CHEETAH 256X448
DIGITAL VIDEO MATRIX SWITCHER

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About This Manual

This manual provides detailed instructions for the installation, operation, and maintenance of the PESA Cheetah 256x448 Digital Video Matrix Switcher.

Warnings, Cautions, and Notes

Warning statements identify conditions or practices that can result in personal injury or loss of life.

Caution statements identify conditions or practices that can result in damage to equipment.

Notes contain information important to the correct installation, operation, or maintenance of the equipment.

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Chapter 1 – Introduction

1.1 Product Description

The Cheetah 256x448 is a fully-featured digital video matrix switcher capable of handling both Serial Digital Interface (SDI) and High-Definition Television (HDTV), as well as other non-standard digital signals, in the same frame. Copper and fiber input and output modules provide for maximum flexibility.

All Cheetah video matrix switchers offer alarm support, switch confirmation, block checking, and power-out-of-range indicators. Optional equipment includes:

- Full feature control system using either standard PESA PRC Control or PESA Network Control
- Video and data signal from 3Mb/s to 1.5 Gb/s
- Conforms to SMPTE 259M and 292M
- Input EQ to 300M SD, 100M HD
- Bypass mode for non-standard data signals
- Output option slots support dual output, fiber output, Digital Analog Converter (DAC) module for SDI conversion to National Television Standards Committee / Phase-alternating line (NTSC/PAL) outputs, SD Converter, and HD to SD converter
- Full redundant controllers available
- N+1 redundant internal DC power; full redundant AC power
- All modules are hot pluggable for on-air maintenance
- Dual output monitor

Figure 1: 256x448 Front View

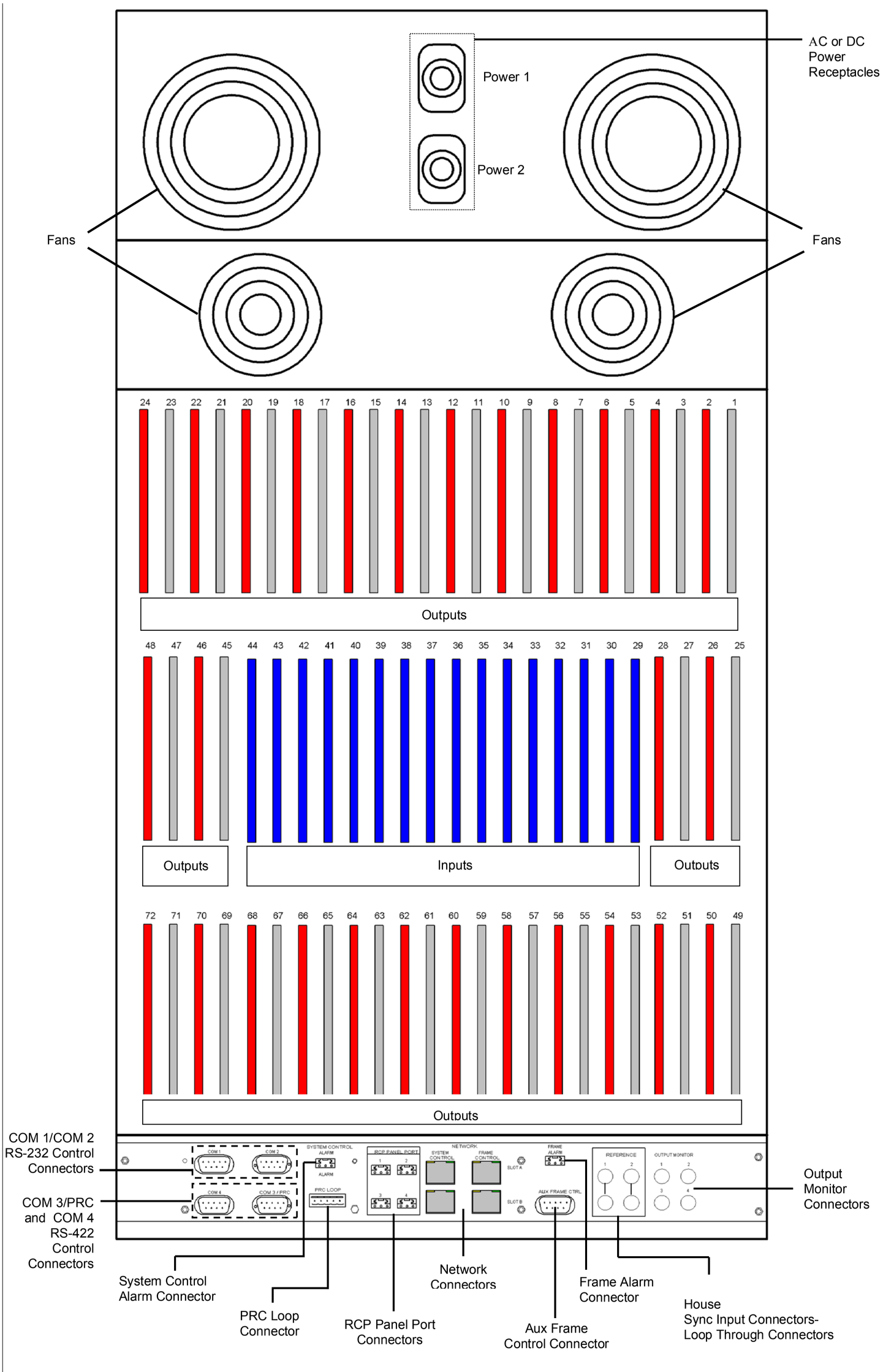


Figure 2: 256x448 Rear View

1.2 Specifications

Physical

RUs 41
Height..... 71.75"
Width ..... 19"
Depth..... 23"
Weight.....625 lbs. (281.25 kg)

Power Requirements

Operating voltage..... 100-240 VAC, 47-63 Hz
Power consumption..... 6000W

Operational Environment

Temperature .....0-40° C
Humidity ..... 10-90% (non-condensing)

Input

Conforms to both SMPTE 259M for SDI and SMPTE 292M for HD
Connector type (copper) ..... 75 Ohm BNC
Return loss .....>15dB minimum to 270 Mbps (SDI)
>15 dB minimum to 1.5 Gbps (HD)
Automatic input cable equalization to .....300M @ 360 Mbps for SDI
100M @ 1.5 Gbps or HD
Connector type (fiber)..... SFF modules w/LC type

Output

Conforms to both SMPTE 259M for SDI and SMPTE 292M
Connector type (copper) ..... 75 Ohm BNC
Return loss .....>15dB minimum to 270 Mbps (SDI)
>15 dB minimum to 1.5 Gbps (HD)
Connector type (fiber)..... SFF modules w/LC type

Chapter 2 – Installation

2.1 Introduction

This section details the Cheetah 256x448 Digital Video Matrix Switcher installation procedures.

2.2 General

If specified when ordered, the Cheetah Switcher will be configured for the intended system at the factory. Before attempting to install any frame, matrix card, controller card, or power supply, read this section carefully.

The Cheetah Switcher contains static sensitive devices. Care should be used when it is necessary to handle the internal circuit cards. It is recommended that a ground wrist strap and grounding mat be used before attempting any equipment installations.

2.3 Unpacking and Inspecting

This equipment contains devices sensitive to electrostatic discharge (ESD). Use a grounded wrist strap and mat when handling the internal circuit cards to prevent ESD.

Immediately upon receipt, inspect all shipping containers. Carefully unpack the equipment and compare the parts received against the packing list and Table 1. If any parts appear to be missing or damaged, please contact PESA immediately.

Table 1. Equipment List

Part Number	Description	Maximum Quantity (see note)
81-9065-2369-0	Mainframe assembly:	1
81-9065-2381-0	Power supply	16
81-9034-6904-0	Power supply (blank)	10
81-9065-2337-0	Matrix frame controller	2
81-9065-2321-0	Input buffer card (SDI)	16
81-9034-6907-0	Input blank	16
81-9065-2315-0	Output combiner (SDI)	28
81-9034-6844-0	Dual output option blank	28
81-9034-6906-0	Output blank	28
81-9065-2333-0	Matrix card	32
81-9065-2317-0	Dual output option BNC	28
81-9065-2319-0	Input buffer HDMR	16
81-9065-2319-0	Input buffer fiber	16
81-9065-2332-0	Output combiner HDMR	28
81-9065-2318-0	Output option DAC SD	28
81-9065-2328-0	Output option fiber	28
81-9065-2304-0	Output monitor	1

These items may be ordered in varying quantities. Please consult your purchase order to verify that you have received the correct quantity.

2.4 Choosing an Installation Location

For safety reasons, this equipment must be located near the socket-outlet or power strip (if plugs are used) so that the AC line cord plugs are easily accessible.

This equipment is designed for installation in a standard 19" equipment rack located in an environment conforming to the specifications in Chapter 1. Locate each unit as closely as possible to its associated equipment to minimize cable runs.

Consider the connection from this equipment to the supply circuit, and the effect that possible overloading can have on overcurrent protection circuits and supply wiring. Refer to nameplate ratings when addressing this concern.

2.5 Mounting in Equipment Rack

Installation or removal of this equipment requires at least two persons in order to avoid possible personal injury or equipment damage. Install this equipment in such a manner as to avoid any tipping hazard from uneven loading of the rack.

Make sure that all power is disconnected before installing the frame into the rack.

Forced-air cooling is provided by fans inside this equipment. Do not block airflow around these fans. Replace all service panels and blank filler plates. Keep the door closed during normal operation.

This equipment is designed for installation in a standard 19" equipment rack. Provide sufficient space behind the equipment racks to allow for control, signal, and power cables. Use all chassis mounting holes, and tighten mounting hardware securely.

Install the equipment into the rack as follows:

1. Insert the chassis into the equipment rack and support the bottom of the chassis until all mounting hardware has been installed and properly tightened.
2. Install the bottom two chassis mounting screws.
3. Install the top two chassis mounting screws.
4. Install any remaining chassis mounting screws.
5. Tighten all of the chassis mounting screws until they are secure.

2.6 Connecting Equipment Cables

Follow these guidelines when connecting equipment cables.

1. Install the equipment in the rack before connecting cables.
2. Relieve strain on all cables to prevent connector separation.
3. To the extent possible, separate control, signal, and power cables to minimize crosstalk and interference.
4. Use as many cable ties as necessary to secure cables to the rack. This will minimize the amount of force transmitted to the equipment and help route cables away from hazardous areas.
5. Route cables away from physical traffic areas to avoid creating a safety hazard.
6. Bundle together any cables connected to a single input/output card and separate them from the other bundles with enough slack to create a service loop. This will permit individual card replacement without disruption to the other input/output cards.

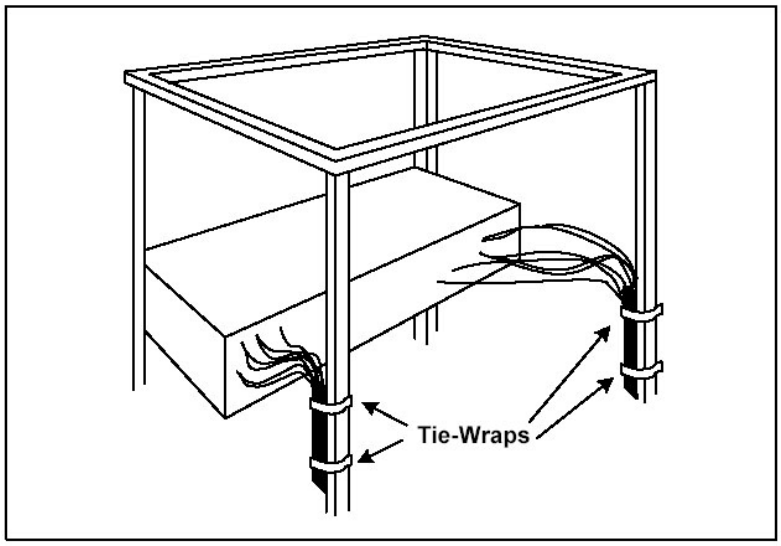


Figure 3. Cables Attached to Supports

2.7 Installing the Cheetah Power Supplies

The power supplies are located on the front of the frame as shown below.

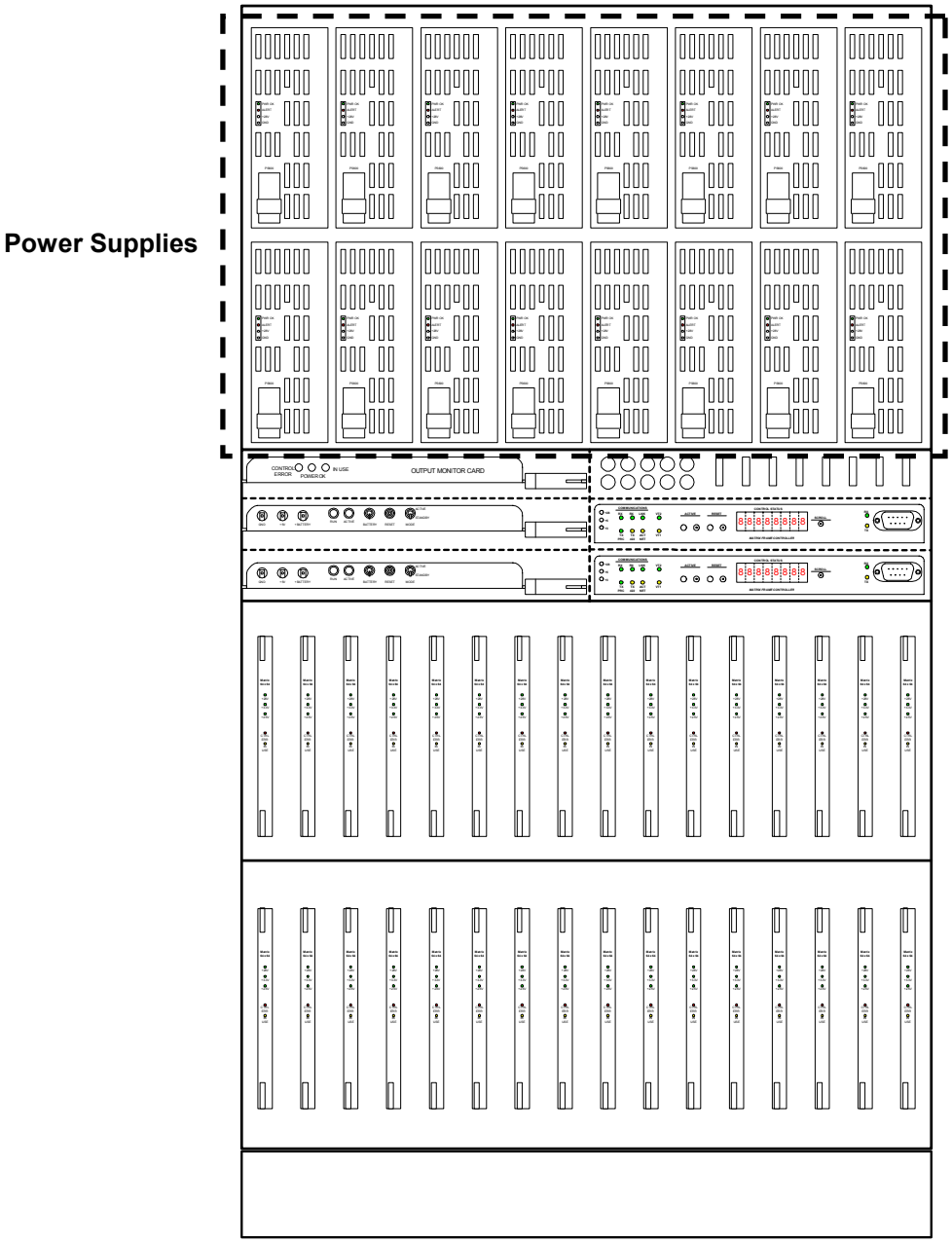


Figure 4. Power Supply Locations (front view)

You can install up to 16 power supplies. Each slot must have either a power supply or a blank installed. You can install them in any slot.

2.7.1 Cheetah Power Supply Information

Cheetah Power Supplies contain electrical shock hazards and should only be serviced by qualified service personnel with experience in servicing off-line switching regulators.

There are no user serviceable parts contained in the Cheetah Power Supply. All service performed on the Power Supply should be performed by the PESA Service Department.

High Leakage Current at 230 VAC. The Cheetah Power Supply leakage current exceeds 3.5mA when used at 230 VAC because of leakage through emission filter capacitors.

The Cheetah Power Supply is responsible for providing a regulated ±28VDC @22A to the switching frame. The Cheetah Power Supply is designed to operate within output specifications with AC line voltage ranges from 95-250 VAC and with AC line frequencies of 50/60 Hz automatically.

In the event of a Cheetah Power Supply failure, return the malfunctioning unit to the PESA Service Department for replacement. The power supplies contain lethal voltages when operating and should only be serviced by the PESA Service Department. Please call the PESA Service Department for a RMA number before returning any units for replacement. The Service Department's phone number is listed on the front page of this manual.

2.7.2 Installing the Power Supplies

Install each power supply as follows:

1. Align the metallic support plate of the first power supply with the card guides in the chassis.
2. Press upward on the power supply latches and carefully insert the power supply into the chassis until the connectors on the power supply make contact with the backplane connectors.
3. Firmly push the power supply into the chassis until the power supply latches engage the corresponding slots in the chassis.
4. Make sure the latch is *fully engaged* (down) to enable the power supply.

Each slot must have either a power supply or a blank installed. A minimum of 4 power supplies must be installed. If you only install 4 power supplies, you can install them in any slot.

Repeat the above steps for the remaining power supplies. Backplane dip switch settings (for information only) are detailed on page 49.

2.7.3 Removing the Power Supplies

To remove a power supply, follow these steps:

1. You may remove power supplies while the Cheetah is operational. Make sure you will still have the minimum number of power supplies installed before removing power supplies. The minimum number depends on your configuration. If you only have the minimum number of power supplies installed and you must remove one, power down the unit first.
2. Remove the Cheetah front cover.
3. Push the latch on the front of the power supply up.
5. Once the latch is pushed up, carefully pull the power supply out of the equipment chassis. Repeat for each power supply you need to remove.

2.8 Power Cord Connections

Make sure that all power is disconnected before installing the frame into the rack.

To prevent damage to the equipment:
- **Read all instructions for proper input voltage ranges.**
- **Use the specified power branch circuit ampacity recommended.**
- **Follow static prevention precautions prior to handling equipment.**

2.8.1 Power Cord and Circuit Breakers

AC power cords may differ depending on your power requirements. The frame is supplied with a pigtail for either IEC-type power cords for 220-240VAC. Two main circuit breakers can be found behind the protective cover located in the front of the frame. The following table describes the power connections for pigtail power cords.

Table 2. IEC-Type Plug Power Connections

	200-240V
Green/Yellow Stripe	Safety Ground
Blue	AC Line
Brown	AC Line

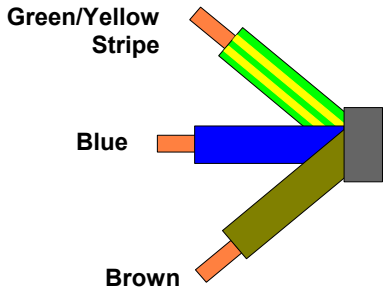


Figure 5. IEC-Type Plug Power Connections

2.8.2 AC External Power Requirements

The 256x256 frame is supplied with pigtail cords for 220-240V service, or with IEC type power cables for 220-240V service.

Table 3. AC Power Filter Assembly

AC Power Cable	Minimum Amps Required	Service Drops
IEC Plug (220-240V only)	30A Service	1- Standard 1-Redundant
Attached Power Cable pigtail (220-240V)	30A Service	1-Standard 1-Redundant

2.9 Setting Level Codes (Strobes)

NOTE **Set the level codes (strobes) BEFORE installing the matrix frame controller card.**

To set the level codes, use the rotary switches located as illustrated below to define a hexadecimal number. Use the settings in the LSB row (lower row) first. For example, to set the Level Strobe to 12, set the LSB Level Strobe switch to C. Switch functions are described in Table 4. You must ensure that these settings match the settings in the 3500Plus System Controller software.

NOTE **If specified by the customer when ordering, these switches will be set at the factory; however, the customer can adjust them as required for system expansion.**

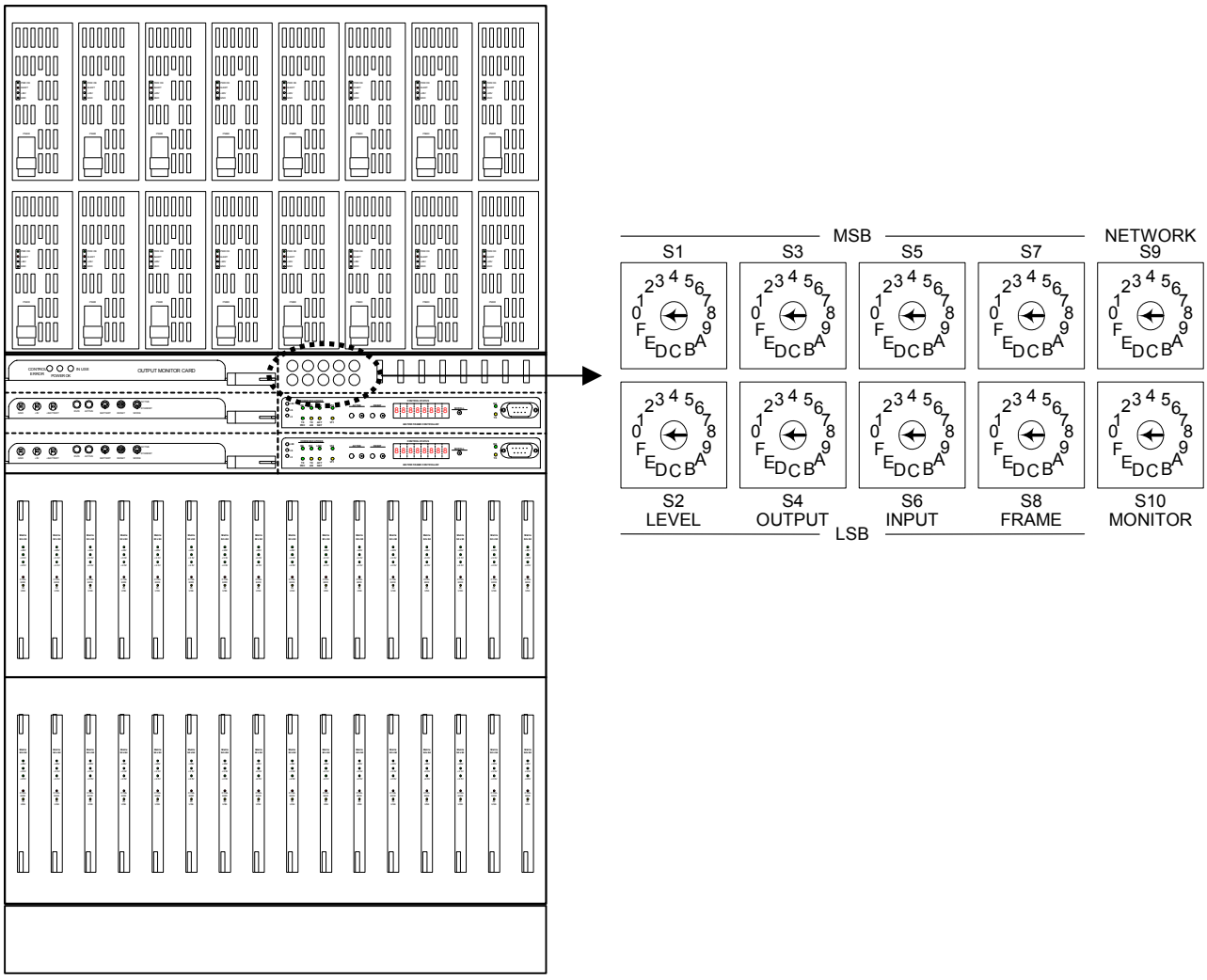


Figure 6. Level Code Switch Location (front view)

Table 4. Strobe Switch Functions

Rotary Switch	Name	Description
S1	MSB Level Code	The level code identifies the matrix level of the router. This setting accepts 1 to 63 in binary (1 to 3F in hexadecimal). This setting must match the Strobe setting in the 3500Plus software (select **Configuration > Component**. The Strobe setting is at the bottom of the window).
S2	LSB Level Code	
S3	MSB Output Offsets	This strobe is used to offset output origin when frames are added to the system. This setting accepts 1 to 255 in binary (1 to FF in hexadecimal). Set this strobe to the first offset number you want to use in this unit. This setting must match the Output Offset setting in the 3500Plus software (select **Configuration > Component**. The Input Offset displays in the lower section of the window).
S4	LSB Output Offsets	
S5	MSB Input Offsets	This strobe is used to offset input origin when frames are added to the system. This setting accepts 1 to 255 in binary (1 to FF in hexadecimal). Set this strobe to the first input number you want to use for this unit. This setting must match the Input Offset setting in the 3500Plus software (select **Configuration > Component**. The Input Offset displays in the lower section of the window).
S6	LSB Input Offsets	
S7	MSB Frame	Specifics the type of frame the boards are plugged into. For the Cheetah 256x448 frame, set this to 4.
S8	LSB Frame	
S9	Network (not used)	Not used.
S10	Monitor	Sets the starting output number. Each switch position increments the output number by 4. If you are not using this feature, leave the level code at zero. If you need to specify a monitor output, add 32 to the Level Code value. Use the resulting number for this setting.

2.10 Fuses

Eight 30-amp plug-in auto fuses, located inside the front of the frame as illustrated in the following figure, provide over-current protection for the associated 64x64 matrix cards. The fuses also provide protection for the I/O boards, in blocks of 64. See the tables starting on page 43 for I/O card fuse information.

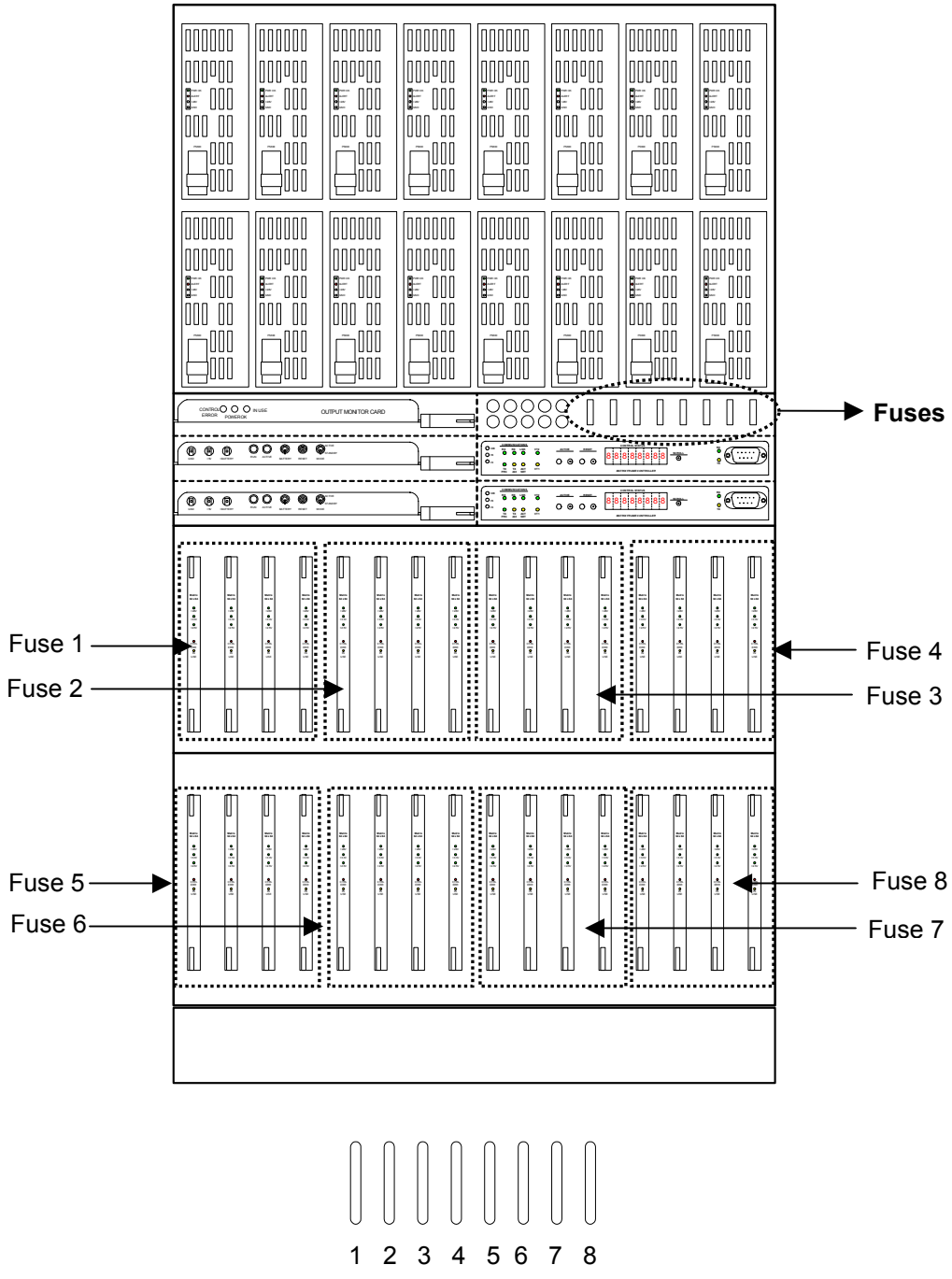


Figure 7. Fuse Location and Fuse Protection

The following graphic illustrates the filter and power distribution on the Cheetah.

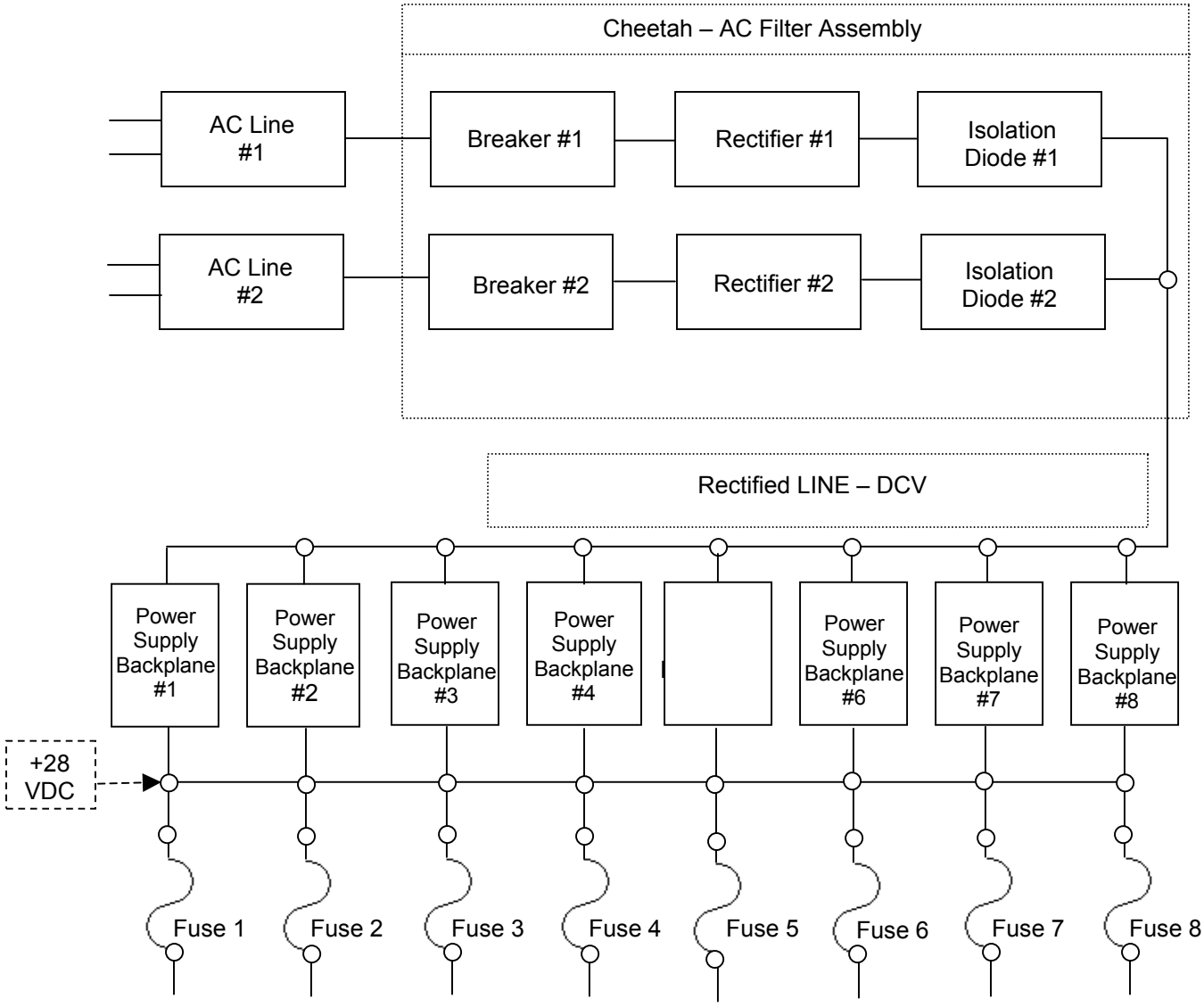


Figure 8. Filter and Power Distribution

The following figure shows the fuses for the 64x64 Digital Video Matrix Cards.

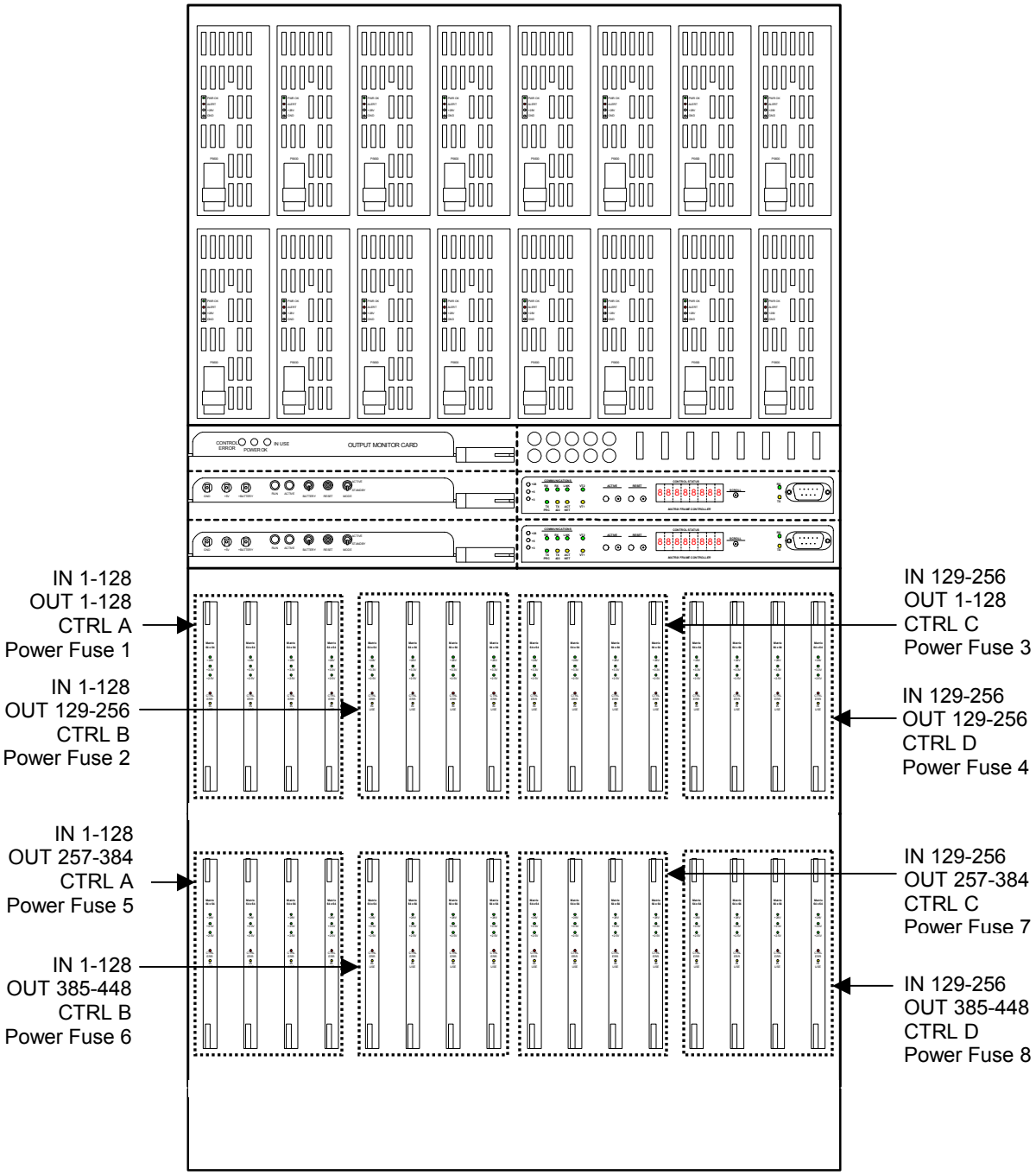


Figure 9. Fuses for 64x64 Digital Video Matrix Cards

The following figure shows the fuses for the Input/Output boards.

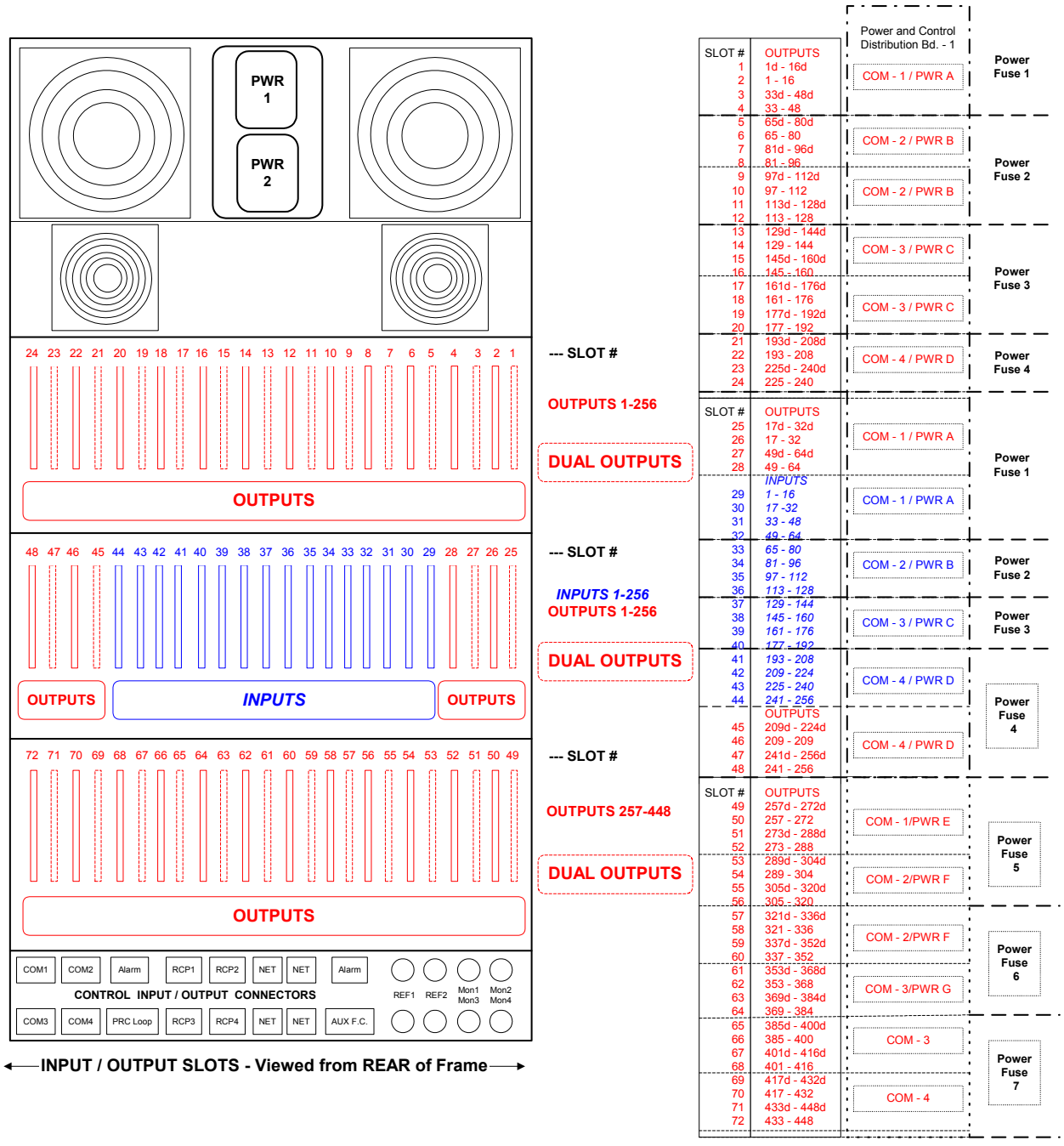


Figure 10. Fuses for Input and Output Boards

2.11 Installing the Output Monitor Control Card

The Output Monitor Control Card is located as shown in the following figure. This card supplies the Output Monitor connectors 1 and 2 located on the back (lower right) of the Cheetah. You will generally use the output monitor connectors for quality assurance or to troubleshoot specific outputs. You control the outputs you can monitor with the Win3500Plus Control System software. See section 2.16.10, Output Monitor Connectors, on page 40 for a diagram and description of the connectors. See section 3.3, Output Monitor Card, on page 53 for details about the LEDs on the front of the card.

The Output Monitor Card is internally strobed to "33". This setting will automatically be offset by 32 based on the Frame strobe setting (see LSB and MSB Frame Strobe setting on page 14). For example, if the Frame strobe is set to 10, the internal Output Monitor Card strobe will be set to 42.

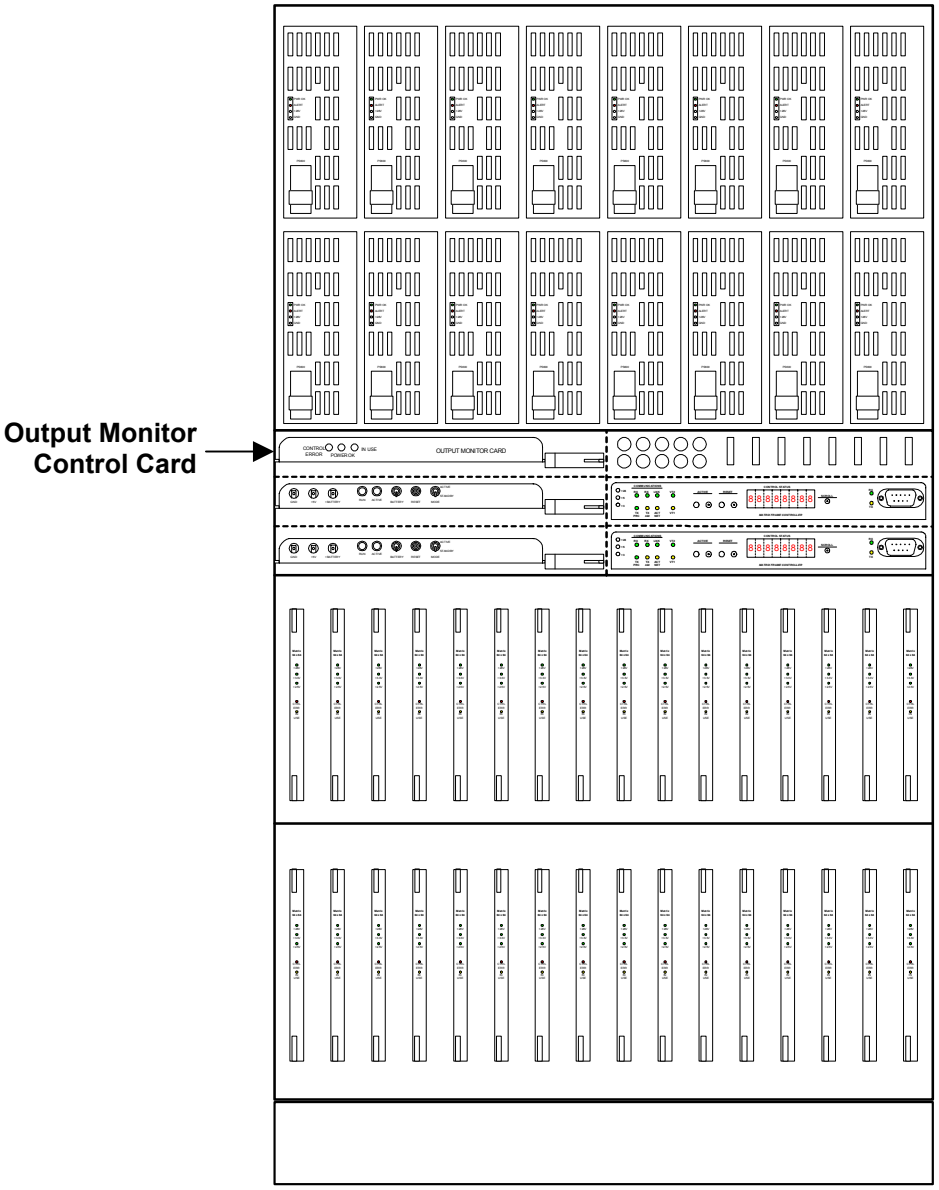


Figure 11. Output Monitor Control Card (front view)

To install the output monitor control card in the Cheetah Routing Switcher follow these steps:

1. Align the card with the card guides in the chassis.
2. Carefully insert the card into the chassis until the connector on the card makes contact with the backplane connector. If possible, inspect the mating connectors to ensure proper alignment.
3. Firmly push the card into the chassis until the connector on the card is fully mated with the backplane connector.

2.12 Installing the 3500Plus System Controller Card

The Cheetah may contain up to two redundant 3500Plus System Controllers. If the primary controller fails, its functions are taken over by the secondary controller. The System Controller, working in conjunction with Win3500Plus Control System software, enables users to configure and operate a switcher system from a standard IBM compatible PC. The System Controller interfaces between the routing switcher and all user-controlled elements, including RCPs, PCs, and so on. Based upon configuration data input during setup and installation, the System Controller sends appropriate I/O control signals to the Cheetah 64x64 Digital Video Matrix Card.

For detailed information about this card, see section 3.4, 3500 System Controller Cards, on page 54.

The 3500 Plus system controller cards are located as illustrated in Figure 12 on page 22. The Cheetah is designed for the installation of up to two System Controller Cards.

If only one System Controller Card is installed in the Cheetah Switcher, install it in the upper card slot.

If you do not use the controller cards, you must connect the Cheetah to a remote system controller.

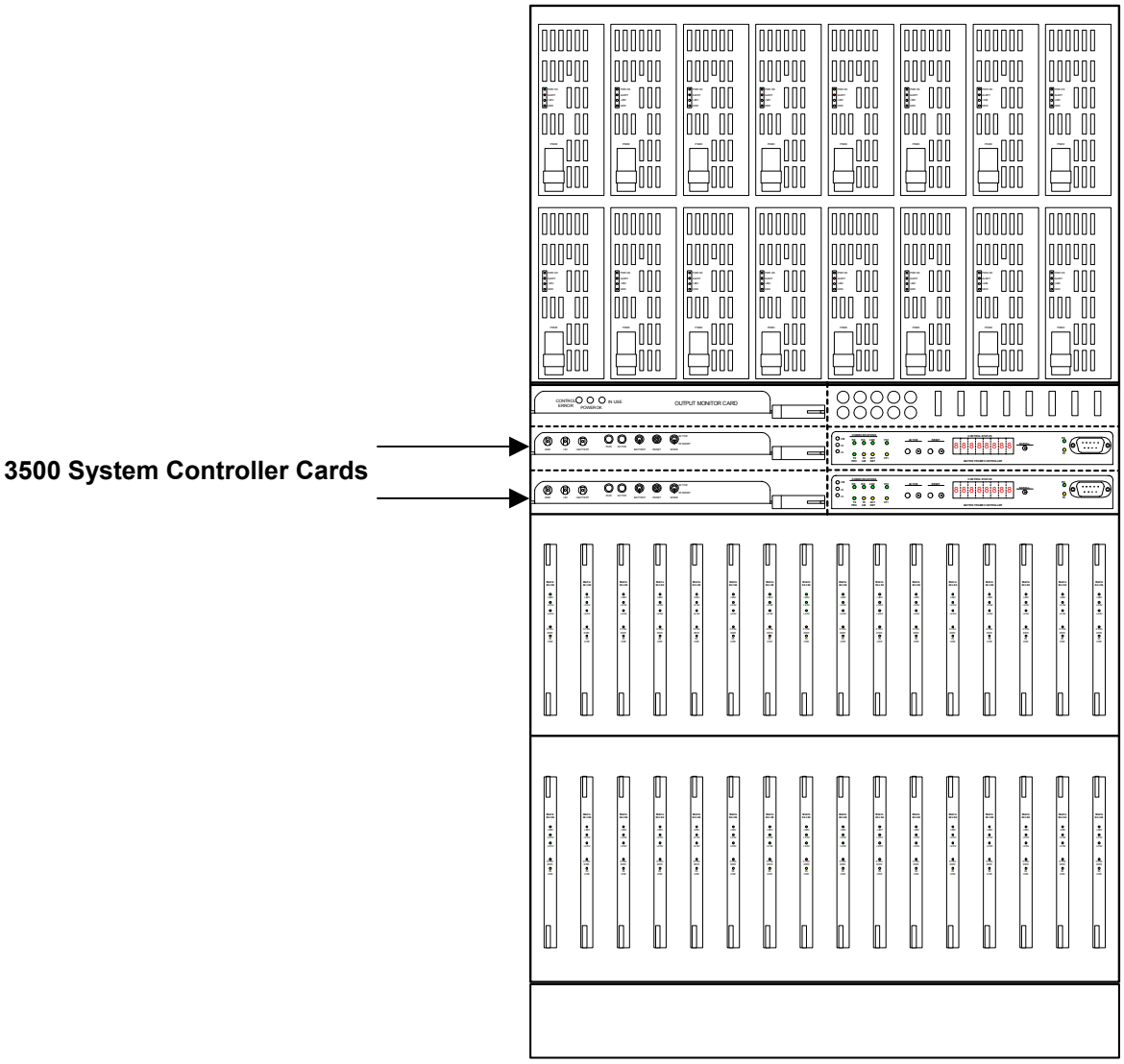


Figure 12. System Controller Card Locations (front view)

Install the system controller cards as follows:

1. Align the card with the card guides in the chassis.
2. Carefully insert the card into the chassis until the connector on the card makes contact with the backplane connector. If possible, inspect the mating connectors to ensure proper alignment.
3. Firmly push the card into the chassis until the connector on the card is fully mated with the backplane connector.
4. Repeat for the second system controller card.

2.13 Installing the Matrix Frame Controllers

For every frame type, at least one Matrix Frame Controller (MFC) is required. The function of the frame controller is to determine frame size, level, input offsets, output offsets, plus other physical characteristics of the frame hardware. For detailed information about this card, see section 3.6,

Matrix Frame Controller on page 58.

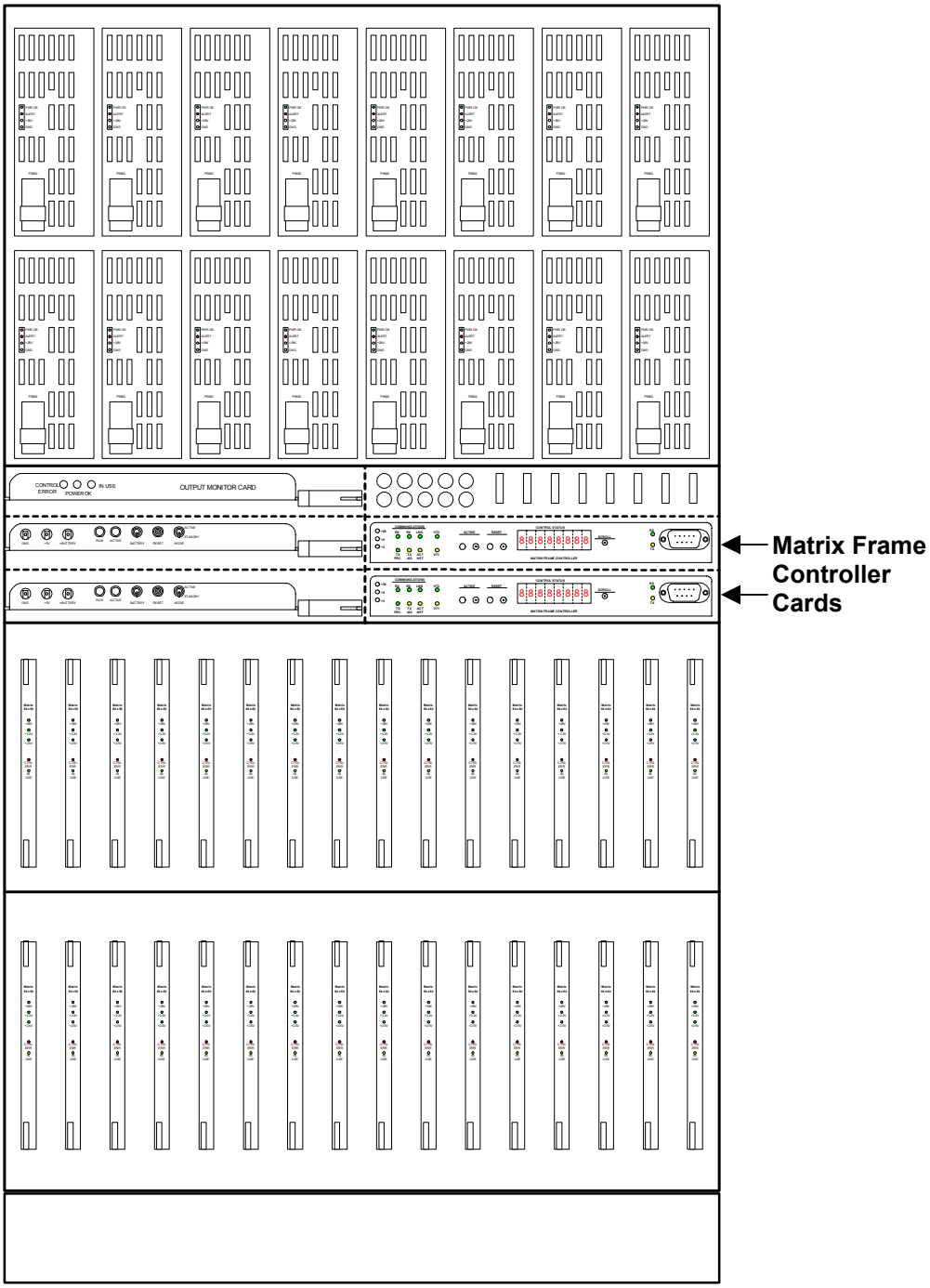


Figure 13. Matrix Frame Controller Cards

Install the system controller cards as follows:

1. Align the card with the card guides in the chassis.
2. Carefully insert the card into the chassis until the connector on the card makes contact with the backplane connector. If possible, inspect the mating connectors to ensure proper alignment.

3. Firmly push the card into the chassis until the connector on the card is fully mated with the backplane connector.
4. Repeat for the matrix frame controller card.

2.14 Installing the 64x64 Digital Video Matrix Cards

Set the level codes (strobes) BEFORE installing the matrix cards. See page 9.

The thirty two 64x64 digital video matrix cards are located as shown in the following figure. For detailed information about this card, see section 3.5, 64x64 Digital Video Crosspoint Matrix Card, on page 56. The Digital Video Matrix Cards are installed in the lower portion of the Cheetah Switcher. To install the cards in the Cheetah Switcher follow these steps:

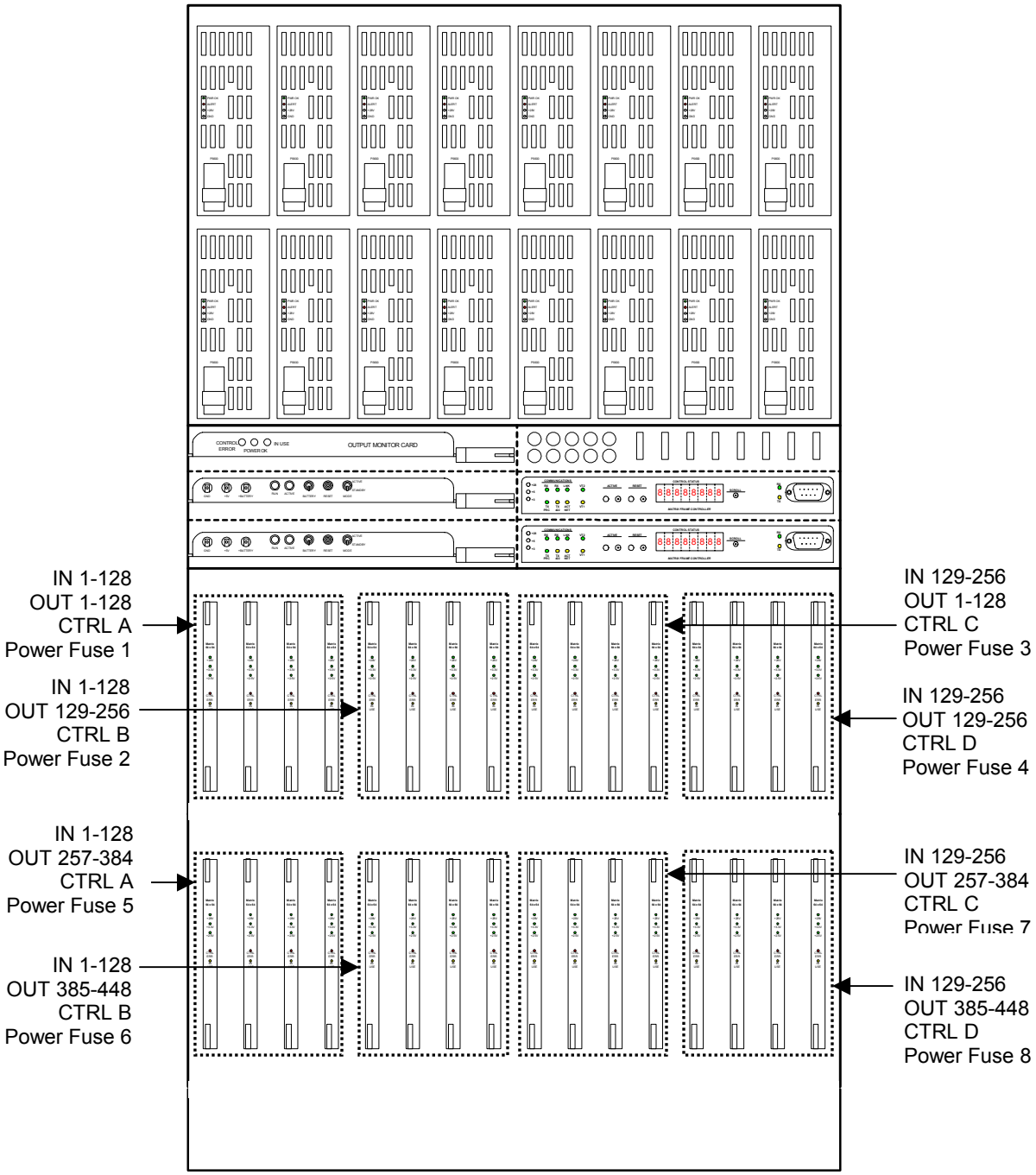


Figure 14. 64x64 Digital Video Matrix Card Locations (front view)

1. Align the card with the card guides in the chassis.
2. Carefully insert the card into the chassis until the latches on the top and bottom the card make contact with the frame.
3. Insert the latches into the frame.
4. Push the front of the latches in towards the frame until the card is secured.
5. Repeat for each additional digital video matrix card.

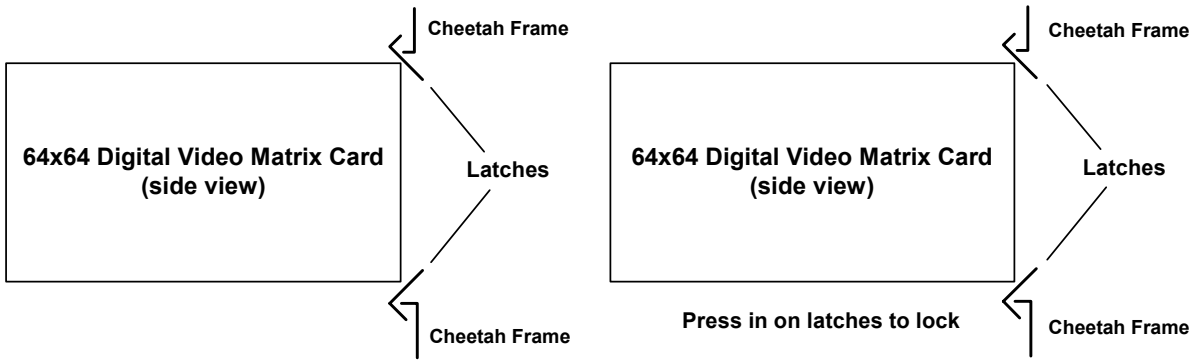


Figure 15. Installing the 64x64 Digital Video Matrix Cards

2.15 Installing Input/Output Buffer Cards

The Input/Output buffer cards provide the input/output signal interface. The illustration on the next page shows which slots are for input and output, and dual output. The dual output slots are odd-numbered and shown with a dashed line in the illustration. For detailed information about these cards and the connections, see section 2.16.11, Input/Output Signal Connectors on page 41. Install the cards as follows:

1. Align the first input/output buffer card with the card guides in the chassis.
2. Carefully insert the input/output buffer card into the chassis until the screw makes contact with the backplane. This will seat the card into the backplane.
3. Secure the screw using a hex socket or a flathead screwdriver.
4. Repeat the above steps for each additional input/output buffer card.

The following graphic shows an overview of the location of all of the input and output buffer cards. The following pages show close-up views of the cards.

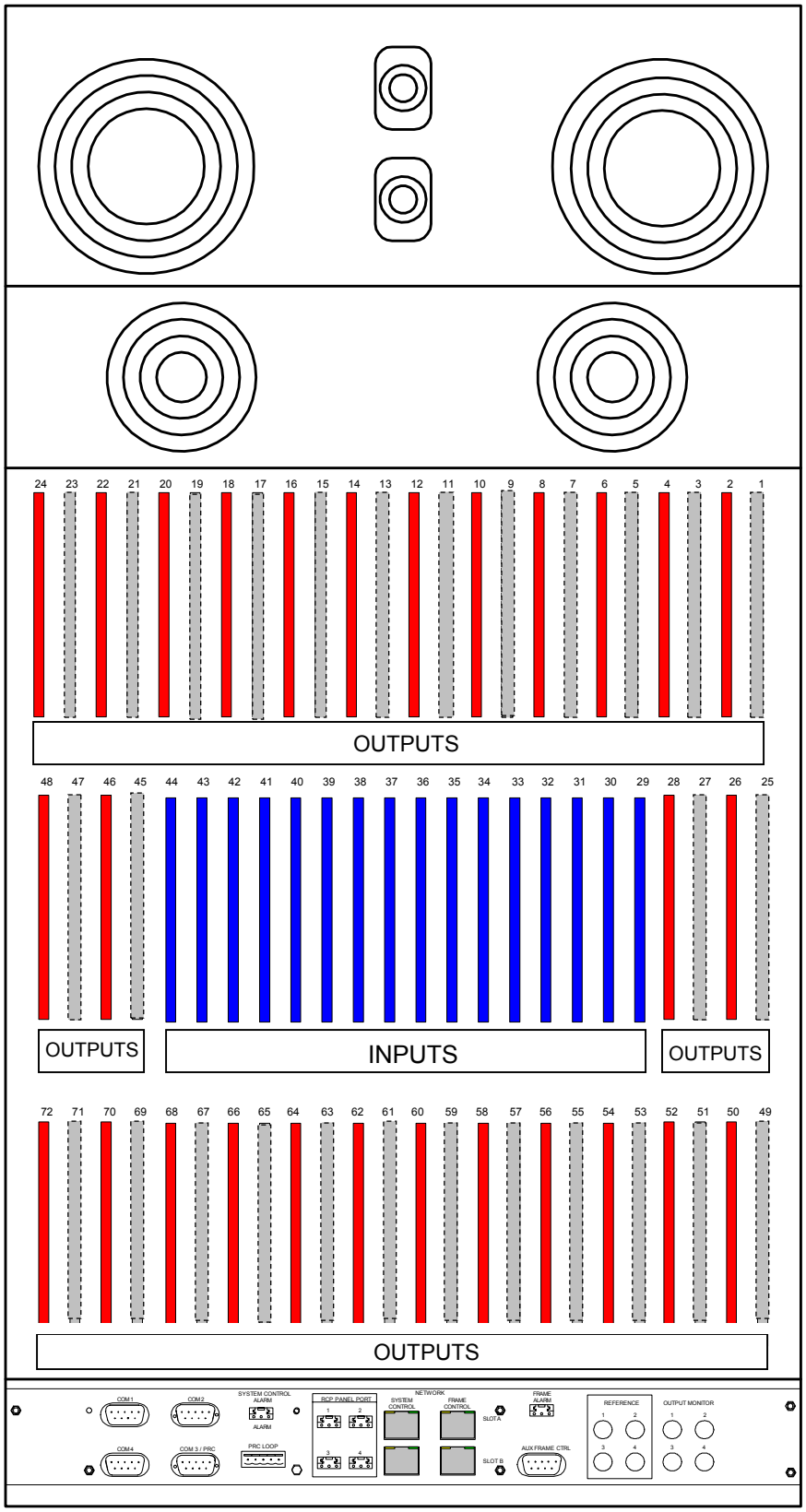


Figure 16. Input/Output Signal Connectors (rear view)

2.16 Rear Panel Connectors

All system interface connectors are located on the rear of this equipment as shown in the following figures.

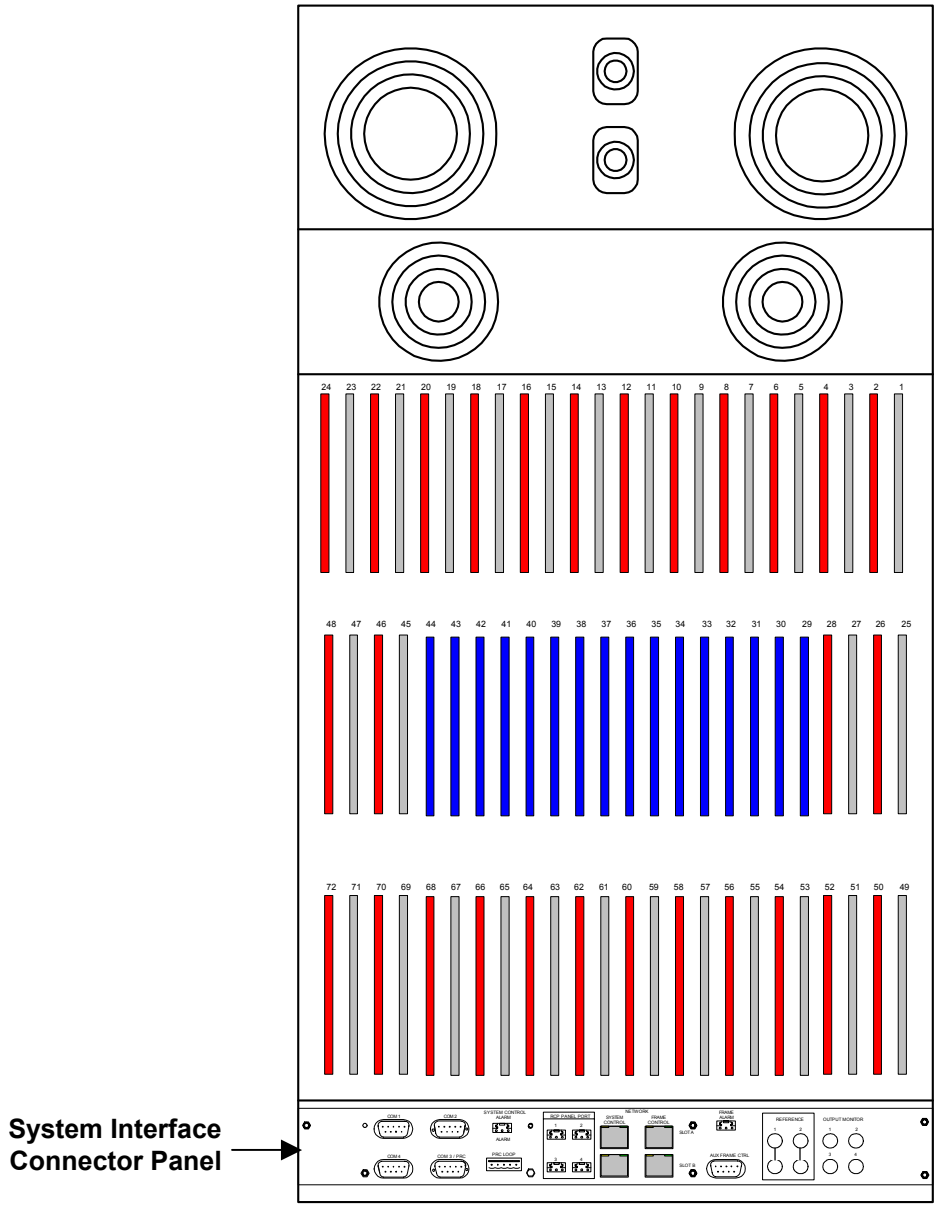


Figure 17. System Interface Connector Panel Location (rear view)

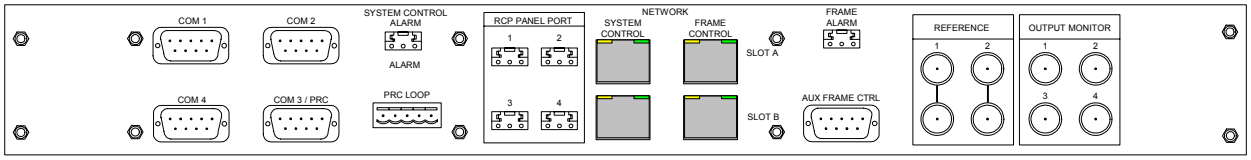


Figure 18. System Interface Connector Panel Close-up

2.16.1 RS-232 Control Connectors COM 1 and COM 2

COM 1 and COM 2 are DB9-Male connectors that provide RS-232 serial communication interfaces. Pinouts are shown in Table 6.

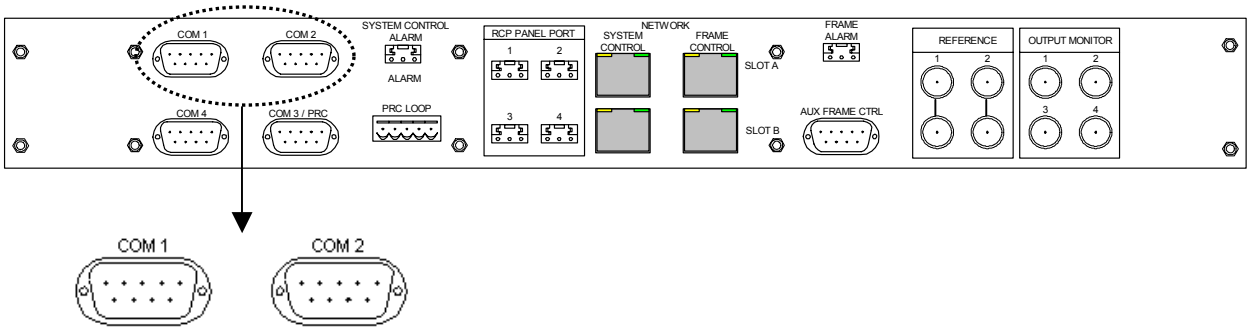


Figure 19. RS-232 Control Connectors

- COM 1 is the primary RS-232 CPU Link and may be connected to a PC running the 3500Plus Control System software with a null modem cable (Part No. 81-9028-0393-0). Or, COM 1 may be connected to an external control device.

  COM 1 may only be used with the P1E protocol at either 9600 or 38400 baud. Set the baud rate with a switch on the controller board. Make sure the communication rate for COM 1 in the 3500Plus software matches the baud rate you are using (in the software, select **System > Communications**).

- COM 2 is a secondary RS-232 CPU Link which may also be connected to a PC or an external control device. COM 2 may be used with either of the protocols shown in Table 5 and may operate at either 9600 or 38400 baud. Set the baud rate with a switch on the controller board. Make sure the communication rate for COM 2 in the 3500Plus software matches the baud rate you are using (in the software, select **System > Communications**).

Table 5. PESA CPU Link Protocols

Protocol	Document Number
CPU Link Protocol No. 1 Extensions (P1E)	81-9062-0408-0
Unsolicited Status Protocol (USP)	81-9062-0409-0

Table 6. COM1 and COM 2 Pin Assignments

Pin	Signal	In/Out
1	CD	Input
2	RX	Input
3	TX	Output
4	DTR	Output
5	Ground	---
6	DSR	Input
7	RTS	Output
8	CTS	Input
9	RI	No Connect

2.16.2 RS-232 Control Connectors COM3/PRC and COM4

These DB9-Male connectors provide RS-422 serial communication interfaces.

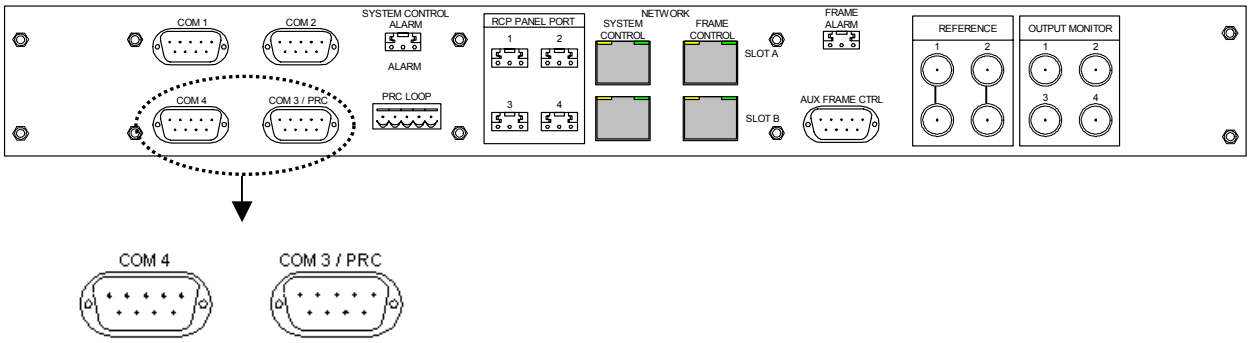


Figure 20. RS-232 COM 3/PRC and COM 4 Control Connectors

COM 3/PRC is the communications interface to a PRC type routing switcher system and is connected to a routing switcher with a serial control cable.

Table 7. COM 3/PRC Pin Assignments

Pin	Signal	In/Out
1	CTS+	Input (not used)
2	MATRIX+	Bi-directional
3	CTLR-	Output
4	RTS-	Output (not used)
5	Ground	---
6	CTS-	Input (not used)
7	MATRIX-	Bi-directional
8	CTLR+	Output
9	RTS+	Output (not used)

COM 4 is an RS-422 CPU Link similar to the RS-232 CPU Link, except the cable may be up to 4000 feet in length and an RS-422 interface card must be installed in the PC. COM 4 may be used with either of the protocols listed in Table 5 on page 31.

Table 8. COM4 Pin Assignments

Pin	Signal	In/Out
1	CTS+	Input
2	RX+	Input
3	TX-	Output
4	RTS-	Output
5	Ground	---
6	CTS-	Input
7	RX-	Input
8	TX+	Output
9	RTS+	Output

2.16.3 System Control Alarm Connector

This three-pin connector, illustrated in the following figure, provides an interface for an external, customer-supplied system control alarm. Alarm contact locations are also shown. A System Alarm originates with the 3500Plus controller. An alarm condition is declared when the controller is in reset and when the standby controller is gathering configuration information from the primary controller. During an alarm condition, an optically isolated, closed circuit exists between contacts 3 and 1 for Controller A (top) and contacts 2 and 1 for Controller B (bottom). This circuit acts as a switch to trigger an optional external alarm in the event of a controller fault or failure. The controller alarm circuit supplies a contact closure but does not provide a voltage to the external alarm. The customer supplied external alarm circuit is connected with a cable constructed as shown in Figure 22. The alarm is activated if the 3500Plus software:

- encounters an interrupt that it does not expect or handle
- is unable to synchronize with the other 3500Plus controller (dual controllers)
- does not get the configuration from the other 3500Plus controller (dual controllers).

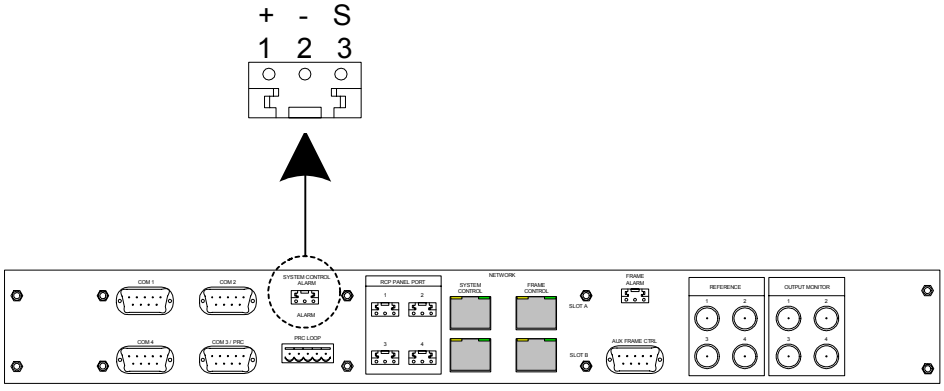


Figure 21. System Control Alarm Connector

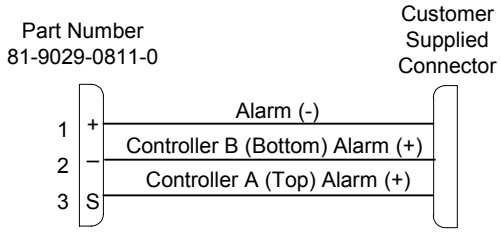


Figure 22. Alarm cableSetting the COM Port Baud Rate

2.16.4 PRC Loop Connector

This five-contact connector, located on the rear of the unit, is a loop-through connector used to provide an RS-422 serial communication interface using the PESA PRC Protocol (Document No. 81-9062-0316-0). It is wired in parallel with the DB-9-Male PRC Loop connector. Contact locations are illustrated in the following figure.

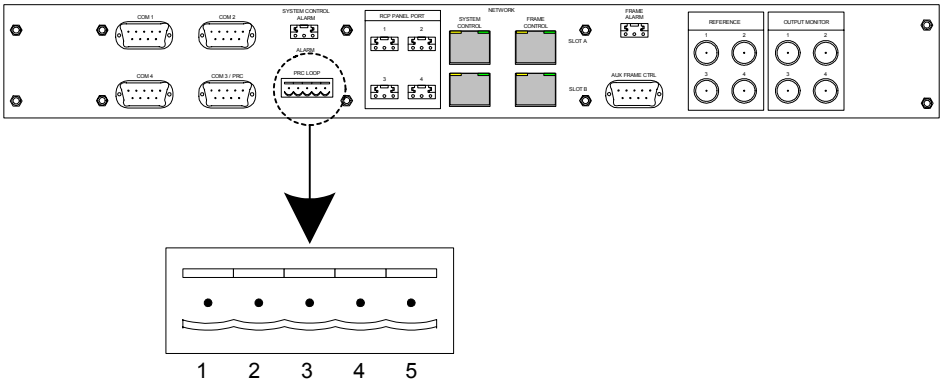


Figure 23. PRC Loop Connector

PRC Loop may be connected to PESA PRC-type equipment with a cable assembly (Part No. 81-9028-0395-0) constructed as shown in the following figure.

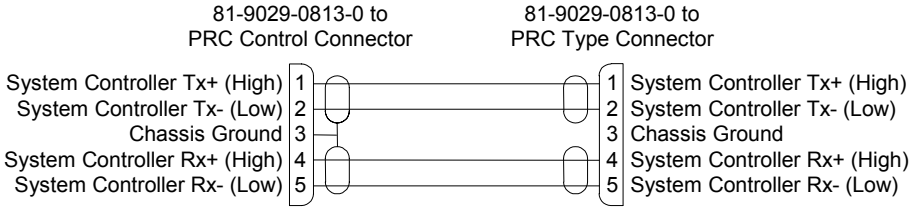


Figure 24. RS-422 System Expansion Cable

2.16.5 RCP Panel Port Connectors

Four RCP connectors, located on the rear of the unit and illustrated in the following figure, provide RS-485 serial communication interfaces using the PESA RCP Protocol (Document No. 81-9062-0300-0).

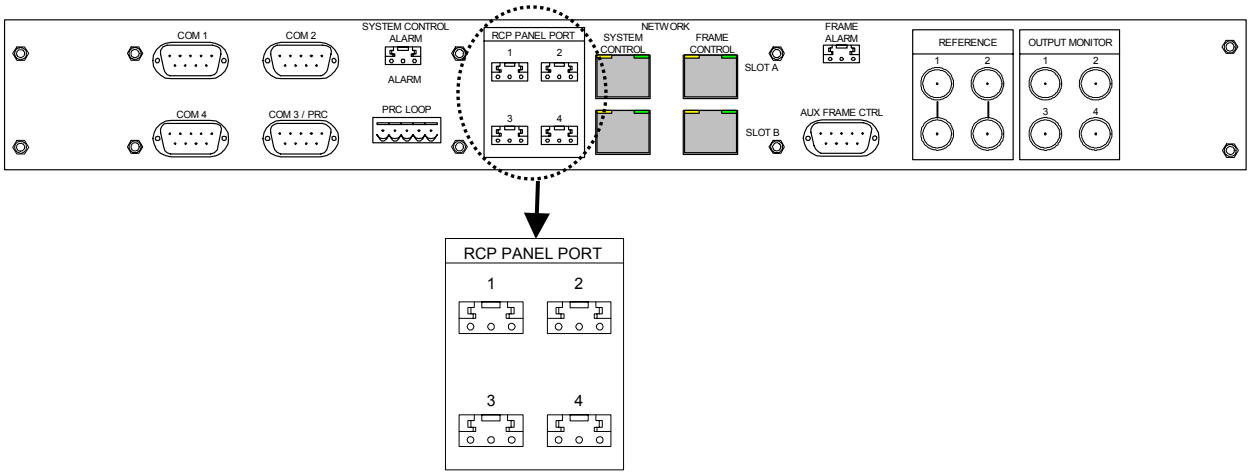
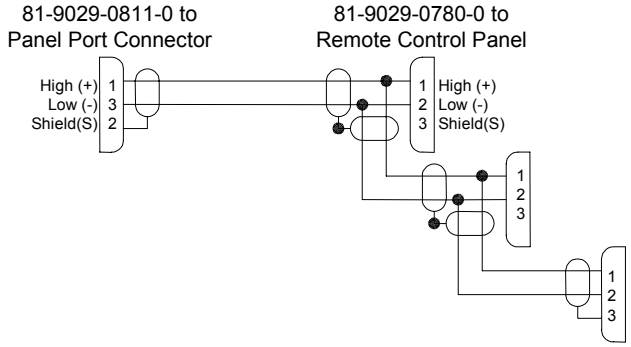


Figure 25. RCP Panel Port Connectors

These RCPs are connected to PESA Remote Control Panels with daisy-chained cables constructed with RCP connectors (Part No. 81-9029-0780-0) and shielded, twisted-pair cable (Part No. 81-9028-0043-2, Belden 8451, or equivalent) as illustrated in the following figure. The connector body has an integral strain relief which requires the use of a nylon cable tie which is included with the connector. If this cable tie is not available, use PESA Part No. 81-9021-0028-8.



NOTE

Cable is not pin for pin! Pins 2 and 3 are swapped.

Figure 26. RS-485 Cable Construction

2.16.6 Network Connectors

The RJ-45 Ethernet connectors, illustrated in the following figure, connect the Matrix Frame Controllers to a 10 or 100Mb/s TCP/IP network. The System Control connectors are not used. Ethernet configuration options are detailed in Appendix A on page 70.

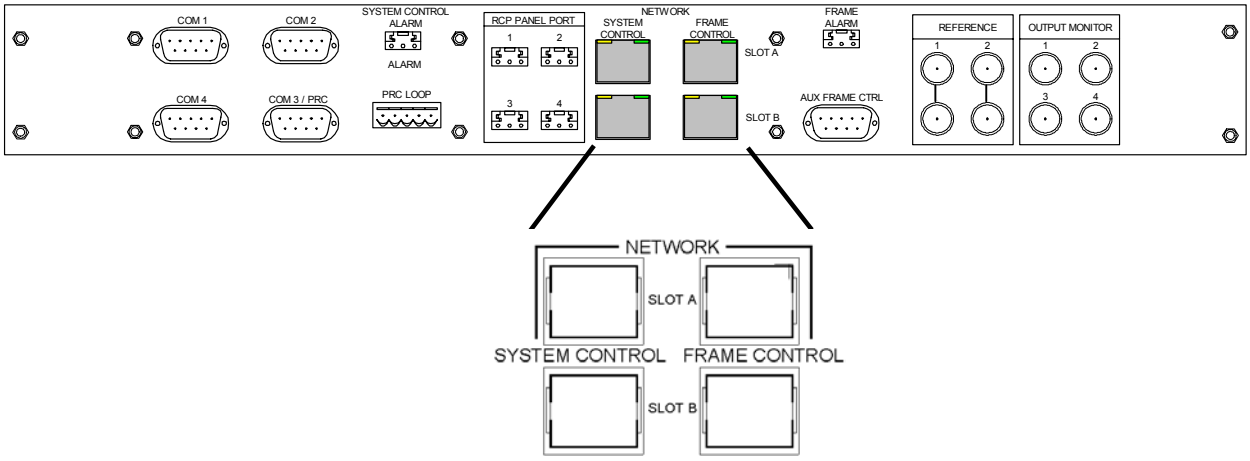


Figure 27. Network Connectors

LED indicators are provided as follows:

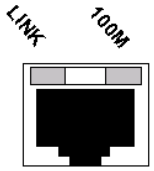


Table 9. Ethernet LED Indicators

LNK	ON = Ethernet LINK established
100M	ON = The Ethernet connection speed is 100Mb/s OFF = The Ethernet connection speed is 10Mb/s

Slots A and B are shown in the following figure.

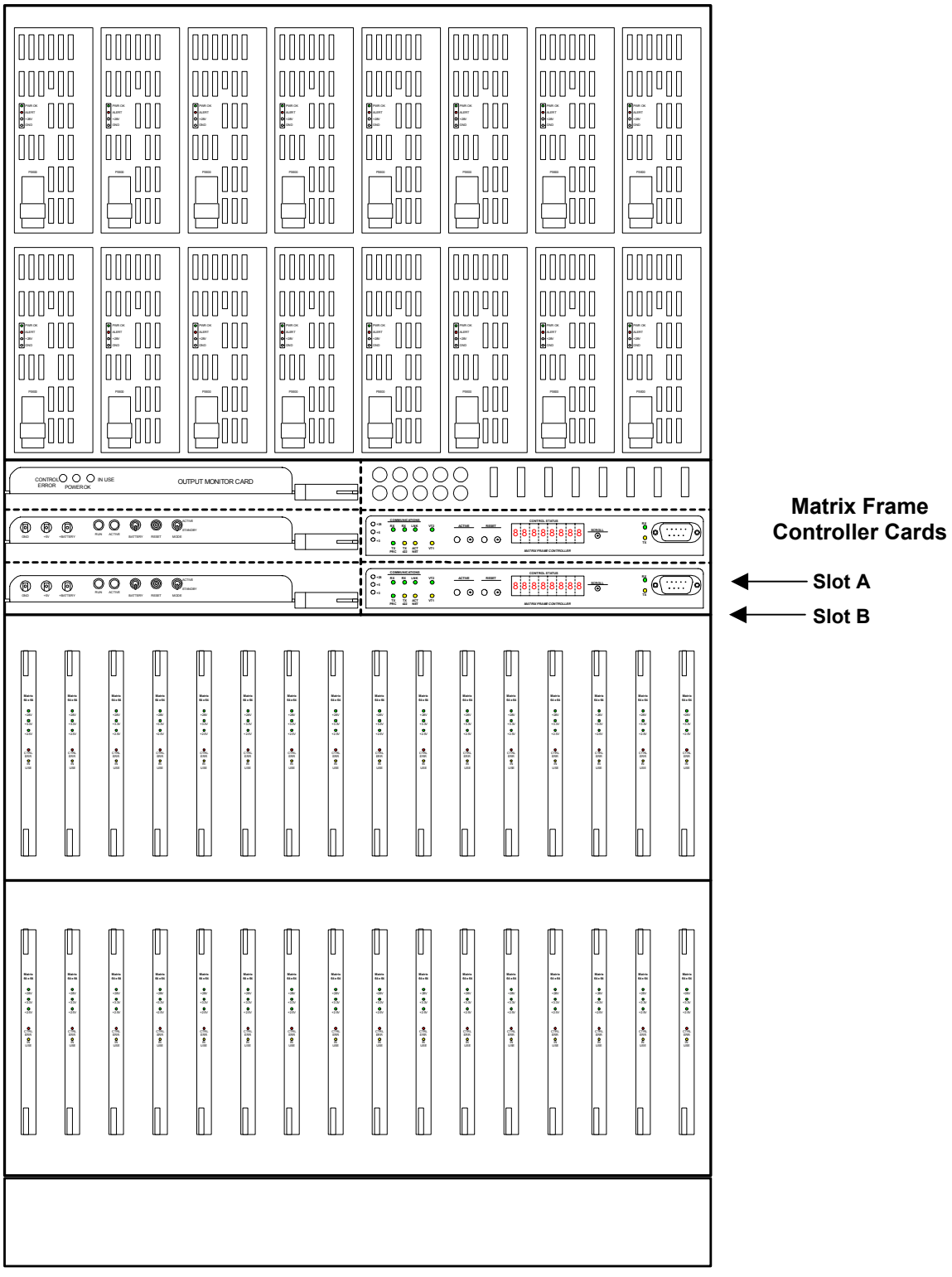


Figure 28. Matrix Frame Controller Cards, Slot A and Slot B

2.16.7 Frame Alarm Connector

This three-pin connector, illustrated in the following figure, provides an interface for an external, customer-supplied frame control alarm. The Matrix Frame Controller determines when a frame alarm condition is declared. Alarm contact locations are illustrated in the following figure. This circuit acts as a switch to trigger an optional external alarm in the event of a controller fault or failure. The controller alarm circuit supplies a contact closure but does not provide a voltage to the external alarm. The customer supplied external alarm circuit is connected with a cable constructed as shown in Figure 30. The alarm is activated if the matrix frame controller:

- finds a card (input, output, matrix, output monitor, power supply, or matrix frame controller) with a temperature out of range (above 0x46 degrees)
- finds a fan's voltage out of range
- finds a power supply's voltage or current out of range

The voltage or current must be out of range for three consecutive times before the Matrix Frame Controller will indicate an alarm.

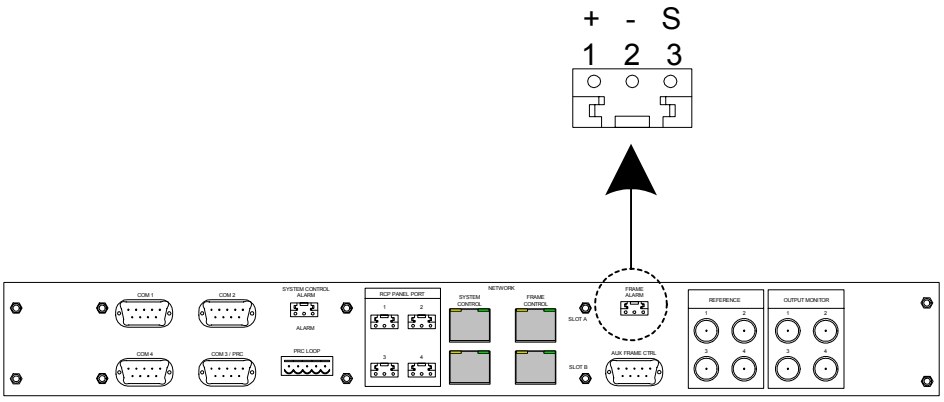


Figure 29. Frame Alarm Connector

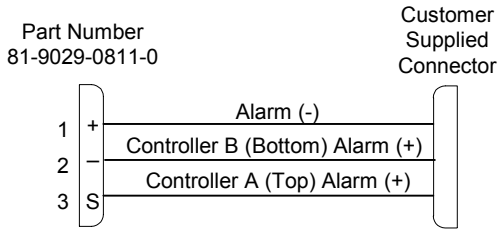


Figure 30. Alarm cable

2.16.8 Aux Frame Control Connector

This connector is used for SNMP management of additional Cheetah switchers. Configuration and operation of the embedded SNMP agent is detailed in Appendix B on page 73.

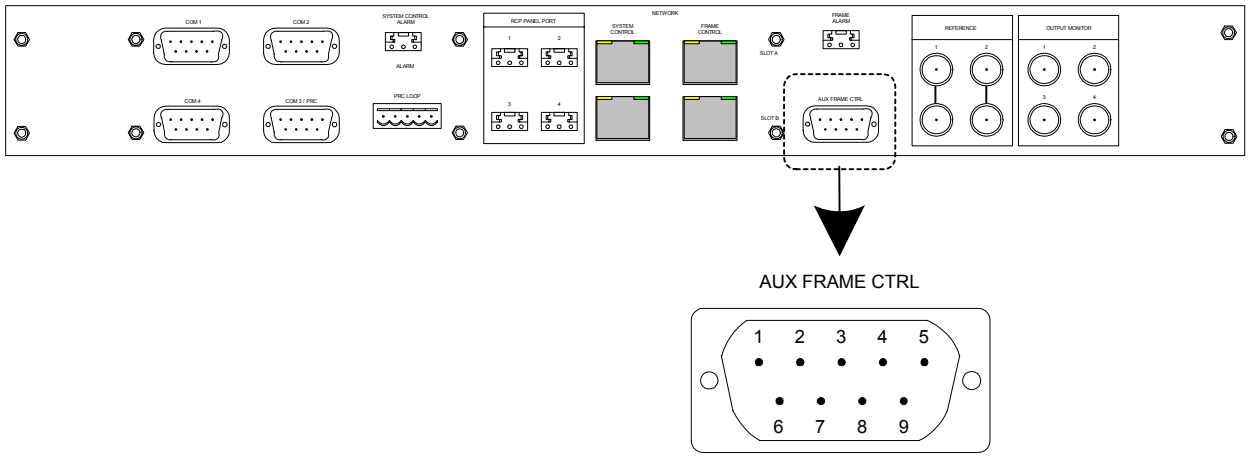


Figure 31. Aux Frame Control Connector

Table 10. Aux Frame Ctrl RS-422 Pin Assignments

Pin	Signal	In/Out
1	CTS+	Input
2	RX+	Input
3	TX-	Output
4	RTS-	Output
5	Ground	---
6	CTS-	Input
7	RX-	Input
8	TX+	Output
9	RTS+	Output

2.16.9 House Sync Input Connectors

These BNC coaxial connectors, illustrated in the following figure, provide the interface for two house sync (analog only) signals (NTSC, PAL, 1080i, 1080P, and 720P only). Each house sync input is a pair of BNC connectors wired in parallel (1 and 3 are a pair; 2 and 4 are a pair). This allows the signal to be daisy-chained from one routing switcher to another.

References 1 and 2 should be connected to the house sync source with coaxial cable and standard BNC connectors. Install 75Ω terminators on all unused connectors. Do not allow these connectors to float unterminated.

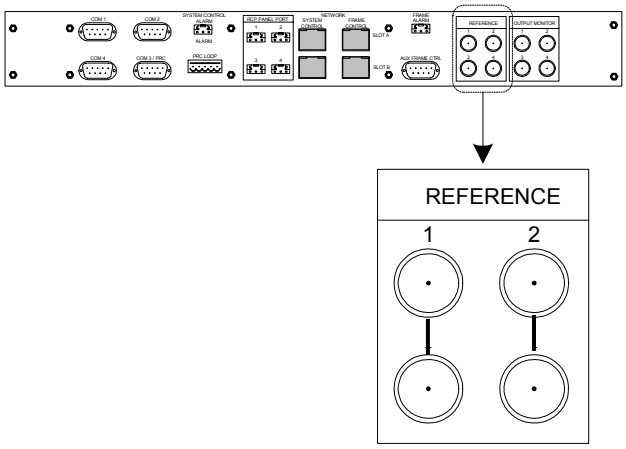


Figure 32. House Sync Input Connectors

2.16.10 Output Monitor Connectors

These BNC coaxial connectors, illustrated in the following figure, provide the interface for evaluating the output signals. Currently, connectors 1 and 2 are available. Connectors 3 and 4 are reserved for future use. You will generally use these for quality assurance or troubleshooting. For example, you would use these to monitor the quality of a specific output signal. You control the outputs you can monitor with the Win3500Plus Control System software. Make sure the Output strobe is set correctly before using this option (see page 14 for details). Install 75 ohm terminators on all unused connectors. Do not allow these connectors to float unterminated.

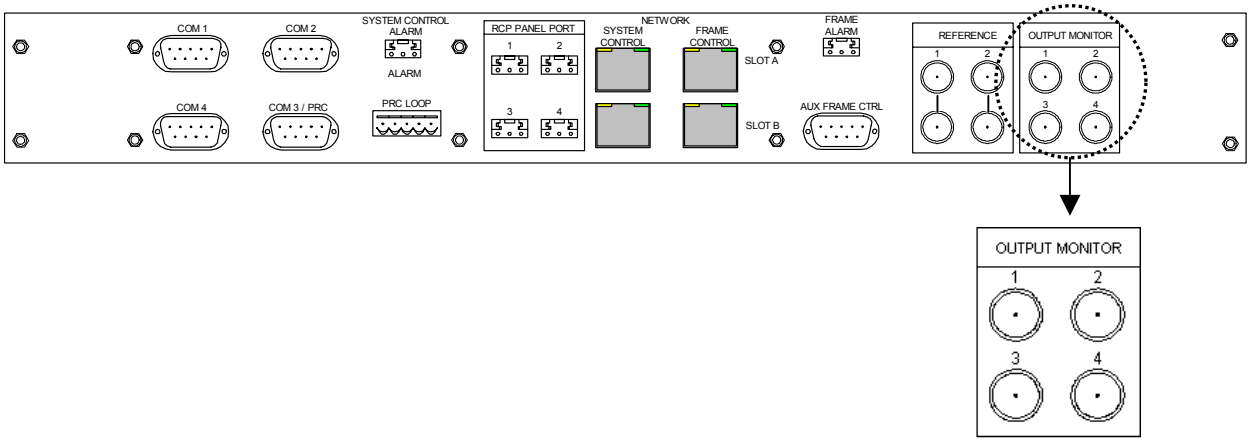


Figure 33. Output Monitor Connectors

2.16.11 Input/Output Signal Connectors

These BNC coaxial connectors, located on the rear of the unit as illustrated in the following figure, provide the input/output signal interface. The digital video input connectors are internally terminated into 75 ohms. Use coaxial cable and a standard BNC connector to connect each source. Input and output modules can be populated in increments of 16. Input modules provide up to 100m of equalization for HD and up to 300M for SDI. Both HD/multi-rate and SDI output modules include a single copper connection. However, daughter boards can be installed to provide a second output per bus. The second output can be either copper or fiber (single mode or multi-mode). For SDI applications, a DAC monitor grade, 10-bit output board can be installed as an option. For HD applications, a HD to SD conversion card can be installed as an option. The Output Slots labeled with a "**d**" in the following diagram represent dual output slots.

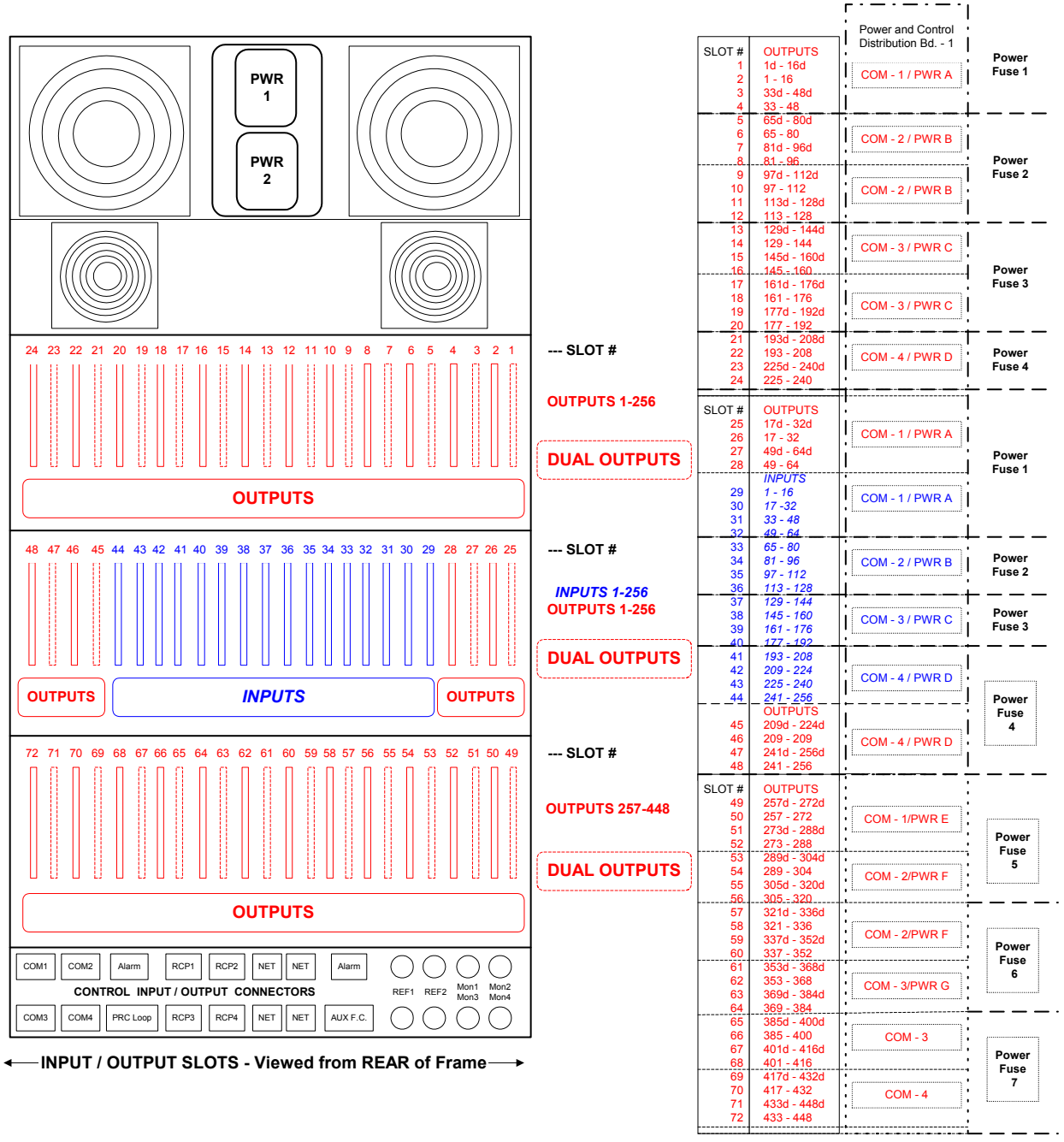


Figure 34. Input/Output Signal Connectors (rear view)

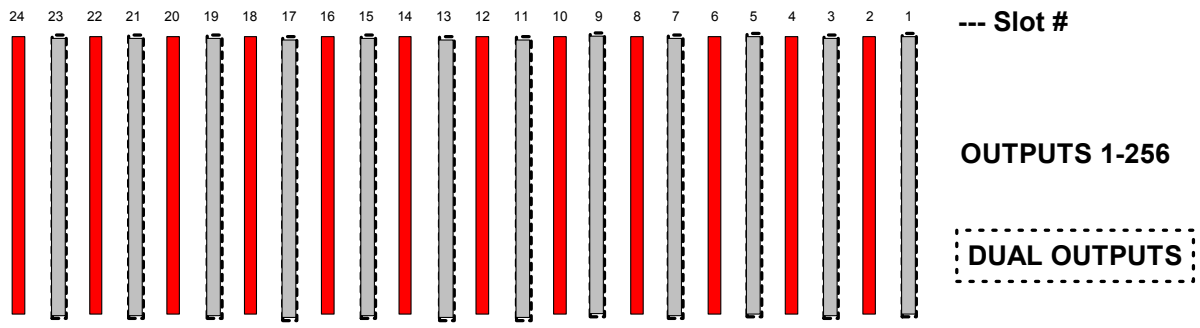


Figure 35. Outputs and Dual Outputs 1-256

Table 11. Outputs and Dual Outputs 1-256

Slot #	Outputs	Power and Control Distribution	Fuse
1 2 3 4	1d-16d 1-16 33d-48d 33-48	COM-1/PWR A	Power Fuse 1
5 6 7 8	65d-80d 65-80 81d-96d 81-96	COM-2/PWR B	Power Fuse 2
9 10 11 12	97d-112d 97-112 113d-128d 113-128	COM-2/PWR B	Power Fuse 2
13 14 15 16	129d-144d 129-144 145d-160d 145-160	COM-3/PWR C	Power Fuse 3
17 18 19 20	161d-176d 161-176 177d-192d 177-192	COM-3/PWR C	Power Fuse 3
21 22 23 24	193d-208d 193-208 225d-240d 225-240	COM-4/PWR D	Power Fuse 4

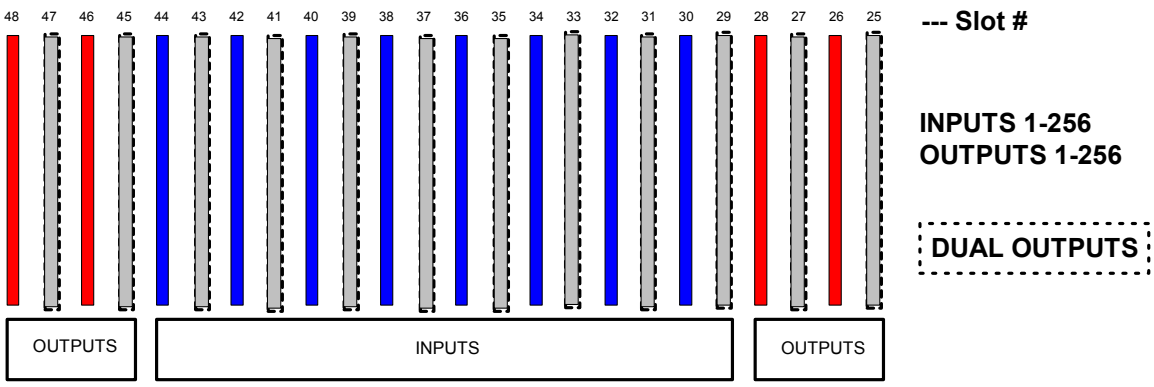


Figure 36. Inputs 1-256, Outputs and Dual Outputs 17-64 and 209-256

Table 12. Inputs 1-256, Outputs and Dual Outputs 17-64 and 209-256

Slot #	Outputs	Power and Control Distribution	Fuse
25	17d-32d	COM-1/PWR A	Power Fuse 1
26	17-32		
27	49d-64d		
28	49-64		
	Inputs	COM-1/PWR A	Power Fuse 1
29	1-16		
30	17-32		
31	33-48		
32	49-64		
33	65-80	COM-2/PWR B	Power Fuse 2
34	81-96		
35	97-112		
36	113-128		
37	129-144	COM-3/PWR C	Power Fuse 3
38	145-160		
39	161-176		
40	177-192		
41	193-208	COM-4/PWR D	Power Fuse 4
42	209-224		
43	225-240		
44	241-256		
	Outputs	COM-4/PWR D	Power Fuse 4
45	209d-224d		
46	209-224		
47	241d-256d		
48	241-256		

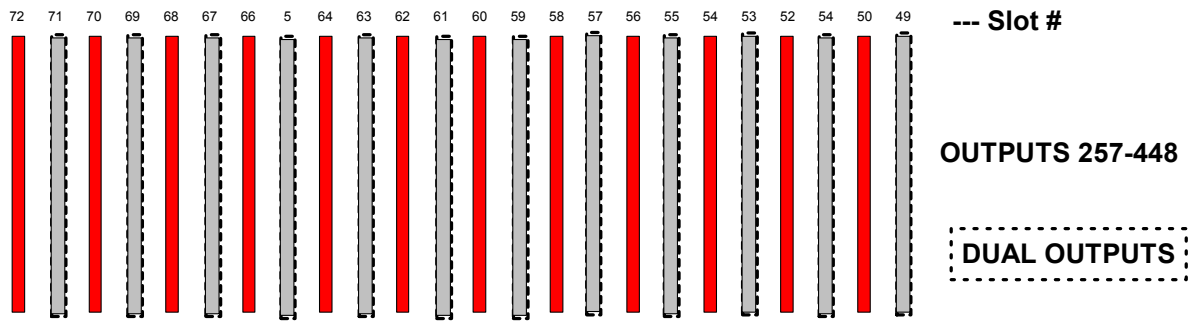


Figure 37. Outputs and Dual Outputs 257-448

Table 13. Outputs and Dual Outputs 257-448

Slot #	Outputs	Power and Control Distribution	Fuse
49 50 51 52	257d-272d 257-272 273d-288d 273-288	COM-1/PWR E	Power Fuse 5
53 54 55 56	289d-304d 289-304 305d-320d 305-320	COM-2/PWR E	Power Fuse 5
57 58 59 60	321d-336d 321-336 337d-352d 337-352	COM-2/PWR F	Power Fuse 6
61 62 63 64	353d-368d 353-368 369d-384d 369-384	COM-3/PWR F	Power Fuse 6
65 66 67 68	385d-400d 385-400 401d-416d 401-416	COM-3/PWR G	Power Fuse 7
69 70 71 72	417d-432d 417-432 433d-448d 433-448	COM-4/PWR G	Power Fuse 7

2.17 Switch Locations and Settings

2.17.1 Matrix Backplane Dip Switches

Each matrix backplane has one eight-position, slide-style switch consisting of eight single-pole single-throw (SPST) switches numbered 1 through 8. Each backplane supports 4 cards. The following figure depicts the location of this switch with the matrix cards removed, and the dip switch settings.

These dip switches are set at the factory. Do NOT change the settings!

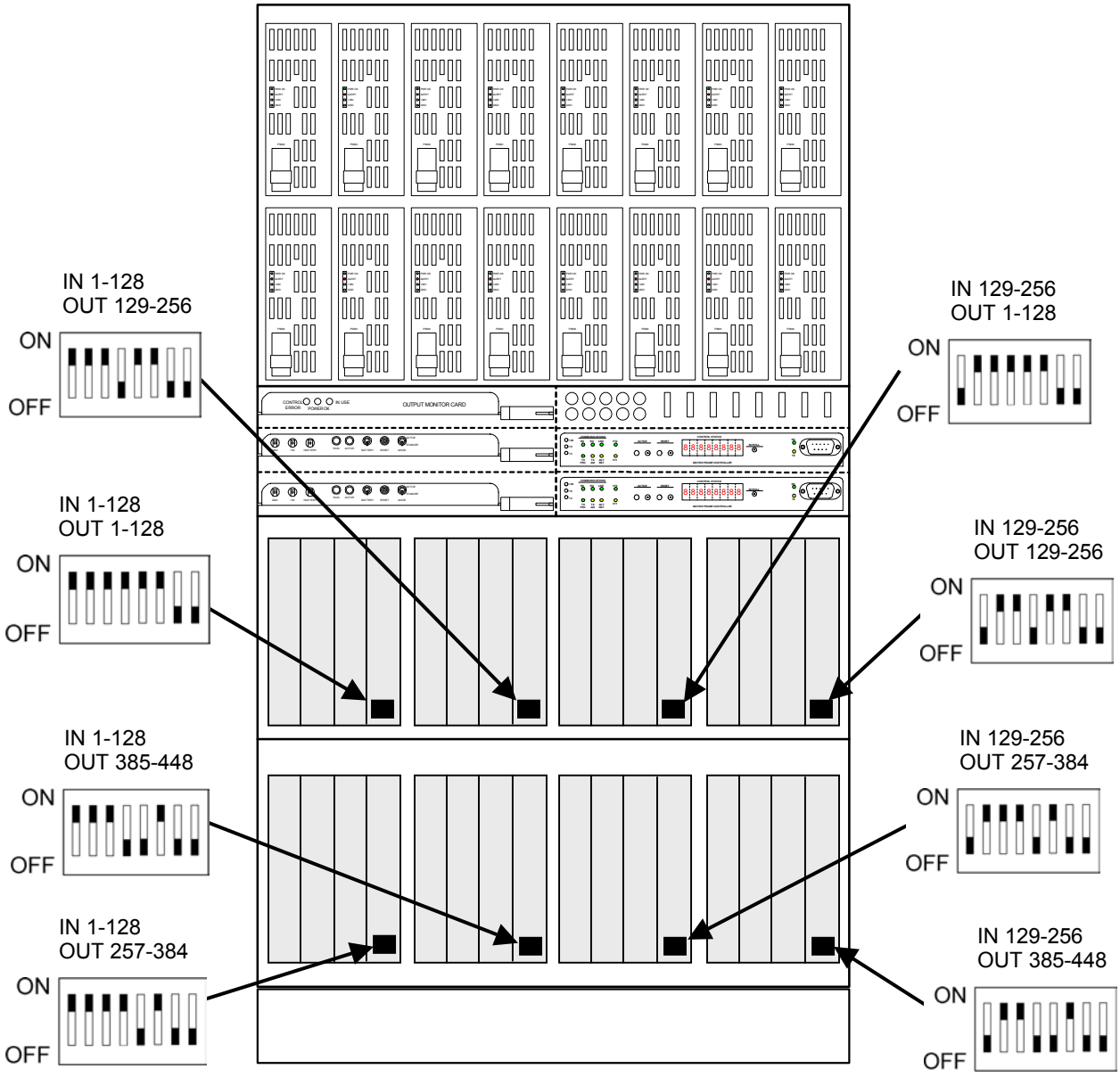


Figure 38. Matrix Backplane Dip Switch Location and Settings

2.17.2 Power Supply Backplane Dip Switches

Each power supply backplane has one eight-position, slide-style switch consisting of eight single-pole single-throw (SPST) switches numbered 1 through 8. Each power supply backplane supports two power supplies. The following figure depicts the location of these switches and the dip switch settings.

These dip switches are set at the factory. Do NOT change the settings!

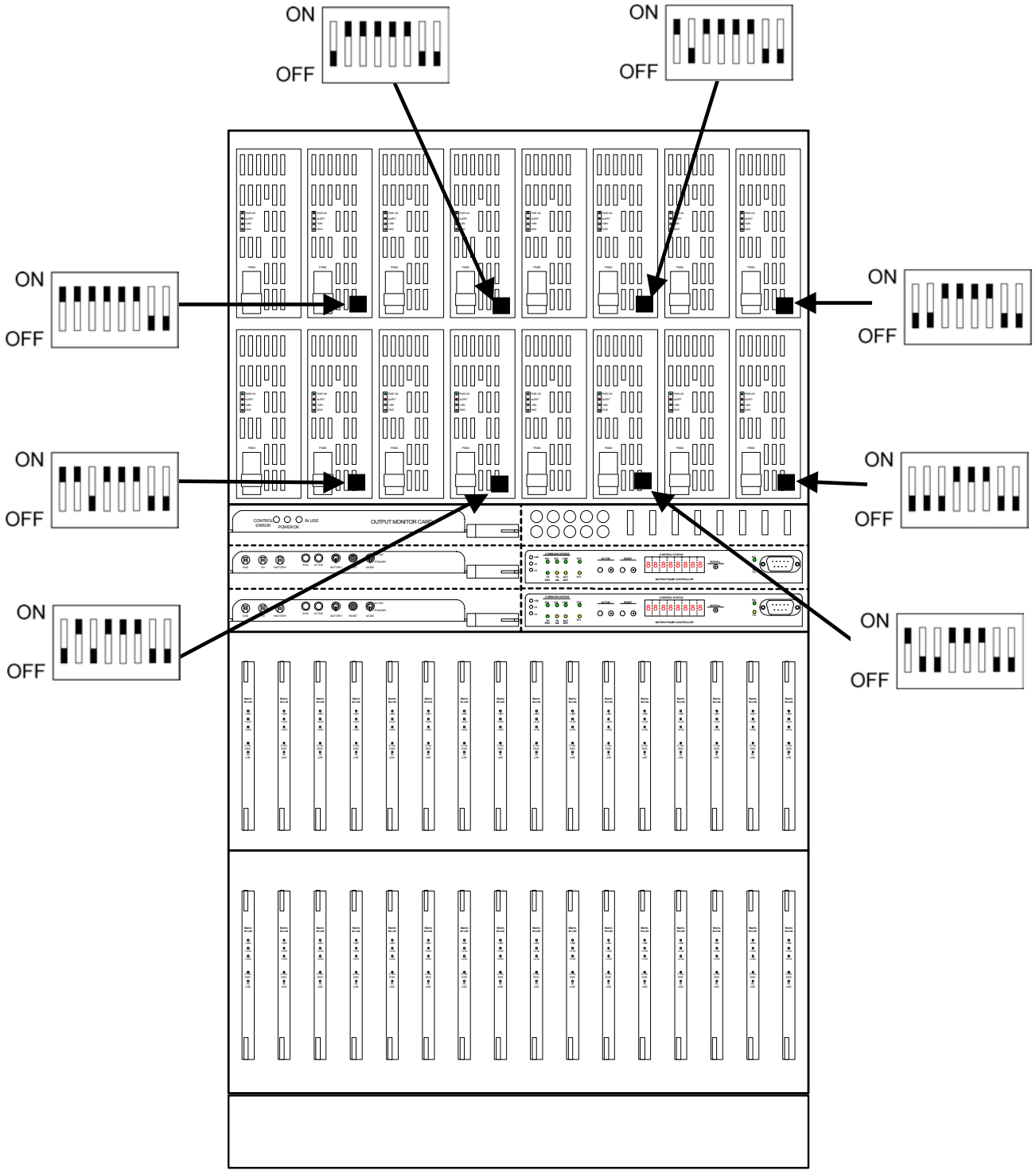


Figure 39. Power Supply Backplane Dip Switch Locations and Settings (viewed from the front of the frame)

2.17.3 Input/Output Backplane Dip Switches

Each input/output backplane has one eight-position, slide-style switch consisting of eight single-pole single-throw (SPST) switches numbered 1 through 8. Each input/output backplane supports 4 cards. The following figure depicts the location of these switches with the cards removed, and the dip switch settings.

These dip switches are set at the factory. Do NOT change the settings!

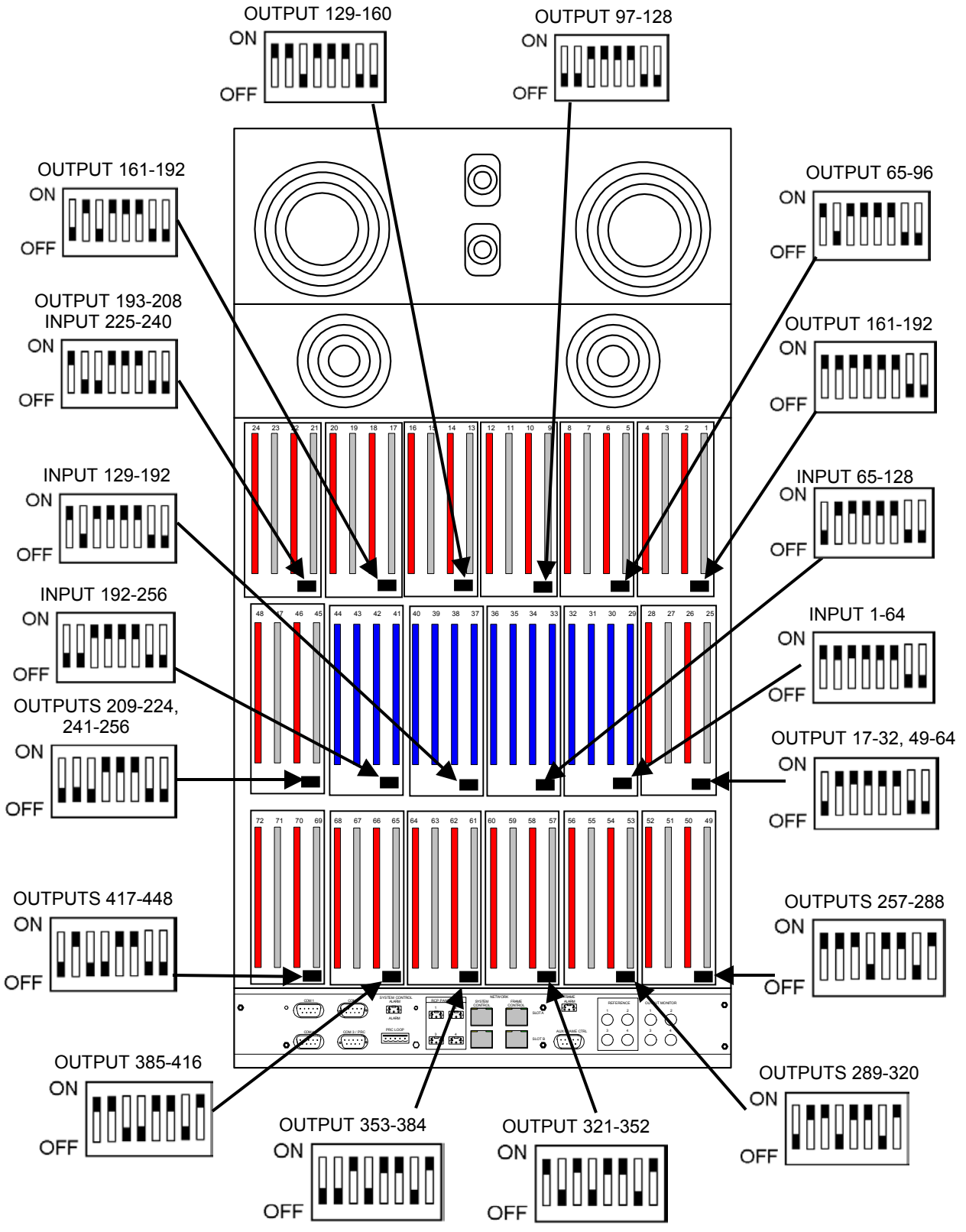


Figure 40. Input/Output Backplane Dip Switch Locations and Settings (viewed from the rear of the frame)

2.18 Connection Guide

Once the Cheetah Digital Video Matrix Switcher is installed in the equipment rack, system connections can be made. Use the following guide to insure that Cheetah Switcher system interconnections are properly connected and that the control, power, sync, and digital video cables are correctly installed.

1. Connect the external sync sources to the reference inputs using Belden 8281 coaxial cable or equivalent. Be sure to properly terminate the external sync sources into 75 ohms.
2. Connect the Output Monitor outputs using Belden 8281 coaxial cable or equivalent. Be sure to properly terminate all outputs with 75 ohms.
3. Connect the primary external computer to the COM 1 Connector using a 9-pin RS232 cable. Please note that this connection **must** be made to configure the internal System Controller using the 3500Plus Control System software package. If a secondary external computer is to be used, connect it to the COM 2 Connector.
4. If additional Cheetah Switchers are to be utilized as part of the switching matrix, connect COM 3/PRC on the primary Cheetah Switcher to COM 3/PRC on the other Cheetah Switcher using 5-pin ribbon cables.
5. If an external controller (such as the 3500Plus System Controller) is used to control the Cheetah Switcher, connect the external controller to COM 4 using 9-pin RS-422 cable.
6. Connect the RCP control panels to the RCP Panel Ports using twisted pair cables. The connections to the control panel may be daisy-chained.
7. If Ethernet connectivity is desired, connect a 10baseT RJ-45 LAN connector to the Slot A and Slot B Network jacks.
8. Configure the Ethernet settings as described in Appendix A.
9. If SNMP management of additional Cheetah Switchers are to be utilized, connect the switchers using 9-pin RS-422 cables to the Aux Frame Ctrl connector as shown in Figure 29 on page 38.
10. Configure the Ethernet and SNMP settings as described in Appendices A and B.
11. If desired, connect an external alarm to the System Control Alarm.
12. If desired, connect an external alarm to the Frame Control Alarm.
13. Connect the digital video sources to the video inputs using Belden 8281 coaxial cable or equivalent 75 ohm coaxial cable.
14. Connect the video outputs to the digital video destinations using Belden 8281 coaxial cable or equivalent.

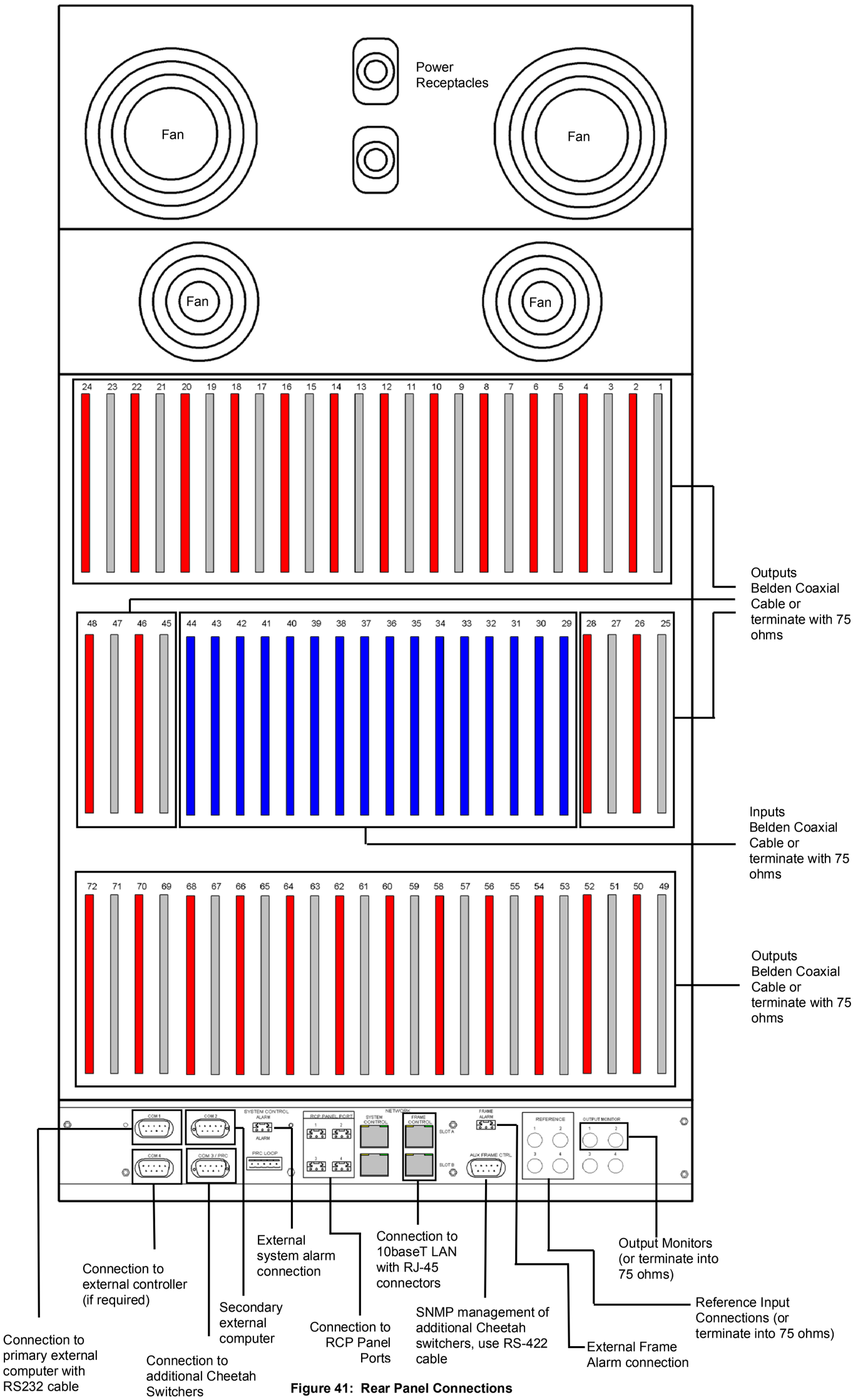


Figure 41: Rear Panel Connections

Chapter 3 – Operation and Functional Description

3.1 Input Buffer Card

The input buffer card provides 16 digital input video channels. Each input channel provides an equalizer to compensate for cable loss, and drivers for internal signal distribution. The input buffer card is available in three versions: SDI, HD-multirate, and fiber optic.

3.1.1 Input Buffer Card LED Indicators

Two LED indicators are located on the edge of the Input Buffer card. These LEDs are described in the following table.

Table 14. Input Buffer Card LED Indicators

LED	Color	Status	Description
COM Error	Green	On	Indicates that an invalid CRC has been detected.
		Blinking	Indicate a loss of communication from the frame controller. This LED can only be reset when a valid CRC is received.
PWR Good	Green	On	Indicates that the +28V, +4.8V, +4.3V, and +3.5V power is stable and within normal operating parameters.
		Blinking	Indicates that 28V is not stable or the 4.8V, 4.3V, or 3.5V power supplies are not working.

3.2 Output Combiner Card

Each output combiner card provides 16 output connections from the system. Each output channel can combine up to eight signals from individual matrix cards. After the signals are combined, the data rate selection switch selects between video re-timers or bypass mode for non-standard data rates. The output combiner is available in either SDI or HD multi-rate versions, each of which can support option cards for dual output BNC or fiber option output. The SD can also support a 10-bit digital analog (DAC) card. The HD-MR card support HD to SD conversion as an option card.

3.2.1 Output Combiner Card LED Indicators

Two LED indicators are located on the Output Combiner card. These LEDs are described in the following table.

Table 15. Output Combiner Card LED Indicators

LED	Color	Status	Description
COM Error	Red	On	Indicates that a control error has occurred or a loss of receive clock from frame controller has been detected. A control error includes a bad CRC of the received data, incorrect number of words in the message being received, or corrupted data in the message being received. If a control error occurs, the LED will remain on until a message with a good CRC has been received
		Blinking	Indicates a missing receive clock error.
PWR Good	Green	On	Indicates that the +28V, +5.0V, +3.7V, and +4.5V power is stable and within normal operating parameters.
		Blinking	Indicates that 28V is not stable or the 5.0V, 3.7V, or 4.5V power supplies are not working.

3.3 Output Monitor Card

The Output Monitor Card controls Output Monitor Sync Connectors 1 and 2 located on the back (lower right) of the Cheetah. See Output Monitor Connectors on page 40 for details. You will generally use the sync connectors for quality assurance or to troubleshoot specific outputs. Using the 3500 Control software, you can select specific outputs to monitor. The following LEDs are located on the card and are described in Table 16.

The Output Monitor Card is internally strobed to "33". This setting will automatically be offset by 32 based on the Frame strobe setting (see LSB and MSB Frame Strobe setting on page 14). For example, if the Frame strobe is set to 10, the internal Output Monitor Card strobe will be automatically set to 42.

Figure 42. Output Monitor Card

3.3.1 Output Monitor Card LED Indicators

Three LED indicators are located on the front of the Output Monitor card. These LEDs are described in Table 16.

Table 16. Output Monitor Card LED Indicators

LED	Color	Status	Description
Control Error	Red	On	Indicates that a control error has occurred or a loss of receive clock from frame controller has been detected. A control error includes a bad CRC of the received data, incorrect number of words in the message being received, or corrupted data in the message being received. If a control error occurs, the LED will remain on until a message with a good CRC has been received
		Blinking	Indicates a missing receive clock error.
Power OK	Green	On	Indicates that the +28V, +4.8V, +4.3V, and +3.5V power is stable and within normal operating parameters.
		Blinking	Indicates that 28V is not stable or the 4.8V, 4.3V, or 3.5V power supplies are not working.
In Use	Yellow	On	Indicates that a crosspoint on the matrix card is activated.

3.4 3500 System Controller Cards

The Cheetah may contain up to two redundant 3500Plus System Controllers. If the primary controller fails, its functions are taken over by the secondary controller. The System Controller, working in conjunction with Win3500Plus Control System software, enables users to configure and operate a switcher system from a standard IBM compatible PC. The System Controller interfaces between the routing switcher and all user-controlled elements, including RCPs, PCs, and so on. Based upon configuration data input during setup and installation, the System Controller sends appropriate I/O control signals to the Cheetah 64x64 Digital Video Matrix Card.

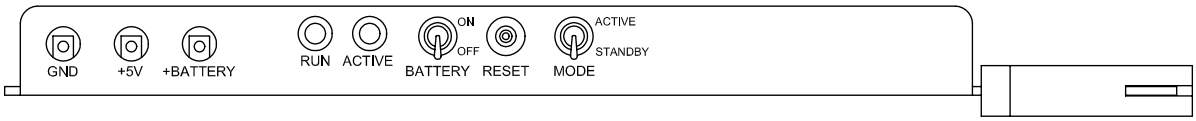


Figure 43. 3500Plus System Controller Board Assembly Front View

3.4.1 GND

This test point provides a convenient ground when measuring voltages at the other test points.

3.4.2 +5V

The voltage measured between this test point and GND is the output of the voltage regulation circuit and should be 5 ±0.1 VDC.

3.4.3 +BATTERY

The voltage measured between this test point and GND is the output voltage of the backup memory power source and should be >2VDC when power has been removed from the board.

3.4.4 LEDs

The 3500Plus System Controller board has three LEDs:

Table 17. 3500Plus System Controller LEDs

LED	Color	Panel Legend	Normal State	Troubleshooting Info
LED1	RED	N/A	OFF	Controller board is in reset state or is in program download mode.
LED2	GRN	RUN	ON	Indicates that input voltage to this board is within design parameters. If LED is OFF: 1. Remove and reinstall board to verify backplane connector is properly seated. 2. Check power supplies for proper operation. 3. Contact PESA Customer Service.
LED3	YEL	ACTIVE	ON	Indicates that the board is currently in active control of a routing switcher system. NOTE In a dual controller system, the primary controller ACTIVE LED will be ON and the backup controller ACTIVE LED will be OFF. If the LED is OFF: 1. Remove and reinstall board to verify backplane connector is properly seated. 2. Ensure the board has been configured to be active. 3. Contact PESA Customer Service.

3.4.5 Battery

This SPDT toggle switch is used to enable and disable the backup memory power source. Early designs of PESA system controllers used a battery for backup power. This switch was used to prevent the battery from discharging during prolonged storage.

The 3500Plus System Controller uses a capacitor as a backup power source which does not need to be isolated during storage. This switch should be in the ON position at all times.

3.4.6 Reset

This SPDT momentary pushbutton switch is used to manually reset the 3500Plus System Controller in the event of system failure or lockup (similar to a warm boot on a PC). To reset the controller, press and hold this switch for about three seconds.

3.4.7 Mode

This SPDT toggle switch is used in a dual controller system to designate which controller is the primary controller, and which is the backup controller. Set the Mode switch to ACTIVE on the primary controller, and to STANDBY on the backup controller.

In a single controller system, this switch has no effect.

3.5 64x64 Digital Video Crosspoint Matrix Card

The 64x64 Digital Video Crosspoint Matrix Card selects one of 64 inputs to each of 64 outputs. Input signals from the input buffer card are buffered to the input of a high-speed matrix. The output of the matrix is again buffered and sent to the output combiner cards. Each matrix card contains input buffer chips (octal bus transceivers) that drive into a single 64x64 crosspoint.

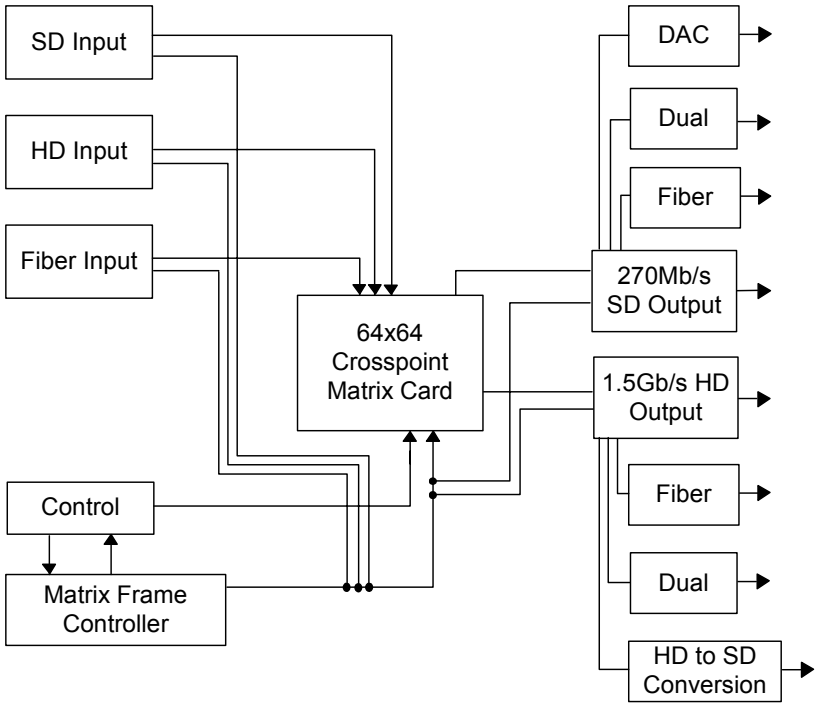


Figure 44. 64x64 Crosspoint Matrix Card Diagram

3.5.1 LED Indicators

Five LED indicators are located on the 64x64 matrix card faceplate, as illustrated in the following figure, and described in Table 18.

Figure 45. 64x64 Matrix Card LEDs

Table 18. Matrix Card LED Descriptions

LED	Color	Status	Description
+28V	Green	On	Indicates that the +28Vpower is stable and within normal operating parameters.
		Blinking	Indicates that +28V is not stable power supplies are not working.
+3.3V	Green	On	Indicates that the +3.3Vpower is stable and within normal operating parameters.
		Off	Indicates that +3.3V is not stable power supplies are not working.
+2.5V	Green	On	Indicates that the +2.5Vpower is stable and within normal operating parameters.
		Off	Indicates that +2.5V is not stable power supplies are not working.
Ctrl Err	Red	On	Indicates that a control error has occurred, or that a loss of receive clock from frame controller has been detected. A control error includes a bad CRC of the received data, incorrect number of words in the message being received, or corrupted data in the message being received. The LED will remain on until a message with a good CRC has been received.
		Blinking	Indicates a missing receive clock error.
		Off	No alert conditions are present.
In Use	Yellow	On	Indicates that a crosspoint on the matrix card is activated.
Port A/B	Yellow	On	These surface-mount LEDs indicate whether the card is communicating with the frame controller via communications port A or B. They are not user-accessible.

3.6 Matrix Frame Controller

The matrix frame controller, located on the right front of the unit, is illustrated below. For every frame type, at least one Matrix Frame Controller (MFC) is required. The function of the frame controller is to determine frame size, level, input offsets, output offsets, plus other physical characteristics of the frame hardware. Both PESA's PRC protocol and NET PRC protocol are available to the MFC. With the NET-PRC protocol, the MFC has the ability to communicate to a system controller via Ethernet connection. More features include SNMP support and redundant MFC cards with auto changeover. On the frame of each matrix frame controller is a diagnostic port (on the far right) used for troubleshooting. For detailed information about how to use this port, see Appendix E on page 109.

The MFC has the ability to provide dual operations. By setting each MFC with its own Ethernet address, updates and active switching can be done in parallel, allowing for immediate crossover during a card failure or network interruption. See Appendix A on page 70 for details on Ethernet configuration options.

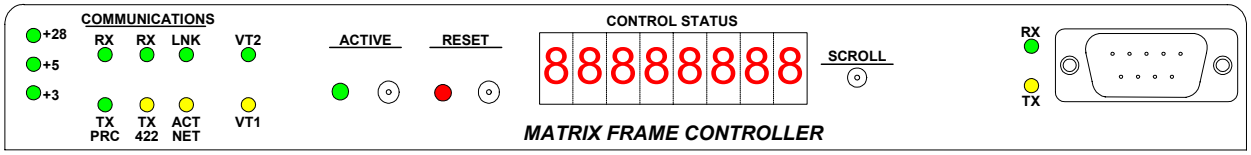


Figure 46. Matrix Frame Controller

3.6.1 Matrix Frame Controller LED Indicators

The matrix frame controller LED indicators are described in Table 19. See Table 23 on page 65 for troubleshooting information.

Table 19. Matrix Frame Controller LED Indicators

LED	Color	Status	Description
+28V	Green	On	Indicates that the +28V power is stable and within normal operating parameters
	Red	On	Indicates that +28V power is not stable.
+5V	Green	On	This LED, when on (green), indicates that the +5V power is stable and within normal operating parameters
	Red	On	Indicates that +5V power is not stable.
+3V	Green	On	Indicates that the +3V power is stable and within normal operating parameters.
	Red	On	Indicates that +3V power is not stable.
PRC Tx/Rx	Green	On	Indicate that PRC traffic is being transmitted or received.
422 Tx/Rx	Green	On	Indicate that RS-422 traffic is being transmitted or received.
ACT NET	Green	On	Indicates that network activity is present.
LNK	Green	On	Indicates that a network connection exists.
VT1/VT2	Green	On	Indicates that a sync signal is present.
Active	Green	On	Indicates the active controller (when dual controllers are in use).
Reset	Red	On	Indicates that the controller is in Reset mode.
Rx	Green	On	Indicates that Receive data is being transmitted.
Tx	Yellow	On	Indicates that Transmit data is being transmitted.

3.6.2 8-Character Display

An eight-character display, illustrated below, is located on the front of the matrix frame controller.

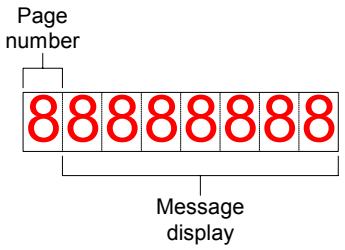


Figure 47. 8-Character Display

The display is divided into two fields. The first character on the far left is a field indicating the page number of the information being displayed. The next seven characters indicate the actual message. Press the “Scroll” button to view successive pages. Each page will appear for 30 seconds, then reset to page 0.

Descriptions of the displayed messages are detailed in Table 20.

Table 20. 8-Character Display Messages

Page	Message	Description
0	ACTV OK STDB ** SNGL OK SNGL **	Describes which frame controller is active, standby, or single operation. It also indicates whether there is an alarm condition present on the controller.
1	IN XXXX	Shows the number of inputs being controlled by the frame controller.
2	OUTXXXX	Shows the number of outputs being controlled by the frame controller.
3	IOFXXXX	Shows the input offset of the matrix.
4	OOFXXXX	Shows the output offset of the matrix.
5	STRB XX	Shows the PRC strobe of the matrix.
6	TEMP OK TEMPBAD	Shows the alarm status of the over temp indicator.
7	PWR OK PWR BAD	Shows the alarm status of the power supply.
8	FAN OK FAN BAD	Shows the alarm status of the fan circuit.
9	PRC NO PRC OK PRC BAD	Describes whether the system is communicating via the PRC bus. If so it indicates whether it has detected any errors on the PRC communication bus.
A	NET NO NET OK NET BAD	Describes whether the system is communicating via the Network Communication. If so, it indicates whether there have been any errors detected.
B	SYN1 NO SYN1 XX	This indicates whether a valid SYNC 1 is present. The type of sync is encoded in the XX.
C	SYN2 NO SYN2 XX	This indicates whether a valid SYNC 2 is present. The type of sync is encoded in the XX.
D	XXX.XXX	This is the first half of the IP address of the frame controller's network node.
E	XXX.XXX	This is the second half of the IP address of the frame controller's network node.
F	INE OK INE BAD	Indicates whether there are any errors detected on any input cards.
G	OTE OK OTE BAD	Indicates whether there are any errors detected on any output cards.
H	MTX OK MTX BAD	Indicates whether there are any errors detected on any matrix cards.
J	PSB OK PSB BAD	Indicates whether there are any errors detected on any power supply cards.
K	INE OK INE BAD	Indicates whether there are any errors detected on any input cards.
L	OTE OK OTE BAD	Indicates whether there are any errors detected on any output cards.
M	MTX OK MTX BAD	Indicates whether there are any errors detected on any matrix cards.
N	PSB OK PSB BAD	Indicates whether there are any errors detected on any power supply cards.

3.6.3 Matrix Frame Controller Switch Locations and Settings (S1 and S2)

S1 and S2 are eight-position, slide-style dip switches consisting of eight single-pole single-throw (SPST) switches numbered 1 through 8, located on the face of the matrix frame controller card, as illustrated below.

These dip switches are set at the factory. Do not change the settings!

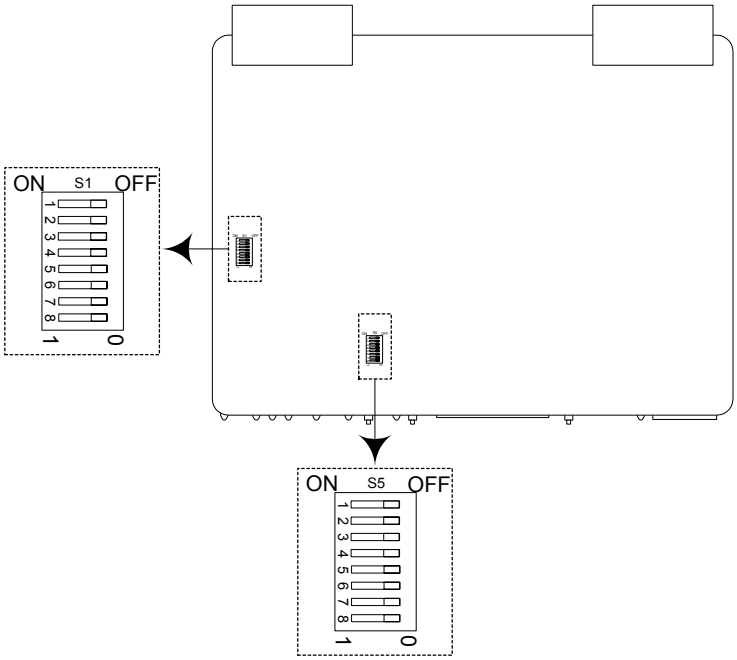


Figure 48. Matrix Frame Controller Dip Switch Locations

3.7 Power Supply

The Cheetah video power supply will provide 28 volts at up to 22 amps. The 28 volt DC output is diode-isolated to allow for redundant configuration.

Frame fan speed control circuitry senses the ambient temperature in the power supply and increases fan speed with increasing temperature. Each fan circuit has a diode output so that with redundant power supply, either circuit will drive the fans. The highest temperature supply normally controls the fan.

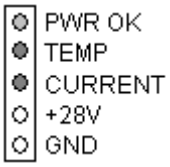


Figure 49. Power Supply LED Indicators and Test Points

3.7.1 LED Indicators and Test Points

Three LED indicators and two test points are located on the front of the power supply, as illustrated in the following figure. The LED indicators are described in Table 21. See Table 22 on page 64 for troubleshooting information.

Table 21. Power Supply LED Indicators

LED	Color	Status	Description
PWR OK	Green	On	Indicates that the +28V power is stable and within normal operating parameters.
Temp	Red	On	Indicates there is an over-temperature condition in the power supply. This **must** be fixed immediately!
Current	Red	Blinking	Indicates there is an over-current condition in the power supply. This **must** be fixed immediately!

3.7.2 +28V and GND Test Points

The test points labeled +28V and GND are used to determine whether +28V power is present.

Chapter 4 – Maintenance and Repair

4.1 Maintenance

This equipment has been designed to give long, trouble-free service with very little maintenance. Under normal service conditions, the only routine maintenance required is to monitor the air filter for cleanliness.

This equipment contains static sensitive devices. A grounded wrist strap and mat should be used when handling the internal circuit cards.

This equipment has been designed so maintenance operations can be performed while the equipment is operational (has power applied). Only the power supply assemblies and the AC line circuits contain potentially lethal shock hazards.

4.1.1 Air Filter

The air filter should be checked monthly to ensure that an adequate supply of clean air is available to cool this equipment. If the air filter is dirty, either clean it with low-pressure air, vacuuming, or a mild soap-and-water solution; or replace it with a new air filter (PESA Part No. 81-9065-2360-0).

4.2 Troubleshooting

4.2.1 Subassembly LEDs

If this equipment fails to operate correctly, check the appropriate LEDs listed below for information concerning operational status.

Table 22. Power Supply LEDs

LED	COLOR	STATUS	DESCRIPTION	ACTION REQUIRED
PWR OK	Green	On	+28V power is stable and within normal operating parameters.	None.
		Off	Power is not present.	Replace the power supply.
Temp	Red	On	+28V power is not within normal operating parameters.	If this alert appears on multiple power supplies, ensure that all of the power supplies are properly installed. If only one power supply appears with this alert, replace it.
			There is an over-temp condition in the power supply. This can occur either because a power supply has been removed, resulting in lower total power; or because an individual power supply is faulty.	Check the fans and make sure all the access panels are in place. If the fans are working, the panels are in place, and the Temp LED is still on, then replace the power supply.
		Off	No alert conditions are present.	None
Current	Red	Blinking	There is an overcurrent condition in the power supply.	Check to make sure all of the other power supplies are functional (the PWR OK LED is on). If the other power supplies are functional and the Current LED is still blinking, then replace the power supply.
		Off	No alert conditions are present.	None

Table 23. Matrix Board LEDs

LED	Color	Status	Description	Action Required
Control Error	**Red**	**On**	Indicates that a control error has occurred or a loss of receive clock from frame controller has been detected. A control error includes a bad CRC of the received data, incorrect number of words in the message being received, or corrupted data in the message being received. In the case of a control error, the LED will remain illuminated until a message with a good CRC has been received.	**Remove and re-insert the board. If the condition continues, replace the board.**
		Blinking	Indicates a missing receive clock error.	**Remove and re-insert the board. If the condition continues, replace the board.**
In Use	**Yellow**	**On**	Indicates that a crosspoint on the matrix card is activated.	**None**
+28V	**Green**	**On**	Indicates that the +28Vpower is stable and within normal operating parameters.	**None**
		Blinking	Indicates that 28V is not stable or the 3.3V or 2.5V power supplies are not working.	**Remove and re-insert the board. If the condition continues, replace the board.**
+3.3V	**Green**	**On**	Indicates that the +3.3V power is stable and within normal operating parameters.	**None**
+2.5V	**Green**	**On**	Indicates that the +2.5V power is stable and within normal operating parameters.	**None**
Port A, Port B (Surface-mounted on the PCB)	**Yellow**	**On**	Indicate whether the board is communicating with the frame controller via communications port A or B.	**None**

Table 24. Output Board LEDs

LED	Color	Status	Description	Action Required
Control Error	**Green**	**On**	Indicates that a control error has occurred or a loss of receive clock from frame controller has been detected. A control error includes a bad CRC of the received data, incorrect number of words in the message being received, or corrupted data in the message being received. In the case of a control error, the LED will remain illuminated until a message with a good CRC has been received.	**Remove and re-insert the board. If the condition continues, replace the board.**
		Blinking	Indicates a missing receive clock error.	**Remove and re-insert the board. If the condition continues, replace the board.**
Power Good	**Green**	**On**	Indicates that the +28V, +5.0V, +3.7V, and +4.5V power is stable and within normal operating parameters.	**None**
		Blinking	Indicates that 28V is not stable or the 5.0V, 3.7V, or 4.5V power supplies are not working.	**Remove and re-insert the board. If the condition continues, replace the board.**
Port A, Port B (Surface-mounted on the PCB)	**Yellow**	**On**	Indicate whether the board is communicating with the frame controller via communications port A or B.	**None.**

Table 25. Input Board LEDs

LED	Color	Status	Description	Action Required
Control Error	**Green**	**On**	Indicates that a control error has occurred or a loss of receive clock from frame controller has been detected. A control error includes a bad CRC of the received data, incorrect number of words in the message being received, or corrupted data in the message being received. In the case of a control error, the LED will remain illuminated until a message with a good CRC has been received.	**Remove and re-insert the board. If the condition continues, replace the board.**
		Blinking	Indicates a missing receive clock error.	**Remove and re-insert the board. If the condition continues, replace the board.**
Power Good	**Green**	**On**	Indicates that the +28V, +4.8V, +4.3V, and +3.5V power is stable and within normal operating parameters.	**None.**
		Blinking	Indicates that 28V is not stable or that the 4.8V, 4.3V, or 3.5V power supplies are not working.	**Remove and re-insert the board. If the condition continues, replace the board.**
+28V	**Green**	**On**	Indicates that the +28V power is stable and within normal operating parameters. This is a surface mount LED located on the PCB.	**None**
+4.8V	**Green**	**On**	Indicates that the +3.3V power is stable and within normal operating parameters. This is a surface mount LED located on the PCB.	**None**

+4.3V	**Green**	**On**	Indicates that the +3.3V power is stable and within normal operating parameters. This is a surface mount LED located on the PCB.	**None**
+3.5V	**Green**	**On**	Indicates that the +2.5V power is stable and within normal operating parameters. This is a surface mount LED located on the PCB.	**None**
Port A, Port B (surface-mounted on the PCB)	**Yellow**	**On**	Indicate whether the board is communicating with the frame controller via communications port A or B.	**None**

4.2.2 PESA Customer Service

If the troubleshooting information above does not resolve your problem, contact PESA's Customer Service Department. Contact information for the Customer Service Department appears on the front cover of this document.

4.3 Repair

Before attempting to repair this equipment, consult your warranty documents and/or PESA's Customer Service Department. Unauthorized field repairs may void your warranty.

The power supply assemblies in this equipment should only be serviced by qualified service personnel using appropriate equipment.

Consult PESA Customer Service before attempting to repair any of the PC cards in this equipment

4.3.1 Replacement Parts

Only parts of the highest quality have been used in the design and manufacture of this equipment. If the inherent stability and reliability are to be maintained, replacement parts must be of the same high quality. Contact PESA's Customer Service Department before installing any parts not purchased from PESA.

4.3.2 Return Material Authorization (RMA)

Before returning any equipment for service or replacement, contact PESA's Customer Service Department for an RMA number. Contact information for the Customer Service Department appears on the front cover of this document.

4.4 PESA Documentation

81-9062-0316-0	PESA Router Control (PRC) Protocol
81-9059-0402-0	3500Plus System Controller Manual
81-9059-426-0	3500Plus Control Software Manual
81-9059-426-0	

Appendix A. – Ethernet Configuration

The Matrix Frame Controller supports a variety of interfaces via the Ethernet interface. These include NET PRC, HTTP (web browser), SNMP (Simple Network Management Protocol), and Telnet. To configure this access, the following items will need to be configured:

Table 26. Ethernet Configuration

Name	Usage	Default
DHCP On/Off	Automatically obtain an IP address from a DHCP server on the network.	On
IP Address	When DHCP is disabled, allows a fixed IP address to be assigned to the Matrix Frame Controller.	0.0.0.0
Subnet Mask	When DHCP is disabled, allows the specification of the subnet mask for the IP address.	0.0.0.0
Gateway	When DHCP is disabled, allows the specification on the default gateway.	0.0.0.0
Telnet On/Off	Enables or disables the Telnet server.	On
Telnet Port	Allows the specification of the TCP port to be used by the Telnet server.	23
Telnet Password	Specifies the password for telnet access.	<blank>
NETPRC Master/Slave	Enables or disables the NETPRC server. Note that the SNMP agent is disabled in Slave mode.	Slave
NETPRC Port	Allows the specification of the TCP port to be used by the NETPRC server.	1000
Read Community	Specifies the read community string for the SNMP agent.	public
Write Community	Specifies the write community string for the SNMP agent.	private
Trap Community	Specifies the trap community string for the SNMP agent.	public
Traps On/Off	Enables or disables SNMP trap generation.	Off
Authentication Traps On/Off	Enables or disables SNMP Authentication failure trap generation.	Off
Trap Target IP	Specifies the IP address to receive SNMP traps.	0.0.0.0

These fields are accessed via the DB-9 RS-232 connector on the Matrix Frame Controller. Communication parameters for this serial interface default to 38400 baud, no parity, 8 data bits, and 1 stop bit.

Upon connection to the serial interface (via a communications program such as Hyperterminal), enter the command 'ET' (for Ethernet) at the '>' prompt. The current Ethernet settings will be displayed (note that these settings are unavailable via the Telnet interface). For example,

```
>et
     MAC address   : 02:02:02:02:02:02
     SERIAL #  : AAAAAA000000001
     DHCP      : ON
     IP address : 192.168.000.104
     Subnet mask   : 255.255.255.000
     Def Gateway   : 192.168.000.002
     NETPRC   : MASTER
     NETPRC port   : 1000
     TELNET    : ON
     TELNET port   : 23
     TELNET pass  :
     RCOMM    : public
     WCOMM    : private
     TCOMM    : public
     TRAP      : OFF
     AUTH      : OFF
     TARGET    : 000.000.000.000
>
```

Help on how to change one of these settings can be obtained by entering the command 'HE ET' (for Help Ethernet) at the '>' prompt. For example,

```
>he et

    Syntax: ET < DHCP [ON|OFF]  | IP [addr]     | GW [addr]     |
        :     SN [addr]      | DP [port]     | TN [ON|OFF]   |
        :     TP [tport]     | TL [pass]     | RCOMM [str]   |
        :     WCOMM [str]    | TCOMM [str]   | TRAP [ON|OFF] |
        :     AUTH [ON|OFF]  | TARGET [addr] | NP [MASTER|SLAVE] >
    Where :  DHCP ON enables client automatic IP address negotiation.
        :  IP [addr] allows you to set the IP address of the PMFC.
        :  GW [addr] allows you to set the gateway address.
        :  SN [addr] allows you to set the subnet mask.
        :  DP [port] allows you to set the NETPRC IP port.
        :  TN ON enables the on-board telnet server.
        :  TP [port] allows you to set the telnet port.
        :  TL [pass] allows you to set the telnet login password.
        :     where addr is in dotted notation (ex. 192.168.1.1}.
        :     where port is in the range [1000...65535].
        :     where tport is in the range [23,1000...65535].
        :  RCOMM [str] allows you to set the SNMP read community string.
        :  WCOMM [str] allows you to set the SNMP write community string.
        :  TCOMM [str] allows you to set the SNMP trap community string.
        :  TRAP ON enables SNMP traps.
        :  AUTH ON enables authentication traps.
        :  TARGET [addr] allows you to set the trap target IP address.
        :  NP [MASTER|SLAVE] sets the NETPRC type of the PMFC.

>et

    MAC address : 02:02:02:02:02:0a
    SERIAL #    : EEEEEE000000001
    DHCP        : ON
    IP address  : 192.168.000.114
    Subnet mask : 255.255.255.000
    Def Gateway : 192.168.000.002
    NETPRC      : SLAVE
    NETPRC port : 1000
    TELNET      : ON
    TELNET port : 23
    TELNET pass :
    RCOMM       : public
    WCOMM       : private
    TCOMM       : public
    TRAP        : OFF
    AUTH        : OFF
    TARGET      : 000.000.000.000

>
```

For example, to set the read community string to 'pesa', enter

```
>ET RCOMM pesa
```

and press return. To view your changes, wait for the '>' prompt and enter 'ET'.

Appendix B. – SNMP

The Cheetah Matrix Frame Controller contains an SNMP v2c agent which is also compatible with SNMP v1 management stations. The agent supports the following standards:

RFC 1903 – SNMPv2 Textual Conventions
RFC 1904 – SNMPv2 Conformance Statements
RFC 1905 – SNMPv2 Protocol Operations
RFC 1906 – SNMPv2 Transport Mappings
RFC 1907 – SNMPv2 SNMP MIB Objects
RFC 1908 – SNMPv1 Coexistence
RFC 2011 – SNMPv2 IP MIB Objects
RFC 2012 – SNMPv2 TCP MIB Objects
RFC 2013 – SNMPv2 UDP MIB Objects

Two enterprise MIBs are used to provide full control of Cheetah Switchers. The first, PESA-TC.MIB, is a MIB which defines some textual conventions. The second, PESA-MATRIX.MIB, contains objects which allow SNMP-based control and monitoring of one or more Cheetah Switchers.

Both of these MIBs are available at the PESA website, www.pesa.com, for electronic download. The full text of these MIBs appears in Appendices C and D.

Note that the agent within the Matrix Frame Controller implements a subset of the PESA-MATRIX MIB. The optional Group tables are reserved for implementation within the System Controller.

The agent is capable of managing multiple Cheetah Switchers. This is accomplished in two steps:

a) connecting the Cheetah Switchers via the RS-422 Aux Frame Port described in section **Error! Reference source not found.**, **Error! Reference source not found.** on page **Error! Bookmark not defined.** and illustrated in **Error! Reference source not found.** on page **Error! Bookmark not defined.**.

b) set the Matrix Frame Controller which is to communicate with your SNMP management application to NETPRC Master. Note that if you have redundant Matrix Frame Controllers in the Switcher, BOTH must be configured as NETPRC Master. Refer to Appendix A to accomplish this.

c) set all other Matrix Frame Controllers which you have connected to the NETPRC Master controller to NETPRC Slave.

The agent will then be able to configure and control all of the Cheetah Switchers in the connected collection.

Once you have configured the Matrix Frame Controller's SNMP agent (as described in Appendix A), you may issue SNMP commands. The following commands were issued on a PC running Linux against a pair of small Cheetah Switchers.

The first of these simply obtains the inventory for the two frames.

```
$ snmpwalk 192.168.0.106 pesaFrameInvDeviceType
PESA-MATRIX-MIB::pesaFrameInvDeviceType.1.1 = INTEGER: frameController(6)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.1.2 = INTEGER: frameController(6)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.1.3 = INTEGER: inputBoard(1)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.1.4 = INTEGER: inputBoard(1)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.1.5 = INTEGER: outputBoard(2)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.1.6 = INTEGER: powerSupply(3)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.1.7 = INTEGER: matrixCard(5)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.1.8 = INTEGER: outputMonitorCard(4)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.2.1 = INTEGER: frameController(6)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.2.2 = INTEGER: inputBoard(1)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.2.3 = INTEGER: outputBoard(2)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.2.4 = INTEGER: powerSupply(3)
PESA-MATRIX-MIB::pesaFrameInvDeviceType.2.5 = INTEGER: matrixCard(5)
```

The next set of commands creates a preset (a collection of switches that are to be taken as a group). In this case, the preset contains two switch definitions (preset members). The first connects source 1 to destination 1 on level 2. The second connects source 2 to destination 2, again on level 2. Both are set to utilize the synchronization signal A (REF 1 on the Cheetah back panel).

```
$ snmpset 192.168.0.106 -c private pesaPresetStatus.1 i 2
PESA-MATRIX-MIB::pesaPresetStatus.1 = INTEGER: active(2)
$ snmpset 192.168.0.106 -c private pesaPresetMemberRowStatus.1.2.1  i 1
PESA-MATRIX-MIB::pesaPresetMemberRowStatus.1.2.1 = INTEGER: active(1)
$ snmpset 192.168.0.106 -c private pesaPresetMemberSyncSource.1.2.1  b syncA
PESA-MATRIX-MIB::pesaPresetMemberSyncSource.1.2.1 = BITS: 80 syncA(0)
$ snmpset 192.168.0.106 -c private pesaPresetMemberSourceNum.1.2.1  u 1
PESA-MATRIX-MIB::pesaPresetMemberSourceNum.1.2.1 = Gauge32: 1
$ snmpset 192.168.0.106 -c private pesaPresetMemberRowStatus.1.2.2  i 1
PESA-MATRIX-MIB::pesaPresetMemberRowStatus.2.2.1 = INTEGER: active(1)
$ snmpset 192.168.0.106 -c private pesaPresetMemberSyncSource.1.2.2  b syncA
PESA-MATRIX-MIB::pesaPresetMemberSyncSource.2.2.1 = BITS: 80 syncA(0)
$ snmpset 192.168.0.106 -c private pesaPresetMemberSourceNum.1.2.2  u 2
PESA-MATRIX-MIB::pesaPresetMemberSourceNum.2.2.1 = Gauge32: 2
$ snmpset 192.168.0.106 -c private pesaTakePreset.0 u 1
PESA-MATRIX-MIB::pesaTakePreset.0 = Gauge32: 1
```

Note that if you specify sources, destinations, or synchronization sources which are unknown to the agent, the operations will fail.

Appendix C. – PESA TC MIB Definitions

```
PESA-TC-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY,
    Integer32,
    enterprises                     FROM SNMPv2-SMI
    TEXTUAL-CONVENTION              FROM SNMPv2-TC;

pesa MODULE-IDENTITY
    LAST-UPDATED "200207170000Z" -- July 17, 2002
    ORGANIZATION "PESA Switching Systems, Inc."
    CONTACT-INFO
              "WWW:       http://www.pesa.com
               Postal:    330-A Wynn Drive
                          Huntsville, Alabama 35805
                          U.S.A.

               Email:     mib-info@pesa.com
               Phone:     +1 256 726 9200
               Fax:       +1 256 726 9271
              "
    DESCRIPTION
        "This MIB module defines a collection of textual conventions
         used in PESA MIBs."
    REVISION "200207170000Z" -- July 17, 2002
    DESCRIPTION "Initial version."
    REVISION "200301240000Z" -- January 24, 2003
    DESCRIPTION "Changed PesaSyncSource bit definitions."
    ::= { enterprises 13674 }

PesaSyncSource ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        "Describes or selects synchronization source(s)."
    SYNTAX  BITS
        {
        syncA(0),
        syncB(1),
        syncC(2),
        syncD(3),
        syncE(4),
        syncF(5)
        }

PesaMatrixStatus ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        "Specifies the status of a matrix."
    SYNTAX  BITS
        {
        unavailable(0),
        up(1),
        invalidConfiguration(2)
        }

PesaFrameStatus ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        "Specifies the status of a frame."
    SYNTAX  BITS
```

```
        {
        unavailable(0),
        up(1),
        invalidConfiguration(2),
        flashMemoryError(3),
        primaryControllerError(4),
        overTemperatureError(5)
        }

PesaBoardStatus ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        "Specifies the status of a frame inventory element (a board)."
    SYNTAX  BITS
        {
        unavailable(0),
        up(1),
        invalidConfiguration(2),
        flashMemoryError(3),
        primaryControllerError(4),
        overTemperatureError(5)
        }

PesaSourceStatus ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        "Specifies the status of a source."
    SYNTAX  BITS
        {
        unavailable(0),
        up(1),
        invalidConfiguration(2)
        }

PesaDestinationStatus ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
        "Specifies the status of a destination."
    SYNTAX  BITS
        {
        unavailable(0),
        up(1),
        invalidConfiguration(2)
        }

PesaDevices ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "Pesa device type enumeration."
    SYNTAX  INTEGER
        {
        inputBoard(1),
        outputBoard(2),
        powerSupply(3),
        outputMonitorCard(4),
        matrixCard(5),
        frameController(6)
        }
END
```

Appendix D. – PESA Matrix MIB Definitions

```
PESA-MATRIX-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    Counter32,
    Unsigned32,
    NOTIFICATION-TYPE,
    TimeTicks                       FROM SNMPv2-SMI
    PesaSyncSource,
    PesaMatrixStatus,
    PesaFrameStatus,
    PesaBoardStatus,
    PesaSourceStatus,
    PesaDevices,
    PesaDestinationStatus,
    pesa                            FROM PESA-TC-MIB
    TruthValue,
    RowStatus                       FROM SNMPv2-TC
    SnmpAdminString                 FROM SNMP-FRAMEWORK-MIB
    MODULE-COMPLIANCE,
    OBJECT-GROUP,
    NOTIFICATION-GROUP              FROM SNMPv2-CONF;

pesaMatrix MODULE-IDENTITY
    LAST-UPDATED "200303240000Z" -- March 24, 2003
    ORGANIZATION "PESA Switching Systems, Inc."
    CONTACT-INFO
              "WWW:       http://www.pesa.com
               Postal:    330-A Wynn Drive
                          Huntsville, Alabama 35805
                          U.S.A.

               Email:     mib-info@pesa.com
               Phone:     +1 256 726 9200
               Fax:       +1 256 726 9271
              "
    DESCRIPTION
        "This MIB module defines a collection of objects for managing
         matrix space"
    REVISION "200207160000Z" -- July 16, 2002
    DESCRIPTION "Initial version."
    REVISION "200208020000Z" -- August 2, 2002
    DESCRIPTION "Added support for multiple matrices."
    REVISION "200301240000Z" -- January 24, 2003
    DESCRIPTION "Removed restriction against dribble mode for
                 read-create objects (i.e. better implementation)."
    REVISION "200303240000Z" -- March 24, 2003
    DESCRIPTION "Added pesaSourceSignalPresence,
                 pesaDestDetectedFormat, and pesaDestReclock."
    ::= { pesa 1 }

pesaMatrixMibObjects OBJECT IDENTIFIER ::= { pesaMatrix 1 }
```

```
-- Matrix table
--

pesaMatrixTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaMatrixEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table describes the overall configuration of the matrix
     space represented within this MIB.  Matrix space consists of
     one or more matrices.  Each row in this table describes a
     matrix.

     Absractly, a matrix may be considered a rectangle which resides
     on a plane, specified by pesaMatrixLevel, in 3-d matrix space.
     This matrix represents a collection of

              contiguous sources
              contiguous destinations

     where each destination may be mapped (or switched) to no more
     than one source.  These sources and destinations are described
     in their respective tables.

     Each source and each destination is associated with a physical entity,
     which is itself located with a frame (chassis).  These physical
     entities are listed within the Frame and Frame Inventory tables."
   ::= { pesaMatrixMibObjects 1 }

pesaMatrixEntry OBJECT-TYPE
   SYNTAX      PesaMatrixEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry exists for each matrix in matrix space."
   INDEX       { pesaMatrixIndex }
   ::= { pesaMatrixTable 1 }

PesaMatrixEntry ::=
    SEQUENCE
    {
    pesaMatrixIndex                         Unsigned32,
    pesaMatrixName                          SnmpAdminString,
    pesaMatrixLevel                         Unsigned32,
    pesaMatrixNumSources                    Unsigned32,
    pesaMatrixSourcesLowerBound             Unsigned32,
    pesaMatrixSourcesUpperBound             Unsigned32,
    pesaMatrixNumDests                      Unsigned32,
    pesaMatrixDestsLowerBound               Unsigned32,
    pesaMatrixDestsUpperBound               Unsigned32,
    pesaMatrixSwitchCount                   Counter32,
    pesaMatrixFailedSwitchCount             Counter32,
    pesaMatrixBlockedSwitchCount            Counter32,
    pesaMatrixStatus                        PesaMatrixStatus,
    pesaMatrixStatusNotify                  TruthValue,
    pesaMatrixSwitchNotify                  TruthValue,
```

```
    pesaMatrixLastChanged                   TimeTicks
    }

pesaMatrixIndex OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The index into the matrix table."
    ::= { pesaMatrixEntry 1 }

pesaMatrixName OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The name for this matrix."
    ::= { pesaMatrixEntry 2 }

pesaMatrixLevel OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The level for this matrix (or 'z' in 3-d space)."
    ::= { pesaMatrixEntry 3 }

pesaMatrixNumSources OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of sources in the matrix.  For a fully populated
         matrix, this is equivalent to pesaMatrixSourcesUpperBound -
         pesaMatrixSourcesLowerBound + 1."
    ::= { pesaMatrixEntry 4 }

pesaMatrixSourcesLowerBound OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The lowest source number in the matrix.  Normally, this is fixed
         at 1.  Matrices that do not support dynamic range assignment
         will treat this as read-only."
    ::= { pesaMatrixEntry 5 }

pesaMatrixSourcesUpperBound OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The highest source number in the matrix.  Normally, this is
         equivalent to pesaMatrixNumSources.  Matrices that do not support
         dynamic range assignment will treat this as read-only."
    ::= { pesaMatrixEntry 6 }
```

```
pesaMatrixNumDests OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of destinations in the matrix.  For a fully
         populated matrix, this is equivalent to pesaMatrixDestsUpperBound -
         pesaMatrixDestsLowerBound + 1.  Matrices that do not support
         dynamic range assignment will treat this as read-only."
    ::= { pesaMatrixEntry 7 }

pesaMatrixDestsLowerBound OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The lowest destination number in the matrix.  Normally, this is
         fixed at 1.  Matrices that do not support dynamic range assignment
         will treat this as read-only."
    ::= { pesaMatrixEntry 8 }

pesaMatrixDestsUpperBound OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The highest destination number in the matrix.  Normally, this is
         equivalent to pesaMatrixNumDests.  Matrices that do not support
         dynamic range assignment will treat this as read-only."
    ::= { pesaMatrixEntry 9 }

pesaMatrixSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of successful switches that have occurred in the
         matrix since the last reset."
    ::= { pesaMatrixEntry 10 }

pesaMatrixFailedSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of failed switches that have occurred in the
         matrix since the last reset.  A failed switch is defined as
         any switch the matrix was commanded to take but that was
         unsuccessful for any reason."
    ::= { pesaMatrixEntry 11 }

pesaMatrixBlockedSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of blocked switches that have occurred in the
```

```
         matrix since the last reset.  A blocked switch is a switch that
         has failed because of administrative policies."
    ::= { pesaMatrixEntry 12 }

pesaMatrixStatus OBJECT-TYPE
    SYNTAX       PesaMatrixStatus
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The overall status of the matrix."
    ::= { pesaMatrixEntry 13 }

pesaMatrixStatusNotify OBJECT-TYPE
    SYNTAX       TruthValue
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Indicates if a pesaMatrixNotifyStatusChange notification
         should be generated when pesaMatrixStatus changes."
    ::= { pesaMatrixEntry 14 }

pesaMatrixSwitchNotify OBJECT-TYPE
    SYNTAX       TruthValue
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Indicates if a pesaMatrixSwitchNotification notification
         should be generated when a switch is taken in the matrix."
    ::= { pesaMatrixEntry 15 }

pesaMatrixLastChanged OBJECT-TYPE
    SYNTAX       TimeTicks
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The value of sysUpTime when pesaMatrixStatus last changed."
    ::= { pesaMatrixEntry 16 }

-- Frame table
--

pesaFrameTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaFrameEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table describes the chassis which house the physical elements
     of matrix space.  A matrix may reside on one or more frames.  A
     frame may contain one or more matrices."
   ::= { pesaMatrixMibObjects 2 }

pesaFrameEntry OBJECT-TYPE
   SYNTAX      PesaFrameEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry exists for each frame in the matrix."
```

```
   INDEX       { pesaFrameIndex }
   ::= { pesaFrameTable 1 }

PesaFrameEntry ::=
    SEQUENCE
    {
    pesaFrameIndex                          Unsigned32,
    pesaFrameName                           SnmpAdminString,
    pesaFrameProductId                      SnmpAdminString,
    pesaFrameSerialNumber                   SnmpAdminString,
    pesaFrameHardwareRev                    SnmpAdminString,
    pesaFrameSoftwareRev                    SnmpAdminString,
    pesaFrameAvailableSyncSources           PesaSyncSource,
    pesaFrameSwitchCount                    Counter32,
    pesaFrameFailedSwitchCount              Counter32,
    pesaFrameBlockedSwitchCount             Counter32,
    pesaFrameStatus                         PesaFrameStatus,
    pesaFrameStatusNotify                   TruthValue,
    pesaFrameLastChanged                    TimeTicks
    }

pesaFrameIndex OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The index for this entry."
    ::= { pesaFrameEntry 1 }

pesaFrameName OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The user specified name for this frame."
    ::= { pesaFrameEntry 2 }

pesaFrameProductId OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The product id for this frame, if available."
    ::= { pesaFrameEntry 3 }

pesaFrameSerialNumber OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The serial number for this frame, if available."
    ::= { pesaFrameEntry 4 }

pesaFrameHardwareRev OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
```

```
    DESCRIPTION
        "The hardware revision for this frame, if available."
    ::= { pesaFrameEntry 5 }

pesaFrameSoftwareRev OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The software revision for this frame, if available."
    ::= { pesaFrameEntry 6 }

pesaFrameAvailableSyncSources OBJECT-TYPE
    SYNTAX       PesaSyncSource
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The sychronization sources available to this frame."
    ::= { pesaFrameEntry 7 }

pesaFrameSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of successful switches that have occurred in the
         frame since the last reset."
    ::= { pesaFrameEntry 8 }

pesaFrameFailedSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of failed switches that have occurred in the
         frame since the last reset.  A failed switch is defined as
         any switch the frame was commanded to take but that was
         unsuccessful for any reason."
    ::= { pesaFrameEntry 9 }

pesaFrameBlockedSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of blocked switches that have occurred in the
         frame since the last reset.  A blocked switch is a switch that
         has failed because of administrative policies."
    ::= { pesaFrameEntry 10 }

pesaFrameStatus OBJECT-TYPE
    SYNTAX       PesaFrameStatus
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The overall status of the frame."
    ::= { pesaFrameEntry 11 }
```

```
pesaFrameStatusNotify OBJECT-TYPE
    SYNTAX       TruthValue
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Indicates if a pesaFrameNotifyStatusChange notification
         should be generated when pesaFrameStatus changes."
    ::= { pesaFrameEntry 12 }

pesaFrameLastChanged OBJECT-TYPE
    SYNTAX       TimeTicks
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The value of sysUpTime when pesaFrameStatus last changed."
    ::= { pesaFrameEntry 13 }

-- Frame inventory table
--

pesaFrameInvTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaFrameInvEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table describes the devices that comprise a frame."
   ::= { pesaMatrixMibObjects 3 }

pesaFrameInvEntry OBJECT-TYPE
   SYNTAX      PesaFrameInvEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaFrameInvTable."
   INDEX
       {
       pesaFrameIndex,
       pesaFrameInvIndex
       }
   ::= { pesaFrameInvTable 1 }

PesaFrameInvEntry ::=
    SEQUENCE
    {
    pesaFrameInvIndex                   Unsigned32,
    pesaFrameInvDeviceType              PesaDevices,
    pesaFrameInvProductId               SnmpAdminString,
    pesaFrameInvSerialNumber            SnmpAdminString,
    pesaFrameInvHardwareRev             SnmpAdminString,
    pesaFrameInvSoftwareRev             SnmpAdminString,
    pesaFrameInvStatus                  PesaBoardStatus,
    pesaFrameInvStatusNotify            TruthValue,
    pesaFrameInvLastChanged             TimeTicks
    }

pesaFrameInvIndex OBJECT-TYPE
```

```
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The index of the pesaFrameInvEntry element (i.e. a card
         or smart power supply in the frame)."
    ::= { pesaFrameInvEntry 1 }

pesaFrameInvDeviceType OBJECT-TYPE
    SYNTAX       PesaDevices
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The device type of this element."
    ::= { pesaFrameInvEntry 2 }

pesaFrameInvProductId OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The product id of this element, if available."
    ::= { pesaFrameInvEntry 3 }

pesaFrameInvSerialNumber OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The serial number of this element, if available."
    ::= { pesaFrameInvEntry 4 }

pesaFrameInvHardwareRev OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The hardware revision of this element, if available."
    ::= { pesaFrameInvEntry 5 }

pesaFrameInvSoftwareRev OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The software revision of this element, if available."
    ::= { pesaFrameInvEntry 6 }

pesaFrameInvStatus OBJECT-TYPE
    SYNTAX       PesaBoardStatus
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The overall status of the frame element."
    ::= { pesaFrameInvEntry 7 }

pesaFrameInvStatusNotify OBJECT-TYPE
```

```
    SYNTAX       TruthValue
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Indicates if a pesaFrameInvNotifyStatusChange notification
         should be generated when pesaFrameInvStatus changes."
    ::= { pesaFrameInvEntry 8 }

pesaFrameInvLastChanged OBJECT-TYPE
    SYNTAX       TimeTicks
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
       "The value of sysUpTime when pesaFrameInvStatus last changed."
    ::= { pesaFrameInvEntry 9 }

-- Sources
--

pesaSourcesTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaSourcesEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table contains an entry for each source in matrix space.
     Each entry represents a single column in a single plane in
     matrix space."
   ::= { pesaMatrixMibObjects 4 }

pesaSourcesEntry OBJECT-TYPE
   SYNTAX      PesaSourcesEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaSourcesTable."
   INDEX
       {
       pesaSourceLevel,
       pesaSourceNum
       }
   ::= { pesaSourcesTable 1 }

PesaSourcesEntry ::=
    SEQUENCE
    {
    pesaSourceLevel                     Unsigned32,
    pesaSourceNum                       Unsigned32,
    pesaSourceName                      SnmpAdminString,
    pesaSourceSwitchCount               Counter32,
    pesaSourceFailedSwitchCount         Counter32,
    pesaSourceBlockedSwitchCount        Counter32,
    pesaSourceStatus                    PesaSourceStatus,
    pesaSourceStatusNotify              TruthValue,
    pesaSourceLastChanged               TimeTicks,
    pesaSourceSignalPresence            TruthValue
    }
```

```
pesaSourceLevel OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The level of this source."
    ::= { pesaSourcesEntry 1 }

pesaSourceNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The number of this source."
    ::= { pesaSourcesEntry 2 }

pesaSourceName OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The name of this source."
    ::= { pesaSourcesEntry 3 }

pesaSourceSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of successful switches that have occurred in the
         matrix since the last reset that involved this source."
    ::= { pesaSourcesEntry 4 }

pesaSourceFailedSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of failed switches that have occurred in the
         matrix since the last reset that involved this source.  A failed
         switch is defined as a switch the matrix was commanded to take but
         that was unsuccessful for any reason."
    ::= { pesaSourcesEntry 5 }

pesaSourceBlockedSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of blocked switches that have occurred in the
         matrix since the last reset that involved this source.  A blocked
         switch is a switch that has failed because of administrative
policies."
    ::= { pesaSourcesEntry 6 }

pesaSourceStatus OBJECT-TYPE
    SYNTAX       PesaSourceStatus
```

```
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The status of this source."
    ::= { pesaSourcesEntry 7 }

pesaSourceStatusNotify OBJECT-TYPE
    SYNTAX       TruthValue
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Indicates if a pesaSourceNotifyStatusChange notification
         should be generated when pesaSourceStatus changes."
    ::= { pesaSourcesEntry 8 }

pesaSourceLastChanged OBJECT-TYPE
    SYNTAX       TimeTicks
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The value of sysUpTime when pesaSourceStatus last changed."
    ::= { pesaSourcesEntry 9 }

pesaSourceSignalPresence OBJECT-TYPE
    SYNTAX       TruthValue
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "Indicates that the source detects an active signal.  For systems
        without the capability to detect source presence, this object
        will return a default value of true."
    ::= { pesaSourcesEntry 10 }

-- Destinations
--

pesaDestsTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaDestsEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table contains entries for each destination in the matrix.
      Each destination represents a row in a plane in matrix space."
   ::= { pesaMatrixMibObjects 5 }

pesaDestsEntry OBJECT-TYPE
   SYNTAX      PesaDestsEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaDestsTable."
   INDEX
       {
       pesaDestLevel,
       pesaDestNum
       }
   ::= { pesaDestsTable 1 }
```

```
PesaDestsEntry ::=
    SEQUENCE
    {
    pesaDestLevel                   Unsigned32,
    pesaDestNum                     Unsigned32,
    pesaDestName                    SnmpAdminString,
    pesaDestSwitchCount             Counter32,
    pesaDestFailedSwitchCount       Counter32,
    pesaDestBlockedSwitchCount      Counter32,
    pesaDestStatus                  PesaDestinationStatus,
    pesaDestStatusNotify            TruthValue,
    pesaDestLastChanged             TimeTicks,
    pesaDestDetectedFormat          INTEGER,
    pesaDestReclock                 INTEGER
    }

pesaDestLevel OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The level of this destination."
    ::= { pesaDestsEntry 1 }

pesaDestNum OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The number of this destination."
    ::= { pesaDestsEntry 2 }

pesaDestName OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
        "The name for this destination."
    ::= { pesaDestsEntry 3 }

pesaDestSwitchCount OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The total number of successful switches that have occurred in the
         matrix since the last reset that involved this destination."
    ::= { pesaDestsEntry 4 }

pesaDestFailedSwitchCount OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The total number of failed switches that have occurred in the
```

```
         matrix since the last reset that involved this destination.  A
failed
         switch is defined as a switch the matrix was commanded to take but
         that was unsuccessful for any reason."
    ::= { pesaDestsEntry 5 }

pesaDestBlockedSwitchCount OBJECT-TYPE
    SYNTAX       Counter32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The total number of blocked switches that have occurred in the
         matrix since the last reset that involved this destination.  A
blocked
         switch is a switch that has failed because of administrative
policies."
    ::= { pesaDestsEntry 6 }

pesaDestStatus OBJECT-TYPE
    SYNTAX       PesaDestinationStatus
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The status of this source."
    ::= { pesaDestsEntry 7 }

pesaDestStatusNotify OBJECT-TYPE
    SYNTAX       TruthValue
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Indicates if a pesaDestNotifyStatusChange notification
         should be generated when pesaDestStatus changes."
    ::= { pesaDestsEntry 8 }

pesaDestLastChanged OBJECT-TYPE
    SYNTAX       TimeTicks
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
        "The value of sysUpTime when pesaDestStatus last changed."
    ::= { pesaDestsEntry 9 }

pesaDestDetectedFormat OBJECT-TYPE
    SYNTAX       INTEGER
                 {
                 unknown(0),
                 formatHD(1),
                 formatSD143(2),
                 formatSD177(3),
                 formatSD270(4),
                 formatSD360(5),
                 formatSD540(6)
                 }
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
```

```
        "Indicates the detected signal format for this destination.
        For systems without support for this object, or in those
        instances when the format cannot be detected, this object will
        return a default value of unknown(0)."
    ::= { pesaDestsEntry 10 }

pesaDestReclock OBJECT-TYPE
    SYNTAX       INTEGER
                 {
                 bypass(0),
                 reclockHD(1),
                 reclock144(2),
                 reclock277(3),
                 reclock360(4)
                 }
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Indicates the destination reclocker frequency.  For systems
        without support for this object, this object will return a
        default value of bypass(0)."
    ::= { pesaDestsEntry 11 }

-- Source Groups
--

pesaSourceGroupsTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaSourceGroupsEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table defines logical grouping of sources in matrix space."
   ::= { pesaMatrixMibObjects 6 }

pesaSourceGroupsEntry OBJECT-TYPE
   SYNTAX      PesaSourceGroupsEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaSourceGroupsTable."
   INDEX       { pesaSourceGroupIndex }
   ::= { pesaSourceGroupsTable 1 }

PesaSourceGroupsEntry ::=
    SEQUENCE
    {
    pesaSourceGroupIndex        Unsigned32,
    pesaSourceGroupName         SnmpAdminString,
    pesaSourceGroupRowStatus    RowStatus
    }

pesaSourceGroupIndex OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The index for this group."
```

```
    ::= { pesaSourceGroupsEntry 1 }

pesaSourceGroupName OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The name for this group."
    ::= { pesaSourceGroupsEntry 2 }

pesaSourceGroupRowStatus OBJECT-TYPE
    SYNTAX       RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object controls creation/deletion of the associated entry in
         this table per the semantics of RowStatus.  If an active entry is
         another table, the entry MUST remain active until all references
         are removed."
    ::= { pesaSourceGroupsEntry 3 }

pesaSourceGroupMembersTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaSourceGroupMembersEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
        "This table defines the members of a logical group of sources in
        matrix space."
   ::= { pesaMatrixMibObjects 7 }

pesaSourceGroupMembersEntry OBJECT-TYPE
   SYNTAX      PesaSourceGroupMembersEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaSourceGroupMembersTable."
   INDEX
       {
       pesaSourceGroupIndex,
       pesaSourceGroupMemberLevel,
       pesaSourceGroupMemberNum
       }
   ::= { pesaSourceGroupMembersTable 1 }

PesaSourceGroupMembersEntry ::=
    SEQUENCE
    {
    pesaSourceGroupMemberLevel         Unsigned32,
    pesaSourceGroupMemberNum           Unsigned32,
    pesaSourceGroupMemberRowStatus     RowStatus
    }

pesaSourceGroupMemberLevel OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
```

```
        "The level of this source.  The source uniquely identified by the
         combination of pesaSourceGroupMemberLevel and
         pesaSourceGroupMemberNum MUST exist in pesaSourcesTable."
    ::= { pesaSourceGroupMembersEntry 1 }

pesaSourceGroupMemberNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The number of this source.  The source uniquely identified by
         the combination of pesaSourceGroupMemberLevel and
         pesaSourceGroupMemberNum MUST exist in pesaSourceTable."
    ::= { pesaSourceGroupMembersEntry 2 }

pesaSourceGroupMemberRowStatus OBJECT-TYPE
    SYNTAX       RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object controls creation/deletion of the associated entry in
         this table per the semantics of RowStatus."
    ::= { pesaSourceGroupMembersEntry 3 }

-- Dest Groups
--

pesaDestGroupsTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaDestGroupsEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table defines logical grouping of destinations in matrix space."
   ::= { pesaMatrixMibObjects 8 }

pesaDestGroupsEntry OBJECT-TYPE
   SYNTAX      PesaDestGroupsEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaDestGroupsTable."
   INDEX       { pesaDestGroupIndex }
   ::= { pesaDestGroupsTable 1 }

PesaDestGroupsEntry ::=
    SEQUENCE
    {
    pesaDestGroupIndex              Unsigned32,
    pesaDestGroupName               SnmpAdminString,
    pesaDestGroupRowStatus          RowStatus
    }

pesaDestGroupIndex OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
```

```
        "The index for this group."
    ::= { pesaDestGroupsEntry 1 }

pesaDestGroupName OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "The name for this group."
    ::= { pesaDestGroupsEntry 2 }

pesaDestGroupRowStatus OBJECT-TYPE
    SYNTAX       RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object controls creation/deletion of the associated entry in
         this table per the semantics of RowStatus.  If an active entry is
         another table, the entry MUST remain active until all references
         are removed."
    ::= { pesaDestGroupsEntry 3 }

pesaDestGroupMembersTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaDestGroupMembersEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table defines logical grouping of outputs in the matrix."
   ::= { pesaMatrixMibObjects 9 }

pesaDestGroupMembersEntry OBJECT-TYPE
   SYNTAX      PesaDestGroupMembersEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaDestGroupMembersTable."
   INDEX
       {
       pesaDestGroupIndex,
       pesaDestGroupMemberLevel,
       pesaDestGroupMemberNum
       }
   ::= { pesaDestGroupMembersTable 1 }

PesaDestGroupMembersEntry ::=
    SEQUENCE
    {
    pesaDestGroupMemberLevel         Unsigned32,
    pesaDestGroupMemberNum           Unsigned32,
    pesaDestGroupMemberRowStatus     RowStatus
    }

pesaDestGroupMemberLevel OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
```

```
        "The level of this destination.  The destination uniquely identified
         by the combination of pesaDestGroupMemberLevel and
         pesaDestGroupMemberNum MUST exist in pesaDestsTable."
    ::= { pesaDestGroupMembersEntry 1 }

pesaDestGroupMemberNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The number of this destination.  The destination uniquely identified
         by the combination of pesaDestGroupMemberLevel and
         pesaDestGroupMemberNum MUST exist in pesaDestsTable."
    ::= { pesaDestGroupMembersEntry 2 }

pesaDestGroupMemberRowStatus OBJECT-TYPE
    SYNTAX       RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object controls creation/deletion of the associated entry in
         this table per the semantics of RowStatus."
    ::= { pesaDestGroupMembersEntry 3 }

-- Source->Destination Blocking (group-level)
--

pesaGroupBlockingTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaGroupBlockingEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table describes a collection of source-destination pairings
      where members of the given source group are administratively prohibited
      from being connected to members of the given destination group."
   ::= { pesaMatrixMibObjects 10 }

pesaGroupBlockingEntry OBJECT-TYPE
   SYNTAX      PesaGroupBlockingEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaGroupBlockingTable."
   INDEX
       {
       pesaGroupBlockingSource,
       pesaGroupBlockingDest
       }
   ::= { pesaGroupBlockingTable 1 }

PesaGroupBlockingEntry ::=
    SEQUENCE
    {
    pesaGroupBlockingSource            Unsigned32,
    pesaGroupBlockingDest              Unsigned32,
    pesaGroupBlockingRowStatus         RowStatus
    }
```

```
pesaGroupBlockingSource OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "Identifies an entry in the pesaSourceGroupsTable."
    ::= { pesaGroupBlockingEntry 1 }

pesaGroupBlockingDest OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "Identifies an entry in the pesaDestGroupsTable."
    ::= { pesaGroupBlockingEntry 2 }

pesaGroupBlockingRowStatus OBJECT-TYPE
    SYNTAX       RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object controls creation/deletion of the associated entry in
         this table per the semantics of RowStatus."
    ::= { pesaGroupBlockingEntry 3 }

-- Source->Destination Blocking (pair-level)
--

pesaBlockingTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaBlockingEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table contains a collection of source-destination pairings
      where the given source is administratively prohibited from being
      connected to the given destination.

      Please note that some implementations MAY require the source and
      destination to be in the same matrix."
   ::= { pesaMatrixMibObjects 11 }

pesaBlockingEntry OBJECT-TYPE
   SYNTAX      PesaBlockingEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaBlockingTable."
   INDEX
       {
       pesaBlockingLevel,
       pesaBlockingSourceNum,
       pesaBlockingDestNum
       }
   ::= { pesaBlockingTable 1 }

PesaBlockingEntry ::=
```

```
    SEQUENCE
    {
    pesaBlockingLevel                       Unsigned32,
    pesaBlockingSourceNum                   Unsigned32,
    pesaBlockingDestNum                     Unsigned32,
    pesaBlockingRowStatus                   RowStatus
    }

pesaBlockingLevel OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaBlockingSourceNum, identifies an entry in
        pesaSourcesTable.  With pesaBlockingDestNum, identifies
        an entry in pesaDestsTable."
    ::= { pesaBlockingEntry 1 }

pesaBlockingSourceNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaBlockingLevel, identifies an entry in
        pesaSourcesTable."
    ::= { pesaBlockingEntry 2 }

pesaBlockingDestNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaBlockingLevel, identifies an entry in
        pesaDestsTable."
    ::= { pesaBlockingEntry 3 }

pesaBlockingRowStatus OBJECT-TYPE
    SYNTAX       RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object controls creation/deletion of the associated entry in
         this table per the semantics of RowStatus."
    ::= { pesaBlockingEntry 4 }

-- Presets
--

pesaPresetTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaPresetEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table describes a collection of preset switch configurations."
   ::= { pesaMatrixMibObjects 12 }

pesaPresetEntry OBJECT-TYPE
```

```
   SYNTAX      PesaPresetEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaPresetTable."
   INDEX
       {
       pesaPresetIndex
       }
   ::= { pesaPresetTable 1 }

PesaPresetEntry ::=
    SEQUENCE
    {
    pesaPresetIndex                   Unsigned32,
    pesaPresetName                    SnmpAdminString,
    pesaPresetStatus                  INTEGER
    }

pesaPresetIndex OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
        "The index of this entry."
    ::= { pesaPresetEntry 1 }

pesaPresetName OBJECT-TYPE
    SYNTAX       SnmpAdminString
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "The name of this preset."
    ::= { pesaPresetEntry 2 }

pesaPresetStatus OBJECT-TYPE
    SYNTAX       INTEGER
                 {
                 inactive(1),
                 active(2)
                 }
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "This object controls the state of the preset.

         When pesaPresetStatus is set to inactive(1), the preset will not
have
         any members (see pesaPresetMembersTable)."
    ::= { pesaPresetEntry 3 }

pesaPresetMembersTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaPresetMembersEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table describes a collection of preset switch configurations.
```

```
      Please note that some implementations MAY require that the source
      and destination be in the same matrix."
   ::= { pesaMatrixMibObjects 13 }

pesaPresetMembersEntry OBJECT-TYPE
   SYNTAX      PesaPresetMembersEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaPresetMembersTable."
   INDEX
       {
       pesaPresetIndex,
       pesaPresetMemberLevel,
       pesaPresetMemberDestNum
       }
   ::= { pesaPresetMembersTable 1 }

PesaPresetMembersEntry ::=
    SEQUENCE
    {
    pesaPresetMemberLevel                   Unsigned32,
    pesaPresetMemberDestNum                 Unsigned32,
    pesaPresetMemberSourceNum               Unsigned32,
    pesaPresetMemberSyncSource              PesaSyncSource,
    pesaPresetMemberRowStatus               RowStatus
    }

pesaPresetMemberLevel OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaPresetMemberSourceNum, identifies an entry in
        pesaSourcesTable.  With pesaPresetMemberDestNum, identifies
        an entry in pesaDestsTable."
    ::= { pesaPresetMembersEntry 1 }

pesaPresetMemberDestNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaPresetMemberLevel, identifies an entry in
        pesaDestsTable."
    ::= { pesaPresetMembersEntry 2 }

pesaPresetMemberSourceNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
       "With pesaPresetMemberLevel, identifies an entry in
        pesaSourcesTable."
    ::= { pesaPresetMembersEntry 3 }
```

```
pesaPresetMemberSyncSource OBJECT-TYPE
    SYNTAX       PesaSyncSource
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "Specifies the synchronization source for this preset switch."
    ::= { pesaPresetMembersEntry 4 }

pesaPresetMemberRowStatus OBJECT-TYPE
    SYNTAX       RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
        "This object controls creation/deletion of the associated entry in
         this table per the semantics of RowStatus."
    ::= { pesaPresetMembersEntry 5 }

-- Current switch configuration
--

pesaCurrentTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaCurrentEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table describes the current state of matrix space."
   ::= { pesaMatrixMibObjects 14 }

pesaCurrentEntry OBJECT-TYPE
   SYNTAX      PesaCurrentEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaCurrentTable.  Each entry represents
        a connected source-destination pair."
   INDEX
       {
       pesaCurrentLevel,
       pesaCurrentDestNum
       }
   ::= { pesaCurrentTable 1 }

PesaCurrentEntry ::=
    SEQUENCE
    {
    pesaCurrentLevel                        Unsigned32,
    pesaCurrentSourceNum                    Unsigned32,
    pesaCurrentDestNum                      Unsigned32
    }

pesaCurrentLevel OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaCurrentSourceNum, identifies an entry in
        pesaSourcesTable.  With pesaCurrentDestNum, identifies
```

```
        an entry in pesaDestsTable."
    ::= { pesaCurrentEntry 1 }

pesaCurrentSourceNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-only
    STATUS       current
    DESCRIPTION
       "With pesaCurrentLevel, identifies an entry in
        pesaSourcesTable."
    ::= { pesaCurrentEntry 2 }

pesaCurrentDestNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaCurrentLevel, identifies an entry in
        pesaDestsTable."
    ::= { pesaCurrentEntry 3 }


-- take preset command
--

pesaTakePreset OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
       "Identifies a row in pesaPresetTable.  Writing a value to this
       object will cause the identified set of preset switches to be
       taken."
    ::= { pesaMatrixMibObjects 15 }

-- take switch command
--

pesaTakeSwitchTable OBJECT-TYPE
   SYNTAX     SEQUENCE OF PesaTakeSwitchEntry
   MAX-ACCESS not-accessible
   STATUS     current
   DESCRIPTION
     "This table allows the taking of a switch."
   ::= { pesaMatrixMibObjects 16 }

pesaTakeSwitchEntry OBJECT-TYPE
   SYNTAX      PesaTakeSwitchEntry
   MAX-ACCESS  not-accessible
   STATUS      current
   DESCRIPTION
       "An entry in the pesaTakeSwitchTable."
   INDEX
       {
       pesaTakeSwitchLevel,
       pesaTakeSwitchSourceNum,
       pesaTakeSwitchDestNum
```

```
        }
    ::= { pesaTakeSwitchTable 1 }

PesaTakeSwitchEntry ::=
    SEQUENCE
    {
    pesaTakeSwitchLevel                         Unsigned32,
    pesaTakeSwitchSourceNum                     Unsigned32,
    pesaTakeSwitchDestNum                       Unsigned32,
    pesaTakeSwitchRowStatus                     RowStatus
    }

pesaTakeSwitchLevel OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaTakeSwitchSourceNum, identifies an entry in
        pesaSourcesTable.  With pesaTakeSwitchDestNum, identifies
        an entry in pesaDestsTable."
    ::= { pesaTakeSwitchEntry 1 }

pesaTakeSwitchSourceNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaTakeSwitchLevel, identifies an entry in
        pesaSourcesTable."
    ::= { pesaTakeSwitchEntry 2 }

pesaTakeSwitchDestNum OBJECT-TYPE
    SYNTAX       Unsigned32
    MAX-ACCESS   not-accessible
    STATUS       current
    DESCRIPTION
       "With pesaTakeSwitchLevel, identifies an entry in
        pesaDestsTable."
    ::= { pesaTakeSwitchEntry 3 }

pesaTakeSwitchRowStatus OBJECT-TYPE
    SYNTAX       RowStatus
    MAX-ACCESS   read-create
    STATUS       current
    DESCRIPTION
       "Setting this object to 'active' will cause a
       switch to be taken."
    ::= { pesaTakeSwitchEntry 4 }

-- notifications
--

pesaMatrixNotifications OBJECT IDENTIFIER ::= { pesaMatrixMibObjects 19 }

pesaMatrixConfigurationConflict NOTIFICATION-TYPE
    OBJECTS
        {
```

```
        pesaMatrixStatus,
        pesaMatrixLastChanged
        }
    STATUS      current
    DESCRIPTION
        "Critical notification that the matrix has a configuration
        conflict."
    ::= { pesaMatrixNotifications 1 }

pesaMatrixNotifyStatusChange NOTIFICATION-TYPE
    OBJECTS
        {
        pesaMatrixStatus,
        pesaMatrixLastChanged
        }
    STATUS      current
    DESCRIPTION
        "Notification that the matrix status has changed."
    ::= { pesaMatrixNotifications 2 }

pesaMatrixSwitchNotification NOTIFICATION-TYPE
    OBJECTS
        {
        pesaCurrentSourceNum
        }
    STATUS      current
    DESCRIPTION
        "Notification that a switch has been taken."
    ::= { pesaMatrixNotifications 3 }

pesaFrameNotifyStatusChange NOTIFICATION-TYPE
    OBJECTS
        {
        pesaFrameStatus,
        pesaFrameLastChanged
        }
    STATUS      current
    DESCRIPTION
        "Notification that a frame's status has changed."
    ::= { pesaMatrixNotifications 4 }

pesaFrameInvNotifyStatusChange NOTIFICATION-TYPE
    OBJECTS
        {
        pesaFrameInvStatus,
        pesaFrameInvLastChanged
        }
    STATUS      current
    DESCRIPTION
        "Notification that a frame element's status has changed."
    ::= { pesaMatrixNotifications 5 }

pesaSourcesNotifyStatusChange NOTIFICATION-TYPE
    OBJECTS
        {
        pesaSourceStatus,
        pesaSourceLastChanged
```

```
        }
    STATUS      current
    DESCRIPTION
        "Notification that a source's status has changed."
    ::= { pesaMatrixNotifications 6 }

pesaDestNotifyStatusChange NOTIFICATION-TYPE
    OBJECTS
        {
        pesaDestStatus,
        pesaDestLastChanged
        }
    STATUS      current
    DESCRIPTION
        "Notification that a destination's status has changed."
    ::= { pesaMatrixNotifications 7 }

-- conformance
--

pesaMatrixConformance OBJECT IDENTIFIER ::= { pesaMatrix 2 }
pesaMatrixGroups OBJECT IDENTIFIER ::= { pesaMatrixConformance 1 }
pesaMatrixCompliances OBJECT IDENTIFIER ::= { pesaMatrixConformance 2 }

pesaMatrixCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
        "The compliance statement for SNMP entities which
         manage PESA Matrices."

    MODULE  -- this module
    MANDATORY-GROUPS
        {
        pesaMatrixGroup,
        pesaMatrixNotificationGroup
        }

    GROUP  pesaGroupingGroup
    DESCRIPTION
       "Support for this group is only required for implementations
        that support grouping of sources and destinations."

    GROUP  pesaPresetGroup
    DESCRIPTION
       "Support for this group is only required for implementations
        supporting presets."

    GROUP  pesaGroupBlockingGroup
    DESCRIPTION
       "Support for this group is only required for implementations
        supporting group level blocking."

    GROUP  pesaBlockingGroup
    DESCRIPTION
       "Support for this group is only required for implementations
        supporting source-destination level blocking."
```

```
    OBJECT      pesaMatrixName
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports user-defined matrix names."

    OBJECT      pesaFrameName
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports user-defined frame names."

    OBJECT      pesaSourceName
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports user-defined source names."

    OBJECT      pesaDestName
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports user-defined destination names."

    OBJECT      pesaMatrixLevel
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports dynamic configuration of matrix space."

    OBJECT      pesaMatrixSourcesLowerBound
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports dynamic configuration of matrix space."

    OBJECT      pesaMatrixSourcesUpperBound
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports dynamic configuration of matrix space."

    OBJECT      pesaMatrixDestsLowerBound
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports dynamic configuration of matrix space."

    OBJECT      pesaMatrixDestsUpperBound
    MIN-ACCESS  read-only
    DESCRIPTION
        "Read-write access is only applicable when the Matrix
         supports dynamic configuration of matrix space."

    ::= { pesaMatrixCompliances 1 }

-- units of conformance
```

```
pesaMatrixGroup OBJECT-GROUP
    OBJECTS
    {
    pesaMatrixName,
    pesaMatrixLevel,
    pesaMatrixNumSources,
    pesaMatrixSourcesLowerBound,
    pesaMatrixSourcesUpperBound,
    pesaMatrixNumDests,
    pesaMatrixDestsLowerBound,
    pesaMatrixDestsUpperBound,
    pesaMatrixSwitchCount,
    pesaMatrixFailedSwitchCount,
    pesaMatrixBlockedSwitchCount,
    pesaMatrixStatus,
    pesaMatrixStatusNotify,
    pesaMatrixSwitchNotify,
    pesaMatrixLastChanged,
    pesaFrameProductId,
    pesaFrameName,
    pesaFrameSerialNumber,
    pesaFrameHardwareRev,
    pesaFrameSoftwareRev,
    pesaFrameAvailableSyncSources,
    pesaFrameSwitchCount,
    pesaFrameFailedSwitchCount,
    pesaFrameBlockedSwitchCount,
    pesaFrameStatus,
    pesaFrameStatusNotify,
    pesaFrameLastChanged,
    pesaFrameInvDeviceType,
    pesaFrameInvProductId,
    pesaFrameInvSerialNumber,
    pesaFrameInvHardwareRev,
    pesaFrameInvSoftwareRev,
    pesaFrameInvStatus,
    pesaFrameInvStatusNotify,
    pesaFrameInvLastChanged,
    pesaSourceName,
    pesaSourceSwitchCount,
    pesaSourceFailedSwitchCount,
    pesaSourceBlockedSwitchCount,
    pesaSourceStatus,
    pesaSourceStatusNotify,
    pesaSourceLastChanged,
    pesaSourceSignalPresence,
    pesaDestName,
    pesaDestSwitchCount,
    pesaDestFailedSwitchCount,
    pesaDestBlockedSwitchCount,
    pesaDestStatus,
    pesaDestStatusNotify,
    pesaDestLastChanged,
    pesaDestDetectedFormat,
    pesaDestReclock,
    pesaCurrentSourceNum,
```

```
    pesaTakeSwitchRowStatus,
    pesaTakePreset
    }
    STATUS      current
    DESCRIPTION
        "This group supports notifications of significant
         conditions associated with a PESA Matrix."
    ::= { pesaMatrixGroups 1 }

pesaGroupingGroup OBJECT-GROUP
    OBJECTS
    {
    pesaSourceGroupName,
    pesaSourceGroupRowStatus,
    pesaSourceGroupMemberRowStatus,
    pesaDestGroupName,
    pesaDestGroupRowStatus,
    pesaDestGroupMemberRowStatus
    }
    STATUS      current
    DESCRIPTION
        "This group supports grouping."
    ::= { pesaMatrixGroups 2 }

pesaPresetGroup OBJECT-GROUP
    OBJECTS
    {
    pesaPresetName,
    pesaPresetStatus,
    pesaPresetMemberSourceNum,
    pesaPresetMemberSyncSource,
    pesaPresetMemberRowStatus
    }
    STATUS      current
    DESCRIPTION
        "This group supports presets."
    ::= { pesaMatrixGroups 3 }

pesaGroupBlockingGroup OBJECT-GROUP
    OBJECTS
    {
    pesaGroupBlockingRowStatus
    }
    STATUS      current
    DESCRIPTION
        "This group supports group level blocking."
    ::= { pesaMatrixGroups 4 }

pesaBlockingGroup OBJECT-GROUP
    OBJECTS
    {
    pesaBlockingRowStatus
    }
    STATUS      current
    DESCRIPTION
        "This group supports group level blocking."
    ::= { pesaMatrixGroups 5 }
```

```
pesaMatrixNotificationGroup NOTIFICATION-GROUP
    NOTIFICATIONS
    {
    pesaMatrixConfigurationConflict,
    pesaMatrixNotifyStatusChange,
    pesaMatrixSwitchNotification,
    pesaFrameNotifyStatusChange,
    pesaFrameInvNotifyStatusChange,
    pesaSourcesNotifyStatusChange,
    pesaDestNotifyStatusChange
    }
    STATUS      current
    DESCRIPTION
        "This group supports notifications of significant
         conditions associated with a PESA Matrix."
    ::= { pesaMatrixGroups 6 }

END
```

Appendix E. - PESA Matrix Frame Controller Debug Port Protocol

The PESA Matrix Frame Controller Debug Port protocol is an RS-232 connection that allows service personnel to directly interact with the PESA Matrix frame controller in order to determine the health of the matrix and to perform certain diagnostics.

E.1 Port Setup

Baud Rate: 38,400

Data Bits: 8

Stop Bits: 1

Parity: None

Flow Control: None

E.2 Command Syntax

Commands consist of the first two non-whitespace ASCII character sequences entered in a command line.

Each command is followed by a series of optional data parameters. Data parameters start after the first whitespace following the command sequence. Commas delimit the data parameters. All data parameters have leading and trailing whitespaces trimmed.

A command is terminated by a Carriage return. A command is not acted on until the carriage return is received.

Command sequences are case insensitive.

E.3 Command Line Character Input

The following indicates how characters input into the debug port are handled.

Command Entry

Commands are entered character by character onto the command line. All ASCII keys are concatenated onto a string. In addition, entry of the DELETE or BACKSPACE keys will cause the last character entered to be removed from the character string.

In verbose mode, all ASCII characters entered into the serial port are echoed back. The DELETE and BACKSPACE keys cause control characters to be echoed that cause the cursor to move back deleting the last character input.

In terse mode, the input characters are not echoed back.

After a command has been executed, the debug port will output the appropriate response (if any) followed by a Carriage Return/Linefeed and the '>' character. The receipt of the '>' character indicates that the next command is ready to be entered.

Control Character Sequences

The following control characters will be immediately acted on upon receipt by the debug port.

- Ctl-C – Aborts the current command and starts new command line with a new prompt.
- Ctl-V – Verbose Response Mode (default) – Causes responses to be returned in a
- Ctl-T – Terse Response Mode – Causes commands to be responded to in a terse mode fit for machine consumption.

E.4 Response Modes

There are two separate response modes for each command.

Verbose Mode

The verbose mode responses include text information and formatting that describe the command response in terms that can be read from a user using a terminal interface to the debug port.

Terse mode

This mode outputs minimal information that fully describes the necessary response data. Its intent is to be read from an automated device such as a PC.

E.5 Command Enumeration

(Command Characters in **BOLD** are those characters that are required for the command. The other characters may be entered to help describe the command to a user interface.

HE – Help Menu

Syntax:

HELP [<cmd>]
Where:
cmd is optional in order to receive more help on specific commands.

Response:

HELP provides a list of the available commands

Comment:

Displays a summary of the commands available with a brief description of what they do. Also displays a summary of the control key codes. The response for this is the same for both verbose and terse modes.

BC – Board Configuration

Syntax:

BC [<**F**AIL>]
Where:
FAIL reports only those boards that are currently reporting failures.

Response:

Comment:

Providing a list of the boards configured within the frame. Along with each board is an indication as to whether the board is reporting status or not.

AL – Alarm

Syntax:

AL
Where:

Response:

Comment:

Responds back with an enumeration of alarms that are currently active in the frame controller.

ME – Memory Statistics

Syntax:

ME
Where:

Response:

Comment:

Responds with data about those memory parameters that can indicate whether the system is experiencing a memory leak or something similar. (They get what we can give them.)

RE – Reset Board

Syntax:

RE
Where:

Response:

Comment:

The Reset Board command (**RE**) must be entered twice in a row before the frame controller will be reset.

SW – Switch Crosspoint

Syntax:

SW <Output>, <Input>[,M][,<sync>
Where:
Output is the output to be switched
Input is the input to be switched
M indicates to switch the monitor matrix (Default is the primary matrix.)
Sync is the sync number (0 or 1) to switch to.

Response:

Comment:

AC – Active Status

Syntax:

AC
Where:

Response:

SINGLE – single frame controller in system.
ACTIVE – active frame controller in dual system.
STANDBY – inactive frame controller in dual system.

Comment:

Indicates whether the board is active or standby.

CO – Communications Status

Syntax:

CO
Where:

Response:

PRC: <status> NET PRC: <status> NET PRC Connections: <num>
Where:
Status is IDLE, ERROR, or OK
Num is the number of Ethernet PRC connections.

Comment:

Indicates whether we are receiving commands from the PRC port or the NETPRC port. NETPRC indicates the number of connections currently active.

FL – FLASH Reprogramming mode

Syntax:

FL
Where:

Response:

Comment:

Causes the operational program to abort and for the system to come back up in the FLASH program installer.

Immediately after the response to this command is sent, the debug port enters into the reFLASHING mode. The board will require a reset to return to where it can receive the standard debug port commands enumerated here.

SS – Switch Status

Syntax:

SS <Output>[,M]
Where:
Output is the output to be switched
M indicates to switch the monitor matrix (Default is the primary matrix.)

Response:

Output: <out> Input: <in> Level: <lev>
Where:
Out is the output number.
In is the input number currently switched to the output.

Lev is the level (MAIN or MONITOR) for the switch status.

Comment:

RC – Roll Call

Syntax:

RC <I | O | M | S>,<A | B>
Where:
I is for INPUT
O is for OUTPUT
M is for MATRIX
S is for SYSTEM BOARD
A is for Port A
B is for Port B

Response:

Roll Call Port: <port> Type: <type>
<data>
Where:
Port is A or B.
Type is INPUT, OUTPUT, MATRIX, or SYSTEM.
Data is the mutiple 8 bit data bytes used to indicate a boards exists in the frame.

Comment:

Roll Call is used to determine if a board exists in the system, which port the board is used to communication on, which slot the board is in relative to the board type, and the boards general condition (Error and / or Over Temperature).

IB – Input Board Status

Syntax:

IB <Slot>
Where:
Slot is the input board slot.

Response:

WC = xxxx OD1 = xxxx OD2 = xxxx OD3 = xxxx CRC = xxxx
Total Errors = xxxx

Comment:

See "Matrix Frame Controller Hardware Interface Protocol MFCHIP" to get specific information on the response.

MB – Matrix Board Status

Syntax:

MB <Slot>
Where:
Slot is the matrix board slot.

Response:

WC = xxxx OD1 = xxxx OD2 = xxxx CRC = xxxx
Total Errors = xxxx

Comment:

See "Matrix Frame Controller Hardware Interface Protocol MFCHIP" to get specific information on the response.

OB – Output Board Status

Syntax:

OB <Slot>
Where:
Slot is the output board slot.

Response:

WC = xxxx OD1 = xxxx OD2 = xxxx OD3 = xxxx OD4 = xxxx
OD5 = xxxx OD6 = xxxx OD7 = xxxx OD8 = xxxx OD9 = xxxx
OD10 = xxxx CRC = xxxx
Total Errors = xxxx

Comment:

See "Matrix Frame Controller Hardware Interface Protocol MFCHIP" to get specific information on the response.

SB – System Board Status

Syntax:

SB <Addr>
Where:
Addr is the system board address.

Response:

Power Supplies (Address = 1 to 16):

WC = xxxx OD1 = xxxx OD2 = xxxx OD3 = xxxx OD4 = xxxx
OD5 = xxxx OD6 = xxxx OD7 = xxxx OD8 = xxxx CRC = xxxx
Total Errors = xxxx

Output Monitor (Address = 17):

WC = xxxx OD1 = xxxx OD2 = xxxx OD3 = xxxx CRC = xxxx
Total Errors = xxxx

Comment:

See "Matrix Frame Controller Hardware Interface Protocol MFCHIP" to get specific information on the response.

CL – Clear Error

Syntax:

CL <I | O | M | S>,<addr>
Where:
I = INPUT
O = OUTPUT
M = MATRIX
S = SYSTEM
Addr = slot or board address

Response:

Comment:

Clears the total number of errors for the specified board.

ST – System Temperature

Syntax:

ST [<I | O | M | P>
Where:
I = INPUT.
O = OUTPUT.
M = MATRIX.
P = POWER SUPPLY

Response:

Temperature:
Frame Controller: <hex> (<dec>)

<type>:

<hex> (dec)<hex> (dec) …

Where:
Hex is the hex number for the temperature.
Dec is the decimal number for the temperature
Type is the board type (INPUT, OUTPUT, etc).

The data following the type is the hex (dec) temperature number
For each board of the specified type in the system.

Comment:

See “Matrix Frame Controller Hardware Interface Protocol MFCHIP” to get specific information on the temperature.

VE – Version of software

Syntax:

VE
Where:

Response:

LOADER: <ver> <date>
INSTALLER: <ver> <date>
PMFC: <ver> <date>
FPGA: <ver>
Matrix Cards:
<ver> <ver> … <ver>
Input Cards:
<ver> <ver> … <ver>
Output Cards:
<ver> <ver> … <ver>
Power Supply Cards:
<ver> <ver> … <ver>
Output Monitor Card: <ver>

Comment:

The version command provides the version number and date for each software modual in the system. If a software module does not exist, then "Invalid" is displayed.

VT – Vertical Trigger

Syntax:

VT [<A | B>]
Where:
VT – no port change.
VT A – change to Port A.
VT B – change to Port B

Response:

Comment:

See “Matrix Frame Controller Hardware Interface Protocol MFCHIP” to get specific information on the vertical trigger command. The vertical trigger command causes the boards to change over to Port A or Port B communications port.

DT – Dual Takeover

Syntax:

DT
Where:

Response:

Comment:

Allows the Standby Frame Controller to take over control of the frame.

EC – Error Count

Syntax:

EC <I | O | M | P>
Where:
I = Input
O = Output
M = Matrix
P = Power Supply

Response:

<Board Type>:

<error count> <error count> …

Comment:

Response gives the number of error counts for all of the boards in the frame for the board type that was specified.

MD – MFCHIP Debug

Syntax:

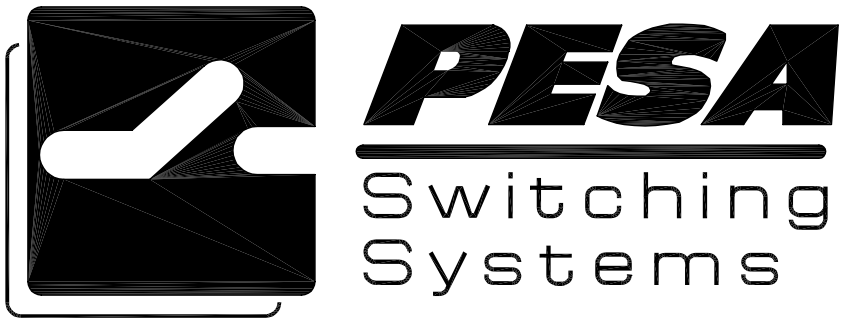
MD [[+ | -] [IR | OR | MR | SR | IS | OS | MS | SS | RA | TA | SC] | RD | CR | CD | CA | CF | SF]
Where:

MD – displays the current flag settings.
"+" - enables the specific flag
"-" - disables the specific flag
IR – Input Roll Call
OR – Output Roll Call
MR – Matrix Roll Call
SR – System Roll Call
IS – Input Board Status
OS – Output Board Status
MS – Matrix Board Status
SS – System Board Status
RA – All MFCHIP Receives
TA – All MFCHIP Transmits
SC – Any Slot Change (Roll Call Slots or Lengths)
Cmds:
RD – Read Data
CR – Clear Read
CD – Clear Data
CA – Clear All Data and Flags
CF – Clear All Flags
SF – Set All Flags

Response:

Comment:

The MFCHIP Debug command is used to store information about MFCHIP Buffer Descriptors and MFCHIP communication problems in a block of RAM. This information can be used to determine what type of errors are occurring with MFCHIP communications.


PESA
Switching
Systems