routing matrices provide asynchronous AES switching. As an option, a P-04Q submodule may be installed. This submodule provides synchronous or Synchronous Quiet Switching (SQS)¹ on the first four outputs. An extra input is provided on each matrix as an AES reference input to be used by this optional submodule. See page 49 for more information about the P-04Q submodule.

The Panacea AES audio routing switcher supports baseband AES signals as well as compressed signals such as Dolby E and Diamond Audio.

Major Components

The Panacea AES matrix module consists of a single printed circuit board (PCB) containing all the circuitry necessary for receiving, conditioning, buffering, switching, and driving the routed signals as well as the circuitry needed to communicate with the control module. In addition, this PCB includes the power connector, alarm connector, and communications connectors (one BNC control input with loop-thru, one serial port, one Ethernet connector, and one BNC reference input with loop-thru).

An optional SQS submodule, P-04Q, may be installed onto the matrix module. This submodule may be configured to operate in two different modes: synchronous or SQS.

¹ SQS is a switching method involving a crossfade of the encoded data, eliminating switching transients and achieving "pop"-free switching of AES audio signals. Since this method requires processing of the data, it cannot be used on AES compatible compressed data streams such as Dolby E or Diamond Audio.

- In Synchronous mode, the submodule provides synchronous switching of AES or compressed AES compatible data streams on frame boundaries.
- In SQS mode, the submodule provides Synchronous Quiet Switching.

Core Routing Module

The Panacea AES audio core routing module board contains a 16×16 (or a 32×32) crosspoint matrix, input receivers, and output drivers. See page 15 for more information about the core routing module.

Crosspoint PLD

The PLD performs all switching functions on the matrix module. Additionally, the PLD contains the communications interface to the control module.

Input Receivers

The input signals are received by quad input receivers, which regenerate and provide a DC offset to the input signals before being processed by the PLD.

Output Driver

The output circuitry buffers and conditions the switched signals to maintain compliance with the required interface standard (balanced or coax).

Module Interconnect (MI)

The module interconnect provides communications, power conversion, and reference conditioning for both the logic control module and the core router module. It also provides control connectivity between the control module and the core router module. This module monitors and controls the single relay alarm for power loss or fan failure. The Alarm jumper, which sets the normally open/normally closed operation of the alarm port, is located on the module interconnect. *See* page 15 for more information about the module interconnect.

Back Panels

AES audio balanced back panel I/O modules use up to 8 D-Type 25-pin connectors. Connectors are positioned as shown in **Figure 1-29**.



Figure 1-29 AES Audio Balanced Rear Back Panel I/O Module Pin Connectors (P-32×32AEB shown)

AES audio coax back panel I/O modules use up to 32 BNC connectors for inputs and up to 32 for outputs. BNCs are positioned as shown in **Figure 1-30**.



Figure 1-30 AES Audio Coax Rear Back Panel I/O Module Pin Connectors (P-32×32AEC shown)

Monitoring and Control

The Panacea AES audio routing switcher can be monitored and controlled through any one of various means. It can be controlled locally via the front panel control option or remotely via serial, X-Y, or Ethernet with a variety of software packages, including RouterWorks[®], Navigator™, and Pilot™. Various monitoring and control options provide a means to manage the switching of video and/or audio signals through this product as well as communicate the status of the input and output signals. The monitoring/alarm capabilities of this product enable you to act accordingly as the result of an alarm condition, should one arise. See page 66 for alarm configuration details.

Power Conversion and Distribution

The external power supply converts 100VAC through 240VAC to +15VDC, which is then supplied to the MI module. The +15V is applied to DC-DC converters, which produces the +5V and +3.3V rails required by the core routing module.

A green LED on the front of the logic control module indicates that power is present in the Panacea frame, but does not guarantee that all rails are present and within required voltage limits.

Control and Communications

The logic interface circuit allows the Panacea AES audio routing switcher module to communicate with the Panacea system controller. In addition to addressing the crosspoint matrix, the logic interface circuit also provides the system controller with information about the system status. Matrix size, module type, firmware revision level, input signal presence, and other information is provided to the system controller through the logic interface. Information about the core routing module can be viewed with a terminal or computer connected to the Panacea system controller via the serial port.

Signal Flow

Figure 1-31 on page 55 is a signal flow diagram of the Panacea AES audio routing switcher.

Configuration Information

The AES audio module requires no additional procedures for configuring DIP switches and the alarm port beyond those described for frame configuration. Frame DIP switch and alarm port configuration is described on page 65 – 70. The optional P-04Q submodule has configurable DIP switches (see **Figure 3-18** on page 87).

Installation Information

All internal modules are installed at the manufacturing facility.



Figure 1-31 Signal Flow Diagram of the AES Digital Audio Routing Switcher

Special Instructions for Dual Matrix, Same-Signal Format Panacea Routing Switchers

Matrix Partitioning

Panacea dual matrix routing switchers with the same format (for example, two 16×16 AES audio coax matrices in a single 2RU frame) are partitioned from larger Panacea back panel configurations prior to shipment. The two matrices are automatically assigned to levels 0 and 1. You can change the starting level in Panacea routing switchers as follows:

 If your Panacea uses a standard resource card (P-RESL), the level setting are always consecutive for each matrix within the same frame. The starting level setting can be changed via the SET FIRSTLEVEL terminal command (see SET FIRSTLEVEL on page 151). If your Panacea uses an enhanced resource card (Ethernet-enabled P-RESH), the levels can be "married" via the SET FIRSTLEVEL and SET MPPARM terminal commands (see SET FIRSTLEVEL on page 172 and SET MPARM on page 165).

Model Numbers and Descriptions

Table 1-16 provides the model numbers and descriptions for all AES audio balanced dual matrix, same-signal format Panacea routing switchers. **Table 1-17** provides the model numbers and descriptions for all AES audio coax dual matrix, same-signal format Panacea routing switchers.

-		
Model Number	Description	
P16×16AEBAEBxx	16×16 dual AES audio balanced routing switcher	
P8×8AEBAEBxx	8×8 dual AES audio balanced routing switcher	
P16×1AEBAEBxx	16×1 dual AES audio balanced routing switcher	
P16×4AEBAEBxx	16×4 dual AES audio balanced routing switcher	
P16×8AEBAEBxx	16×8 dual AES audio balanced routing switcher	

 Table 1-16
 AES Audio Balanced Signal Formats

Table 1-17 AES Audio Coaxial Signal Formats

Model Number	Description
P16×16AECAECxx	16×16 dual AES audio coaxial routing switcher
P8×8AECAECxx	8×8 dual AES audio coaxial routing switcher
P16×1AECAECxx	16×1 dual AES audio coaxial routing switcher
P16×4AECAECxx	16×4 dual AES audio coaxial routing switcher
P16×8AECAECxx	16×8 dual AES audio coaxial routing switcher

2 Installation



WARNING

Potentially lethal voltages are present within the frame during normal operation. Disconnect all power cords from the frame before you remove the front panel. Do not apply power to the frame while the front panel is open unless the unit is being serviced by properly trained personnel.

Installing the Panacea Frame



CAUTION

We recommend that you test your system before its final installation. Make sure you verify its configuration, cabling, and proper system operation

Siting Requirements

Ensuring Adequate Rack Space

The Panacea frame is designed for mounting into a standard width 19-in. (48.3-cm) rack. Frames are secured to the rack with standard front-mounting ears built into the chassis. Make sure to provide adequate space behind the mounting ears, and appropriate clearance for the connecting cables at the rear of the frame.

Ensuring Proper Temperature and Ventilation

The Panacea frame is cooled by forced air that is drawn in from the left side of the frame and expelled through the right side. You can stack any number of frames in a rack as long as you maintain proper ventilation and remove all obstructions to air flow.

An ambient temperature should be maintained between 32° F (0° C) and 122° F (50° C) at a relative humidity of 10%-90% (non-condensing). No special cooling arrangements are necessary, but make sure to prevent excessive ambient heat rise in closed, unventilated equipment racks. To ensure proper ventilation, keep the front panel of the frame closed during operation; otherwise, the frame could overheat.

Meeting Electrical Requirements

Load Limitations

Both the 1RU and the 2RU mounting frame accept one desktop power supply unit (PSU). Both frames are prewired to accept a second, optional power supply for power backup. Their power consumption is nominally 65VA. A fully loaded frame operates with a single power supply; however, we recommend that you include a second optional power supply for cooler operation and power redundancy.

Maximum Power Dissipation

These ratings refer to the total module power consumption (excluding that of the power supply) allowable within a Panacea frame. The limits are based on the ability of the unit to dissipate heat over a temperature range of 32° F to 122° F (0° C to 50° C).

Voltage Selection

The Panacea frame does not have a voltage selector switch. The desktop power supply has a continuous input range of 100VAC to 240VAC.

Protective Ground

Since the desktop power supply does not present a shock hazard, the Panacea frame does not have a protective safety earth ground.

Mounting Requirements

A Panacea frame can be mounted in a standard width 19-in. (48.3 cm) rack using four $^{10}/_{32}$ Phillips-head mounting screws. The back of the frame does not need to be supported. The frame can be mounted in either the front or the rear of the rack, thereby providing more efficient use of your equipment housing space. The rack ears can be attached to the frame in either direction, thereby allowing you flexible mounting options.

The mounting requirements of the Panacea frame options are as follows:

- The 1RU mounting frame requires one unit of rack space, that is, 1.75 in. (44 mm) of standard rack space. The depth from the mounting surface is 5.25 in. (13.3 cm).
- The 2RU mounting frame requires two units of rack space, that is, 3.5 in. (88 mm) of standard rack space. The depth from the mounting surface is 5.25 in. (13.3 cm).



Figure 2-2 Panacea Frame Physical Dimensions (2RU)

The desktop power supply is 6 in. (15.2 cm) wide by 1.1 in. (2.8 cm) high by 2.45 in. (6.2 cm) deep.



Figure 2-3 Desktop Power Supply Physical Dimensions

Mounting a Panacea Frame in the Rack Front

Frames are secured to the rack with standard front-mounting ears built into the chassis. The steps for mounting a Panacea frame in the front of the rack are outlined in *Installation Procedures* on page 63.



Figure 2-4 Panacea Frame with Front-Mounting Ears

Mounting a Panacea Frame in the Rack Rear

Frames are secured to the rack with standard back-mounting ears attached to the chassis. Make sure to provide adequate space behind the mounting ears, and appropriate clearance for the connecting cables at the rear of the frame.



Figure 2-5 Panacea Frame with Back-Mounting Ears

In-Frame Architecture

The Panacea is made of modular building blocks, which are as follows:

- Back panel I/O modules
- Resource module (standard or enhanced)
- Desktop power supply module
- Fan module (when requested)
- Extended processing module (for example, clean switch, quiet switch, crosspoint, and so forth)
- Local control panel

All modules and power supplies ordered are installed in the Panacea frame before it is shipped.

Control Functionality

Program Mode

Program mode operation allows you to manipulate all system configuration and routing parameters inherent in the router via any program operation (for example, HyperTerminal¹ commands, software applications, and so forth). This mode ignores the DIP switch settings for both destination and level offset, except during initial startup when no valid database is detected. In this case, when the router first boots up, it initializes all registers with the DIP switch information until you overwrite the information via program commands. To configure the Panacea for Program mode operation, set the resource module's DIP switches as shown in **Figure 3-4** on page 69.

¹ "HyperTerminal" is a product of Hilgraeve, Inc., Monroe, Michigan.

The enhanced module uses two sub-modes under Program mode: simple partitioning mode and advanced partitioning mode.

- Simple partitioning mode allows you to customize a router using terminal commands. Once you have customized the router, you can then save these settings by performing certain file operations. See Appendix D for a list of these settings and operations.
- Advanced partitioning mode allows you to customize the router through software such as RouterMapper. While in this mode you are not permitted to set router parameters via terminal commands.

Simple partitioning mode and advanced partitioning mode are controlled via the **SET RMODE** command. See page 169 for more information.

DIP Switch Mode

DIP switch mode operation allows you to operate your Panacea with minimal (and often no) additional setup. This mode allows you to set parameters outside of the ones supported by the DIP switches (for example, destination offset and level offset). All other parameters (for example, source offset, data rate, matrix partitioning, and so forth) are settable while in DIP switch mode and stays set through power-up and power-down cycles. To configure the Panacea for DIP switch mode operation, set the resource module's DIP switches as shown in **Figure 3-4** on page 69.

Setting Up the Power Supply Module

One desktop power supply module is included as standard equipment in the Panacea frame. Adding another power supply module provides redundancy. No configuration settings are needed for the power supply module(s).

Push the power supply module plug into the PS1 connector (see **Figure 2-6**) until the fastener clips. To make sure the power supply module is plugged in, gently pull on the plug cable to make sure the fastener is secure. It should not pull out easily.



CAUTION

You may see an arc within the connector internally as the power supply connection is made. This is normal.

If you are using a second power supply module, plug it into the PS2 connector (see **Figure 2-6**). Follow the same procedure as for the first power supply.



Figure 2-6 PS1 and PS2 Power Supply Connector Locations

An optional power supply mounting tray allows you to mount up to seven 1RU desktop power supplies, up to five 2RU desktop power supplies, or a combination of 1RU and 2RU power supplies on the same tray. See **Appendix H** for power supply mounting tray installation instructions.

Fan Module The optional fan module is easily replaced in the field in the event of a fan failure. There are no configuration settings needed for the fan module. See **Appendix I** for fan replacement instructions.

Installation Procedures



Note: Since the Panacea is specifically ordered in a particular configuration, the Panacea frame is custom configured to those specifications.

The Panacea can be installed anywhere within a routing system and can be controlled in a variety of ways, including local control panels, PC-based software control, or serial port control. Because the flexibility of the Panacea allows for many possible configurations, the installation procedures depends on the desired configuration and system design. General installation procedures are outlined below.

- 1 Ensure that all packing foam, strapping, and tape is removed from the frame.
- **2** Mount the frame in an rack that provides power and cooling facilities. The frame is designed for mounting in a standard equipment rack.
- **3** Align the frame so that all 4 screw holes in the mounting ears match up with those in the rack. (Adjustable ears on each side of the frame allow adjustable depth placement of the frame within the rack.
- **4** Secure the frame to the rack with the rack screws and washers.
- **5** Connect all sources to the appropriate input connection on the back panel I/O module(s).
- **6** Connect all destinations to the appropriate output connection on the back panel I/O module(s).
- 7 Connect the control device(s) to the appropriate port (X-Y, SERIAL, Ethernet, and so forth) on the frame's rear panel.
- **8** If the router is to be used in a multiple frame system, connect the additional frames using port the appropriate scheme (X-Y, Ethernet, and so forth).
- **9** If the router is at the end of the X-Y bus, terminate the other X-Y connector with a coaxial 75Ω termination.
- **10** Connect the SYNC input connector to a valid reference signal if vertical interval switching is desired.
- **11** Connect the 3-pin alarm port to the appropriate alarm device(s), as necessary.
- 12 Connect the desktop power supply to the power source.
- **13** Connect the READY line as needed.

Installing Panacea Modules

All internal modules are configured and installed at the manufacturing facility. The only user-configurable settings that may need to be adjusted are the Alarm jumper and the DIP switches. (The analog audio routing switcher allows an additional jumper selectable married [stereo] or independent [dual channel] matrix mode option).

- See page 66 for information about the Alarm jumper.
- See page 67 for information about the frame DIP switches; see page 87 for information about the AES audio P-04Q submodule DIP switches.
- See page 74 for information about the analog audio married/independent matrix mode options.

Field Upgrading the Panacea System

The Panacea product line is not designed for extensive field service; however, some field service changes can be done on-site. See *Product Servicing* on page 5 for more information about field service.

3 Configuration



WARNING

Potentially lethal voltages are present within the frame during normal operation. Disconnect all power cords from the frame before you remove the front panel. Do not apply power to the frame while the front panel is open unless the unit is being serviced by properly trained personnel.

Frame Configuration Details



CAUTION

We recommend that you test your system before its final installation. Make sure you verify its configuration, cabling, and proper system operation.

Some Panacea front panel units do not have supporting hinges. Consequently, if the front panel face plate is removed and not handled properly, it can fall with sufficient force to dislocate and/or damage the ribbon cable attached to the resource module connector. When removing the front panel, hold the face plate firmly to ensure that it does not become damaged.



Note: Special module configuration details are explained in **Module Configuration Details** on page 74

Resource Module DIP Switch and Jumper Summary

Figure 3-1 and **Figure 3-3** shows the location of the DIP switches on the Panacea resource module. **Figure 3-4** through **Figure 3-6** provide a summary of the functions of each DIP switch. **Figure 3-2** shows the location of the alarm port jumper on the Panacea MI board. (Specific information on the switches and jumper appears throughout this chapter.)



Figure 3-1 Resource Module DIP Switch Location

Configuring the Panacea MI and Resource Module

There are two items that may need to be configured before operating the resource module (if settings other than the defaults are desired):

- The Alarm jumper on the MI board
- Three DIP switches on the front of the resource module

Alarm Jumper on the MI Module

The Alarm jumper sets the normally open/normally closed operation of the alarm port. For convenience, the alarm contact closures port provides both normally open and normally closed contacts for each alarm condition.

- The normally open (NO) connection is open when the alarm condition does not exist and is closed when the alarm condition exists. Unless otherwise noted, the frame is shipped from the manufacturing facility with the alarm port configured for normally open (NO) operation.
- The normally closed (NC) connection is closed when the alarm condition does not exist and is open when the alarm condition exists.

To switch the alarm port from normally closed operation to normally open operation, follow these steps:

- 1 Unplug the Panacea frame so that it does not receive electrical power.
- **2** Remove the screws on the front of the Panacea front panel. (The screws in the front panel are captive. Do not separate them from the front panel.)
- **3** Gently pull the front panel away from the frame.
- **4** Tilt the front panel down to expose the MI module. The location of the NO/NC jumper is shown in **Figure 3-2**.



Figure 3-2 Location of NO/NC Jumpers for the Alarm Port

- **5** Using a pair of tweezers or needle-nosed pliers, pull the jumper pack loose from its location.
- 6 Push the jumper pack onto the pins of the desired location.
- 7 Tilt the front panel back up to cover the exposed front of the router.
- 8 Reattach the front panel to the Panacea router.

DIP Switches on the Resource Module

The resource module has three banks of 8-pole DIP switches that are accessible from the front of the Panacea frame. These DIP switches can be set in two different operating modes (DIP switch mode [page 69] and Program mode [page 69]) for controlling the Panacea.

Default Settings

- For all modules except the P16SCQ and P16HSCQ, default settings are all OFF: DIP switch mode on starting level 0 with the serial port set for Harris (auto detect) protocol at 9600 baud rate.
- For the P16SCQ/P16HSCQ, SW1 pole 1 is ON; all other default settings settings are OFF: Program mode on starting level 0 with the serial port set for Harris (auto detect) protocol at 9600 baud rate.

To configure the Panacea DIP switches, follow these steps:

- 1 Remove the screws on the front of the Panacea front panel. (The screws in the front panel are captive. Do not separate them from the front panel.)
- 2 Gently pull the front panel away from the frame.
- **3** Tilt the front panel down to expose the DIP switches.





Panacea standard module configuration allows "marrying" both matrices of a two-matrix configured frame. (Matrices can be "married" together and appear to the control system as a single matrix, or they can be configured to behave as two independent switchers.) If pole 4 on DIP switch SW3 is set to Same Level (ON), both matrices are assigned levels beginning at the first level assigned on poles 1-3 of DIP switch SW2. If the matrices are then partitioned, the first partition of each matrix begins at the same first level. If pole 4 on DIP switch SW3 is set to Consecutive Levels (OFF), contiguous levels are assigned, beginning at the first level assigned on poles 1-3 of DIP switch SW2.

4 Set the DIP switches as shown in Figure 3-4, Figure 3-5, and Figure 3-6.

SW1 (Figure 3-4 on page 69) provides DIP switches for these functions:

- Program/DIP switch mode
- Harris panel ID (DIP switch mode)
- □ Frame / panel ID (Program mode)
- IP Address

SW2 (Figure 3-5 on page 69) provides DIP switches for these functions:

- First Level
- Destination Offset

SW3 (Figure 3-6 on page 70) provides DIP switches for these functions:

- Serial port format
- RS-422 termination
- **RS-422** multidrop mode
- (Standard modules) Multi-matrix addressing mode (see note) or (enhanced modules) IP mode
- Serial port protocol
- Serial port baud rate
- Tilt the front panel back up to cover the exposed front of the router.
- **6** Reattach the front panel to the Panacea router.

5



* Additional IDs available following the binary count

Figure 3-4 DIP Switch Configuration: SW1



Figure 3-5 DIP Switch Configuration: SW2



Figure 3-6 DIP Switch Configuration: SW3

Back Panel Connections

The control and power section of the rear panel includes these items:

- DC input power connector
 - (Optional) AC or DC power module
 - One 3-pin alarm/comm port ("Ready Line")
- One 9-pin serial port
- One pair of BNC X-Y ports (single looping X-Y)

- One pair of BNC sync ports (single looping reference input)
- One RJ-45 Ethernet connection (enhanced resource module only)



Figure 3-7 Power and Control Section

Alarm/Comm Port

The 3-pin alarm/comm port reports alarms as they occur in the frame, and provides a synchronization pin for multiple frame routing systems.

- Pin 1 (labeled "+") Normally open/normally closed (jumper selectable)
 - "Normally closed" is shorted with the common (closed) when an alarm condition does not exist and the frame is powered.
 - "Normally open" is shorted with the common (closed) when an alarm condition exists. The default operation of the alarm relay is "normally open."
- Pin 2 (GND) Relay common
- Pin 3 (labeled "-") READY line (synchronizes Panacea frames in a multiple frame routing system); a wire connected from this pin to the READY line pin on all other frames in the system ensures that switches occur simultaneously between router frames

The alarm port provides indication of these alarm conditions:

Table 3	3-1	Alarm	Conditions
---------	-----	-------	------------

Alarm Condition	Description
PS fail	Alarm asserted in the event of a power supply failure (in systems with multiple power supplies, the alarm is asserted if any power supply fails)
Fan (module) fail	Alarm asserted in the event of a failure of the frame cooling fans
Specific alarms	Generated by core routing module

The alarm relay circuitry has been designed so the relays are energized when the alarm condition does not exist. If a relay fails or if the circuit controlling a relay fails, the relay de-energizes, which causes the corresponding alarm to be asserted. If the frame loses power, the alarm relay becomes de-energized, and the alarm condition is asserted. The relay is energized when power is applied to detect when power is lost and to allow the alarm to be asserted.



Figure 3-8 Typical Alarm Operation

frame power is off

Serial Port



Note: Detailed information about serial control configuration and operation is located in Chapter 5

One of the many powerful features of a Harris router control system is its ability to use a serial port to access the entire system. The serial port, in effect, can be the control gateway to the entire routing system. The serial port allows external control of the Panacea by a computer, user, or automation system via a serial connection using RS-232 or RS-422.

- Pin assignments for RS-232 signal format are provided in Table 5-1 on page 95.
- Pin assignments for RS-422 signal format are provided in Table 5-2 on page 96.

The port is configured for RS-232 or RS-422 using DIP switches on the resource module (see **Figure 3-6** on page 70)

The serial control port supports two-level control via commands in the Harris protocol, the Grass Valley Group SMPTE (binary) and ASCII serial port command protocols. Changes made to the crosspoint status using the serial port are reflected on any control panel connected to the routing switcher.

All Harris protocols currently use 8 data bits, no parity, and 1 stop bit.

X-Y Port

The X-Y control bus is a high speed serial interface by which Harris routers and control panels are interconnected. The X-Y control bus links multiple routers and control panels in a bus topology.

The X-Y coaxial control port allows control panels and router frames to be interconnected using standard 75Ω video coax cable. The ends of the X-Y bus must be terminated using standard 75Ω video terminators.

The Panacea features one looped-through port (two BNC connectors). If either of the BNCs is used, the other associated X-Y port connection must be terminated with a 75 Ω BNC terminator or connected to another device's X-Y port. For example, it is not necessary to terminate either of the BNCs if neither is used.

Sync Port (Reference Signal Input)

The sync port is the input connection for a synchronization signal. A sync signal is typically an external NTSC or PAL composite video reference signal or a 4 Vp-p composite sync signal. Locking the routing switcher to a valid sync signal is necessary if vertical interval switching is required. Panacea supports tri-level sync in addition to standard, NTSC, and PAL reference types.

Panacea uses these timing mode options: Auto, Standard, and Advanced.

- In Auto mode:
 - The switch point is determined by the detected sync type only based on SMPTE RP-168 specifications. If you want to change from these defaults, the operation described in the sections titled "Standard Mode" or "Advanced Mode" is required. The router reconfigures when a new sync is detected. The switch timing assumes that the sync signal and the I/O signals are the same.
 - □ If no reference is detected, the router defaults to a set time delay before switching.
- In Standard mode:
 - The switch point is determined by your choice of signal type. The switch point is then determined by a look-up of SMPTE RP-168 specifications. If the you want to change from this default, the operation described in "Advanced Mode" is required. Based on the signal type you choose, the switch point is determined by a cross-lookup of the correct timing for that type of signal and the detected sync type.
 - □ If no sync is detected, the router defaults to a set time delay before switching.
- In Advanced mode:
 - Enter a delay (in microseconds) for switching with reference to the sync pulse of the sync signal.
 - **D** This allows full flexibility for custom requirements.

For information on how to set the timing mode for a standard resource module, see *SET TIMING* on page 152. For information on how to set the timing mode for an enhanced resource module, see *SET TIMING* on page 163.

Ethernet Connection

(Available only on enhanced resource module) The Ethernet connection provides high-speed links for configuration, control, and monitoring of the complete routing system. The Ethernet connection uses 10/100Base-T wiring. The pin assignments for the Ethernet connection are listed in **Table 3-2**.

Pin	Function	Pin	Function
1	Transmit Data +	5	Not used
2	Transmit Data -	6	Receive Data -
3	Receive Data +	7	Not used
4	Not used	8	Not used

Table 3-2 Pin Assignments to Ethernet Connections

Back Panel I/O Modules

Analog Audio Back Panel I/O Modules Connectors

The analog audio back panel I/O modules use up to 16 D-Type 25-pin connectors. These connectors are positioned as shown in **Figure 1-16** on page 23.

Analog Video Back Panel I/O Modules Connectors

The analog video back panel I/O modules use up to 32 BNC connectors for inputs and up to 32 for outputs. These BNCs are positioned as shown in **Figure 1-18** on page 28.

Serial Digital Video Rear Back Panel I/O Module Connectors

The serial digital video back panel I/O modules use up to 32 BNC connectors for inputs and up to 32 for outputs. These BNCs are positioned as shown in **Figure 1-20** on page 38.

AES Audio Balanced Rear Back Panel I/O Module Connectors

The AES audio balanced back panel I/O modules use up to 8 D-Type 25-pin connectors. These connectors are positioned as shown in **Figure 1-29** on page 53.

AES Audio Coax Rear Back Panel I/O Module Connectors

The AES audio coax back panel I/O modules use up to 32 BNC connectors for inputs and up to 32 for outputs. These BNCs are positioned as shown in **Figure 1-30** on page 54.

Module Configuration Details

Configuration details specific to a particular module are described below. If the module requires no specialized procedures, only frame configuration is necessary. See *Frame Configuration Details* on page 65 for more information about frame configuration.

Analog Audio Configuring DIP Switches and the Alarm Port

This module requires no specialized procedures for configuring DIP switches and the alarm port.

Configuring the Stereo ("Married) / Dual Mono ("Independent") Matrix Mode Jumper

When shipped, the J7 jumper is set to "married" as the default setting.

The analog audio module can be configured for operation as a "married" (stereo) or "independent" (dual mono) matrix. A jumper pack on the P-A2-SB module, as shown in **Figure 3-9** on page 75, controls the matrix mode. See Table 1-2 on page 23 for a list of the matrices that support this mode.

To select independent (dual channel) operation or married (stereo) matrix mode, follow these steps:

- 1 Unplug the Panacea frame so that it does not receive electrical power.
- **2** Remove the screws on the front of the Panacea front panel. (The screws in the front panel are captive. Do not separate them from the front panel.)

- **3** Gently pull the front panel away from the frame.
- **4** Tilt the front panel down to expose the analog audio submodule. The location of the "married/independent" matrix mode jumper is shown in **Figure 3-9** on page 75.
- **5** Using a pair of tweezers or needle-nosed pliers, pull the jumper pack loose from its location on J7.
- **6** Choose one of the following:
 - Push the jumper pack across pins 1 and 2 of J7 for "independent" (dual mono).
 - Leave the jumper pack off for "married" (stereo).
- 7 Tilt the front panel back up to cover the exposed front of the router.
- **8** Reattach the front panel to the Panacea router.
- **9** Reapply power to the frame, and verify proper functionality in the new matrix mode.



Figure 3-9 "Married/Independent" Matrix Mode Jumper

Connector Pin Assignments

Table 3-3	Analog	Audio	Connector	Pin	Assignments
-----------	--------	-------	-----------	-----	-------------

Pin	Output 1-8 or Input 1-8	Output 9-16 or Input 9-16	Output 17-24 or Input 17-24	Output 25-32 or Input 25-32
1	Unused	Unused	Unused	Unused
2	8 GND	16 GND	24 GND	32 GND
3	7-	15-	23-	31-
4	7+	15+	23+	31+
5	6 GND	14 GND	22 GND	30 GND
6	5-	13-	21-	29-
7	5+	13+	21+	29+
8	4 GND	12 GND	20 GND	28 GND
9	3-	11-	19-	27-
10	3+	11+	19+	27+
11	2 GND	10GND	18 GND	26 GND

Pin	Output 1-8 or Input 1-8	Output 9-16 or Input 9-16	Output 17-24 or Input 17-24	Output 25-32 or Input 25-32
12	1-	9-	17-	25-
13	1+	9+	17+	25+
14	8-	16-	24-	32-
15	8+	16+	24+	32+
16	7 GND	15 GND	23 GND	31 GND
17	6-	14-	22-	30-
18	6+	14+	22+	30+
19	5 GND	13 GND	21 GND	29 GND
20	4-	12-	20-	28-
21	4+	12+	20+	28+
22	3 GND	11 GND	19 GND	27 GND
23	2-	10-	18-	26-
24	2+	10+	18+	26+
25	1 GND	9 GND	17 GND	25 GND

Table 3-3 Analog Audio Connector Pin Assignments (Continued)

Analog Video

This module requires no specialized configuration procedures.

Serial Digital Video (HS/S/R)

Configuring DIP Switches and the Alarm Port

This module requires no specialized procedures for configuring DIP switches and the alarm port.

Output Format Selection

The output format is controlled by the Reclockmode setting. Reclockmode settings are used by autotiming to set the output standard. They only take effect when autotiming is performed. (Reclockmode setup may be initiated either through a Hyperterminal session or through the Panacea control application.) In **Table 3-4**, the number in parentheses (#) equates to the reclock mode as it appears in the terminal interface.

Table 3-4	Output Format Selections
-----------	---------------------------------

Output	Format Description
Auto-Mode (0)	When an output is set to auto mode (factory default), autotiming selects the most prevalent input standard that is valid with the given reference. If the same number of S and HS inputs are found, it defaults to HS. If the same number of 1080i and 720p are found, it defaults to 1080i. Both outputs are the selected standard.

Output	Format Description
270Mb/s (4)	When this mode is selected, the output is formatted as Standard Definition 525 lines in a 270 Mb/s stream. This mode requires an NTSC reference.
270 Mb/s-50 (9)	When this mode is selected, the output is formatted as Standard Definition 625 lines in a 270 Mb/s stream. This mode requires a PAL reference.
1.485 Gb/s-1080i/29.9 (7)	When this mode is selected, the output is formatted as High Definition 1080i /29.97 in a 1.485 Gb/s stream. This mode requires either an NTSC reference or a 1080i/ 29.97 tri-level reference.
1.485 Gb/s-1080i/25 (10)	When this mode is selected, the output is formatted as High Definition 1080i /25 in a 1.485 Gb/s stream. This mode requires either an PAL reference or a 1080i/25 tri-level reference.
1.485 Gb/s-1080i/30 (11)	When this mode is selected, the output is formatted s High Definition 1080i /30 in a 1.485 Gb/s stream. This mode requires a 1080i/30 tri-level reference.
1.485 Gb/s-720p/59.9 (13)	When this mode is selected, the output is formatted as High Definition 1080i/59.94 in a 1.485 Gb/s stream. This mode requires either an NTSC reference or a 1080i/59.94 tri-level reference.
1.485 Gb/s-720pi/60 (15)	When this mode is selected, the output is formatted as High Definition 1080i/60 in a 1.485 Gb/s stream. This mode requires a 720p/60 tri-level reference.

 Table 3-4
 Output Format Selections (Continued)

See **Appendix C** for information about standard module Reclock and Autotiming modes:

- AUTOTIME (page 148)
- SET RECLOCKMODE (page 151)
- SHOW RECLOCKMODES (page 153)
- SHOW RECLOCKSETTINGS (page 153)

See **Appendix D** for information about enhanced module Reclock and Autotiming modes:

- GET RECLOCKMODE (page 162)
- **SET AUTOTIME** (page 162)
- SET RECLOCKMODE (page 162)
- SHOW RECLOCKMODES (page 162)
- SHOW RECLOCKSTATUS (page 162)

Clean/Quiet Switch (P-SCQ, P-HSCQ)



CAUTIONImportant Information about Panacea Clean/Quiet Switch Devices:

You *must* autotime all sources after making any adjustment to parametric transition settings and clicking "SET." (See *Setting Up the Clean Switch Autotiming* on page 80.) Settings are not maintained unless autotiming is run after parametric transition settings are adjusted for video or audio and set.

The Panacea clean/quiet switch *requires* all connected sources to be timed within 1 line of each other upstream of the device in order to perform "Clean" video and "Quiet" audio switching.

If your Panacea clean/quiet switch device is switched to an empty source (or to a source that is out of time with respect to the other sources), and then switched back to an in-time source, you can expect a "noisy" switch for both video and audio on the return switch. This is because the criteria are not met for a "Clean and Quiet" switch to happen. (See *Setting Up the Clean Switch Autotiming* on page 80.) The subsequent switch likely also exhibits noise. Once the device is again switching between timed sources, Clean and Quiet operation is resumed. *Make every effort not to switch to sources with no signal presence*.

Configuring DIP Switches and the Alarm Port

This module requires no specialized procedures for configuring DIP switches and the alarm port.

Setting Up the Clean Switch via RouterMapper



Note: If you want to set up the clean switch via terminal operation, see page 84

Panacea clean/quiet switch routers provide error-free switching of digital video by delaying each signal according to its timing so that all output signals are sent in a continuous stream with the same alignment to a required reference signal. This is done by incorporating a buffer capable of storing a line of video. The buffer is emptied at the same alignment to the reference for all inputs which, when combined with switching per SMPTE RP-168, provides an error-free switch. A continuous output stream is provided in which the video data content changes while the underlying transport stream is maintained in a continuous manner. The clean switch also maintains an output signal when a switch is made to an input with no signal. It supplies an internally generated black signal to maintain lock of downstream equipment.

Setting Up Clean Switch Reclock Mode (P-SCQ and P-HSCQ Modules)



Note: This section presupposes that you have a working knowledge of Navigator or RouterMapper configuration utility software application and have used its other capabilities. If not, please refer to the configuration utility software application user guide and familiarize yourself with its functions before you continue.

- **1** At the main window, highlight the name of the P-SCQ or P-HSCQ router that you want to modify.
- 2 Click the right mouse button to display a drop-down menu.

- **3** Scroll down to the **Parametric Settings...** option; then, click **<Enter>**. The *Parametric Settings* window opens.
- **4** Select the Transition tab (see **Figure 3-10** on page 79), and then click **Refresh**. The factory default Reclocker setting (Auto) appear for Program Output 1 (PGM 1).

Parametric Settings - Panacea 0 (127)	×
Clean Switch Transition	
Matrix ID: 0 Votput: PGM 1	Reclocker: Auto
Video & Audio Processing	F Enable Audio Processing
Video Transition	Audio Transition
Transition Type: Cut Fade	Transition Type: Cut Fade 💌
Transition Duration:	Transition Duration:
0 4.2s	s 0 4.2s
Frames: 52 second: 1.7	Frames: 19 second: 0.6
Status	
Advanced	Restore Defaults Set Refresh
	OK Help

Figure 3-10 Transition Tab

- **5** Select the output to change by choosing PGM 1 or PGM 2 in the Output pull-down list.
- **6** Open the Reclocker pull-down list and choose the reclocker format desired.

Only the reclocker choices valid for the sync type applied to the frame appear. **Table 3-5** provides a list of input standards supported for each of the supported reference signal types.

The Auto settings are used for all typical applications.

Table 3-5	Supported Inpu	t Standards for Supported	Reference Signal Types
-----------	----------------	---------------------------	-------------------------------

Clean Switch Reference	Supported Signal Types
NTSC	270-525, 1.485-1080i/299 or 720p/299
PAL	270-625, 1.485-1080i/25 or 720p/50
1080i/299	1.485-1080i/299
720p/599	1.485-720p/599
1080i/25	1.485-1080i/25
1080i/30	1.485-1080i/30
720p/60	1.485-720p/60

7 After making the reclocker choices, press Set.

RouterMapper asks to Autotime the unit after making these changes.



CAUTION

You must autotime all enabled sources after making any adjustment to parametric or transition settings and clicking Set. After the Set function is complete, select the Clean Switch tab and run Autotiming on all enabled sources. Refer to Setting Up the Clean Switch Autotiming for more information on autotiming and parametric settings.

Settings are not maintained unless autotiming is run on all enabled sources after parametric or transition settings are adjusted for video or audio.

8 Click Yes to proceed. (See page 80.)



Important! Autotime all enabled sources *after* making any adjustment to parametric or transition settings and clicking Set. The

Figure 3-11 Autotime All Enabled Sources

Setting Up the Clean Switch Autotiming

- 1 If necessary, select the Clean Switch tab.
- Verify that the sources to be timed appear as ENABLE in the Availability column. (The autotiming status of each source is shown in the Availability column.)To enable or disable inputs that do not have source connections:
 - Select the source line.
 - Click Enable to include the source in the Autotime sequence. OR

Click **Disable** to remove the source from the Autotime sequence.

Click **Auto Timing**¹. After the Autotime is complete, click **Refresh**².

¹ You should also perform autotiming under the following circumstances: Whenever a Panacea clean/quiet unit is power cycled; whenever additional sources are added (you must enable the source in the autotiming user interface, and then run autotiming); and whenever upstream equipment is power cycled or rebooted, or changes are made to a signal format.

3

Availability	Level	Level In	Source 4	Vertical Time	Horizontal Time	In Ti
ENABLE	Level 0	1	1			
ENABLE	Level 0	2	2			
ENABLE	Level 0	3	3			
ENABLE	Level 0	4	4			
ENABLE	Level 0	5	5			
ENABLE	Level 0	6	6			
ENABLE	Level 0	7	7			
ENABLE	Level 0	8	8		***	
ENABLE	Level 0	9	9		***	
ENABLE	Level 0	10	10			
ENABLE	Level 0	11	11			
ENABLE	Level 0	12	12			
ENABLE	Level 0	13	13			
ENABLE	Level 0	14	14			
ENABLE	Level 0	15	15			

Figure 3-12 Clean Switch Tab

The In Time column shows you if sources are within the required timing window. The Vertical Time and Horizontal Time columns indicate the actual timing.

- If a "No" appears in the In Time column or the Vertical Time and Horizontal Time columns contain dashes (–), autotiming can take place:
 - **Click Auto Timing**.
 - Wait for the autotime to take place (approximately 30 seconds). Sources out of time blink on the front panel.
 - Click Refresh.
- If the In Time column still displays a "No" or if dashes still appear in the Vertical Time and Horizontal Time columns, check sources and source timing.
- 4 Select the Transition tab, and then click **Refresh**.

The factory default transition setting ("cut") appears.

² "Refresh" is required for any updated information to be displayed accurately. Timing information is only updated during the Autotime sequence.

Parametric Settings - Pana	cea 0 (127)		×
Clean Switch Transition			
Matrix ID: 0	Beclocker Settings	Reclocker: Auto	×
Video & Audio Processing	1	F F F F F F F F F F	F + 1 = 1
Video Transition Transition Type:	Cut 💌	Audio Transition Transition Type:	
Status			
	Advanced	estore Defaults Set	Refresh
			OK Help

Figure 3-13 Factory Default Transition Settings

- **a** If you want a different transition type, click on the Transition Type drop-down list box, and then make your selection.
- **b** If you want to set a different transition duration, click on the Transition Duration bar and slide it to the desired rate (both seconds and frames are indicated). The transition duration change applies to all transitions except **Cut**, which does not have a duration.

Parametric Sett	ings - Panace	a 0 (127)		
Clean Switch	Transition			
Matrix ID:	0 💌	Reclocker Settings Output: PGM 1	Reclocker: Auto	_
-Video & Aud	tio Processing			
Video Transition Transition 0 Frames:	nsition Type: Duration: 	Cross Fade	C Enable Audio Processin Audio Transition Transition Type: Transition Duration: 0 Frames: 65	g Audio Follow
Status				
		Advanced	estore Defaults Se	Refresh
				OK Help

Figure 3-14 Transition Duration Bar

By default, audio effects is set to Pass-Through so it always cuts, regardless of the video transition. To allow other transitions:

c Click Advanced.

The Audio Processing Settings tab opens.

d If necessary, click the Effects tab.

Audio Processing Settin	igs		×
Effects Gain Source			
Output: PGM 1	🔽 Audio Group	Present In Output	
Group Group 1 C Group 2	Channel 1 & 2:	None	
C Group 3 C Group 4	Channel 3 & 4:	Mute Channel	
Set Refresh		Lopy Right to Left Mute Channel None Swap Left and Right	
	Status:		
		ОК Н	ielp

Figure 3-15 Effects Tab

- e Click **Refresh** to reset the tab entries to their defaults.
- **f** In the Output drop-down list box, select PGM 1.
- **g** Select the radio button next to a group associated with PGM 1. (Each group contains four audio channels.)
- **h** Select the Audio Group Present in Output check box for each group.
- i From the Channel 1 & 2 and the Channel 3 & 4 drop-down list boxes, verify "None," or select the desired effect.
- j Repeat steps g, h, and i for each group associated with PGM 1.
- **k** Click **Set** to accept changes.



If you are not using PGM 2, skip to step step 5.

- I If necessary, in the Output drop-down list box, select PGM 2.
- **m** Select the radio button next to a group associated with PGM 2.
- **n** Select the Audio Group Present in Output check box for each group.
- From the Channel 1 & 2 and the Channel 3 & 4 drop-down list boxes, verify "None," or select the desired effect.
- **p** Repeat steps m, n, and o for each group associated with PGM 2.
- 5 Click Set to accept changes, and then click Auto Timing.



CAUTION

You must autotime all enabled sources after making any adjustment to parametric or transition settings and clicking Set. After the Set function is complete, select the Clean Switch tab and run Autotiming on all enabled sources. Refer to Setting Up the Clean Switch Autotiming for more information on autotiming and parametric settings.

Settings are not maintained unless autotiming is run on all enabled sources after parametric or transition settings are adjusted for video or audio.

Availability	Level	Level In	Source	 Vertical Time 	Horizontal Time	In Ti
ENABLE	Level 0	1	1			
ENABLE	Level 0	2	2			
ENABLE	Level 0	3	3			
ENABLE	Level 0	4	4			
ENABLE	Level 0	5	5			
ENABLE	Level 0	6	6			
ENABLE	Level 0	7	7			
ENABLE	Level 0	8	8		***	
ENABLE	Level 0	9	9			
ENABLE	Level 0	10	10		***	
ENABLE	Level 0	11	11			
ENABLE	Level 0	12	12			
ENABLE	Level 0	13	13			
ENABLE	Level 0	14	14			
ENABLE	Level 0	15	15			

Important! Autotime all enabled sources *after* making any adjustment to parametric or transition settings and clicking Set.

Figure 3-16 Autotime All Enabled Sources

- 6 After the Autotime is complete, click **Refresh**.
- 7 Click OK until you return to the RouterMapper main menu window.

If you made changes to the transition duration, a message ("Needs Download") appears next to the router or panel name listed on the RouterMapper main menu window. Highlight the appropriate devices and click **Download** to download the revised settings.

Clean Switch Setup/Output Format Selection via Terminal Operation Commands



If you want to set up the clean switch via configuration utility software, see page 78.

The BNC connector labels on a a P16SCQ display the same label markings as a P16HSCQ. See **Figure 3-17** for an illustration.



Figure 3-17 BNC Connector Label Markings for P16SCQ / P16HSCQ

Setup

Note: For information about setting autotiming for standard modules, see **AUTOTIME** on page 148. For information about setting autotiming for enhanced modules, see **SET AUTOTIME** on page 162

The clean switch operates off a line buffer. Input signals must be synchronized and timed within one line of each other for clean switching to occur. The clean switch module for the S version supports standard definition and a standard definition reference is used.

The Panacea unit automatically picks a buffer suitable to most inputs available. Autotiming setup may be initiated either through a Hyperterminal session or through the Panacea control application. The unit also runs the autotiming setup at power-on when the router is first received from the factory. This occurs at each power-on until a valid reference and at least on valid input signal are detected. From this point on, the unit uses stored information until autotiming is manually initiated.

Table 3-6 provides a list of input standards supported for each of the supported reference signal types.

Clean Switch Reference	Supported Signal Types
NTSC	270-525, 1.485-1080i/59.9 or 720p/50.0
PAL	270-625, 1.485-1080i/50.0
1080i/299	1.485-1080i/59.9
720p/599	1.485-720p/59.9
1080i/25	1.485-1080i/50.0
1080i/30	1.485-720p/60.0
720p/60	1.485-720p/60.0

Table 3-6	Reference Sigr	nal Types Inpu	it Standards
-----------	----------------	----------------	--------------

Output Format Selection

The output format is controlled by the **Reclockmode** setting. **Reclockmode** settings on the clean switch are used by autotiming to set the output standard. They only take effect when autotiming is performed. (**Reclockmode** setup may be initiated either through a Hyperterminal session or through the Panacea control application.) In **Table 3-7**, the number in parentheses (#) equates to the reclock mode as it appears in the terminal interface.

S

Output	Format Description
Auto-Mode (0)	When an output is set to auto mode (factory default), autotiming selects the most prevalent input standard that is valid with the given reference. If the same number of S and HS inputs are found, it defaults to HS. If the same number of 1080i and 720p are fond, it defaults to 1080i. Both outputs are the selected standard.
270Mb/s (4)	When this mode is selected, the output is formatted as Standard Definition 525 lines in a 270 Mb/s stream. This mode requires an NTSC reference.
270 Mb/s-50 (9)	When this mode is selected, the output is formatted as Standard Definition 625 lines in a 270 Mb/s stream. This mode requires a PAL reference.
1.485Gb/s-1080i/59.9 (7)	When this mode is selected, the output is formatted as High Definition 1080i /29.97 in a 1.485 Gb/s stream. This mode requires either an NTSC reference or a 1080i/ 29.97 tri-level reference.
1.485 Gb/s-1080i/50.0 (10)	When this mode is selected, the output is formatted as High Definition 1080i /25 in a 1.485 Gb/s stream. This mode requires either an PAL reference or a 1080i/25 tri-level reference.
1.485 Gb/s-1080i/60.0 (11)	When this mode is selected, the output is formatted s High Definition 1080i /30 in a 1.485 Gb/s stream. This mode requires a 1080i/30 tri-level reference.
1.485 Gb/s-720p/59.9 (13)	When this mode is selected, the output is formatted as High Definition 1080i/59.94 in a 1.485 Gb/s stream. This mode requires either an NTSC reference or a 1080i/59.94 tri-level reference.
1.485 Gb/s-720pi/60 (15)	When this mode is selected, the output is formatted as High Definition 1080i/60 in a 1.485 Gb/s stream. This mode requires a 720p/60 tri-level reference.

See **Appendix C** for information about standard module Reclock and Autotiming modes:

- **AUTOTIME** (page 148)
- SET RECLOCKMODE (page 151)
- SHOW RECLOCKMODES (page 153)
- SHOW RECLOCKSETTINGS (page 153)

See **Appendix D** for information about enhanced module Reclock and Autotiming modes:

• GET RECLOCKMODE (page 162)

- SET AUTOTIME (page 162)
- SET RECLOCKMODE (page 162)
- SHOW RECLOCKMODES (page 162)
- SHOW RECLOCKSTATUS (page 162)

AES Audio Configuring DIP Switches and the Alarm Port

The AES audio module requires no specialized procedures for configuring DIP switches and the alarm port; however, the P-04Q submodule has configurable DIP switches (see **Figure 3-18**).

P-04Q Submodule DIP Switches

Figure 3-18 shows configurable DIP switch settings for the P-04Q submodule.



Figure 3-18 P-04Q DIP Switch Settings

In 32×4 and 16×4 matrices, the router can be configured for 4 destinations or 2 destinations with dual outputs. When configured for two destinations, two identical output signals are provided for each destination. Destination 1 appears on outputs 1 and 2. Destination 2 appears on outputs 3 and 4.

In other matrix sizes, the router can be configured to provide the SQS outputs on the first four destinations; or, in dual partitioned matrices, on the first two destinations of each partition. For example, if a 16×16 matrix is partitioned into dual 8×8 matrices, the first two destinations of each 8×8 partition are the SQS outputs.

Connector Pin Assignments

Pin	Output 1-8 or Input 1-8	Output 9-16 or Input 9-16	Output 17-24 or Input 17-24	Output 25-32 or Input 25-32
1	Unused	Unused	Unused	Unused
2	8 GND	16 GND	24 GND	32 GND
3	7-	15-	23-	31-
4	7+	15+	23+	31+
5	6 GND	14 GND	22 GND	30 GND
6	5-	13-	21-	29-
7	5+	13+	21+	29+
8	4 GND	12 GND	20 GND	28 GND
9	3-	11-	19-	27-
10	3+	11+	19+	27+
11	2 GND	10GND	18 GND	26 GND
12	1-	9-	17-	25-
13	1+	9+	17+	25+
14	8-	16-	24-	32-
15	8+	16+	24+	32+
16	7 GND	15 GND	23 GND	31 GND
17	6-	14-	22-	30-
18	6+	14+	22+	30+
19	5 GND	13 GND	21 GND	29 GND
20	4-	12-	20-	28-
21	4+	12+	20+	28+
22	3 GND	11 GND	19 GND	27 GND
23	2-	10-	18-	26-
24	2+	10+	18+	26+
25	1 GND	9 GND	17 GND	25 GND

Table 3-8 AES Audio (Balanced I/O) Connector Pin Assignments

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4 Operation

Control Features

The Panacea modular routing switchers are compatible with all existing Harris routers and control panels. Panacea frames include the following control options:

- A standard serial port for remote control from computers, users, and automation systems (configurable for RS-232 or RS-422) (see page 72 for configuration information)
- A single looping X-Y port for connecting to remote control panels and other routers (see page 72 for configuration information)
- A single looping sync port for the connection for a synchronization signal (see page 73 for configuration information)
- An alarm port
- An Ethernet port¹ (see page 73 for configuration information)
- A local control panel option
- A software-based control system

Front Panel Options

You can configure your Panacea frame with one of two front panel styles:

A blank front

Using an RS-232 serial cable, connect the Panacea frame to a local PC or laptop. Follow the steps outlined in **Appendix B**, *Terminal Operation* for setting up a Hyperterminal² session to perform serial port operation commands.

 An optional local control panel (use any Harris control panels except the ABAp panel series, 12×2HADESC2, and 32×8p)

We offer a wide variety of programmable control panels that can be used to control your Panacea. The programmable panel series uses RouterMapper configuration utility software to program the panel for customization.

For more information about operating your local control panel, refer to the *RCP-P Programmable Control Panel Series Configuration and Operation Manual.*



Note: PDF versions of the control panel manuals are available on the documentation DVD.

¹ Ethernet connection capability is available only with the enhanced resource module.

² HyperTerminal, a product of Hilgraeve Inc., is a communications applet that ships with Windows 95/ 98 and Windows NT 4.0.

Firmware-Based Control System

The Panacea can operate in two modes:

- DIP switch mode (page 93), which is used for basic matrix switching on the X-Y bus with Harris protocol
- Program mode (page 93), which is used when you want to use other protocols, software matrix partitioning, non-typical offsetting, or a variety of starting levels

These two modes allow the Panacea to be a part of virtually any signal routing system.

Software-Based Control Systems

Your Panacea modular routing switcher system makes use of the most innovative control systems available on the market today. The operating system used for the Panacea is a real-time embedded operating system that uses an interrupt-driven and priority-based task scheduling algorithm to control the operations of the router. This means that switches occur in a timely manner, which allows the Panacea to be used in broadcast facilities where timing is crucial to the success of the facility.

The configuration utility for programming your Panacea for operation is called RouterMapper, an easy-to-use Windows[®]-based application for programming RouterWorks, router frames, control panels, and the Opus master controller. Using RouterMapper, you may create a database that describes a routing system (that is, available levels, sources, and destinations). That database may be downloaded to a control panel and/or router frame, and may be used in conjunction with RouterWorks software applications. See your **RouterMapper Configuration Utility Reference Guide** for instructions on how to set up your Panacea for operation.

There are several options available to control your Panacea:

- Navigator[™], an application that allows you to easily create custom browser pages that represent your network and its various environments around the world. You can associate objects on these pages with network events, user-defined actions, and other browser pages. This allows you to consolidate, simplify, and centralize the status monitoring of the network's many devices and environments on a few easy-to-use and -understand browser pages. This can lead to more efficient and economical operation of your network.
- RouterWorks[®], a Windows®-based 32 bit control system. RouterWorks uses a graphic user interface to improve the manageability and ease of use of the control system.

Modes of Operation

There are two separate control functionality modes of operation for Panacea modules: DIP switch mode and Program mode.

DIP Switch Mode

DIP switch mode operation allows you to operate your Panacea with minimal (and often no) additional setup. This mode allows you to set parameters outside of the ones supported by the DIP switches (for example, destination offset and level offset). All other parameters (for example source offset, data rate, matrix partitioning, and so forth) are settable while in DIP switch mode and remain set in non-volatile memory through power-up and power-down cycles.

To configure the Panacea for DIP switch mode operation, set the resource module's DIP switches as shown in **Figure 3-4** on page 69.

Program Mode

Program mode operation allows you to manipulate all system configuration and routing parameters inherent in the router via any program operation (for example, HyperTerminal commands, software applications, and so forth). This mode ignores the DIP switch settings for both destination and level offset in most cases, except during initial startup when no valid database is detected. In this case, when the router first boots up, it initializes all registers with the DIP switch information until you overwrite the information via program commands.

Program mode requires router configuration to be done via a computer. RouterMapper, the Windows-based router configuration utility software program, configures the Panacea in Program mode. (Refer to the RouterMapper manual for information on configuring the Panacea.) Alternatively, you can conduct a Hyperterminal session to configure the Panacea in Program mode. (Refer to **Appendix B** for information on setting up a Hyperterminal session.)

To configure the Panacea for Program mode operation, set the resource module's DIP switches as shown in **Figure 3-4** on page 69.

For more information about operating procedure in Program mode, refer to the *Serial Protocol Reference for Harris Routing Switchers Operation and Reference Manual.* 94 Chapter 4 Operation

Serial Control Configuration and Operation



Note: GVG TEN-XL operations are not available for Panacea products with an enhanced resource module.

Serial Control Configuration

One of the many powerful features of the Harris router control system is its ability to use a serial port to access the entire system. The serial port, in effect, is the control gateway to the entire routing system. The serial port allows external control of the Panacea by a computer, user, or automation system via a serial connection using RS-232 or RS-422.

Serial Port Pin Assignments

Pin	Function	
1	Frame Ground	
2	RxD (Data received by router)	
3	TxD (Data sent by router)	
4	Data Terminal Ready [*]	
5	Ground	
6	Data Set Ready (DSR)*	
7	Request to Send (RTS) [†]	
8	Clear to Send (RTS) [†]	
9	Frame Ground	

 Table 5-1
 RS-232
 Signal Format
 Pin
 Assignments

* Pins 4 and 6 connected internally.

[†] Pins 7 and 8 connected internally.

Pin	Signal (Tributary)	Description	Connection to Remote Computer (Controller)
1	FG	Frame Ground	Frame Ground
2	Ta (Tx-)	Transmitted Data	Ra (Rx-)
7	Tb (Tx+)	(Twisted Pair)	Rb (Rx+)
6	Тс	Received Data Shield	Received Data Shield
8	Ra (Rx-)	Received Data	Ta (Tx-)
3	Rb (Rx+)	(Twisted Pair)	Tb (Tx+)
4	Rc	Transmitted Data Shield	Transmitted Data Shield
9	FG	Frame Ground	Frame Ground
5	SP	(Not Connected)	(Not Connected)

 Table 5-2
 RS-422
 Signal Format
 Pin
 Assignments

Serial Port RS-232/RS-422 Configuration

The port is configured for RS-232 or RS-422 using DIP switches on the resource module (see **Figure 3-6** on page 70).

Operation Using Terminal Protocol

Harris terminal protocol is the specific protocol used by Harris routers. The Panacea has two types of protocol: single-bus and multi-bus. Single-bus is used when the two destinations are the same destination located on two different levels. Multi-bus is used when the two destinations are on the same level.

DIP Switch Settings

Harris terminal protocol is enabled using the DIP switch setting, as shown in **Figure 3-6** on page 70.

Data Format In Harris terminal protocol, all words are sent and received using the following format:

Data Format	Description	
Data rate	DIP switch selectable	
Default data rate	9600 baud rate	
Data encoding	8 data bits (ASCII data, most significant bit always 0) No parity 1 stop bit	
Communications standard	RS-232 or RS-422; jumper pack selectable	
Default communications standard	RS-232	

Table 5-3 Harris Protocol Data Format

Communications Interlocking

The serial control port does not use hardware handshaking to coordinate data flow between the control port and the user. Data transmission to the serial control port is controlled by means of a prompt character and requires no additional handshaking (the serial control port incorporates a 250 Byte type-ahead buffer to ease input timing).

For Panacea products with an enhanced resource module, data transmission from the serial control port can be controlled by employing the XON/XOFF software flow control. Output from the serial control port can be paused by sending an XOFF (hexadecimal 13 or, on a terminal, by holding down the CTRL key and pressing "S"). Transmission from the serial control port can be restarted by sending an XON (hexadecimal 11 or, on a terminal, by holding down the CTRL key and pressing "Q"). The XON and XOFF entries take effect immediately upon receipt by the serial control port. If the serial control port receives and XOFF without a following XON, transmission is automatically re-enabled approximately 7¹/₂ seconds after the receipt of the last XOFF to avoid inadvertent system lockup.

The Command Line

When using the serial control port, the routing system is controlled by means of a Command Line (an ASCII string of up to 255 characters comprising one or more individual instructions to the serial control port). The Command Line offers the best compromise between manual operations via a data terminal and automatic control via a computer.

Command Line Entry

A command line can be entered in either upper or lower case characters via a data terminal or computer. The Echo Mode determines the response of the router to the incoming data stream. If the Echo Mode is ON, the entered characters are echoed back to the operator, and any error message is sent in its entirety. If the Echo Mode is **OFF**, characters are not echoed, and only the error number of an error message is sent to the operator. The entry of more than 255 characters, or the entry of any illegal character, triggers an **ERROR 2001** message and causes the entire Command Line to be ignored. Editing of the Command Line is limited to the use of a <BACKSPACE> to remove characters from the Command Line (the <BACKSPACE> and the removed character are not counted in the 255-byte entry limit), and to <ESC>, which aborts the current string.

Command Syntax

Commands consist of a keyword followed by additional parameters, as needed. Only the first letter of the keyword is actually required, and the keyword may be preceded or followed by any number of spaces. Depending upon the actual command, one or more parameters may be required. Leading spaces are allowed for parameters (note that certain parameters may not include trailing spaces). A space is not needed between the keyword and the first parameter, if the parameter is numeric. However, a space is required after the keyword, if the keyword is followed by an alphabetic parameter. Multiple numeric parameters must be separated by commas or spaces. No delimiters are required between multiple alphabetic parameters, or when a numeric parameter is followed by an alphabetic parameter. Certain commands use field separators (for example, the '/' or ':' characters) to divide the command into two or more subgroups.

Each distinct command is terminated by a semicolon, thus allowing more than one command to be entered on each Command Line. The use of the semicolon at the end of the last command in a Command Line is optional.

Order of Command Execution

No commands are executed until the Command Line has been completed (until the carriage return has been pressed). The commands are then processed in the order received. Control is not returned to the operator until all commands of the current Command Line have been processed, all requested crosspoint operations have been committed, and all transmissions and error messages have been completed. When the serial port is ready to receive a new Command Line, a '>' is transmitted as a prompt, regardless of the status of the Echo Mode. Commands are processed in the order received, but they are not necessarily executed in the order received. Requests to change crosspoints are buffered by the router until processing of the current Command Line has been completed. At that time, all crosspoint connection requests in that Command Line are taken simultaneously, essentially creating a command line salvo.

Error Messages

Errors are grouped into three classes, shown by the first digit of the error code.

- Class 1 errors are typically fatal (that is, the operation of the system is suspended until the problem is corrected) and usually involve some failure in the operation of the X-Y communications bus.
- Class 2 errors involve the entry or syntax of the Command Line and generally indicate that a specific command or part of a command cannot be properly executed.
- Class 3 errors typically indicate problems with a router frame or interconnected system. Although Class 3 errors may invalidate router configuration, they usually are not fatal to serial control port operation.

Table F-1 on page 183 provides a list of messages generated by all Harris routers. Not all message types are generated by every frame, but all message types are listed for completeness.

System Operations and Queries

Commands in the systems operations and queries group are used to set the Echo Mode, list the current crosspoint connection status, obtain command syntax information, and determine the system configuration. System operations and queries are performed by executing the **QUERY**, **INFORMATION**, **READ**, **POLL**, **ZERO**, and **TERMINAL** commands. You can find a description each of these commands on the following pages.

Command	Standard Module	Enhanced Module
INFORMATION	page 148	page 157
POLL	page 149	page 157
QUERY	page 149	page 157
READ	page 149	page 157
TERMINAL	page 153	page 158
ZERO	page 153	page 158

Table 5-4 Harris Terminal Protocol System Operations Commands

Operation Using GVG TEN-XL ASCII Protocol

The ASCII interface mode is enabled by setting DIP switches as shown in **Figure 3-6** on page 70.

TEN-XL ASCII Serial Data Format

In TEN-XL ASCII protocol all words sent and received use the following format.

Data Format	Description
Data rate	DIP switch selectable
Default data rate	9600 baud rate
Data encoding	7 data bits Odd parity 1 stop bit
Communications standard	RS-232 or RS-422; jumper pack selectable
Default communications standard	RS-232

Table 5-5 GVG TEN-XL ASCII Protocol Data Format

Definitions

Hexadecimal [hex] numbers are represented with the prefix '0x.' For example:

- The hex equivalent of decimal '8' is written '0x08.'
- The hex equivalent of decimal '12' is written '0x0C.'
All internal crosspoint representations are '0' based, which means that crosspoint number 1 (or the first crosspoint) is represented internally as crosspoint 0.

The TEN-XL ASCII protocol uses two reserved words, as shown in Table 5-6.

Reserved Word	Hexadecimal Equivalent	Control Character
STX	0x02	^В
ENQ	0x05	^E

 Table 5-6
 ASCII Reserved Words

TEN-XL ASCII Protocol: Programming Reference

TEN-XL ASCII protocol uses standard ASCII hex codes for the transmission of commands. Programmers building command strings must use the hex equivalent code in order to successfully convey commands from their controlling software (controller) to the Panacea switcher (tributary).

Exceptions from the TEN-XL ASCII Protocol

Due to hardware differences between Panacea and TEN-XL routers, there are differences in implementation for the Panacea.

The Panacea series supports more inputs (up to 12) compared to TEN-XL (up to 10 inputs) routers. To access sources beyond 10, the use of the data byte has been expanded.

Data Byte		Corresponding
Internal Representation	Hexadecimal Character	Source
0x30	0	1
0x31	1	2
0x32	2	3
0x33	3	4
0x34	4	5
0x35	5	6
0x36	6	7
0x37	7	8
0x38	8	9
0x39	9	10
0x41	А	11*
0x42	В	12*

Table 5-7 Source to Data Byte Equivalents

* Varies from standard TEN-XL implementation.

Since the Panacea series does not support power supply status reporting, the POWER SUPPLY STATUS byte [PS] in the reply string always returns [0x31], which is equivalent to [1].

String Structures

In addition, in the case of a **WRITE** or a **TAKE** command string, the reply is held off until the crosspoint is physically taken by the switcher, up to a maximum of 75 mSec. Any command string created must adhere to the following string structures.

Write or Take Command String

[STX][AH][AL][VXPT][AXPT]	All codes are adjacent to each other, and no
	spaces are allowed.

Read or Query Command String

[STX][AH][AL][ENQ]

All codes are adjacent to each other, and no spaces are allowed.

Reply Command String

[VXPT][AXPT][PS]

All codes are adjacent to each other, and no spaces are allowed.

Table 5-8 ASCII Command Definitions

Command	Definition
[STX] - (0x02)	Standard ASCII hex code for Start of Transmission
[ENQ] - (0x05)	Standard ASCII code for Enquiry
[VXPT]	Video crosspoint coded as (0–9, A, B) [corresponding ASCII hex codes (0x30–0x39, 0x41, 0x42)] 0 corresponds to crosspoint 1
[AXPT]	Audio crosspoint coded as (0–9, A, B) [corresponding ASCII hex codes (0x30–0x39, 0x41, 0x42)] 0 corresponds to crosspoint 1
[PS]	Power Supply - fixed at 1 [corresponding ASCII hex code 0x31]; meaning that power supply one (the only one present) is active
[AH] *	High order address - range of (0–9, A–F) [corresponding ASCII hex codes (30–39, 41– 46)]
[AL] *	Low order address - range of (0–9, A–F) [corresponding ASCII hex codes (30–39, 41– 46)]

* [AH] combined with [AL] gives an address range of 0-FF.

TEN-XL ASCII Protocol: Examples

The following are examples of the TEN-XL ASCII protocol write and read commands. They should serve as a guide to programmers using this protocol.

Input Selection - Follow Mode



Note: Issuing any command string, whether it is **WRITE** or **READ**, always generates a reply from the switcher.

Result desired	Switch to input 3 for both audio and video.	
Premise	The Panacea frame address is set to '00' [all sw2 DIP switches in the off position], and video input [3] and audio input [3] are desired [Follow Mode].	
Action	Send this string from the controller to the switcher: ^B0022 Note that [^B] is equivalent to hex [0x02] or the Start of Transmission [STX] code required at the beginning of the WRITE string (refer to the <i>Write or Take Command String</i> on page 101).	
Effect	After the crosspoints are asserted, the switcher responds with the "Reply Command String." 221 This translates to the video [3] and audio [3] crosspoints recently asserted by the command string issued, and power supply status [1] (refer to the <i>Reply Command String</i> on page 101).	

Input Selection - Breakaway Mode

Result desired	Switch to video input 12 and audio input 7.	
Premise	The Panacea frame address is set to '00'[all sw2 DIP switches in the off position] and video input [12] and audio input [7] are desired [Breakaway Mode].	
Action	Send the string from the controller to the switcher: ^B00B6 Note that [^B] is equivalent to hex [0x02]or the Start of Transmission [STX] code required at the beginning of the write string (refer to the <i>Write or Take Command String</i> on page 101).	
Effect	After the crosspoint is asserted, the switcher responds with the 'Reply Command String:' B61 This translates to the current video [12] and audio [7] crosspoints asserted, and power supply status [1] (refer to the <i>Reply Command String</i> on page 101).	



Note: Character [B] in the Reply Command string is the last number in the range of 12 possible crosspoints for the video crosspoint parameter [VXPT]; hence, it is crosspoint [12] (refer to the **Reply Command String** on page 101).

Frame Status Request

Result desired	Get the Panacea frame's crosspoint status.
Premise	The Panacea frame address is set to '00' and the video crosspoint [3] and audio crosspoint [11] are asserted.
Action	Send this string from the controller to the switcher: ^B00^E Note that [^B] is equivalent to hex [0x02]or the Start of Transmission [STX] code required at the beginning of the query string, and that [^E] is equivalent to hex [0x05] or the Enquiry [ENQ] code required at the end of a query string to execute the command (refer to the <i>Write or Take</i> <i>Command String</i> on page 101).
Effect	Switcher responds with "Reply Command String" 2A1 This translates to the current video [3] and audio [11] crosspoints asserted, and power supply status [1] (refer to the <i>Reply Command String</i> on page 101)



Note: Character [A] in the Reply Command string is the second to the last number in the range of 12 possible crosspoints for the audio crosspoint parameter [AXPT]; hence, it is crosspoint [11] (refer to the **Reply Command String** on page 101).

Operation Using GVG TEN-XL SMPTE (Binary) Protocol

The SMPTE interface mode is enabled by setting DIP switches as shown in **Figure 3-6** on page 70.

TEN-XL SMPTE Serial Data Format

In compliance with the SMPTE protocol, all words sent and received, with the exception of the BREAK character, have the following format:

Table 5-9 GVG TEN-XL SMPTE Protocol Data Forn

Data Format	Description
Data rate	DIP switch selectable
Default data rate	9600 baud rate
Data encoding	8 data bits Even parity 1 stop bit
Communications standard	RS-232 or RS-422; jumper pack selectable
Default communications standard	RS-232

Definition of the TEN-XL SMPTE Protocol

Figure 5-1 shows the State Diagram used to define the SMPTE protocol. The following subsections explain this protocol.



Figure 5-1 SMPTE Protocol State Diagram

TEN-XL SMPTE Protocol - Programming Reference

GVG TEN-XL SMPTE protocol is a binary protocol. **Table 5-10** provides a listing of several of the commands used in this protocol.

A Note on Standard Reserved Words

The TEN-XL SMPTE protocol uses a number of standard reserved words such as **ESC**, **ACK** and **NAK**. Be careful not to confuse these words with the standard ASCII definition of the reserved words.

In TEN-XL SMPTE protocol, the following definitions are used:

Reserved Word	TEN-XL SMPTE Definition
ESC	0x03
АСК	0x04
NAK	0x05

Table 5-10 SMPTE Reserved Words



The **BREAK** character is a special attention character with the following format:

Figure 5-2 Definition of a BREAK Character

Exceptions to TEN-XL SMPTE Protocol

Due to hardware differences between the Panacea routers and TEN-XL routers, there are differences in the Panacea implementation.

1 Source Numbers for **READ** and **WRITE** commands: The Panacea Series supports more inputs (up to 12) than the TEN-XL (up to 10 inputs) routers. To provide access to sources beyond 10, the use of the data byte has been expanded.



Note: [ADDR] is transmitted as two bytes. If [ADDR] is 0x80A0, it would be sent as 0x80, 0xA0, where 0x80 is [ADDRHI] and 0xA0 is [ADDRLO].

2 Since the Panacea does not support power supply status reporting, the POWER SUPPLY STATUS byte of the **READ** sequence [PS] always returns 0x00.

Data Byte Nibble	Corresponding Source
0x01	1
0x02	2
0x03	3
0x04	4
0x05	5
0x06	6
0x07	7
0x08	8
0x09	9

Table 5-11 SMPTE Data Byte to Source Comparison

Data Byte Nibble	Corresponding Source
0x0A	10
0x0B	11 *
0x0C	12 *

 Table 5-11
 SMPTE Data Byte to Source Comparison (Continued)

* Varies from standard TEN-XL implementation.

Packet Structures

TEN-XL SMPTE protocol uses hex-coded packets for the transmission of commands. Every command issued by the controlling software [controller] causes a reply from the Panacea switcher [tributary]. Programmers building command packets must adhere to the following packet structures.

 Table 5-12
 SMPTE Command Definitions

Command	Hex	Definition
[BREAK]	Hardware	A special attention character; see Figure 5-2 on page 105 for format
[ADDR]	0x8**0	SMPTE Address.
[ESC]	0x03	Escape is a Reserved Word.
[BC]	0x02	Byte Count is fixed at 0x02
[CMD]	0x41 or 0xC1	Command: Read fixed at 0x41 and Write fixed at 0xC1
[DATA]	Audio: upper nibble Video: lower nibble.	Data: Indicates the crosspoints to be selected, where audio is in the upper nibble and video in the lower nibble
[CS]	Any number	Checksum: Calculated as the 2's complement of the addition of [BC], [CMD], [DATA], or [XPT]. In the case of a Reply Sequence pack, [PS] is also added before calculating the 2's complement
[XPT]	Audio: upper nibble Video: lower nibble	Crosspoint: Contains the current crosspoint status for all existing levels (up to 2) in frame
[PS]	0x00	Power Supply: Set to 0 since power supply reporting is not supported
[RESPONSE]	See Table 5-14 on page 107	See Table 5-14 on page 107

** Determined by the SMPTE Address set on DIP Switch SW1.

Frame Status Request (Poll) Sequence Packet

[BREAK][ADDR+1]

All codes are adjacent to each other, and no spaces are allowed.

(The [ADDR+1] is a short-cut method utilized by the SMPTE protocol to get a Poll without using a command byte. The command byte is incorporated into the address byte, and the Poll command in represented by adding a "1" to the SMPTE address in the last nibble.)

 Table 5-13
 SMPTE POLL Command

Command	Hex	Definition
[BREAK]	Hardware	A special attention character; see Figure 5-2 on page 105 for format
[ADDR+1]	0x8**1	SMPTE address

** Determined by the SMPTE address set on DIP switch SW1.

Poll messages are initiated by the controller with the transmission of a **BREAK** followed by a poll address, per the SMPTE standard. The SMPTE poll address is one more than the device's SMPTE select address. If the received address matches the switcher polling address, it responds with one of four characters.

Response Commands (to the Poll Sequence)

Response	Explanation
RST (0x07)	The switcher has been powered up or a reset has occurred since the last poll.
NAK (0x05)	A protocol error (time-out), parity (invalid command) has occurred since the last poll.
SVC (0x08)	A change in crosspoint or power supply status has occurred since the last poll.
ACK (0x04)	There has been no change in status since the last poll.

 Table 5-14
 Response to Poll Sequence

Write Sequence Packet

[BREAK][ADDR][ESC][BC][CMD][DATA][CS]

All codes are adjacent to each other, and no spaces are allowed

 Table 5-15
 SMPTE Write Command

Command	Нех	Definition
[BREAK]	Hardware	A special attention character; see Figure 5-2 on page 105 for format
[ADDR]	0x8**0	SMPTE Address.
[ESC]	0x03	Escape is a Reserved Word.
[BC]	0x02	Byte Count is fixed at 0x02

[CMD]	0xC1	Command: Write fixed at 0xC1
[DATA]	Audio: upper nibble Video: lower nibble.	Data: Indicates the crosspoints to be selected, where audio is in the upper nibble and video in the lower nibble
[CS]	Any number	Checksum: Calculated as the 2's complement of the addition of [BC], [CMD], [DATA].

Table 5-15 SMPTE Write Command (Continued)

** Determined by the SMPTE address set on DIP switch SW1.

WRITE messages are initiated by the controller with the transmission of a **BREAK** followed by a select address and five additional bytes. (Refer to **WRITE** sequence.) If the packet is received properly, the switcher responds with [ACK] (0x04).

(Long) Read Sequence Packet

```
a) [BREAK][ADDR][ESC][BC][CMD][DATA][CS]
```

All codes are adjacent to each other, and no spaces are allowed

READ messages are initiated by the controller with the transmission of a **BREAK** followed by a select address and five additional bytes; *see* (LONG) Read Sequence packet, above.

 Table 5-16
 SMPTE Command Definitions

Command	Hex	Definition
[BREAK]	Hardware	A special attention character; see Figure 5-2 on page 105 for format
[ADDR]	0x8**0	SMPTE Address.
[ESC]	0x03	Escape is a Reserved Word.
[BC]	0x02	Byte Count is fixed at 0x02
[CMD]	0x41	Command: Read fixed at 0x41
[DATA]	Any number	Value of [DATA] is ignored.
[CS]	Any number	Checksum: Calculated as the 2's complement of the addition of [BC], [CMD], [DATA].

** Determined by the SMPTE address set on DIP switch SW1. If the sequence from "a)" is received correctly, the switcher replies with [ACK]. The controller then sends transmit enable [TEN].

b) [TEN]

All codes are adjacent to each other, and no spaces are allowed

 Table 5-17
 SMPTE Long Read Command

Command	Нех	Definition
[TEN]	0x09	Transmit/Enable: a Reserved Word.

The switcher then responds with a reply sequence packet. See Item 7.

(Short) Read Sequence Packet

[BREAK][ADDR][TEN]

All codes are adjacent to each other, and no spaces are allowed

Table 5-18 SMPTE Short Read

Command	Hex	Definition
[BREAK]	Hardware	A special attention character; see Figure 5-2 on page 105 for format
[ADDR]	0x8**0	SMPTE Address.
[TEN]	0x09	Transmit/Enable: a Reserved Word.

** Determined by the SMPTE address set on DIP switch SW1.

From the SMPTE protocol state diagram, it can be seen that this is a simpler way to request the read response message.

Reply Sequence Packet

[ESC][BC][CMD][XPT][PS][CS]

All codes are adjacent to each other, and no spaces are allowed

Table 5-19 SMPTE Command Defin	nitions
--------------------------------	---------

Command	Hex	Definition
[ESC]	0x03	Escape is a Reserved Word.
[BC]	0x03	Byte Count is fixed at 0x03
[CMD]	0xC1	Command: Fixed at 0xC1
[XPT]	Audio: upper nibble Video: lower nibble.	Indicates the crosspoint status, where audio is in the upper nibble and video in the lower nibble
[PS]	0x00	Fixed at zero
[CS]	Any number	Checksum: Calculated as the 2's complement of the addition of [BC], [CMD], [XPT] and [PS].

** Determined by the SMPTE address set on DIP switch SW1.

TEN-XL SMPTE Protocol: Examples

The following are examples of the TEN-XL SMPTE protocol commands. They should serve as a guide to programmers using this protocol.

Frame Status Request (Poll)

Result desired	Get the current frame status.	
Premise	The Panacea frame address is set to '8050' and the Panacea frame was recently powered up.	
Action	Send this string from the controller to the switcher:	
	Command Syntax: <break> [ADDR+1]</break>	
Effect	The switcher responds with [RST] 0x07 The switcher has been powered up or a reset has occurred since the last poll.	
If any of the followir conditions also exists	ng Reply Commands occur, it could be because one of the following s, rather than the premise used in the above example.	
NAK (0x05)	A protocol error (time-out, parity, invalid command) has occurred since the last poll.	
SVC (0x08)	A change in crosspoint or power supply status has occurred since the last poll.	
ACK (0x04)	There has been no change in status since the last poll.	

Write Command Example

Result desired	Selection of audio crosspoint 1 and video crosspoint 10
Premise	The Panacea frame address is set to 10 which is '80A0' and was recently powered up.
Action	Send this string from the controller to the switcher:
Command Syn	tax: <break> [ADDR][ESC][BC][CMD][DATA][CS]</break>

Command String: <BREAK> 80A00302411A23

Effect

The switcher responds with [ACK] 0x04

(Long) Read Sequence Example

Result desired	Crosspoint Status (long)
Premise	The Panacea frame address is set to 10 which is '80A0' and was recently powered up.
Action 1	Send this string from the controller to the switcher:

Command Syntax: <BREAK> [ADDR][ESC][BC][CMD][DATA][CS] Command String: <BREAK> 80A00302C11A23 The switcher responds with Effect 1 [ACK] 0x04 Action 2 Send [TEN] 0x09 to the switcher. Effect 2 The switcher responds with [ESC][BC][CMD][XPT][PS][CS] Command Syntax **Command String** 0303C14300F9 The crosspoint status by has the same format as the data byte of the write command. This read response indicates Result description audio crosspoint four and video crosspoint three are selected.

(Short) Read Command Example

Result desired	Crosspoint Status (Short)
Premise	The Panacea frame address is set to 10 which is '80A0' and was recently powered up.

(01

Action 1 Send this string from the controller to the switcher:

.

Command Syntax: <BREAK> [ADDR][TEN]

Command String: <BREAK> 80A009

Effect The switcher responds with

Command Syntax [ESC][BC][CME

Command String

[ESC][BC][CMD][XPT][PS][CS] 0303C14300F9

(This is the same six-byte response as the 'Effect 2' from 'Action 2' in the Read Sequence (Long) example.)

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6 Troubleshooting Communications Issues

If experiencing communications issues (for example, no control panel or serial port control) on a Panacea frame, use this troubleshooting guide to verify proper setup and configuration before contacting the Customer Service department. Troubleshooting steps for a standard or an enhanced module are virtually identical; however, any differences are indicated.

If you are not sure if a standard or an enhanced resource module is installed, check the part number of the Panacea frame. (The part number can be found on a sticker at the rear of the frame.) If the part number ends in an **E**, an enhanced resource module is installed.

If communication problems still persist after you have checked the potential trouble spots, contact the Customer Service department. When discussing your issue with a Customer Service representative, mention that you have used this checklist.

Checking Serial Settings (Standard and Enhanced Resource Modules)

Checking the DIP Switches

The DIP switch settings determine the serial communications type (RS-232 or R-S422), baud rate, and protocol type. For troubleshooting purposes, a PC with an RS-232 port and RouterMapper is required. The latest version of RouterMapper software can be downloaded from our website



Note: Older Panacea frames do not have hinges on the front panel. so ensure the panel does not drop

1 Remove the front panel from the Panacea frame and locate DIP switches SW1, SW2, and SW3 as shown in Figure 6-1.



Figure 6-1 Panacea DIP Switch Locations

- 2 Make a note of the current DIP switch positions, and then place all the switches in the down position as shown in the picture above. By placing all the switches in the down position we can check whether there is a hardware or configuration issue. With all switches down the serial port format is RS-232 and the baud rate is 9600.
- **3** In RouterMapper, make sure the Comm Settings are configured for the correct COMM port and for a baud rate of 9600. (See the *RouterMapper Configuration Utility Reference Guide* for information on how to do this.)
- **4** Select **Poll** to see if RouterMapper can communicate with the Panacea frame.
 - If RouterMapper does not discover the Panacea frame, the modem cable may be loose or disconnected. See Checking the Modem Cable on page 115.
 - If RouterMapper discovers the Panacea frame, the original DIP switch settings must be examined to find why it does not communicate. Pay particular attention to the following DIP switches:

SW1, Pole 1: Program Mode switch

If the router stops responding when this switch is turned on to Program mode, it probably has an invalid configuration provided. See *Checking Programmed Configuration* on page 117.

SW2: Switching Level and Destination Offset

These DIP switches assign the switching level and destination offset. They must correspond with the control panel configuration and programming.

SW3, Pole 1: RS-232/RS-422 Switch

Normally RS-422 mode is only used with Automation systems. If the DIP switch is set for RS-422, make sure that the controlling PC also communicates via an RS-422 port.

Graph SW3, Poles 5 and 6: Software Mode (Enhanced Resource Module only)

SW3 Pole 5 must be in the Off position When SW3 Pole 6 is in the On position, it sets the serial ports to follow the programmed configuration via the terminal and/ or RouterMapper. If there is no communication, try turning this switch and all other SW3 poles off. Then use RouterMapper or a terminal set at 9600 baud rate.

SW3, Poles 5 and 6: Protocol Format (Standard Resource Module only)

These two switches assign the protocol format. Leave these switches off for Harris protocol. If these switches are set to a GVG protocol format, RouterMapper is not able to communicate.

SW3, Poles 7 and 8: Baud Rate

These two switches assign the baud rate. If communications appear to be intermittent, try changing the baud rate to a lower setting.

Checking the Modem Cable

When the serial format is RS-232, a null modem cable (with female connectors on both ends) is used. Only three wires must be connected.

- Pins 2 and 3 crossed
- Pin 5 to Pin 5

Buzz out the null modem cable with a multi-meter to ensure these connections are made.

Checking the Resource Module Ribbon Cable

A gray ribbon cable connects the P-MI module to the front panel resource module on every Panacea frame. This ribbon cable provides power and the communications line to the resource module. Make sure that the ribbon cable is attached properly to both the P-MI board and the front panel resource module. Pay careful attention to the connection on the P-MI (see **Figure 6-2**). Even if the cable looks like it is connected properly, apply upward pressure to the connection to ensure good contact; then, retry the communication.



Figure 6-2 Connecting the Ribbon Cable to the P-MI Module

If you suspect that the ribbon cable is faulty, you can order new ones. Use the following part numbers:

P-2RU-CAB1 Ribbon cable for a Panacea 2RU frameP-1RU-CAB1 Ribbon cable for a Panacea 1RU frame

Checking P-MI Module Placement

Occasionally the P-MI module may become slightly unseated from the back plane and cause communication issues. Ensure that the P-MI is pushed tightly into the back plane as shown in **Figure 6-3**. Even if the P-MI module appears to be snug, apply forward pressure to the board; then, recheck communications.



Figure 6-3 Checking P-MI Module Placement

Checking X-Y and Genlock Connectors

If there are communications issues it may be possible that the X-Y and Genlock cables are connected vertically to the rear of the Panacea frame instead of diagonally, as shown in **Figure 6-4**. (This may also produce the symptom of no vertical interval switching if an X-Y cable is connected to the genlock BNC. If using a Panacea clean/quiet switch, P16SCQ, then it may also produce green flashes in the video.)



Figure 6-4 X-Y/Genlock Connector Orientation

Checking Programmed Configuration

If the serial port can be communicated with but the control panel cannot control it, then the Panacea may not be configured properly. This normally only occurs when DIP switch SW1-1 is set to the On position for Program mode.



See **Appendix B**, *Terminal Operation* for detailed information about how to set up a communication session via HyperTerminal or Telnet.

1 Open a communications session with a program such as HyperTerminal (or Telnet for Ethernet connections) and connect to the Panacea frame. Ensure the correct COMM port and baud rate are set in HyperTerminal. The Bits per second field is the baud rate and must match the baud rate set by DIP switches SW3-7 and 3-8 on the resource module. The other parameters (Data bits, Parity, Stop bits, and Flow Control) must appear as shown in Figure 6-5.

Bits per second:	9600	~
Data bits:	8	~
Parity:	None	~
Stop bits:	1	~
Flow control:	None	•

Figure 6-5 Panacea Parameters

- 2 At the > prompt, type SHOW OFFSETS. Information similar to the following appears.
 - > show offsets

Frame Offsets:	
First Level	0
First Source	1
First Destination	1

- >
- **3** If the level, source, or destination does not match that what is expected, use the following commands to set the correct values at the > prompt:

SET FIRSTLEVEL=# — In this command, "#" is the desired switching level; it is normally set to 0 for video, 1 for audio.

SET FIRSTSOURCE=# — In this command, "#" is the desired starting source; it is normally set for 1.

SET FIRSTDESTINATION=# — In this command, "**#**" is the desired starting destination; it is normally set for 1.

4 (Enhanced modules only) After the correct settings have been entered, type **SAVE MP** at the **>** prompt to save these changes permanently.

5 Determine if Combiner Mode is turned on or off. Combiner mode should only be turned on if the Panacea is part of a larger combiner system.

At the > prompt, type **SHOW COMBINER**. Something similar to the information shown below appears.

```
> show combiner
```

Frame is in Program Mode. Combiner settings are Active.

```
Current Combiner Settings:
```

Mode = Primary Frame Blocksize = 16 Number of Blocks = 2

>

If the combiner settings are Active, type **SET COMBINERMODE=n** at the **>** prompt to disable Combiner Mode.

6 Recheck to see if the panel can now control the frame. Note that the panel must also be properly programmed to control the levels, sources, and destinations as defined in step 3 on page 117.

Checking Ethernet Settings (Enhanced Modules Only)

When troubleshooting Ethernet problems, first make sure that communication can be established with the serial port. If not, go back to **Checking Serial Settings (Standard and Enhanced Resource Modules)** starting on page 113.

1 At the serial port, type **SHOW IPDISPLAY** at the > prompt. The following information appears:

>show ipdisplay

Active:

Ip Address: 192.168.100.250 Gateway Address: 192.168.100.1 Netmask Address: 255.255.255.0 Mac address 00-90-F9-00-3B-35

Stored:

Ip Address: 192.168.100.250 Gateway Address: 192.168.100.1 Netmask Address: 255.255.255.0 Mac address 00-90-F9-00-3B-35

2 Make sure the IP address, gateway address, and subnet mask settings correct. If not, use the following commands to configure these settings.

SET IP1=xxx.xxx.xxx.xxx SET GATEWAY1=xxx.xxx.xxx.xxx SET NETMASK1=xxx.xxx.xxx.xxx

After the settings have been made, type **SAVE SYSCONFIG** at the > prompt to permanently store these settings.

3 Verify the maximum number of allowed Ethernet connections. At the > prompt, type **SHOW VXYCONNECTIONS**. Information similar to the following appears:

> show vxyconnections VIRTUALXY SYSTEM INFORMATION Maximum Number of Connections = 4 Connections:

This information displays the maximum number of Ethernet clients that may control the frame. "Clients" are products, such as an Ethernet control panel, RouterWorks software, or Pilot/Navigator software. The maximum number of connections should be at least 1 higher then the expected number of clients. For example, if you anticipate up to 4 clients on your system set the maximum number of connections to 5. The upper limit is 12.

To change the maximum number of connections, type **SET TMAXCONNECTIONS=#**, where **#** is anywhere between 2 and 12. To permanently save this setting, type **SAVE SYSCONFIG** at the > prompt.

- **4** Connect your PC to the Panacea frame. If connecting directly from the PC to the Panacea, a crossover Ethernet cable is required, or use two straight cables with a hub or switch.
- 5 From a Windows Command prompt, try to ping the IP address of the Panacea frame.
 - If you can ping it, go to step 6.
 - If you cannot ping the Panacea frame, the cables and/or the PC setup must be verified.
 - Ensure that a good wire connection is being made by checking that the green LED on the Ethernet port is on.
 - □ Also check the green connection LED on the switch or hub.

Ensure that the PC has a valid IP address and is on the same subnet as the Panacea frame. If you are not sure how to do this, check with your IT department.

- 6 If you cannot communicate to the Panacea frame with an Ethernet control panel, make sure the panel is pointing to the correct IP address. From the serial port of the control panel, type **SET SERVER=**<IP address of Panacea>.
- 7 If using RouterWorks, make sure that the correct IP address for the Panacea frame is configured in the Comm Settings menu in RouterMapper first, as shown below, before launching RouterWorks.

Communications Settings			
Default Connection	Host IP Search Order:		
C. Carial		Add	
, sena	10.157.70.68	Modify	
C Dial-Up		Remove	
TCP/IP		Bemove All	
<u> </u>			
Uemo		Up	
	Total: 1	Down	
Help Host IP reconnect preferences			
Cancel	Reconnect only to current host IP		
ОК	Search host IPs list 1 tin	nes	

Figure 6-6 RouterMapper Comm Settings Menu

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7 Specifications



Note: All specifications and designs are subject to change without notice.

Frame Specifications

Table 7-1 Electrical Specifications

Item	Specification
Input	
1RU	1RU portable desktop power supply (rear mount AC or DC power supply module available as an option) 2RU portable desktop power supply (rear
2RU	mount AC or DC power supply module available as an option)
Desktop power supply	Universal input
1811	47-63 Hz, 70 W
	100-240 VAC
2811	47-63 Hz, 130 W
210	100 – 240 VAC
Output	15 VDC
Total power	
1RU	70 W
2RU	
Performance temperature	41° – 104°F (5° – 40°C)
Operating temperature	32° – 122°F (0° – 50°C)

Item	Specification
Size	
1RU	19 in.×5.25 in.×1.75 in. (48.3 cm×13.3 cm×44 cm)
2RU	19 in.×5.25 in.×3.5 in. (48.3 cm×13.3 cm×88 cm)
Weight (fully loaded)	
1RU	5 lb (2.3 kg)
2RU	7 lb (3.2 kg)
Indicators	
Standard resource module Enhanced resource module	Power/alarm LED Power/alarm LED Data LED
Cooling (only in HD and analog audio)	Forced air/convection

 Table 7-2
 Mechanical Specifications

 Table 7-3
 Frame Input/Output Signal Specifications

Item	Specification
RS-232/RS-422 serial communication	DB-9 pin connector
Alarm/comm port	Harris 3-pin connector
X-Y (coaxial communication)	75Ω BNC
Sync	75Ω BNC
Ethernet	RJ-45

Module Specifications

Analog Audio

 Table 7-4
 Analog Audio Input Specifications

Item	Specification
Number of inputs	8, 16, or 32
Signal type	Balanced analog audio
Impedance	
66Ω	High Z (20 k Ω)
600Ω	60002
Connector	DB-25

Item	Specification	
CMRR	> 70 dB rejection 20 Hz to 20 kHz	
600Ω	> 65 dB rejection, 20 Hz to 20 kHz typical> 60 dB worst case	
Nominal input level	+8 dBm	
Maximum level		
66Ω	+28 dBu +20 dBm	
600Ω		

 Table 7-4
 Analog Audio Input Specifications

Table 7-5 Analog Audio Output Specifications

Item	Specification
Number of outputs	1, 4, 8, 16, or 32
Signal type	Balanced analog audio
Impedance	66Ω or 600Ω
Connector	DB-25
Maximum level	+28 dBu (66Ω) +20 dBm (600Ω)
DC output level	± 50 mV maximum
Maximum cable length	328 ft (100 m) of Belden 8451 or equivalent
Minimum load	600Ω

	Table 7-6	Analog Audio	66Ω Performance	Specifications
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Item	Specification
Gain	Unity, ± 0.1 dB
THD+N*	< 0.01% at 28 dBu < 0.005% , typical
IMD (SMPTE 4:1)	< 0.005%, +24 dBu, typical < 0.01%, worst case
Crosstalk	Better than –85 dB, typical Better than –80 dB, worst case
Frequency response	< –3 dB to 200 kHz < ± 0.15 dB, 20 Hz to 20 kHz
S/N ratio	Better than –105 dB typical Better than –100 dB worst case
Performance temperature	41° to 104°F (5° to 40°C)
Operating temperature	32° to 122°F (0° to 50°C)

^{*} THD+N increases as matrix size and/or number of destinations increase. The worst case is a 128×64 stereo system or a 128×128 mono system with all destinations set to a single source. In this worst case, the THD+N is < 0.025%, 20 Hz to 20 kHz, +28 dBu, with a High Z load.

Item	Specification
Gain	Unity, ± 0.15 dB
THD+N	< 0.01%, 20 Hz to 20 kHz, +20 dBm < 0.005% , typical
IMD (SMPTE 4:1)	< 0.001%, +20 dBm < 0.02%,typical
Crosstalk	> 80 dB isolation, 20 Hz to 20 kHz, all hostile, typical > 95 dB isolation, worst case
Frequency response	< ± 0.15 dB, 20 Hz to 20 kHz [*] -3 dB point: > 200 kHz
S/N ratio	> 100 dB ref. to +28 dBu 20 Hz to 20 kHz, typical
Performance temperature	41° to 104°F (5° to 40°C)
Operating temperature	32° to 122°F (0° to 50°C)

Table 7-7 Analog Audio 600Ω Performance Specifications

* Frequency response in 600 Ω version with 328 ft (100 m) of cable is – dB @ 20 kHz, –14 dB @ 200 kHz, into a 600 Ω load.

Analog Video

Table 7-8	Analog	Video	Input	Specifications
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Item	Specification
Number of inputs	8, 16, or 32
Signal type	Composite or component analog video, or any video or RF signal within the voltage and frequency limits
Connector	75Ω BNC per IEC 169-8
Signal coupling	DC
Impedance	75Ω
Return loss	> 45 dB at 5 MHz > 35 dB at 20 MHz > 18 dB at 250 MHz
Normal input level	1.0 Vp-р
Maximum level	3.0 Vp-p centered at 0 V

Table Analog Viaco Output Specifications	Table 7-9	Analog	Video	Output	Specifications
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Item	Specification
Number of outputs	1, 4, 8, 16, or 32
Signal type	Composite or component analog video, or any video or RF signal within the voltage and frequency limits
Connector	75Ω BNC per IEC 169-8

Item	Specification
Impedance	75Ω
Return loss	> 45 dB at 5 MHz > 35 dB at 20 MHz > 18 dB at 250 MHz
Normal level	1.0 Vp-р
Maximum level	3.0 Vp-p centered at 0 V
Tilt	0.1%

 Table 7-9
 Analog Video Output Specifications

 Table 7-10
 Analog Video Performance Specifications

Item	Specification
DC offset	< ± 50 mV
Input to input gain	Unity ± 0.15 dB
Frequency response	± 0.1 dB from DC to 20 MHz ± 0.5 dB from 20 to 50 MHz + 2 dB to –3 dB from 50 to 200 MHz
Crosstalk	> 65 dB typical > 60 worst case
Differential gain	< 0.15% at 3.58 MHz and 4.43 MHz
Differential phase	< 0.15 degree at 3.58 MHz and 4.43 MHz
Phase scatter	$< \pm 1^{\circ}$ input to input
Signal to noise	> 65 dB 5 MHz
Power consumption	35 W
Performance temperature	41° to 104°F (5° to 40°C)
Operating temperature	32° to 122°F (0° to 50°C)

Multirate/Standard Definition/Clean Switch

 Table 7-11
 HS/S Input Specifications

Item	Specification
Number of inputs	16
Connector	75Ω BNC per IEC 169-8
Signal type	SMPTE 259M, SMPTE 344M, and SMPTE 292M signal formats (HS only) Frequency limited - 3.072 Mb/s to 1.485 Gb/s
Normal input level	800 mVp-p ±10%
Maximum input level	1200 mV
Return loss	Better than –20 dB (5 MHz to 540 MHz) Better than –18 dB (540 MHz to 1.485 GHz)

Item	Specification
Equalization	Automatic
270 Mb/s	1,100 ft (335 m) Belden 1694A
1.485 Gb/s (HS only)	400 ft (122 m) Belden 1694A

Table 7-11 HS/S Input Specifications

Item	Specification
Number of outputs	1, 4, 8, 16, or 32
Connector	75 Ω BNC per IEC 169-8
Signal type	SMPTE 259M, SMPTE 344M, and SMPTE 292M signal formats
Reclocking	Automatic for all SMPTE-defined data rates Pass-thru for all nonstandard clock rates
Output amplitude	800 mV-p±10%
Return loss	Better than –20 dB (5 MHz to 540 MHz) Better than –18 dB (540 MHz to 1.485 GHz)
Slew rate	
SD/ASI	400-700 pS
HD	(270)5
Overshoot	< 10% of amplitude
Jitter	< 0.2 UI @ frequency tested

 Table 7-12
 HS/S Output Specifications

Table 7-13 HS/S Performance Specifications

Item	Specification
DC offset	0 ± 0.5 V
Power consumption 16×16 32×32	25 W 50 W
Propagation delay	< 4.5 nS P16 <i>xn</i> S (270 Mb/s) < 13 nS P16 <i>xn</i> SR (270 Mb/s) < 5.5 nS P32 <i>xn</i> S (270 Mb/s) < 13.5 nS P-32 <i>xn</i> SR (270 Mb/s)
Performance temperature	41° to 104°F (5° to 40°C)
Operating temperature	32° to 122°F (0° to 50°C)

3 Gb Serial Digital Video

 Table 7-14
 3 Gb Input Specifications

Item	Specification
Number of inputs	8, 16, or 32
Connector	75Ω BNC per IEC 169-8
Impedance	75Ω
Signal type	SMPTE 259M, SMPTE 344M, SMPTE 292M, SMPTE 424, DVB-ASI Most other <1 Vp-p digital NRZ/NRZI signals, 3 Mb/s to 3.0 Gb/s
Maximum input amplitude	880 mV
Nominal input amplitude	800 mV±10%
Return loss	Better than 18 dB, to 270 Mb/s Better than 16 dB, to 1.5 Gb/s Better than 12 dB, to 3.0 Gb/s
Equalization	Automatic
270 Mb/s	1,148 ft (350 m) Belden 1694A
1.485 Gb/s	492 ft (150 m) Belden 1694A
2.97 Gb/s	328 ft (100 m) Belden 1694A

Table 7-15 3 Gb Output Specifications

Item	Specification
Number of outputs	4, 8, 16, or 32
Connector	75Ω BNC per IEC 169-8
Impedance	75Ω
Signal type	SMPTE 259M, SMPTE 344M, SMPTE 292M, SMPTE 424, DVB-ASI Most other <1 Vp-p digital NRZ/NRZI signals, 3 Mb/s to 3.0 Gb/s
Maximum output amplitude	880 mV
Nominal output amplitude	800 mV ± 10%
Reclocking	Automatic for 270 Mb/s, 1.485 Gb/s, and 2.97 Gb/s Pass-thru for all nonstandard clock rates
Return loss	Better than 18 dB, to 270 Mb/s Better than 16 dB, to 1.5 Gb/s Better than 12 dB, to 3.0 Gb/s
Slew rate	<135 pS
DC offset	0 ± 0.5 V
Overshoot	< 10% of amplitude
Jitter	< 0.3 UI @ frequency tested

Item	Specification
Power consumption	50W with reclock modules 25W with bridge modules
Propagation delay (for reference only)	< 7 nS with reclock modules < 5 nS with bridge modules
Performance temperature	41° to 104°F (5° to 40°C)
Operating temperature	32° to 122°F (0° to 50°C)

Table 7-16 3 Gb Performance Specifications

Clean/Quiet Switch

Table 7-17 P16SCQ/P16HSCQ Input Specifications

Item	Specification
Number of inputs	16
Connector	75Ω BNC per IEC 169-8
Signal type	SMPTE 259M and SMPTE 292M signal formats
Maximum input level	1200 mV
Return loss	Better than –20 dB (5 MHz to 540 MHz) Better than –18 dB (540 MHz to 1.485 GHz)
Equalization	Auto
270 Mb/s (SD only) 1.485 Gb/s (HS only)	984 ft (300 m) Belden 1694A 328 ft (100 m) Belden 1694A

Table 7-18	P16SCQ/P16HSCQ	Output Specifications

Item	Specification
Number of outputs	2 clean 6 aux
Connector	75Ω BNC per IEC 169-8
Signal type	SMPTE 259M and SMPTE 292M signal formats
Reclocking	Automatic for all SMPTE-defined data rates Pass-thru for all nonstandard clock rates
Return loss	Better than –20 dB (5 MHz to 540 MHz) Better than –18 dB (540 MHz to 1.485 GHz)
Jitter	< 0.2UI @ frequency tested
Output amplitude	800 mVp-v ± 10%
DC offset	0 ± 0.5 V
Rise / fall time 270 Mb/s (SD only) 1.485 Gb/s (HS only)	400 — 1500 ps < 270 ps

Item	Specification
Power consumption 16×2	= 50 W
Performance temperature	41° to 104°F (5° to 40°C)
Operating temperature	32° to 158°F (0° to 70°C)

Table 7-19 P16SCQ/P16HSCQ Performance Specifications

Clean/Quiet Switch with Relay Bypass

Table 7-20 P16SCQ-RB/P16HSCQ-RB Input Specifications

Item	Specification
Number of inputs	16
Connector	75Ω BNC per IEC 169-8
Signal type	SMPTE 259M and SMPTE 292M signal formats
Maximum input amplitude	800 mV
Equalization	Auto
270 Mb/s 1.485 Gb/s	984 ft (300 m) Belden 1694A 328 ft (100 m) Belden 1694A

Table 7-21 P16SCQ-RB/P16HSCQ-RB Output Specifications

Item	Specification
Number of outputs	2 clean 6 aux
Connector	75Ω BNC per IEC 169-8
Signal type	SMPTE 259M and SMPTE 292M signal formats
Maximum output amplitude	800 mV
DC offset	0 ± 0.5 V
Jitter	< 0.2 UI typical

 Table 7-22
 P16SCQ-RB/P16HSCQ-RB
 Performance
 Specifications

Item	Specification
Power consumption 16×2	= 50 W
Performance temperature	41° to 104°F (5° to 40°C)
Operating temperature	32° to 158°F (0° to 70°C)

AES Audio

ltom	Specification	
Item	Balanced I/O	Coaxial I/O
Туре	Balanced, transformer coupled	AC coupled
Qty. (signals)	32, 16, or 8	32, 16, or 8
Qty. (reference)	One, terminated	One, looping
Connector (signals)	DB-25	BNC
Connector (reference)	Removable terminal strip	BNC
Impedance	110Ω	75Ω
Return loss	N/A	>30 dB, 0.1 MHz to 6 MHz >25 dB, 6 MHz to 12 MHz
Signal amplitude	0.2 Vp-p to 7 Vp-p	0.1 Vp-p to 2 Vp-p

 Table 7-23
 AES Audio Input Specifications

 Table 7-24
 AES Audio Output Specifications

Itom	Specification		
item	Balanced I/O	Coaxial I/O	
Туре	Balanced, transformer coupled	Unbalanced	
Quantity	32, 16, 8, 4, or 1	32, 16, 8, 4, or 1	
Connector	DB-25	BNC	
Impedance	110Ω	75Ω	
Return loss	N/A	> 35 dB, 0.1 MHz to 6 MHz > 25 dB, 6 MHz to 12 MHz	
Signal amplitude	5 Vp-p \pm 1 V into 110 Ω load	1.0 Vp-p \pm 10% into 75 Ω load	
DC offset	0.0 V ± 50 mV	0.0 V ± 50 mV	
Rise / fall time	5 ns to 30 ns	30 ns to 44 ns	

Table 7-25	AES Audio	Performance	Specifications
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Item	Specification	
Propagation delay	< 170 ns, asynchronous mode < 1.5 AES frames, synchronous or SQS modes	
Intrinsic jitter	< 5 ns	
Switching type	Asynchronous, synchronous, or synchronous quiet switching (SQS)	
AES frame rates	30 kHz – 192 kHz in asynchronous mode 32 kHz, 44.1 kHz, or 48 kHz in synchronous or SQS mode	

Data rates	Up to 30Mb/s, 50% duty cycle, asynchronous mode	
Power consumption	< 20 W	
Performance temperature	41°F to 104°F (5°C to 40°C)	
Operating temperature	32°F to 122°F (0° to 50°C)	

Table 7-25 AES Audio Performance Specifications

A Safety Precautions, Certifications and Compliances

Carefully observe the safety alert symbols below for dangers, warnings, and cautions. They alert installers and operators of possible dangers or important information contained in this manual.

Keep in mind, though, that warnings alone do not eliminate hazards, nor are they a substitute for safe operating techniques and proper accident prevention measures.

Any user-serviceable components (such as fuses or batteries) are only replaceable by those components listed in the manual.

IMPORTANT! Only qualified personnel should perform service procedures.

Safety Terms and Symbols in this Manual



WARNING: Statements identifying conditions or practices that may result in personal injury or loss of life. High voltage is present.



CAUTION: Statements identifying conditions or practices that can result in damage to the equipment or other property.

Safety Terms and Symbols on the Product



DANGER: High voltage and indicates a personal injury hazard immediately accessible as one reads the marking.



WARNING: Indicates a personal injury hazard not immediately accessible as one reads the marking.



CAUTION: Indicates a hazard to property, including the product, or to pay attention and refer to the manual.



Protective ground (earth) terminal.



Fuse. Replace with same type and rating of fuse. Zur Vermeidung von Feuer verwenden Sie nur Sicherungen mit der für dieses Produkt geforderten Typ und Stromstärke.

Preventing Electrostatic Discharge

Observe precautions for handling electrostatic sensitive devices.



CAUTION: Electrostatic discharge (ESD) can damage components in the product. To prevent ESD, observe these precautions when directed to do so:

- **1** Use a Ground Strap. Wear a grounded antistatic wrist strap to discharge the static voltage from your body while installing or removing sensitive components.
- 2 Use a Safe Work Area. Do not use any devices capable of generating or holding a static charge in the work area where you install or remove sensitive components. Avoid handling sensitive components in areas that have a floor or benchtop surface capable of generating a static charge.
- **3** Handle Components Carefully. Do not slide sensitive components over any surface. Do not touch exposed connector pins. Handle sensitive components as little as possible.
- 4 Transport and Store Carefully. Transport and store sensitive components in a static-protected bag or container.

Injury Precautions



WARNING: Potentially lethal voltages are present within the frame during normal operation. The AC power cord must be disconnected from the frame before the top panel is removed. (In frames with multiple power supplies, remove ALL power cords.) Power should not be applied to the frame while the top is open unless properly trained personnel are servicing the unit.

Pull out the plug from the main socket before the removal of a cover.

Przod zdjeciem pokrywy wyciagnac wtyczke z gniazda sieciowego. WARNING: SHOCK HAZARD - DO NOT OPEN. AVIS: RISQUE DE CHOC ÉLECTRIQUE - NE PAS OUVRIR.

MOUNT IN RACK ONLY INSTALLER SUR SUPPORT DE MONTAGE SEULEMENT.

Use proper power cord



To avoid fire hazard, use only the power cord specified for this product.

Ground the product



This is a Safety Class 1 product and is grounded through the grounding conductor of the power cord. To avoid electrical shock, the grounding conductor must be connected to earth ground. Before making connections to the product's input or output terminals, ensure the product is properly grounded. WARNING: THIS APPLIANCE MUST BE GROUNDED.

WARNING: THIS APPLIANCE MUST BE EARTHED. VARNING: APPARATEN SKALL ANSLUTAS TILL JORDAT UTTAG NÄR DEN ANSLUTS TILL ETT NÄTVERK.

Do Not Operate Without Covers



To avoid electrical shock or fire hazard, do not operate this product with covers or panels removed.

Use Proper Fuse



To avoid fire hazard, use only the fuse type and rating specified for this product.

Do Not Operate in Wet/Damp Conditions



To avoid injury or fire hazard, do not operate this product in wet or damp conditions.

Do Not Operate in an Explosive Atmosphere



To avoid injury or fire hazard, do not operate this product in an explosive atmosphere.

Avoid Exposed Circuitry



To avoid injury, remove jewelry such as rings, watches, and other metallic objects. Do not touch exposed connections and components when power is present.
Product Damage Precautions

CAUTION:



Disconnect power from the frame before removing or installing input/ output modules. Removing or installing modules with power applied could cause serious damage to system components.

Use Proper Power Source

Do not operate this product from a power source that supplies more than the specified voltage.

Use Proper Voltage Settings



Before applying power, ensure that the line selector is in the proper position for the power source being used.

Provide Proper Ventilation



To prevent product overheating, provide proper ventilation.

Do Not Operate With Suspected Failures

If you suspect there is damage to this product, have it inspected by qualified service personnel.

CAUTION: This unit can have more than one power supply cord. To de-energize the internal circuitry, you have to disconnect all power cords.



ADVARSEL: Utstyret kan ha mere ennn en tilførselsledning. For å gjore interne deler spennigsløse må alle tilførselsledningene trekkes ut.

VARNING: Denna apparat har mer än en nätanslutning. Samtliga nätkablar måste bortkopplas för att göra de interna kretsarna spänningsfria.



FUSE: REPLACE WITH SAME TYPE AND RATING OF FUSE.

CAUTION: REPLACE WITH SAME TYPE FUSE.

ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE.

CAUTION: DISCONNECT SUPPLY CORD BEFORE CHANGING FUSE.

ATTENTION: DÉBRANCHER AVANT DE REMPLACER LE FUSIBLE.

ACHTUNG: VOR AUSWECHSELN DER SICHERUNG IST DAS GERÄT VOM NETZ ZU TRENNEN.

CAUTION



Disconnect power from the frame before removing or installing input/ output modules. Removing or installing modules with power applied could cause serious damage to system components.

Use Proper Power Source



Do not operate this product from a power source that supplies more than the specified voltage.

EMC and Safety Standards

This product has been tested and found to comply with the following IEC, FCC, UL, ICES, and CSA standards, per the provision of the Electromagnetic Compatibility Directive 89/ 336/EEC of 3 May 1989 as amended by 92/31EEC of 28 April 1992 and 93/68/EEC, Article 5 of 22 July 1993, and the Low Voltage Directive 73/23/EEC of 19 February 1973.

EMC Standards

Table A-1 EMC Standards

EMC Standard	Description
EN55014	Limits and Methods of Measurement of Radio Disturbance Characteristics of Electric Motor-Operated and Thermal Appliances for Household and Similar Purposes, Electric Tools, and Similar Electric Apparatus
EN55022	Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment-Class A
EN55103-1	Electromagnetic Compatibility — Product Family Standard for Audio, Video, Audio-Visual, and Entertainment Lighting Control Apparatus for Professional Use — Part 1: Emission, Environment E4
EN55103-2	Electromagnetic Compatibility — Product Family Standard for Audio, Video, Audio-Visual, and Entertainment Lighting Control Apparatus for Professional Use — Part 2: Immunity, Environment E4
EN61000-3-2	Limits for Harmonic Current Emissions (Equipment Input Current Less Than or Equal to 16 A Per Phase)
EN61000-3-3	Limitations of Voltage Fluctuations and Flicker in Low Voltage Supply Systems for Equipment with Rated Current Less Than 16 A
EN61000-4-2	Electrostatic Discharge Requirements "ESD" 2 kV CD, 4 kV AD
EN61000-4-3	Radiated Radio-Frequency Electromagnetic Field Immunity Test 1 V/m {1 kHz 80% AM, 80-1000 MHz}
EN61000-4-4	Electrical Fast Transient Requirements "Burst," 0.5 kV Sig. & Ctrl. Lines 0.5 kV a.c. & d.c. Power Line, 0.5 kV Functional Earth

EMC Standard	Description
EN61000-4-5	Surge Immunity Test 0.5 kV a.c. Power Line
EN61000-4-6	Immunity to Conducted Disturbances Induced by Radio Frequency Fields 1 V rms 0.15-80 MHz Sig. & Ctrl. Lines, 3 V rms 0.15-80 MHz d.c. Power Line, 1 V rms 0.15-80 MHz a.c. Power Line, 1 V rms 0.15-80 MHz Functional Earth
EN61000-4-11	Voltage Dips, Short Interruptions, and Voltage Variations- Immunity Tests

 Table A-1
 EMC Standards (Continued)

These devices are for professional use only and comply with Part 15 of FCC rules. Operation is subject to the following two conditions:

- 1 These devices may cause interference to radio and TV receivers in residential areas.
- **2** These devices accept any interference received, including interference that may cause undesired operations.

Changes or modifications not expressly approved by Harris Corporation, the party responsible for compliance to the FCC Part 15 Rule, could void the user's authority to operate this equipment legally in the United States.

These devices do not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference standard entitled "Digital apparatus," ICES-003 of the Canadian Department of Communications.

Additional EMC Information

This device is for professional use in a controlled EMC environment, such as purpose-built broadcast studios.

EMC regulations require that the radiation emitted from this unit does not exceed certain limits. These limits are only met when the front panel is closed and the two thumb screws are secured.

Compliance to the EMC regulations is also dependent on the use of suitably shielded (screened) cables. Coax cables should be of the double-shielded (screened) variety. Unused BNCs should be fitted with 75Ω terminations.

All audio cables should be screened with the shield (screen) making good contact with the metallic parts of the cable connectors.

D-type connectors used with this unit should always have metallic shells with the shield (screen) of the cable mechanically bonded to the metal shell. It is further recommended that the D-type cable connectors be of the "dimple" variety. These connectors make a better contact and consequently improve EMC performance.

Safety Standards

Harmonized Standard	Reference IEC Standard	Description
EN 60950:1992 with Am1, Am 2, Am 3, Am4, A11 amendments	IEC 60950:1991 (Modified)	Safety of Information Technology Equipment
EN 60950	IEC 60950:1999 (Modified)	Safety of Information Technology Equipment
	IEC 60950-1 (2001-10)	Information Technology Equipment Safety— Part 1: General Requirements
EN 60065	IEC 60065: 1998 (Modified) 6th Edition	Audio, Video, and Similar Electronic Apparatus Safety Requirements
	IEC 60065 (2001) 7th Edition	Audio, Video, and Similar Electronic Apparatus Safety Requirements
	Amendment 1 to IEC 60065 7th Edition	Audio, Video, and Similar Electronic Apparatus Safety Requirements
EN 60825-1:1999	IEC 60825-1:1993	Safety of Laser Products— Part 1: Equipment Classification, Requirements, and User's Guide
EN 60825-2:2000	IEC 60825-2:2000	Safety of Laser Products— Part 2: Safety of Optical Fibre Communication Systems
	IEC 60825-1 (2001-08) Edition 1.2	Safety of Laser Products— Part 1: Equipment Classification, Requirements, and User's Guide
UL 1419 (March 28, 1997	2nd Edition	Standard for Professional Video and Audio Equipment
UL 6500 (September 30, 1999)	2nd Edition	Standard for Audio/Video and Musical Instrument Apparatus for Household, Commercial, and Similar General Use
UL 60950 (December 1, 2000)	3rd Edition	Safety of Information Technology Equipment

 Table A-2
 Harmonized and Reference IEC Safety Standards

Harmonized Standard	Reference IEC Standard	Description
CAN/CSA-C22.2 No. 60950-00		Safety of Information Technology Equipment (Bi-National Standard, with UL 60950)
CAN/CSA- E60065-00		Audio, Video and Similar Electronic Apparatus Safety Requirements (Adopted IEC 60065:1998, 6th Edition, with Canadian Deviations)
CAN/CSA-C22.2 No. 1-98		Audio, Video, and Similar Electronic Equipment
CSA C22.2 No. 1-98 including Am1 (June, 2003)		Audio, Video, and Similar Electronic Equipment

Table A-2 Harmonized and Reference IEC Safety Standards (Continued)

B Terminal Operation

A separate serial control port is used to control a Panacea from an external computer or automation system. The serial port may be used to monitor the system configuration, determine the current status of crosspoint connections, change crosspoint connections in any matrix, and setup pre-programmed crosspoint takes sequences, or salvos. These (and other) operations are assigned to the serial port via a series of commands called "terminal operation" commands.

- You can find a list of the terminal commands available for the Panacea standard module starting on page 147.
- You can find a list of the terminal commands available for the Panacea enhanced module starting on page 155.

Establishing a Terminal Operation Session

Before you configure your Panacea product, you need to initiate a terminal operation session. You need to determine which type of setup to use:

- For a standalone system with serial connections, see *Establishing a Terminal Operation Session for Serial Control Interface Products* on page 141.
- For a standalone system with Ethernet connections, see *Establishing a Telnet Session* for *Ethernet Control Interface Products* on page 142.
- For a network system with serial connections see *Establishing a Terminal Operation* Session for Serial Control Interface Products on page 141 and Network Configuration from Terminal Control Mode on page 143.
- For a network system with Ethernet connections see *Establishing a Telnet Session for Ethernet Control Interface Products* on page 142 and *Network Configuration from Terminal Control Mode* on page 143.

Establishing a Terminal Operation Session for Serial Control Interface Products

1 Configure a host machine (such as a PC with HyperTerminal¹ installed) for serial port communication at a baud rate of 9600 with these settings: Data on the serial control port is encoded as **8N1**:

¹ HyperTerminal, a product of Hilgraeve Inc., is a communications applet that ships with Windows 95/98 and Windows NT 4.0.

- **8**
- None
- **1**
- No flow-control
- **2** Ensure that DIP switch SW3 is set as follows:
 - 1 = OFF (down position)
 - 2 = OFF (down position)
 - 3 = OFF (down position)
 - 4 = OFF (down position)
 - 5 = OFF (down position)
 - 6 = OFF (down position)
 - 7 = OFF (down position)
 - 8 = OFF (down position)
- **3** Connect a null modem serial cable from a PC serial port to the serial port on the back of the Panacea frame..
- 4 Connect the X-Y to the router network.



CAUTION

Make sure the X-Y network is terminated appropriately.

- **5** Start up both PC and terminal emulation application.
- 6 Apply power to the Panacea frame.
- 7 At the host machine keyboard, enter the letter "Q."

The Command Summary screen opens. (See **Figure C-1** on page 148 for an example of the standard module command summary screen. See **Figure D-1** on page 156 for an example of the enhanced module summary screen.)

Establishing a Telnet Session for Ethernet Control Interface Products

Follow these steps to establish a Telnet session to the Panacea frame if the Telnet application is resident on a PC:

- **1** Connect an Ethernet crossover cable between the 10Base-T connector on a PC to the 10Base-T connector on the Panacea.
- 2 Change the IP address of your PC to a static IP address compatible with the Panacea IP address.



Note: Invoking Telnet commands requires a valid username and password. The default username is **leitch** and the default password is **leitchadmin**. You should change these defaults to ones that are more meaningful for your organization.

- **3** At a DOS prompt, enter the word "**telnet**" and the IP address of the Panacea frame (for example, telnet 100.200.50.10).
- 4 Press <**Enter**>.

The Telnet screen appears.

- **5** Enter your login, and then press **< Enter**>.
- 6 Enter your password, and then press **<Enter**>.
 - The startup screen and the message "Type Q for menu..." appears.
- 7 Type in the letter "Q" (it does not appear on the screen), and then press <Enter>.
 The Command Summary screen appears. (See page 156 for an example of the Command Summary screen.)

Once a Telnet session is established, you have access via the Telnet interface to the commands listed in this section. Also see *Telnet Interface* on page 144 for more information.

Network Configuration from Terminal Control Mode

The Panacea is ready to process user commands whenever you see the ">" prompt. All user-entered commands should be followed by a carriage return. The Panacea comes preconfigured with a network MAC address. However, you must configure the **IP**, **GATEWAY**, and **NETMASK** parameters to have basic network control of the Panacea.

The following are network configuration commands. Use your proper network settings accordingly. The network parameters in these examples are fictitious and should not be used. If you are not sure of the proper network addresses to use, consult your Network System Administrator. From the terminal program, issue these commands when a ">" (prompt) is seen below the Command Summary window:

>SET IP1=192.168.127.33
>
>SET GATEWAY1=192.168.127.1
>
>SET NETMASK1=255.255.255.128
>
>SAVE SYSCONFIG
Saving SysConfig.xml
Save complete.

You may review the network settings with the following terminal commands:

>show ipdisplay



Note: Active" settings are the ones that the Panacea frame currently uses. "Stored" settings are the ones that are used the next time the Panacea frame is started up. The numbers are different if the IP address is changed.

Active:

```
Ip Address: 192.168.127.33
Gateway Address: 192.168.127.1
Netmask Address: 255.255.255.128
Mac address 00-90-F9-00-22-F3
```

Stored:

Ip Address: 192.168.127.33 Gateway Address: 192.168.127.1 Netmask Address: 255.255.255.128 Mac address 00-90-F9-00-22-F3

>

This completes network configuration of the Panacea frame. For IP changes to take effect, the Panacea frame should be restarted, type the reboot command at the terminal prompt:

>reboot

Telnet Interface

Telnet Configuration

The Telnet interface allows remote connection to the router from a standard Telnet client program (such as those provided with the Windows operating system) over IP port 23. To log into the Telnet interface, a user account and password is required (please refer to the **Table D-8** on page 171 for appropriate user management commands).

The Telnet commands listed in **Table D-2** on page 159 provide control of the Panacea Telnet interface (accessed by typing **SHOW TELNET** at the command prompt). The commands appropriate to this configuration are

- SET TMAXCONNECTIONS
- SET TDISCONNECTUSER

- SHOW TCONNECTIONS
- SAVE SYSCONFIG

User Management

User accounts are required to be created for access to the router via the Web, Telnet or FTP interfaces exposed by the router. Appropriate user management commands are listed in **Table D-8** on page 171.

Virtual X-Y (Network) Configuration

The virtual X-Y interface allows remote connection to a router from Harris Ethernet-enabled router control hardware and software packages such as the RCP-ABA-E, RouterWorks, Pilot 3.0 and Navigator 2.0. To connect to the virtual X-Y interface, the router should be configured as a virtual X-Y server.

To enable the virtual X-Y server on the Panacea's Ethernet port, use the following commands:

>set ENET1 PROTOCOL2=ON
(Changes must be saved and the frame reset to take effect.)
>save sysconfig
Saving SysConfig.xml
Save complete.
>reboot

To configure operational parameters of the server, use the virtual X-Y commands listed in **Table D-2** on page 159 (accessed by typing S**HOW VIRTUALX-Y** at the command prompt). The commands appropriate to this configuration are

- SET VX-YMAXCONNECTIONS
- SET VX-YDISCONNECTUSER
- SHOW VX-YCONNECTIONS

146 Chapter

C Terminal Operation Commands for Panacea Standard Modules

Startup Operation

- 1 Set up a host machine as described in **Appendix B**.
- 2 At the host machine, type the letter "Q." The Command Summary screen opens (see Figure C-1 on page 148).

Command Summary Screen



Note: Some command descriptions refer to specific error message numbers. For an explanation of these error message numbers, please see **Appendix F** (page 183).

The Command Summary screen (**Figure C-1**) should be seen on the terminal emulation application. The Command Summary screen provides the basic command line entry syntax for the commands available for a Panacea router.

BASIC COMMAND LINE ENTRY SYNTAX	
AUTOTIME Start CleanSwitch autotiming funct	tion
DESTINATION # [.#.] Take crosspoints or set crosspoint	t request
INFORMATIONList system status and operational	l parameters
LEVEL #	-
POLL #Poll source connections	
QUERY List basic Command Line entry synt	tax
READList current crosspoint status	
SOURCE # Set current Source number	
SET MP #-#Set Matrix Partition Style <[1]2]	>=#
SET ALARMENABLE #, #=#Set/Clear Alarm Enable <module,mod< td=""><td>le=[1]0]></td></module,mod<>	le=[1]0]>
SET COMBINERSIZE = # # Set CombinerSBlocksize>. <number of<="" td=""><td>f Blocks></td></number>	f Blocks>
SET EOBYPASS # #=#	output=[1 0]>
SET FIRSTLEVEL =#Set Frame Program Mode first leve?	L <[015]>
SET FIRSTSOURCE =#Set Frame Program Mode first Source	ce
SET FIRSTDESTINATION =#Set Frame Program Mode first Desti	ination
SET PANELLEVELS =# [,#,].Set Local Panel Dip-switch Mode Le	evels
SET RECLOCKMODE #, #=#Set/Clear Reclock Mode <module, ou<="" td=""><td>utput=[7]></td></module,>	utput=[7]>
SET SLEWRATE #, #-#Set Output Slew Rate <module, output<="" td=""><td>put=[1 0]></td></module,>	put=[1 0]>
SET TIMING # Set Crosspoint Take Timing for Mat	trix [1]2]
SHOW ALARMS Display alarm status	
SHOW ID Display serial numbers	
SHOW INPUTSDisplay input status	
SHOW MP #Display Matrix Partition informat:	ion[1 2]
SHOW OFFSETSDisplay Frame Offsets	
SHOW OUTPUTSDisplay output status	
SHOW PANELLEVELSDisplay Local Panel Dip-switch Mod	de Levels
SHOW RECLOCKSETTINGSDisplay Reclocker Settings	
SHOW RECLOCKMODESList Available Reclock Modes	
SHOW TIMING Display Crosspoint Take Timing	
XPOINT [#.1# #[# 1]/ 1Set specified crosspoints	
ZERO	

Figure C-1 Command Summary Screen

List of Commands

The commands listed in **Table C-1** are in order corresponding to their appearance on the Command Summary screen. Each command is defined, its syntax is illustrated, its parameters are listed, and its response is provided.

Table C-1	Startup	Operation	Commands:	Panacea	Standard	Module
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Command	Syntax	Input Parameters	Result
ΑυτοτιΜΕ	AUTOTIME or A	None	Starts the clean switch Autotime function if an optional clean switch module is installed.
DESTINATION	DESTINATION #[,#,] or D #	#=Destination number	Completes crosspoint operations after the level number and the source number have been set
INFORMATION	INFORMATION or I	None	Provides information on the overall system as seen from the connection to the X-Y bus

Command	Syntax	Input Parameters	Result
LEVEL	LEVEL # or L #	#=Level number	Sets the level number for a router that is connected to an active system
POLL	POLL # or P #	#=Source number to be searched; may be any number 1 to 12	Determines which destinations are connected to a specific source number
QUERY	QUERY or Q	None	Provides a list that includes a basic command syntax and brief description of each command
READ	READ or R	None	Lists all crosspoints within a frame in order by level numbers, then by destination numbers that show which source is assigned to each of the destinations on that level Each crosspoint connection is represented by a numeric pair separated by a semicolon and a space: the first number is the destination number; the second number is the source number that is connected to that destination
SOURCE	SOURCE # or S #	#=Source number.; can range from 1 to the maximum number of sources on that level, or "X" for disconnect	Sets the desired source number
SET MP	SET MP #=#	<pre>#=# = Module=Option # = Module (#=1 through x, where x is the number of hardware matrices available in a frame) #=Option (use SHOW MP to see currently selected option and which, if any, options are available for that routing module)</pre>	Allows logical subpartitions to be defined from a single larger matrix.

 Table C-1
 Startup Operation Commands: Panacea Standard Module (Continued)

Command	Syntax	Input Parameters	Result
SET ALARMENABLE	SET ALARMENABLE #,#=#	#,# = Module,Alarm number # = Alarm enabling 0 = Disable 1 = Enable	Sets or clears automatic alarm reporting over X-Y bus for alarm selected An alarm that is not enabled for automatic reporting can still be read for its alarm state; use SHOW ALARMS to view alarm states See Appendix E , <i>Device</i> <i>Alarm List</i> for a list of alarm numbers, their meanings, and which module types use them
SET COMBINERMODE	SET COMBINERMODE = [ON/OFF]	ON = Enables frame combiner functionality OFF = Disables frame combiner functionality	Frame combiner functionality enabled or disabled When ON, frame is configured as a system combiner; it switches (combines) outputs of other router frames to form a larger router. SET COMBINERMODE SET COMBINERSIZE SET FIRSTSOURCE SHOW COMBINER Destination locks and protects continue to work normally; however, crosspoint restrictions cannot be stored by the combiner frame for the entire system, and are therefore not allowed Only one block size is allowed for a combiner system
SET COMBINERSIZE	SET COMBINERSIZE = #,#	#,# = Block size, Number of blocks	Sets block size and number of blocks for a frame combiner
SET EQBYPASS	SET EQBYPASS #,#=#	#,# = Matrix,Input # = 0128	Sets or clears the input equalization function on router modules that support this option; use SHOW INPUTS to view current settings

 Table C-1
 Startup Operation Commands: Panacea Standard Module (Continued)

Command	Syntax	Input Parameters	Result
SET FIRSTLEVEL Note: Dual matrix routing switchers with the same format are partitioned from larger Panacea back panel configurations prior to shipment. The two matrices are automatically assigned to levels 0 and 1.	SET FIRSTLEVEL =#	# = Any number from 0 through 15 that corresponds to the first Level	Sets the first Level of all router modules in a frame If a standard logic controller is installed, any additional levels (either physical or partitioned) is assigned consecutive increasing number To enable this command, you must set the pole 4 DIP switch on SW3 to ON This command is only available in Program mode
SET FIRSTSOURCE	SET FIRSTSOURCE =#	# = A number that corresponds to the first Source	Sets the first Source of a frame (this command is useful for making a large system using a combiner frame) This command is only available in Program mode
SET FIRSTDESTINATION	SET FIRSTDESTINATION =#	# = A number that corresponds to the first Destination	Sets the first Destination for a frame This command allows you to define a destination offset for the frame., which is useful in large systems to keep multiple frames from appearing to the control system as "slaves"
SET PANELLEVELS	SET PANELLEVELS =#[,#,]	# = Control and status levels settings	Sets DIP switch mode levels for a local control panel (LCP) if installed
SET RECLOCKMODE	SET RECLOCKMODE #,#=#	#,#=# = Module,output=[07]	Specifies (sets or clears) the reclock operation of each output of a router module that support that option Use SHOW RECLOCKMODES for a list of options Use SHOW OUTPUTS to view current settings

 Table C-1
 Startup Operation Commands: Panacea Standard Module (Continued)

Command	Syntax	Input Parameters	Result
SET SLEWRATE	SET SLEWRATE #,#=#	#,#=# = Module,output=[1 0] 1 = Slow 0 = Fast	Sets or clears the output slew rate of each output as either slow or fast on router modules that support that option (slew rates are not applicable to SD matrices or to HD matrices with reclock submodules) Use SHOW OUTPUTS to view current settings
SET TIMING	SET TIMING #	# = Matrix = [1 2]	Sets the crosspoint Take timing for a matrix This command brings up a page with three options: Auto Mode, Standard Mode, and Advanced Mode Use Auto Mode for most installations Use Standard Mode if the sync reference is different than the video type being switched (for example, NTSC SYNC, HDTV VIDEO) Use Advanced Mode for setting a switch point for video standards not otherwise supported.
SHOW ALARMS	SHOW ALARMS	None	Displays alarm status
SHOW COMBINER	SHOW COMBINER	None	Displays a frame's combiner option settings
SHOW ID	SHOW ID	None	Displays controller and interface serial numbers
SHOW INPUTS	SHOW INPUTS	None	Shows input present and EQ bypass settings if those features are supported by the device
SHOW MP	SHOW MP #	# = Number of the matrix you want to see	Displays matrix partition information
SHOW OFFSETS	SHOW OFFSETS	None	Displays a frame's combiner option settings
SHOW OUTPUTS	SHOW OUTPUTS	None	Displays output present, lock status, and slew rate setting if those features are supported by the device

 Table C-1
 Startup Operation Commands: Panacea Standard Module (Continued)

Command	Syntax	Input Parameters	Result
SHOW PANELLEVELS	SHOW PANELLEVELS	None	Displays current DIP switch mode levels for a local control panel (this information can be viewed at any time, but it is only used by the frame when it is in DIP switch mode)
SHOW RECLOCKSETTINGS	SHOW RECLOCKSETTINGS	None	Displays which, if any, reclock settings are in use
SHOW RECLOCKMODES	SHOW RECLOCKMODES	None	Displays which, if any, reclock modes are supported by the device
SHOW TIMING	SHOW TIMING	None	Lists Crosspoint Take timing; information that appears depends on whether SET TIMING for Auto, Standard, or Advanced mode was set
TERMINAL	TERMINAL [ON OFF] or T[/F]	ON=Turns on Echo mode OFF=Turns off Echo mode	 When ECHO mode is ON, all the characters sent are "echoed" to the terminal When ECHO mode is OFF, messages sent are not "echoed" to the terminal
XPOINT	XPOINT [#L:] [#S] [,#D,#D,] or X [#L:] [#S] [,#D,#D,]	[#L:]=Level number [#S]=Source number [,#D,#D,]=Destination number	The crosspoint is executed (you can use a READ command to confirm the crosspoint connection) This command combines the operations of the LEVEL , SOURCE , and DESTINATION commands into one command; and allows multiple crosspoint connection requests in one command
ZERO	ZERO or Z	None	The device is restarted and status is cleared

Table C-1 Startup Operation Commands: Panacea Standard Module (Continued)

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D Terminal Operation Commands for Panacea Enhanced Modules

Startup Operation

- 1 Set up a host machine as described in Appendix B.
- 2 At the host machine, type the letter "Q." The Command Summary screen opens (see Figure D-1 on page 156).

System Setup

If you are setting up a brand new system, follow these steps:

- 1 Set up a name for your hardware file via the **SET HWFILE** command (see page 164).
- **2** Set up a name for your matrix partitioning file via the **SET MPFILE** command (see page 166).
- **3** Save the new file names to the sysconfig.xml file via the **SAVE SYSCONFIG** command (see page 161).
- **4** Set the parameters you want to save to the hardware file and matrix partitioning file.
- **5** Save your files via the **SAVE HW** command (see page 164) and the **SAVE MP** command (see page 166).

If you are working with an existing system setup and do not want to change the names of the hardware and matrix files, follow these steps:

- 1 Set the parameters you want to save to the hardware file and matrix partitioning file.
- 2 Save your files via the SAVE HW command (see page 164) and the SAVE MP command (see page 166).

If you are working with an existing system setup and want to change the names of the hardware and matrix files, follow these steps:



Note: If you change a file name, a new file is added to your system. The original file is not overwritten. If you want to use or re-use another file, use the **SET HWFILE** (page 164) or the **SET MPFILE** (page 166) commands.

1 Set the parameters you want to save to the hardware file.

- 2 Set up the new name for your hardware file via the **SET HWFILE** command (see page 164).
- 3 Save your files via the SAVE HW command (see page 164).
- 4 Set the parameters you want to save to the matrix partitioning file.
- **5** Set up the new name for your matrix file via the **SET MPFILE** command (see page 166).
- **6** Save your files via the **SAVE MP** command (see page 166).
- **7** Save the new file names to the sysconfig.xml file via the **SAVE SYSCONFIG** command (see page 161).

Command Summary Screen

The Command Summary screen (**Figure D-1**) should be seen on the terminal emulation application. The Command Summary screen provides the basic command line entry syntax for the commands available for a Panacea router.

😵 g - HyperTerminal 📃 💷 🗶
Ele Edit View Call Iransfer Help
DESTINATION # [, #,] Take crosspoints or set crosspoint request INFORMATION List system status and operational parameters LEVEL #

Figure D-1 Command Summary Screen

List of Terminal Commands

The commands listed in **Table D-1** on page 157 are in order corresponding to their appearance on the Command Summary screen (**Figure D-1** on page 156). Each command is defined, its syntax is illustrated, its parameters are listed, and its response is provided. More detailed explanations of these commands can be found in the *Serial Protocol Reference Manual*.

 Table D-1
 Terminal Commands from Terminal Protocol Menu Screen

Command	Syntax	Input Parameters	Result
DESTINATION	DESTINATION #[,#,] or D #	#=Destination number	Completes crosspoint operations after the level number and the source number have been set
INFORMATION	INFORMATION or I	None	Provides information on the overall system as seen from the connection to the X-Y bus
LEVEL	LEVEL # or L #	#=Level number	Sets the level number for a router that is connected to an active system
POLL	POLL # or P #	#=Source number to be searched; may be any number 1 to 12	Determines which destinations are connected to a specific source number
QUERY	QUERY or Q	None	Provides a list that includes a basic command syntax and brief description of each command
READ	READ or R	None	Lists all crosspoints within a frame in order by level numbers, then by destination numbers that show which source is assigned to each of the destinations on that level Each crosspoint connection is represented by a numeric pair separated by a semicolon and a space: the first number is the destination number; the second number is the source number that is connected to that destination
SOURCE #	SOURCE # or S #	<pre># = Source number.; can range from 1 to the maximum number of sources on that level, or "X" for disconnect</pre>	Sets the desired source number

 Table D-1
 Terminal Commands from Terminal Protocol Menu Screen (Continued)

Command	Syntax Input Parameters		Result
TERMINAL	TERMINAL [ON OFF] or T[/F]	ON = Turns on Echo mode OFF = Turns off Echo mode	 When ECHO mode is ON, all the characters sent are "echoed" to the terminal When ECHO mode is OFF, messages sent are not "echoed" to the terminal
SET DEVICEID = #	SET DEVICEID = #	#=DevicelD; may be any number between 0 and 127	
SHOW DEVICEID	SHOW DEVICEID	None	Displays the device ID
XPOINT (combines operations of the LEVEL , SOURCE , and DESTINATION commands into one command; and allows multiple crosspoint connection requests in one command)	XPOINT [#L:] [#S] [,#D,#D,] or X [#L:] [#S] [,#D,#D,]	[#L:]= Level number [#S] = Source number [,#D,#D,] = Destination number	The crosspoint is executed (you can use a READ command to confirm the crosspoint connection)
ZERO	ZERO or Z	None	The device is restarted and status is cleared
SHOW MENU	SHOW MENU E	E = Ethernet command options	Displays subcommands for Ethernet command options (see page 159 for a list of subcommands)
	SHOW MENU F	F = File system command options	Displays subcommands for file system command options (see page 161 for a list of subcommands)
	SHOW MENU H	H = Hardware options command options	Displays subcommands for hardware options (see page 162 for a list of subcommands)
	SHOW MENU M	M = matrix configuration command options	Displays subcommands for the matrix configuration command options (see page 165 for a list of subcommands)
	SHOW MENU P	P = Protocol configuration command options	Displays subcommands for the protocol configuration command options.(see page 169 for a list of subcommands)
	SHOW MENU R	R=Frame command options	Displays subcommands for frame command options (see page 167 for a list of subcommands)

Command	Syntax	Input Parameters	Result
	SHOW MENU U	U = User account command options	Displays subcommands for user account options command options (see page 171 for a list of subcommands)
REBOOT	REBOOT	None	The device is restored, but the status is not cleared

 Table D-1
 Terminal Commands from Terminal Protocol Menu Screen (Continued)

SHOW MENU [#] Subcommands

The **SHOW MENU** [#] command lists submenus of commands specific to that particular parameter you enter. The **SHOW MENU** subcommands are listed starting in **Table D-2** through **Table D-8** on page 171. Each command is defined, its syntax is illustrated, its parameters are listed, and its response is provided.

Table D-2 Men	LE (Ethernet)) Subcommands
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Command	Syntax	Input Parameters	Result
SET IP	SET IPx=#.#.#	x = Ethernet port number #.#.#.# = IP address (factory default setting is 192.168.100.250)	Sets the router IP address for a network connector; this value is stored permanently once set and does not have to be entered each time at power-up Reboot the router device for IP related changes to take effect
SET GATEWAY	SET GATEWAYx=#.#.#	x = Ethernet port number #.#.#.# = Gateway IP address (factory default setting is 192.168.100.1)	Sets the network gateway IP address; this value is stored permanently once set and does not have to be entered each time at power-up Reboot the router device for IP related changes to take effect
SET NETMASK	SET NETMASKx=#.#.#.#	x = Ethernet port number #.#.#.# = System IP address	Assigns IP address to a subnet mask
SHOW IPDISPLAY	Show Ipdisplay	None	Device displays active and stored network IP address, subnet mask, and gateway address

Table D-2	Menu F	(Ethernet)	Subcommand	s (C	ontinued)
			Jubcommunu.	ישן נ	ontinucu	/

Command	Syntax	Input Parameters	Result
SET BOOTDEFAULTS	SET BOOTDEFAULTS	None	Resets the IP address, subnet mask, and network gateway address to the factory defaults; settings take effect after you reboot the device
The SET BOOTDEFAL parameters in your sys your router. Do not us this command, contac	ILTS command completely overw tem before it operates. Improper e this command without first cor t Customer Service immediately.	rites all system parameters use of this command may ntacting Customer Service.	and requires you to reset all result in permanent damage to If you have inadvertently used
SET PING	SET PING #.#.#.	#.#.#.#. = IP address of another device or computer	 If the device or computer is accessible, CLIENT #.#.#. IS ALIVE message appears If the device or computer is not accessible, HOST UNREACHABLE message appears
SET APACHESTOP	SET APACHESTOP	None	Device stops running the Apache* Web server * "Apache" is a licensed trademark of the Apache Software Foundation, Forest Hill, Maryland, USA.
SHOW TELNET	SHOW TELNET	None	 Displays these Telnet options available on your device: SET TMAXCONNECTIONS SET TDISCONNECTUSER SHOW TCONNECTIONS
SET TMAXCONNECTIONS	SET TMAXCONNECTIONS=#	# = Number of allowable concurrent Telnet sessions	Restricts the maximum number of concurrent Telnet sessions to a specific number (the maximum number of sessions cannot exceed 12)
When you use the SET TMAX not save change permanently. REBOOT command to continu	CONNECTIONS command the sy Use the SAVE SYSCONFIG comm with the previous configuration	stem changes the number nand to commit the chang n.	of sessions allowed but it does to system memory or use the
SET TDISCONNECTUSER	SET TDISCONNECTUSER=#	# = Session number	Terminates the Telnet connection to your device (SHOW TCONNECTIONS command displays the number of sessions)
SHOW TCONNECTIONS	SHOW TCONNECTIONS	None	Displays Telnet system information (that is, who is connected and the number of total connections)
SHOW VIRTUALXY	SHOW VIRTUALXY	None	Displays these virtual (network) X-Y options available on your device: SET VXYMAXCONNECTIONS SET VXYDISCONNECTUSER SHOW VXYCONNECTIONS

Command	Syntax	Input Parameters	Result		
SET VXYMAXCONNECTIONS	SET VXYMAXCONNECTIONS=#	/XYMAXCONNECTIONS=# # = Number of allowable concurrent virtual X-Y sessions			
When setting this value, note that one connection is always required by the system, so this value should be set to one number greater than your desired maximum number of client connections; for example, if you need two simultaneous client connections, =# should be set to 3 to allow for the required "system" connection. When you use this command the system changes the number of sessions allowed but it does not save change permanently. Use the SAVE SYSCONFIG command to commit the change to system memory or use the REBOOT command to continue with the previous configuration.					
SET VXYDISCONNECTUSER	USER SET VXYDISCONNECTUSER=# # = Session number Terminates a virtual X-Y connection to your device (SHOW VXYCONNECTIO) displays the number of sessions)				
SHOW VXYCONNECTIONS	SHOW VXYCONNECTIONS	None	Displays virtual X-Y system information (that is, who is connected and the number of total connections)		
SAVE SYSCONFIG	SAVE SYSCONFIG	None	Saves device's operating system parameters		

Table D-3 Menu F	(File System) S	Subcommands
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Command	Syntax	Input Parameters	Result
SET FILEDEL	SET FILEDEL=Name	Name = Name of file to be deleted	Specified file deleted; the message FILE (file name) DELETED appears on the response screen
GET BOOTFILE	GET BOOTFILE=Name	Name = Name of the boot file	Displays name of the boot file that was loaded when the device booted up
SET BOOTFILE	SET BOOTFILE=Name	Name = Name of the boot file	System changes the name of the boot file, but does not display the new name unless you enter the GET BOOTFILE command
SHOW FS	SHOW FS	None	Displays all pertinent file system information
SHOW FILES	SHOW FILES	None	Displays a list of associated files

Command	Syntax	Input Parameters	Result	
SHOW ALARMS	SHOW ALARMS	None	Displays alarm status	
SET ALARMENABLE	SET ALARMENABLE #,#=#	 #,#=# = Module,alarm number 0 (Disable) 1 (Enable) 	Sets or clears the automatic alarm reporting over the X-Y bus for the alarm selected See Appendix E , Device Alarm List for a list of alarm numbers, their meanings, and which module types use them	
SET AUTOTIME	SET AUTOTOME #	# = Matrix	Starts the clean switch autotime function if an optional clean switch module is installed.	
SHOW INPUTS	SHOW INPUTS	None	Displays the number of inputs for each matrix, and tells whether or not input signal presence detection is available for a particular matrix	
SHOW RECLOCKMODES	SHOW RECLOCKMODES	None	Displays which, if any, reclock modes are supported by the device.	
SHOW RECLOCKSTATUS	SHOW RECLOCKSTATUS	None	Displays current reclock status for all matrices on the display screen	
GET RECLOCKMODE	GET RECLOCKMODE #,#	#,# = Matrix,output [0 through 128]	Displays current reclock mode, sorted by output, on the display screen	
SET RECLOCKMODE	SET RECLOCKMODE #,#	#,# = Matrix,output [0 through 128]	Allows you to specify the reclock operation of each output of a router module that supports that option. See SHOW RECLOCKMODES for a list of options; use GET RECLOCKMODE command to view the current settings	
When you enter the SET RECLOCKMODE command, the system sets or clears the reclock mode, but it does not save the change permanently until you enter the SAVE HW command. Use the SAVE HW command to commit the change to system memory, or use the REBOOT command to continue with the previous configuration.				
SET EQBYPASS	SET EQBYPASS #,#	#,# = Matrix,output [0 through 128]	Allows you to bypass (disable) the input equalization function on router modules that support this option. Use SHOW EQBYPASS command to view current settings	

When you enter the **SET EQBYPASS** command, the system sets or clears the EQ bypass mode setting, but it does not save the change permanently until you enter the **SAVE HW** command. Use the **SAVE HW** command to commit the change to system memory, or use the **REBOOT** command to continue with the previous configuration.

Command	Syntax	Input Parameters	Result
SHOW EQBYPASS	SHOW EQBYPASS	None	Displays EQ bypass settings on the display screen
SET SLEWRATE When you enter the SET SLEW permanently until you enter th memory, or use the REBOOT of	SET SLEWRATE #,#=# /RATE command, the system sets e SAVE HW command. Use the S command to continue with the pr	Module,output=[1 0] 1 = Slow 0 = Fast s the output slew rate, but AVE HW command to con revious configuration.	Sets the slew rate of each output as either slow or fast on router modules that support this option (slew rates are not applicable to SD matrices or to HD matrices with reclock submodules) Use SHOW SLEWRATE command to view current settings tit does not save the change mmit the change to system
SHOW SLEWRATE	SHOW SLEWRATE	None	Shows the slew rate of each output as either slow or fast on router modules that support this option. Slew rates are not applicable to SD matrices or to HD matrices with reclock submodules. For matrices with a slew rate of slow, the output display reports ON ; for matrices with a slew rate of fast, the output display reports OFF ; for standard definition matrices or high definition matrices with a reclock submodule, the message " Matrix [X] does not support the Slew Rate option " appears.
SET TIMING	SET TIMING #	# = Matrix [1 2]	Displays a page with three options: Auto Mode, Standard Mode, and Advanced Mode. Use Auto Mode for most installations; use Standard Mode if the sync reference is different than the video type being switched (for example., NTSC SYNC, HDTV VIDEO); use Advanced Mode for setting a switch point for video standards not otherwise supported

 Table D-4
 Menu H (Hardware Options) Subcommands (Continued)

When you enter the **SET TIMING** command, the system sets the matrix Crosspoint Take timing, but it does not save the change permanently until you **enter** the **SAVE HW** command. Use the **SAVE HW** command to commit the change to system memory, or use the **REBOOT** command to continue with the previous configuration.

Table D-4	Menu H (Hardware	Options) Subcommands	(Continued)
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Command	Syntax	Input Parameters	Result
SHOW TIMING	SHOW TIMING	None	Displays information that depends on whether the SET TIMING command for Auto, Standard, or Advanced mode was set.
SET CABLE EQ	SET CABLE EQ #,#=#	# = Matrix [1 2] #=# = Matrix input [0 through 127]	Sets or clears the cable equalization settings of each input on router modules that support this option Use SHOW CABLE EQ command to view current settings

When you enter the **SET CABLE EQ** command, the system sets the cable equalization setting, but it does not save the change permanently until you enter the **SAVE HW** command. Use the **SAVE HW** command to commit the change to system memory, or use the **REBOOT** command to continue with the previous configuration.

SHOW CABLE EQ	SHOW CABLE EQ	None	Displays the current cable equalization settings
SET ROUTERBYPASS	SET ROUTERBYPASS #, #=#	<pre># = Matrix [1 2] ,# = Matrix output [0 4] 0 = Output 1 4 = Output 2 =# = Set or clear [1 0] 1 = Set 0 = Clear</pre>	Sets or clears the router bypass settings of each output on Panacea clean/ quiet switch router modules with relay bypass Use SHOW ROUTERBYPASS command to view current settings

When you enter the **SET ROUTERBYPASS** command, the system sets the router bypass setting, but it does not save the change permanently until you enter the **SAVE HW** command. Use the **SAVE HW** command to commit the change to system memory, or use the **REBOOT** command to continue with the previous configuration.

SHOW ROUTERBYPASS	SHOW ROUTERBYPASS	None	Displays the current router bypass settings for Panacea clean/quiet switch router modules with relay bypass
SAVE HW	SAVE HW	None	Saves the current hardware configuration to file (hw.xml is the default file name; this can be changed via the SET HWFILE command)
SET HWFILE	SET HWFILE=Filename	Filename = Any name you designate as the hardware configuration file name	Sets the file name for the XML file used to store hardware parameters
GET HWFILE	GET HWFILE	None	Displays the file name of the current XML file used to store hardware parameters
SAVE SYSCONFIG	SAVE SYSCONFIG	None	Saves device's operating system parameters

Table D-4 Menu H (Hardware Options) Subcommands (Continued)

Command	Syntax	Input Parameters	Result	
The SAVE SYSCONFIG command saves a device's operating system parameters, including configuration file names, to				
the sysconfig.xml file. Saved system parameters are used during the re-initialization of your device to allow you to reuse				

custom configurations.

Table D-5 Menu M (Matrix) Subcommands

Command	Syntax	Input Parameters	Result
SHOW MP	SHOW MP #	# = The number of the matrix you want to see	The SHOW MP response screen displays this information for the requested matrix: program mode, matrix types, new inputs, stuffed inputs, available partitions, current partition, components, sources, destinations, levels, starting source, and starting destination
SET MP	SET MP #=#	1st # = Module 1 through x, where x is the number of hardware matrices available in a frame 2nd # = Option	Allows logical subpartitions to be defined from a single larger matrix; use the SHOW MP command to see the currently selected option and which (if any) options are available for that routing module
When you enter the SET MP co permanently until you enter the memory, or use the REBOOT co	ommand, the system changes the e SAVE MP command. Use the S command to continue with the pr	matrix partitioning style, k AVE MP command to con revious configuration.	out it does not save the change nmit the change to system
SET MPARM	SET MPARM or SET MPARM #	# = The number of the matrix you want to set	Allows each individual component within a matrix to be configured; properties that can be configured are Level assignment, starting Source, and starting Destination (this command can only be used in the simple partitioning mode component of Program mode)
When you enter the SET MPARM command, the system changes the matrix parameters, but it does not save the change permanently until you enter the SAVE MP command. Use the SAVE MP command to commit the change to system memory, or use the REBOOT command to continue with the previous configuration			
	SHOW COMBINER	None	Displays a frame's combiner option settings

Command	Syntax	Input Parameters	Result	
Four terminal commands are used to configure a combiner system: SET COMBINERMODE SET COMBINERSIZE SET FIRSTSOURCE SHOW COMBINER Destination locks and protects continue to work normally. However, crosspoint restrictions cannot be stored by the combiner frame for the entire system, and are therefore not allowed. (Note that only one block size is allowed for a combiner system.)				
SET COMBINERMODE	SET COMBINERMODE= [ON OFF]	ON = Enables frame combiner functionality OFF = Disables frame combiner functionality	When ON , the frame is configured as a system combiner. It switches (combines) the outputs of other router frames to form a larger router	
SET COMBINERSIZE	SET COMBINERSIZE=#,#	#,# = Block size, number of blocks	Sets the frame combiner block size and the desired number of blocks	
SAVE MP	SAVE MP	None	Saves the current matrix partitioning information to the matrix partitioning file configured in sysconfig.xml.	
SET MPFILE	SET MPFILE=FileName	FILENAME = Name for the matrix partitioning XML file	Sets the name for the file used to store matrix partitioning information.	

When you enter the **SET MPFILE** command:

- The system changes the name of the XML file, but does not save the change permanently until you enter the SAVE MP command. Use the SAVE MP command to commit the change to system memory, or use the REBOOT command to continue with the previous configuration.
- The system changes the name of the matrix partitioning file, but does not display the new name. Use the **GET MPFILE** command to view the current settings.

GET MPFILE	GET MPFILE	None	Displays the file name stored in sysconfig.xml that is used to save matrix partitioning information
SAVE SYSCONFIG	SAVE SYSCONFIG	None	Saves device's operating system parameters

Table D-6	Menu R ((Frame)) Subcommands
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Command	Syntax	Input Parameters	Result		
SHOW RPARM	SHOW RPARM	None	Displays the basic router parameters, as well as software and firmware versions		
SHOW OFFSETS	SHOW OFFSETS	None	Displays a frame's combiner option settings. (For the enhanced module, these values are used in DIP switch mode only. However, they serve as a starting point when changing component properties in Program mode.)		
following individual this FIRSTLEVEL sta In Program mode, yo individually for every FIRSTDESTINATION	In DIP switch mode, the FIRSTLEVEL value serves as the starting Level of the first matrix component. Every following individual independent matrix component has its Level assignment numbered sequentially based on this FIRSTLEVEL starting value. All Source and Destination offsets remain the same throughout the matrix. In Program mode, you can set the FIRSTLEVEL , FIRSTSOURCE , and FIRSTDESTINATION assignments individually for every component. However, the system uses the FIRSTLEVEL , FIRSTSOURCE , and FIRSTDESTINATION values as the starting values.				
SET FIRSTLEVEL	See page 172 for more information				
SET FIRSTSOURCE	See page 174 for more information				
SET FIRSTDESTINATION	See page 175 for more informa	tion			
SHOW PANELLEVELS	SHOW PANELLEVELS	None	Displays the current DIP switch mode levels for a local control panel. (This information can be viewed at any time, but it is only used by the frame when it is in DIP switch mode.)		
SAVE MP	SAVE MP	None	Saves the current matrix partitioning information to the matrix partitioning file configured in sysconfig.xml.		
SET MPFILE	SET MPFILE=FileName	FILENAME = Name for the matrix partitioning XML file	Sets the name for the file used to store matrix partitioning information.		

When you enter the **SET MPFILE** command:

- The system changes the name of the XML file, but does not save the change permanently until you enter the SAVE MP command. Use the SAVE MP command to commit the change to system memory, or use the REBOOT command to continue with the previous configuration.
- The system changes the name of the matrix partitioning file, but does not display the new name. Use the **GET MPFILE** command to view the current settings.

Table D-6	Menu R (Frame) Subcommands (Continued)

Command	Syntax	Input Parameters	Result
GET MPFILE	GET MPFILE	None	Displays the file name stored in sysconfig.xml that is used to save matrix partitioning information
SAVE SYSCONFIG	SAVE SYSCONFIG	None	Saves device's operating system parameters, including configuration file names, to sysconfig.xml file; saved system parameters are used during the re-initialization of your device to allow you to reuse custom configurations
GET TIME	GET TIME	None	Displays the system date and time
SET TIME	SET TIME = AABBCCDDEEFF	AA = Year BB = Month CC = Day DD = Hour EE = Minute FF = Second	System date and time information are changed to correspond to the input parameters
SHOW TIMESERVER	SHOW TIMESERVER	None	Displays the time server IP address and the timeout length as set via the SET TIMESERVER command
SET TIMESERVER	SET TIMESERVER=#,#	#,# = IP address,timeout length	Sets the time server IP and timeout in milliseconds
SET TIMEZONE	SET TIMEZONE=#	# = Time zone offset in minutes	Sets the time zone offset (in minutes) from Coordinated Universal Time (UTC)

Command	Syntax	Input Parameters	Result
SET SYNCTIME	SET SYNCTIME	None	Causes the device to update its time to synchronize with the time server's time
SET RMODE	SET RMODE	None	Provides current partitioning (simple or advanced) mode setting. System prompts you enter the frame mode number for the frame you want to reset. After you enter the frame mode number, the system automatically performs a SAVE SYSCONFIG command, then asks you if you want to reboot the system If you reboot the system, the new setting takes effect when the frame is re-initialized; otherwise, the frame stays in its current configuration.
If you set the PMODE to Simple Partitioning Mode, you can change, undate, and save files via terminal			

 Table D-6
 Menu R (Frame) Subcommands (Continued)

If you set the **RMODE** to Simple Partitioning Mode, you can change, update, and save files via terminal commands. (You can use a terminal to set the **RMODE** to either Simple Partitioning Mode or Advanced Partitioning Mode.) If you set the **RMODE** to Advanced Partitioning Mode, you can change, update, and save files via RouterMapper. While in this mode you cannot set router parameters via terminal commands. (You cannot use RouterMapper to set the **RMODE** back to Simple Partitioning Mode.)

Table D-7. Menu P (Protocol Configuration) Subcommands

Command	Syntax	Input Parameters	Result
SHOW LICENSE	SHOW LICENSE	None	Displays the licensed options you have available on your web router application device
SHOW PORTS	SHOW PORTS	None	Displays a port/protocol configuration summary table that shows which protocols are attached to particular serial or IP communications ports
SHOW PROTOCOLS	SHOW PROTOCOLS	None	Displays a list of available protocols (not all protocols are applicable to both serial and Ethernet ports)

Table D-7. Menu P (Protocol Configuration) Subcommands

Command	Syntax	Input Parameters	Result
SET SERIAL	SET SERIALx opts	 x = Serial port for which you want to set protocol and options opts = Options (protocol, serial baud rate, serial communications mode, [RS-422 only] transmission line termination) 	Sets designated serial port to use designated protocol with designated options
GET SERIAL	GET SERIALX	x = Serial port for which you want protocol information	Displays protocol information for designated serial port
SET ENET	SET ENETx opts	 x = Ethernet port for which you want to set protocol and options opts = Options (protocol [ON OFF]; other options vary by protocol) GVG client must know IP address of primary and secondary servers that it is to connect 	Adds or removes a protocol on designated Ethernet port; sets designated Ethernet port to use designated protocol with designated options
GET ENET	GET ENETX	x = Ethernet port for which you want protocol information	Displays protocol information for designated Ethernet port
SET IP	SET IPx=#.#.#.#	<pre>x = Ethernet port number #.#.#.#=System IP address (for example, 192.168.1.1)</pre>	Sets the router IP address for a network connector
SET GATEWAY	SET GATEWAYx=#.#.#.#	<pre>x = Ethernet port number #.#.#.#=System IP address (for example, 192.168.1.10)</pre>	Sets the network gateway IP address
SET NETMASK	SET NETMASKx=#.#.#.#	<pre>x = Ethernet port number #.#.#.#=System IP address (for example, 255.255.255.128)</pre>	Assigns the IP address to a subnet mask
SHOW TELNET	SHOW TELNET	None	Displays these Telnet options available on your device: [*] • SET TMAXCONNECTIONS • SET TDCONNECTUSER • SHOW TCONNECTIONS
SHOW VIRTUALXY	SHOW VIRTUALXY	None	Displays these virtual (network) X-Y options available on your device: ** • SET VXYMAXCONNECTIONS • SET VXYDISCONNECTUSER • SHOW VXYCONNECTIONS

Command	Syntax	Input Parameters	Result
SAVE SYSCONFIG [†]	SAVE SYSCONFIG	None	Saves system file names and configuration information [†]

[†] This command saves a device's operating system parameters, including configuration file names, to the sysconfig.xml file. Saved system parameters are used during the re-initialization of your device to allow you to reuse custom configurations

Command	Syntax	Input Parameters	Result
SHOW USERS	SHOW USERS	None	Shows a list of authorized users, associated groups, and login status via the User Account Summary Table
SAVE USER	SAVE USER=abc,#,abc	abc = Name of user being added to Panacea compact flash module database # = Group to which the specified user is added abc = Password for the specified user	 System asks for ADMIN password System asks for new password for specified user System asks for password confirmation User is added to flash module database
SET DELETEUSER	SET DELETEUSER=abc	abc = Name of user being deleted from Panacea compact flash module database	 System asks for ADMIN password System asks for verification that the user should be deleted User is deleted from flash module database
SET PASSWORD	SET PASSWORD =abc,abc	abc = Name of user who needs password to access Panacea functions changed to a new password abc = Password for specified user	 System asks for ADMIN password System asks for <i>existing</i> password for specified user System asks for <i>new</i> password for specified user System asks for <i>new</i> password confirmation Specified password for user is changed on flash module database
SET USERGROUP	SET USERGROUP USER=abc,#	abc = Name of user who is assigned to a specific group # = Group number	 System asks for ADMIN password User is added to a specific group User group is required, but not used by Panacea

 Table D-8
 Menu U (User Account) Subcommands
SET FIRSTLEVEL

Definition

This command allows you to set the first Level of a frame. You can set the first Level manually via DIP switch settings; for Simple Partitioning mode via HyperTerminal commands; or for Advanced Partitioning mode via the Navigator or RouterMapper configuration utility software.

Setting First Level via DIP Switch, Simple Partitioning, or Advanced Partitioning Mode



Note: Dual matrix routing switchers with the same format are partitioned from larger Panacea back panel configurations prior to shipment. The two matrices are automatically assigned to levels 0 and 1.

Setting First Level via DIP Switch Mode

In DIP switch mode, the **FIRSTLEVEL** value serves as the starting Level of the first matrix component. Every following individual independent matrix component has its Level assignment numbered sequentially based on this **FIRSTLEVEL** starting value. All Source and Destination offsets remain the same throughout the matrix.

These setup values apply to alarm reporting and matrix partitioning.

- 1 Set pole 1 of DIP switch SW1 to DIP switch mode (see Figure 3-4 on page 69).
- 2 Set poles 1-3 of DIP switch SW2 to the desired first Level (see Figure 3-5 on page 69).
- **3** Set poles 4-8 of DIP switch SW2 to the desired first Destination (see **Figure 3-5** on page 69).
- 4 Via a HyperTerminal session:
 - **a** Set up the desired first Source (see *Command Information* on page 175 for command syntax).
 - **b** Enter the **SAVE MP** command to commit the change to system memory (see **SAVE MP** on page 167 for command syntax).

Setting First Level via Simple Partitioning Mode

In Simple Partitioning mode, you can set the Level, Source, and Destination assignments individually for every component. However, the system uses the **FIRSTLEVEL**, **FIRSTSOURCE**, and **FIRSTDESTINATION** values as the starting values.

These setup values apply to alarm reporting and the initial properties only for a designated component of your routing matrix.

- 1 Set pole 1 of DIP switch SW1 to Program mode (see Figure 3-4 on page 69).
- 2 Via a HyperTerminal session:
 - **a** Set the router partitioning mode to Simple Partitioning Mode (see *SET RMODE* on page 169 for command syntax).
 - **b** Set up the desired first Level (see *Command Information* on page 173 below for command syntax).
 - **c** Set up the desired first Destination (see *Command Information* on page 177 for command syntax).

- **d** Set up the desired first Source (see **Command Information** on page 175 for command syntax).
- e Enter the **SET MPARM** command to set independent component properties (see **SET MPARM** on page 165 for command syntax).
- **f** Enter the **SAVE MP** command to commit the change to system memory (see **SAVE MP** on page 167 for command syntax). When you enter the **SET FIRSTLEVEL** command, the system changes the first Level, but it does not save the change permanently until you enter the **SAVE MP** command.

Setting First Level via Advanced Partitioning Mode

First Level, first Destination, and first Source set through the Navigator or RouterMapper software application apply to alarm updating only, The software application allows you to individually configure each component within a matrix.

- 1 Set pole 1 of DIP switch SW1 to Program mode (see Figure 3-4 on page 69).
- **2** Via a PC with Navigator or RouterMapper software application installed, set up your frame to the desired configuration.

The software application automatically sets the frame to Advanced Partitioning mode. If you need to reset the frame to simple partitioning mode:

- **3** Exit the software application.
- **4** Via a HyperTerminal session, set the router partitioning mode to Simple Partitioning Mode (see *SET RMODE* on page 169 for command syntax).

Command Information

Syntax

SET FIRSTLEVEL =#

Command	SET FIRSTLEVEL	Set a frame's first Level command
Parameters	=#	A number that corresponds to the first Level (can be any number from 0 through 15)

Response

This command sets the first level of all router modules in a frame. If a standard logic controller is installed, any additional levels (either physical or partitioned) are assigned consecutive increasing numbers.

SET FIRSTSOURCE

Definition

This command allows you to set the first Source of a frame. You can set the first Source "manually" (that is, via HyperTerminal commands after setting First Level and First Destination via DIP switches); for Simple Partitioning mode via HyperTerminal commands; or for Advanced Partitioning mode via the Navigator or RouterMapper configuration utility software.

Setting First Source via DIP Switch, Simple Partitioning, or Advanced Partitioning Mode

Setting First Source via DIP Switch Mode

In DIP switch mode, the **FIRSTSOURCE** value serves as the starting Source of the first matrix component. Every following individual independent matrix component has its Source assignment numbered sequentially based on this **FIRSTSOURCE** starting value. All Levels and Destination offsets remains the same throughout the matrix.

These setup values apply to alarm reporting and matrix partitioning.

- 1 Set pole 1 of DIP switch SW1 to DIP switch mode (see Figure 3-4 on page 69).
- 2 Set poles 1-3 of DIP switch SW2 to the desired first Level (see Figure 3-5 on page 69).
- **3** Set poles 4-8 of DIP switch SW2 to the desired first Destination (see **Figure 3-5** on page 69).
- **4** Via a HyperTerminal session:
 - **a** Set up the desired first Source (see **Command Information** below for command syntax).
 - **b** Enter the **SAVE MP** command to commit the change to system memory (see **SAVE MP** on page 167 for command syntax).

Setting First Source via Simple Partitioning Mode

In Simple Partitioning mode, you can set the Level, Source, and Destination assignments individually for every component. However, the system uses the **FIRSTLEVEL**, **FIRSTSOURCE**, and **FIRSTDESTINATION** values as the starting values.

These setup values apply to alarm reporting and the initial properties only for a designated component of your routing matrix.

- 1 Set pole 1 of DIP switch SW1 to Program mode (see Figure 3-4 on page 69).
- 2 Via a HyperTerminal session:
 - **a** Set the router partitioning mode to Simple Partitioning mode (see *SET RMODE* on page 169 for command syntax).
 - **b** Set up the desired first Level (see *Command Information* on page 173 for command syntax).
 - **c** Set up the desired first Destination (see **Command Information** on page 177 for command syntax).
 - **d** Set up the desired first Source (see **Command Information** below for command syntax).

- e Enter the **SET MPARM** command to set independent component properties (see *SET MPARM* on page 165 for command syntax).
- **f** Enter the **SAVE MP** command to commit the change to system memory (see **SAVE MP** on page 167 for command syntax). When you enter the **SET FIRSTSOURCE** command, the system changes the first Source, but it does not save the change permanently until you enter the **SAVE MP** command.

Setting First Source via Advanced Partitioning Mode

First Level, first Destination, and first Source set through Navigator or RouterMapper apply to alarm updating only, The software application allows you to individually configure each component within a matrix.

- 1 Set pole 1 of DIP switch SW1 to Program mode (see Figure 3-4 on page 69).
- **2** Via a PC with Navigator or RouterMapper software application installed, set up your frame to the desired configuration.

The software application automatically sets the frame to Advanced Partitioning mode. If you need to reset the frame to simple partitioning mode:

- **3** Exit the software application.
- **4** Via a HyperTerminal session, set the router partitioning mode to Simple Partitioning mode (see *SET RMODE* on page 169 for command syntax).

Command Information

Syntax

SET FIRSTSOURCE =#

Command	SET FIRSTSOURCE	Set a frame's first Source command
Parameters	=#	A number that corresponds to the first Source

Response

This command is useful for making a large system that uses a combiner frame.

SET FIRSTDESTINATION

Definition

This command allows you to set the first Destination of a frame. You can set the first Destination manually via DIP switch settings; for Simple Partitioning mode via HyperTerminal commands; or for Advanced Partitioning mode via the Navigator or RouterMapper configuration utility software.

Setting First Destination via DIP Switch, Simple Partitioning, or Advanced Partitioning Mode

Setting First Destination via DIP Switch Mode

In DIP switch mode, the **FIRSTDESTINATION** value serves as the starting Destination of the first matrix component. Every following individual independent matrix component has its Destination assignment numbered sequentially based on this **FIRSTDESTINATION** starting value. All Levels and Source offsets remain the same throughout the matrix.

These setup values apply to alarm reporting and matrix partitioning.

- 1 Set pole 1 of DIP switch SW1 to DIP switch mode (see Figure 3-4 on page 69).
- 2 Set poles 1-3 of DIP switch SW2 to the desired first Level (see Figure 3-5 on page 69).
- **3** Set poles 4-8 of DIP switch SW2 to the desired first Destination (see **Figure 3-5** on page 69).
- 4 Via a HyperTerminal session:
 - **a** Set up the desired first Source (see *Command Information* on page 175 for command syntax).
 - **b** Enter the **SAVE MP** command to commit the change to system memory (see **SAVE MP** on page 167 for command syntax).

Setting First Destination via Simple Partitioning Mode

In Simple Partitioning mode, you can set the Level, Source, and Destination assignments individually for every component. However, the system uses the **FIRSTLEVEL**, **FIRSTSOURCE**, and **FIRSTDESTINATION** values as the starting values.

These setup values apply to alarm reporting and the initial properties only for a designated component of your routing matrix.

- 1 Set pole 1 of DIP switch SW1 to Program mode (see Figure 3-4 on page 69).
- 2 Via a HyperTerminal session:
 - **a** Set the router partitioning mode to Simple Partitioning mode (see *SET RMODE* on page 169 for command syntax).
 - **b** Set up the desired first Level (see **Command Information** on page 173 for command syntax).
 - **c** Set up the desired first Destination (see **Command Information** below for command syntax).
 - **d** Set up the desired first Source (see *Command Information* on page 173 for command syntax).
 - e Enter the **SET MPARM** command to set independent component properties (see *SET MPARM* on page 165 for command syntax).
 - **f** Enter the **SAVE MP** command to commit the change to system memory (see **SAVE MP** on page 167 for command syntax). When you enter the **SET FIRSDESTINATION** command, the system changes the first Destination, but it does not save the change permanently until you enter the **SAVE MP** command.

Setting First Destination via Advanced Partitioning Mode

First Level, first Destination, and first Source set through Navigator or RouterMapper apply to alarm updating only, The software application allows you to individually configure each component within a matrix.

- 1 Set pole 1 of DIP switch SW1 to Program mode (see Figure 3-4 on page 69).
- 2 Via a PC with Navigator or RouterMapper software application installed, set up your frame to the desired configuration.

The software application automatically sets the frame to Advanced Partitioning mode. If you need to reset the frame to simple partitioning mode:

- **3** Exit the software application.
- **4** Via a HyperTerminal session, set the router partitioning mode to Simple Partitioning mode (see *SET RMODE* on page 169 for command syntax).

Command Information

Syntax

SET FIRSTDESTINATION =#

Command	SET FIRSTDESTINATION	Set a frame's first Destination command
Parameters	=#	A number that corresponds to the first Destination

Response

This command allows you to define a destination offset for the frame. This is useful in large systems to keep multiple frames from appearing to the control system as "slaves."

178 Chapter

E Device Alarm List

Both Panacea standard and enhanced resource modules use the **SET ALARMENABLE** command. This command requires you to insert the appropriate alarm number for automatic reporting. **Table E-1** provides a list of alarm numbers with their corresponding descriptions, as well as an indicator as to which modules use these alarm numbers. (Analog video, HD/SDI, and SDI modules do not have alarm numbers associated with them.)

Device Alarm List

Alarm	Description (by Module Type)			
No.	Analog Audio	Clean/Quiet Switch	AES Audio	
1	Power supply alarm - no +5V		AES reference not locked	
2	Power supply alarm - no +17V			
3	Power supply alarm - no +12V			
4	Power supply alarm - no -17V	_		
5	Power supply alarm - no -12V			
6	Power supply alarm - no -5V			
7	Channel A audio overload > 28.2dBu	_		
8	Channel B audio overload > 28.2dBu			
9	Channel A has no audio	—	—	
10	Channel B has no audio	—	_	

Table E-1 Device Alarm Numbers and Descriptions

Alarm	Description (by Module Type)				
No.	Analog Audio	Clean/Quiet Switch	AES Audio		
11 — 24	Reserved for future use	Reserved for future use	Reserved for future use		
25	—	Input 1 has timing error	_		
26	—	Input 2 has timing error	_		
27	—	Input 3 has timing error	—		
28	_	Input 4 has timing error			
29	—	Input 5 has timing error	—		
30	_	Input 6 has timing error			
31	_	Input 7 has timing error			
32	_	Input 8 has timing error	_		
33	—	Input 9 has timing error	—		
34	—	Input 10 has timing error	_		
35	—	Input 11 has timing error	_		
36	—	Input 12 has timing error	_		
37	—	Input 13 has timing error	_		
38	—	Input 14 has timing error	—		
39	—	Input 15 has timing error	_		
40	—	Input 16 has timing error	_		
41	—	Input 17 has timing error	_		
42	—	Input 18 has timing error	—		
43	—	Input 19 has timing error	_		
44	—	Input 20 has timing error	—		
45	—	Input 21 has timing error	—		
46	_	Input 22 has timing error	_		
47	—	Input 23 has timing error	_		
48	—	Input 24 has timing error	—		
49	—	Input 25 has timing error	—		
50	—	Input 26 has timing error	—		
51	—	Input 27 has timing error	—		
52	_	Input 28 has timing error	—		
53	_	Input 29 has timing error	—		
54	_	Input 30 has timing error	—		
55	—	Input 31 has timing error	—		

Table E-1	Device Alarm	Numbers and	Descriptions	(Continued)
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Alarm	Description (by Module Type)			
No.	Analog Audio	Clean/Quiet Switch	AES Audio	
56	—	Input 32 has timing error	_	
57	_	Monitor all input timing alarms		
58	—	Monitor all alarms	_	
59 — 254	Reserved for future use	Reserved for future use	Reserved for future use	
255	—	Power supply 1 failed		
256		Power supply 2 failed	—	

Table E-1 Device Alarm Numbers and Descriptions (Continued	d)
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182 Appendix E Device Alarm List

X-Y Error Messages and Hexadecimal Numbers

X-Y error messages are generated from the router when there has been an X-Y bus error, a system fault error or command line entry error. Some command entry errors may not be identified as an error by the router or routing system if they are made in conjunction with other commands that are operational and accurate. The following errors are divided by class and are accompanied by detailed descriptions of the error.

Error messages are summarized in **Table F-1** on page 183. **Table F-1** is a list of messages generated by all Harris routers. Not all message types are generated by every frame, but all message types are listed here for completeness.

- **Class 1 Errors** Class 1 errors are X-Y communications bus errors that have nothing to do with the communications through the serial port. Please check the X-Y bus for problems here.
- **Class 2 Errors** Class 2 errors are command line entry errors that occur when a mistake is made on the command line.

Class 3 Errors Class 3 errors are system fault errors.

 Table F-1
 Class 1, Class 2, and Class 3 Error Messages

Error No.	Definition	Explanation	
CLASS 1 ER	CLASS 1 ERRORS		
1001	Fatal X-Y bus collision detected during transmission. Press the ESC key to reset.	A fatal error caused by a failure in the X-Y communications bus. The router automatically resets within approximately five seconds. The router can be reset faster by sending the ESC character to the serial port or by pressing the Panel Enable button on the local control panel.	

Error No.	Definition	Explanation
CLASS 2 ER	RORS	
2001	Illegal character or error detected on character receipt. Command Line aborted.	A transmission error from the controlling device has been noted (for example, a framing error), an illegal character has been sent (for example, an illegal control character), or more than 254 characters have been entered. This error aborts any command line entered since the last prompt (the same effect as if an ESCAPE were entered on the command line).
2002	Illegal, invalid, or overrange parameter entered. Command entry ignored.	An illegal parameter has been entered and the offending command has been ignored. If there are commands on the command line following the command causing the error, they may not perform as expected (for example, a LEVEL command with an overrange value does not change the level number).
2003	Current source value out of range for the requested Level. Invalid crosspoint request(s) ignored.	The currently set source number is greater than the number of sources in the currently set level and a crosspoint connection was attempted. Only the illegal crosspoints are ignore while legal requests on the command line are set.
2004	Level requested does not exist. Command entry ignored.	The level number requested is valid (0255) but the level does not exist in the current system. Subsequent commands in the command line may not perform as expected as the currently set level number remains unchanged.
2005	Invalid command entered in Command Line. Command entry ignored.	The first letter of the command key word is not valid for this revision. The offending command is skipped.
2007	Error in entering destination number(s). Invalid crosspoint request(s) ignored.	An invalid parameter was entered in a DESTINATION or CLEAR command. Only those requests with invalid destination numbers are ignored while valid requests are set.
2008	Error in entering XPOINT command parameter(s). Invalid crosspoint request(s) ignored.	Illegal entries have been included in the destination field of an XPOINT command. The invalid crosspoints are ignored while valid requests are set.
		The currently selected source is not a valid source or not valid on the requested level. The command requested is skipped.
2009	Current source value out of range for the requested Level. Command entry ignored.	The currently selected source is not a valid source or not valid on the requested level. The command requested is skipped.

Table F-1 Class 1, Class 2, and Class 3 Error Messages (Contin	nued)
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Error No.	Definition	Explanation			
CLASS 3 ER	CLASS 3 ERRORS				
3002	No active levels have been detected. Check system configuration.	The router has not found any active routing frames. Instructions involving system information or crosspoint operations are disallowed.			
3003	No system has been detected. Command entry ignored.	This message is sent when the router has found no active levels and a command has been issued attempting to set crosspoints or to read system status.			
3004	Illegal configuration DIP switch setting. System setup aborted, frame resetting.	This is a fatal error typically caused by having any of the DIP switches in the wrong position.			
3005	Too many levels set in frame. All internal crosspoint resources ignored. Only operations external to the frame available.	This error occurs when the resources of the I/O modules, combined with the logic board DIP switch settings, cause the frame to set a level number greater than 255. All internal resources are ignored as if no I/O modules are present in the frame.			
3006	Illegal I/O board configuration setting. All internal crosspoint resources ignored. Only operation external to the frame available.	This error is typically caused by errors in trying to configure a multiplexer I/O module (too many I/ O modules are being combined for the particular multiplexer module). All internal resources are ignored as if no I/O modules are present in the frame.			
3008	Too many sources or destinations set in frame. All internal crosspoint resources ignored. Only operations external to frame available.	This error occurs when the resources of the I/O modules, combined with the logic board DIP switch settings, cause the frame to set a source number or destination number greater than 4096. All internal resources are ignored as if no I/O modules are present in the frame.			
3009	Illegal front panel type setting. Front panel operations are disabled.	The local control panel settings on the router are invalid. Check the DIP switch configuration on the router.			

Table F-1 Class 1, Class 2, and Class 3 Error Messages (Continued)

Zero-Based Hexadecimal Numbers

Pass-through protocol uses zero-based hexadecimal numbers for all levels, sources, and destination numbers. For example, the first physical source encountered for a router level, the pass-through protocol would call Source 0. This is in contrast with terminal protocol, which would refer to this source as Source 1 since terminal protocol is one-based decimal system.

These two number systems, along with the character equivalents, are shown in Figure F-1.

Symbol 、 a b c d e f g h i j k l m n o p q r s t u v w x y z { } ~	Symbol à á á a a a a æ ç è é ê ë ì í î ĭ ð ñ ò ó ô ö ö ÷ ø ù ú û û ý þ ÿ
Hex 60 61 62 63 64 65 66 67 68 69A 60E 67 71 72 74 75 76 77 78 79A 7F	Hal E0 E1 E2 E3 E5 E6 E7 E9 E8 E0 E1 E2 E5 E6 E1 E2 E5 E6 E1 E2 E5 E6 E1 E2 E5 E6 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1 E1
Decim 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127	Decim 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255
Symbol @ < B C D E F G H – J K L M Z O P Q R S T U V V X Y Z [/] ^ –	Symbol えんえん 人 任 C E E E E e L 「 T D N O O O O O × Ø U Ú U Ü Y P B
Hex 40 41 42 43 44 45 467 48 9 40 47 48 49 40 40 40 47 48 49 40 40 40 40 40 40 40 40 40 40 40 40 40	hal Hex C0 C1 C2 C3 C4 C5 C6 C7 C8 C0 CC CC C7 C6 C7 C7 C0 C0 C0 C0 C0 C0 C0 C0 C0 C0 C0 C0 C0
Decim 64 65 66 67 68 69 71 72 73 75 76 77 80 81 82 84 85 88 88 90 91 92 93 95 95	Decim 192 193 194 195 196 197 198 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223
Symbol ! # \$ % & ' ()) * + ; ()) * + ; 0 1 2 3 4 5 6 7 8 9 : ; ; < = > ?	Symbol i ¢ £ ¤ ¥ §: ©ª « ¬ - ® - ° ± 2 3 , μ¶. i ° »¼¼¼ ¿
hail Hex 20 21 22 22 24 25 26 27 28 29 20 22 20 24 25 26 27 28 29 2A 20 2E 27 30 31 32 33 34 35 36 37 38 39 3A 3C 3D 3F 3F	ADDED TO A CONTRACT OF A CONTR
Decim 32 33 34 36 37 38 40 41 43 44 45 47 48 49 51 52 53 45 56 7 89 60 1 23 66 3 66 61 62 63	Decim 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 181 182 183 184 185 186 187 188 189 190 191
Symbol	Symbol , , , , , , , , , , , , ,
al Hex 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1E 1F	al Hex 80 81 82 83 84 85 86 87 88 87 88 80 84 80 82 87 88 80 80 80 80 80 80 80 80 80
Decim 0 1 2 3 4 5 6 7 8 9 10 11 12 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 9 20 21 22 24 25 26 20 21 22 23 24 25 26 20 21 22 23 24 25 26 20 21 22 23 24 25 26 27 28 20 21 22 23 24 25 26 27 28 20 21 22 23 24 25 26 27 28 20 21 20 21 22 23 24 25 26 27 28 20 21 20 21 20 21 22 23 24 25 26 27 28 20 21 20 21 22 23 24 25 26 27 28 20 21 22 23 24 25 26 27 28 20 31 27 28 20 31 20 21 22 23 24 25 26 27 28 20 31 27 28 20 31 27 28 20 31 27 28 29 30 31 27 28 29 30 31 27 28 29 30 31 27 28 29 30 31 27 28 29 30 31 27 28 29 30 31 27 28 29 30 31 27 28 29 30 31 27 28 29 30 31 27 28 29 30 31 31 20 27 28 29 30 31 31 31 31 31 31 31 31 31 31	Decim 128 129 130 131 132 133 134 135 136 137 138 139 141 142 143 145 146 147 145 146 147 145 150 151 152 153 154 155 156 157 158

Figure F-1 Zero-Based Hexadecimal Numbers and Character Equivalents

G Enhanced Resource Module Installation



Note: For more information about enhanced resource modules, see **Resource Module** on page 16. The illustrations in this appendix show a 2RU frame; however, the instructions apply equally to a 1RU frame.



CAUTION

Some Panacea front panel units do not have supporting hinges. Consequently, if the front panel face plate is removed and not handled properly, it can fall with sufficient force to dislocate and/or damage the ribbon cable attached to the resource module connector. When removing the front panel, hold the face plate firmly to ensure that it does not become damaged

Removing the Existing Resource Module

- 1 Unplug the Panacea frame so that it does not receive electrical power.
- **2** Unscrew the screws on the front of the Panacea front panel. (The screws in the front panel are captive. Do not separate them from the front panel.)



Figure G-1 Removing the Screws from the Front Panel

- **3** Gently pull the front panel away from the frame.
- **4** Unscrew the eight 4-40×1/8 flat head screws (four on top, four on the bottom) attaching the sub-panel assembly to the front panel. Set these screws aside, as you will need them later.



Figure G-2 Separating the Sub-Panel Assembly from the Front Panel



CAUTION

Do not attempt to remove the connector by pulling on the ribbon cable. This will damage the connector.

- **5** Remove the cable retaining plate, then carefully remove the cable from the resource module by grasping the outer edges of the connector and pulling it away from the panel.
- **6** Unscrew the ribbon cable retainer, then unplug the ribbon cable from the connector on the resource module.



Figure G-3 Removing the Ribbon Cable

- 7 Pull the sub-panel assembly away from the front panel.
- **8** Unscrew the five 4-40×3/16 pan head screws attaching the resource module to the sub-panel. Set these screws aside, as you will need them later.



Figure G-4 Removing the Screws from the Resource Module

9 Remove the resource module from the sub-panel.

Installing the New Resource Module

1 Insert the resource module tab (located at the module end next to the DIP switches) into the slot in the front sub-panel, then slide the resource module into place inside the sub-panel.





2 Using five 4-40×3/16 pan head screws, attach the module to the front sub-panel.



Figure G-6 Attaching the Enhanced Resource Module to the Sub-Panel

Reattaching the Front Panel

- 1 Align the sub-panel assembly with the front panel, then press the sub-panel assembly into the rear side of the front panel.
- 2 Align the mounting holes of the two panels.
- **3** Using the eight 4-40×1/8 flat head screws, attach the sub-panel assembly to the front panel.



Figure G-7 Attaching the Sub-Panel Assembly to the Front Panel

4 Plug the ribbon cable to the connector on the resource module.



Figure G-8 Plugging In the Ribbon Cable

5 Reattach the ribbon cable retaining plate.

- 6 Align the reassembled front module with the frame body.
- 7 Tighten the screws on the front of the panel. As you tighten the screws, the front module is pulled tight to the frame body.

194 Chapter

H Power Supply Mounting Tray Installation

The Panacea product line includes an optional power supply mounting tray, which allows you to mount up to seven 1RU desktop power supplies or up to five 2RU desktop power supplies. You can mount a combination of 1RU and 2RU power supplies on the same tray. This power supply mounting tray can be forward- or rear-mounted into a regular frame rack.



Note: For more information about Panacea power supplies, see **Power Supply Module** on page 18.

Tools You'll Need

- One standard 19-in. (48.3-cm) equipment rack
- One power supply mounting tray kit containing
- One power supply mounting tray
 - □ Seven 4-in.×2-in. VELCRO® "hook" and "loop" strip sets¹
 - □ Twenty 4-40×¾ flat-head screws
- One size T-10 star screwdriver (for 2RU desktop power supply only)
- One Phillips-head screwdriver (for 2RU desktop power supply only)
- For a 1RU: One to seven 1RU desktop power supplies (P-1RU-PS-O) OR

For a 2RU: One to five 2RU desktop power supplies (P-2RU-PS-O)

Pre-Installation Checklist



Note: See page 57 for more information on these items.

- Adequate rack space: The power supply mounting tray mounts in a standard 19-in.
 (48.3-cm) equipment rack and requires the equivalent of two rack units of space (3.5 in.
 [88 mm] of standard rack space) when a P-2RU-PS-O power supply is installed.
- Proper temperature and ventilation: An ambient temperature should be maintained between 32° F (0° C) and 122° F (50° C) at a relative humidity of 10%-90% (non-condensing).

¹ "VELCRO" is a registered trademark of Velcro Industries B.V.

 Adequate electrical requirements: Both the 1RU and the 2RU power supplies have a continuous input range of 100 VAC to 240 VAC.

Installing a 1RU Desktop Power Supply

1 If necessary, clean off the surface of the power supply and the power supply mounting tray where you plan to attach the VELCRO fastener.

VELCRO comes in pieces that are referred to as "hook" and "loop" (see Figure H-1).

- "Hook" VELCRO has rows of small hooks on the side opposite the adhesive.
- "Loop" VELCRO has a soft, felt appearance on the side opposite the adhesive.





When a piece of "hook" VELCRO and a piece of "loop" VELCRO are pressed together, they form a tight bond that is secure, yet easily separated. When following the instructions for mounting the P-1RU-PS-O power supply to the power supply tray, always use a piece of "hook" VELCRO in combination with a piece of "loop" VELCRO, or you will not achieve a VELCRO bond.

2 Press the piece of "hook" VELCRO to the piece of "loop" VELCRO so that the pieces are bonded.

3 Peel the tape away from the adhesive on the "loop" side of the VELCRO strip, then press the strip firmly into place on the back of the power supply.



CAUTION

Make sure you do not cover up the Safety information listed on the power supply.



Figure H-2 Location of VELCRO Strips

Moving the VELCRO strip from its original location weakens the adhesive's "sticking" capability and may damage the paint surface on the power supply mounting tray.

4 Peel the tape away from the adhesive on the "hook" side of the VELCRO strip, then press the power supply firmly into place on the power supply mounting tray (see **Figure H-3**).





5 Wait five minutes for the tape adhesive to set.

Installing Multiple 1RU Desktop Power Supplies

1 If necessary, clean off the surface of each power supply and the power supply mounting tray where you plan to attach the VELCRO fasteners.

- **2** Press the piece of "hook" VELCRO to the piece of "loop" VELCRO so that the pieces are bonded.
- **3** Refer to **Figure H-4** for a guide to positioning the power supplies.



Figure H-4 1RU Power Supply Positioning Guide

Moving the VELCRO strip from its original location weakens the adhesive's "sticking" capability and may damage the paint surface on the power supply mounting tray.

4 Peel the tape away from the adhesive on the "loop" side of each VELCRO strip, then press each strip firmly into place on the back of each power supply.



CAUTION

Make sure you do not cover up the Safety information listed on the power supply.

- **5** Peel the tape away from the adhesive on the "hook" side of each VELCRO strip, then press each power supply firmly into place on the power supply mounting tray.
- **6** Wait five minutes for the tape adhesive to set.

Installing a 2RU Desktop Power Supply

1 On the reverse side of the power supply, remove the rubber feet from each corner. A star-head screw is then visible at each corner.



Figure H-5 Location of Screws on Power Supply



CAUTION

Do not use a Phillips head screwdriver to remove screws. If you do, you may strip the threads on the screw head.

- 2 Using a T-10 star screwdriver, remove the screws from the power supply. *Handle the power supply carefully. With the screws out, the power supply case may separate.*
- **3** Line up the screw holes on the power supply with the screw holes on the power supply mounting tray. (It may be easier to position the tray above the power supply, as shown in **Figure H-6**.)
- 4 Insert the flat-head screws into the screw holes.



Figure H-6 Alignment of Power Supply Mounting Tray and Power Supply

5 Using a Phillips-head screwdriver, tighten the screws until the heads are flush with the tray surface. You may feel some resistance as you tighten the screws. This is normal.

Installing Multiple 2RU Desktop Power Supplies

1 On the reverse side of each power supply, remove the rubber feet from each corner. A star-head screw is then visible at each corner (see Figure H-5 on page 199).



CAUTION

Do not use a Phillips head screwdriver to remove screws. If you do, you may strip the threads on the screw head.

- 2 Using a T-10 star screwdriver, remove the screws from the power supply. *Handle the power supply carefully. With the screws out, the power supply case may separate.*
- 3 Line up the screw holes on the power supplies with the screw holes on the power supply mounting tray. (It is easier to position the tray above the power supply.) Refer to Figure H-7 for a guide to positioning the power supplies.



Figure H-7 2RU Power Supply Positioning Guide

- 4 Insert the flat-head screws into the screw holes (see Figure H-6 on page 199).
- **5** Using a Phillips-head screwdriver, tighten the screws until their heads are flush with the tray surface. You may feel some resistance as you tighten the screws. This is normal.

Installing a Combination of 1RU and 2RU Desktop Power Supplies

The procedures for installing both 1RU and 2RU desktop power supplies onto one power supply mounting tray are the same as described above. Since the process for installing a 2RU desktop power supply is more involved, you may want to install the 2RU desktop power supply first, then install the 1RU power supply.

Make sure that the power supplies are mounted side-by-side, not one on top of the other.

Installing a Power Supply Mounting Tray into a Frame Rack

1 Mount the tray in a standard equipment rack. You can mount the tray in either the front or the back.

- **2** Align the tray so that all 4 screw holes in the mounting ears match up with those in the rack.
- **3** Secure the tray to the rack with the rack screws and washers.
- 4 Plug each power supply into its corresponding Panacea routing switcher.

Fan Module Replacement



Note: The fan module is only necessary with certain formats (for example, analog audio and high definition). For general information about the fan module, see page 19.

The optional fan module is easily replaced in the field in the event of a fan failure. There are no configuration settings needed for the fan module.

The illustrations in this appendix show a 2RU frame; however, the instructions apply equally to a 1RU frame.

Uninstalling an Existing Fan Module

1 Remove the screws on the front of the Panacea front panel. (The screws in the front panel are captive. Do not separate them from the front panel.)



Figure I-1 Removing the Screws from the Front Panel

- **2** Gently pull the front panel away from the frame.
- **3** Move the front panel to expose the frame interior.
- **4** Grasping the fan module between your thumb and forefinger, pull the fan module out of the frame.



Figure I-2 Removing the Existing Fan Module

Installing a Replacement Fan Module

- 1 Locate the pin assembly on the fan module and the pin connector inside the frame (see Figure I-3).
- 2 With the pin assembly facing the pin connector inside the frame, carefully guide the fan module into place. (Make sure that the module lines up with the recessed guides on the top and bottom of the frame.)



Figure I-3 Guiding the Fan Module Into Place

3 Push the fan module in until it stops. The module locks in place when it sets securely.



Figure I-4 Proper Fan Module Placement

- **4** Align the front module with the frame body.
- **5** Tighten the screws on the front of the panel. As you tighten the screws, the front module is pulled tight to the frame body.

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