

CHEETAH 64X64 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 64x64 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

Cheetah is a full-featured 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. Features include:

- 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, 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
- Output monitor

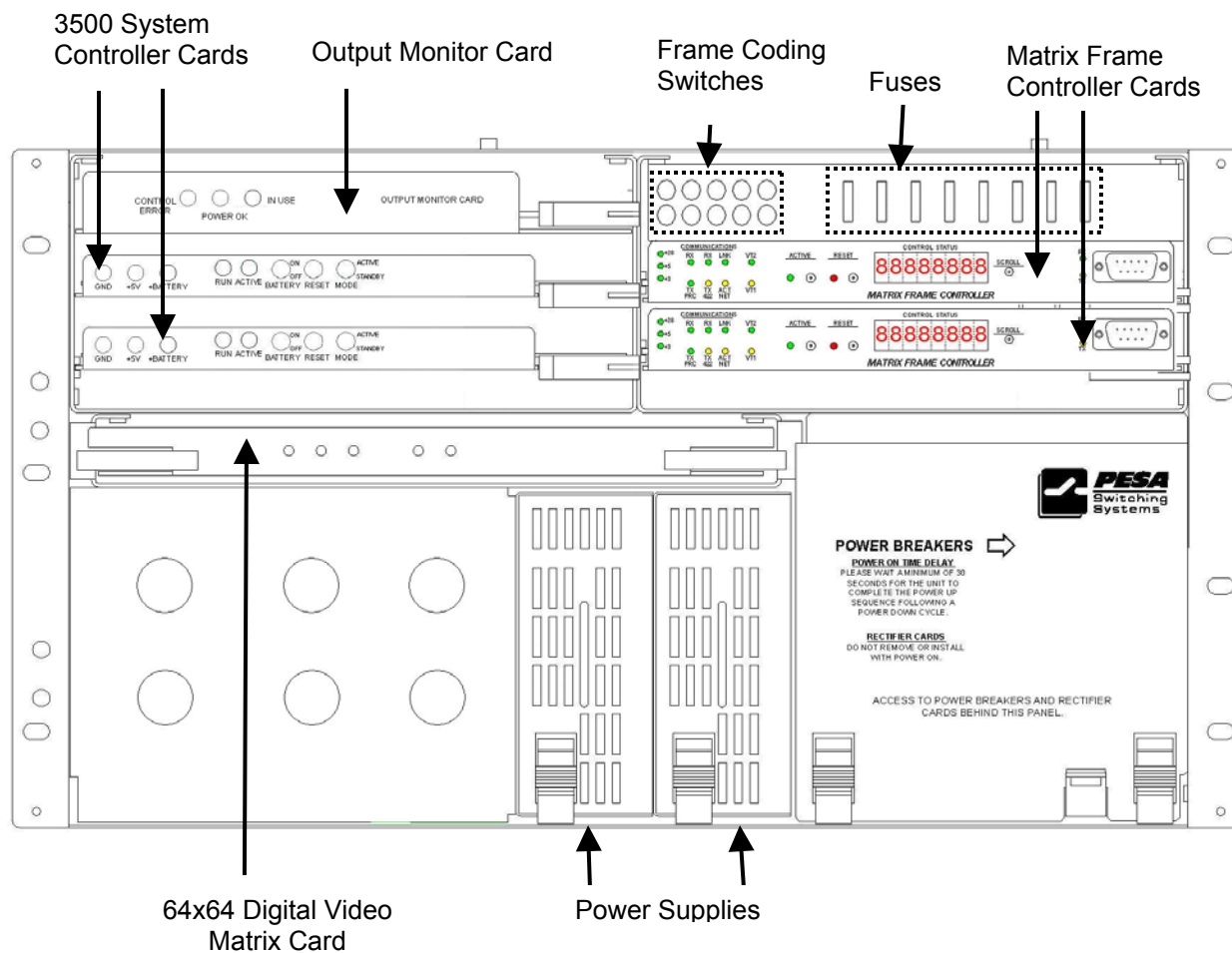


Figure 1. Cheetah 64x64 Front View

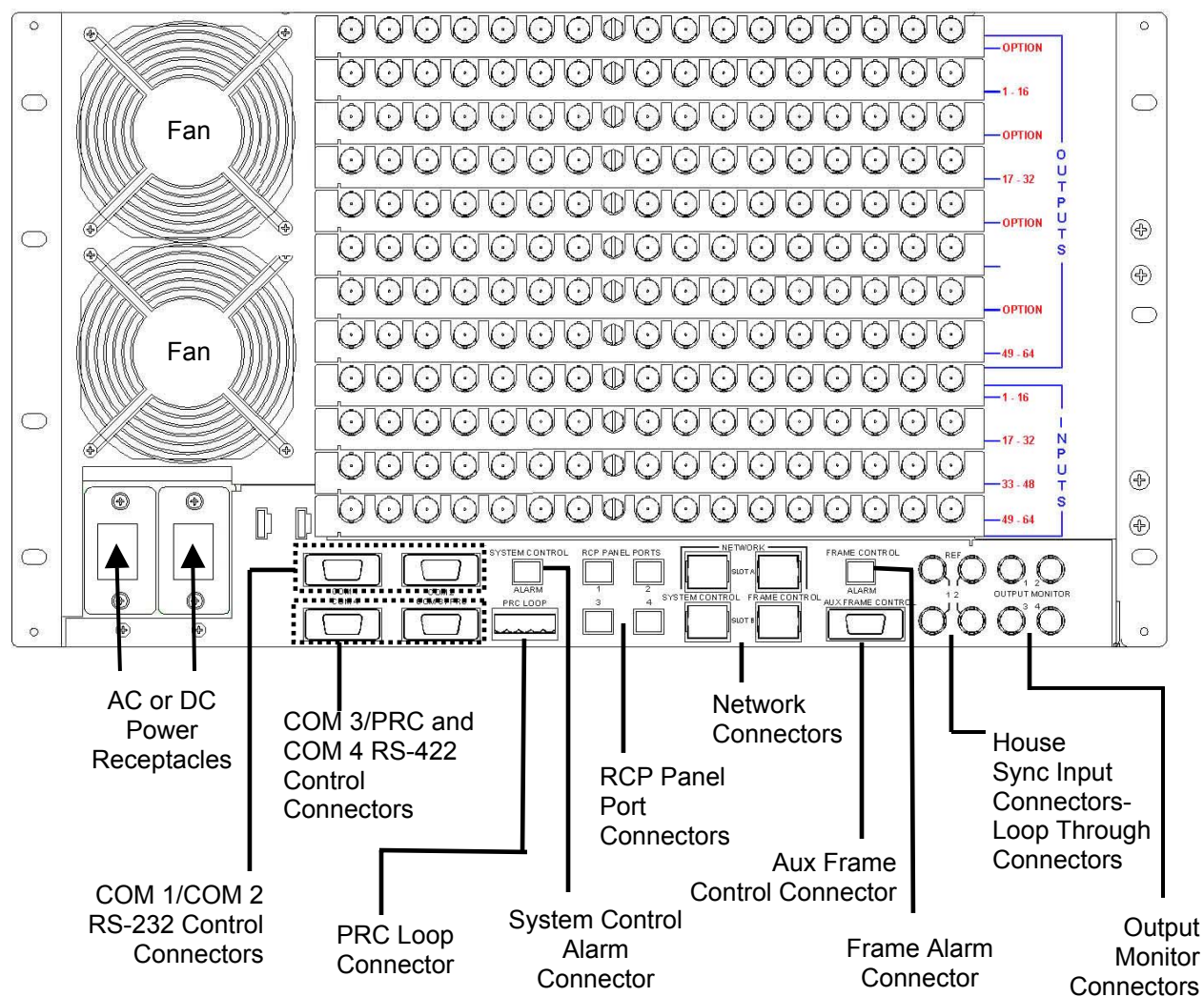


Figure 2. Cheetah 64x64 Rear View

1.2 Specifications

Physical

RUs	7
Height.....	12.25"
Width	19"
Depth.....	23"
Weight (fully loaded).....	90 lbs. (40.82 kg)
(may weigh less depending on the configuration)	

Electrical Signals for Inputs

Standards:.....	High Definition video conforming to SMPTE 292M
	Serial Digital video conforming to SMPTE 259M
Connector Type:	75 ohm BNC, SFF modules w / LC type (fiber card)
Signal Level:	800 mV p-p +10%
Impedance:	75 ohms nominal
Return Loss:.....	HD >15 dB from 5MHz to 1.5 GHz
	SD > 15 dB from 5 MHz to 540 MHz
Cable Equalization:	HD Automatic up to 100 meters, Belden 8281
	SD Automatic up to 300 meters, Belden 8281

Electrical Signals for Outputs

Connector Type:	75 ohm BNC (output card)
	75 ohm BNC (dual output card)
	SFF modules w / LC type (fiber card)
Signal Level:	800 mV p-p +10%
Signal Polarity:	Non-inverting with respect to input ports
Impedance:	75 ohms nominal
Return Loss:.....	HD > 15 dB from 5MHz to 1.5 GHz
	SD > 15 dB from 5MHz to 540 MHz

Signal Operational Specifications

Polarity:	All paths non-inverting
Reclocking SD:	Automatic selection of 143 Mb/s, 177 MB/s, 270Mb/s,
	360 Mb/s, 540 Mb/s
Reclocking HD:	Automatic selection of 143 Mb/s, 177 Mb/s, 270 Mb/s, 360 Mb/s,
	540 Mb/s and 1.5 Gb/s

Reference (Sync) Inputs

No. of Inputs:2 standard
Connector: 75 ohm BNC
Return Loss: > 40 dB, 100 KHz to 30 MHz
Signal Formats:NTSC, PAL “Black Burst”, or HD Tri-Level
Sync per SMPTE 274, SMPTE 276 M
Signal Level:Nominal 1.0 V p-p +/- 6dB

DAC Card Specifications

Connector Type: 75 ohm BNC
Connection/Card: 16 Individual Outputs
Conversion:10 bit Serial Digital to Analog
Oversampling: 4X
Output: NTSC/PAL

Power Supplies

AC Inputs95 VAC to 240 VAC AC, 50-60 Hz,
IEC (C-19 High Current) type connector
Maximum Watts per frame350 Watts
(fully loaded with all options)
DC Input (voltage)48 VDC +/- 20%

Cooling

Internal cooling fans with auto sensing speed adjustments

Control

Panel Comm: RS-485, 3 pin WECO
Control Comm: RS-232 or PESA PRC for 3500 System
Connector Type: 9 pin, D sub, female
Network Connector:RJ-45, Ethernet, 2 per frame

Environmental

Operating Temperature: 0-40 degrees C
Operating Humidity: 10-90% non condensing

Chapter 2 – Installation

2.1 Introduction

This section details the Cheetah 64x64 Digital Video Matrix Switcher installation procedures. The following topics are discussed:

- Unpacking and Inspecting
- Installation Location
- Mounting
- Connecting Equipment Cables
- Setting Level Codes
- Installing Cards
- Rear Panel Connectors
- Subassembly Installation
- Switch Locations and Settings

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

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

Table 1. Equipment List

Part Number	Description	Maximum Quantity (see note)
81-9065-2418-0	Mainframe assembly:	1
81-9065-2381-0	Power supply	2
81-9034-6904-0	Power supply (blank)	2
81-9065-2397-0	Matrix frame controller	2
81-9065-2321-0	Input buffer card (SDI)	8
81-9034-6907-0	Input blank	8
81-9065-2322-0	Output Option HD-MR to SD	8
81-9065-2315-0	Output combiner (SDI)	8
81-9034-6844-0	Dual output option blank	8
81-9034-6906-0	Output blank	8
81-9065-2333-0	Matrix card	1
81-9065-2317-0	Dual output option BNC	8
81-9065-2319-0	Input buffer fiber	8
81-9017-0370-0	Output option DAC SD	8
81-9065-2318-0	Output option fiber	8
81-9065-2328-0	Output monitor	1
81-9017-0376-0	Output option HD to SD	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.



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.

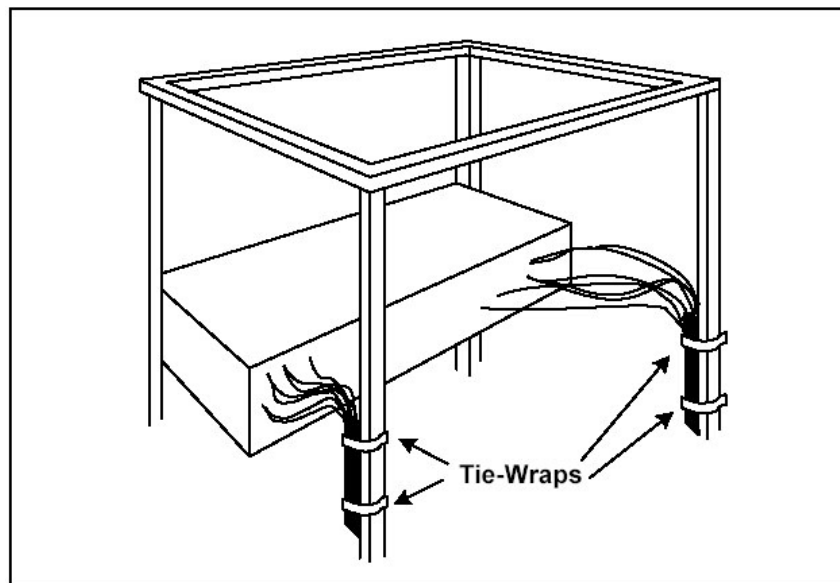


Figure 3. Cables Attached to Supports

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.

2.7 Power Supply Installation

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

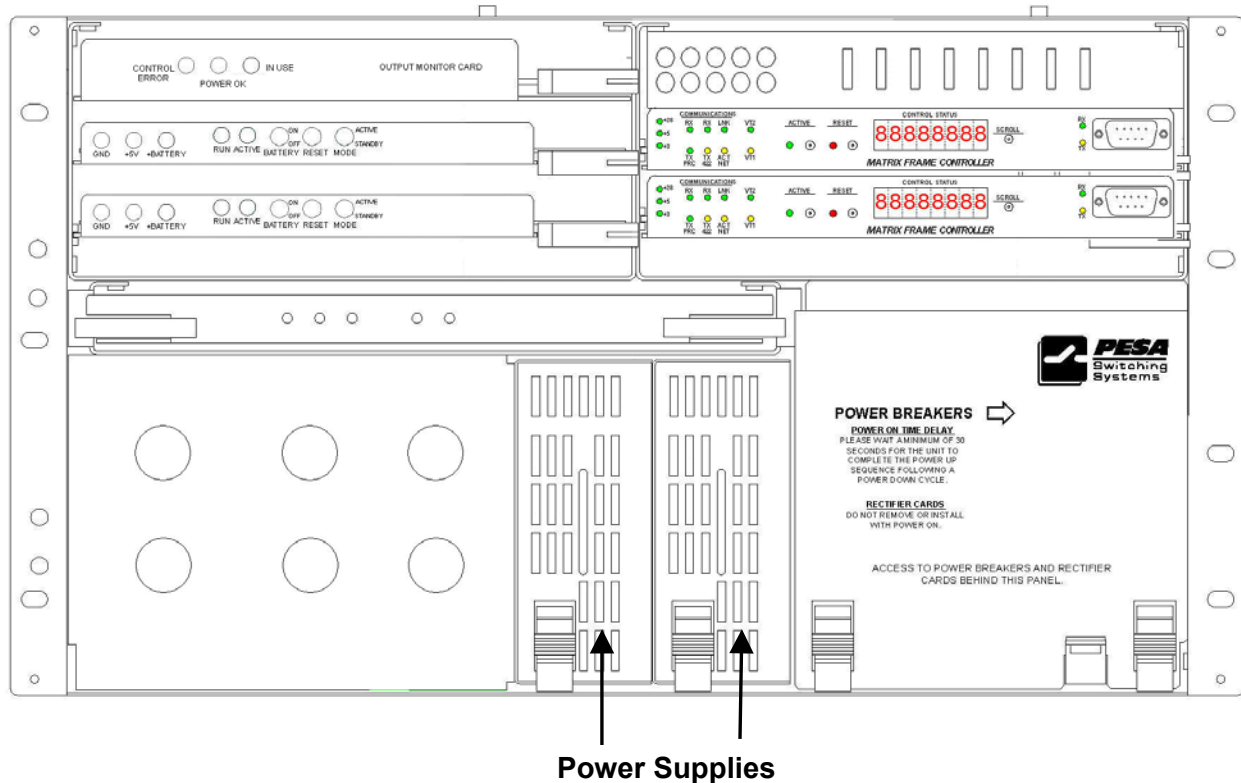


Figure 4. Power Supply Locations (front view)



Each slot must have either a power supply or a blank installed. If you only install one power supply, you can install it in either 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 $\pm 28\text{VDC}$ @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 up on the power supply latch 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. Push the latch on the front of the power supply down. Make sure the latch is *fully engaged* (down) to enable the power supply.



You can install up to eight power supplies. Each slot must have either a power supply or a blank installed. 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 34.

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.
4. 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 two power cord types: a pigtail for 100-120VAC, and either pigtail or 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

	100-240V	200-240V
Green/Yellow Stripe	Safety Ground	Safety Ground
Blue	Neutral	AC Line
Brown	Line	AC Line

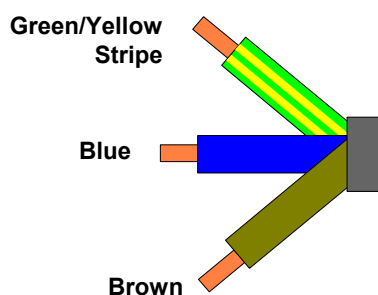


Figure 5. IEC-Type Plug Power Connections

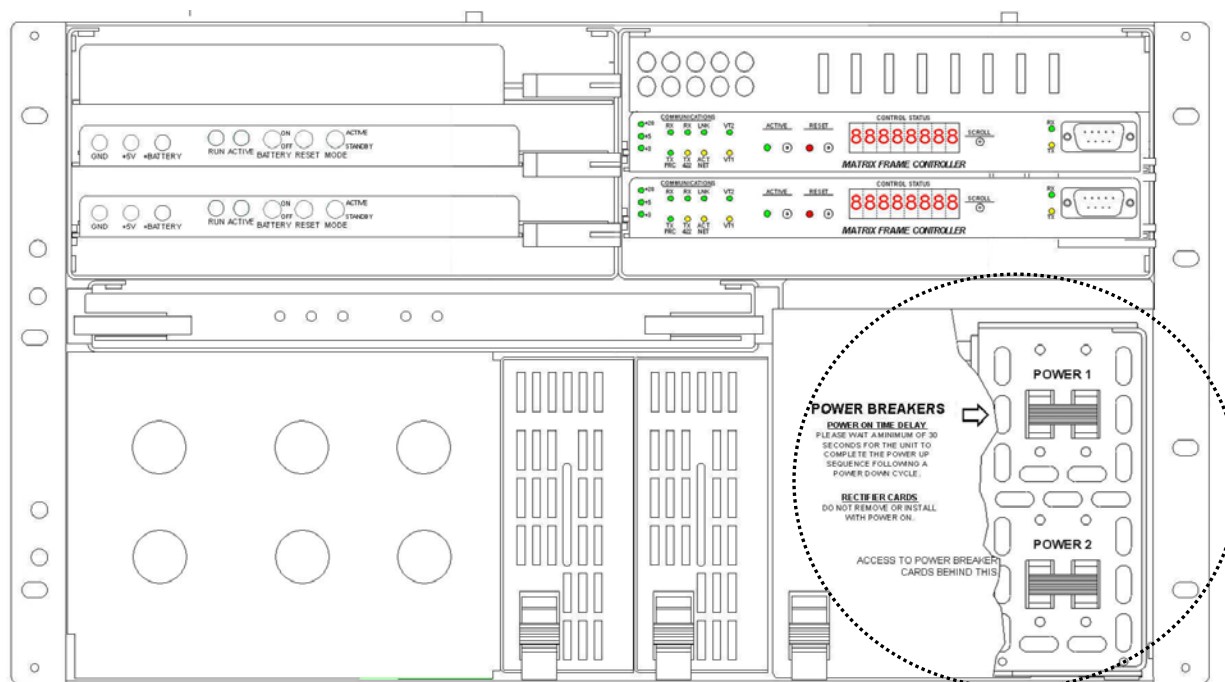


Figure 6. Front Panel Circuit Breakers

2.8.2 AC External Power Requirements

The 64x64 frame is supplied with pigtail cords for 100-120V or 220-240V service, or with IEC type power cables for 220-240V service. The following heavy-duty 100-120V plug-type power connectors can be ordered from your local electrical outlet store:

- Plug..... Hubbell CS8265C
- Receptacle Hubbell CS8269

Install each according to Hubbell Manufacturing's recommendations.

Table 3. AC Power Filter Assembly

AC Power Cable	Minimum Amps Required	IEC	Pigtail	Service Drops
IEC Plug (220-240V only)	30A Service	Yes	No	1- Standard 1-Redundant
Attached Power Cable (100-120V)	40A Service	No	Yes	1-Standard 1-Redundant
Attached Power Cable (220-240V)	30A Service	Yes	Yes	1-Standard 1-Redundant



This AC power filter assembly has been designed for 110-120V and includes connectors and cords specified to cover maximum power requirements. However, a frame with this type cordage can also be connected to 220-240V if required.

2.9 Setting Level Codes (Strobes)



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 2. You must ensure that these settings match the settings in the 3500Plus System Controller software.



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.

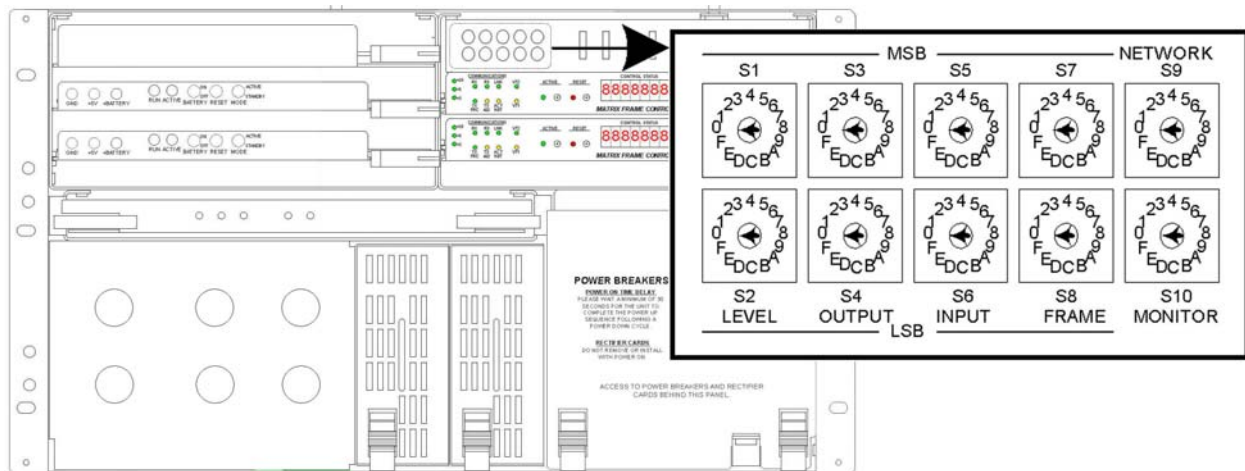


Figure 7. Level Code Switch Location (front view)

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	Specifies the type of frame the boards are plugged into. For the Cheetah 64x64 frame, set this to 3.
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 various cards that are installed.

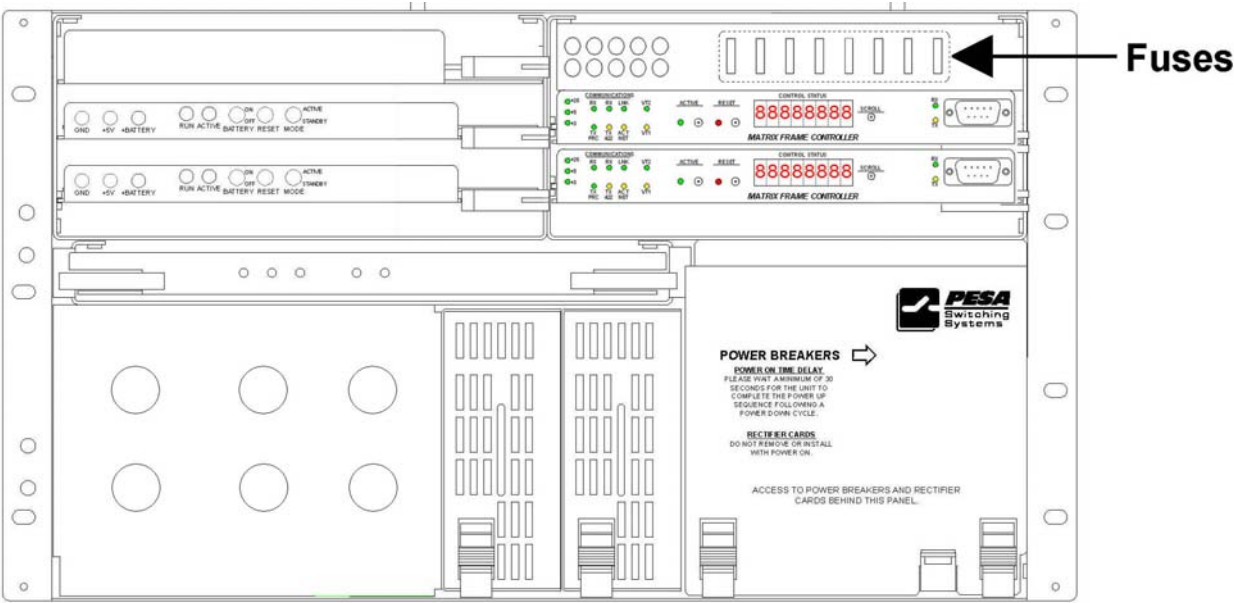


Figure 8. Fuse Locations

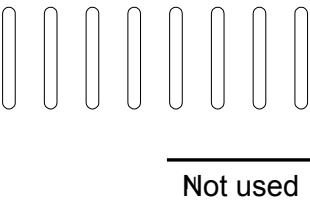


Figure 9. Fuse Protection

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 32 for a diagram and description of the connectors. See section 3.3, **Output Monitor Card**, on page 39 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 automatically set to 42.

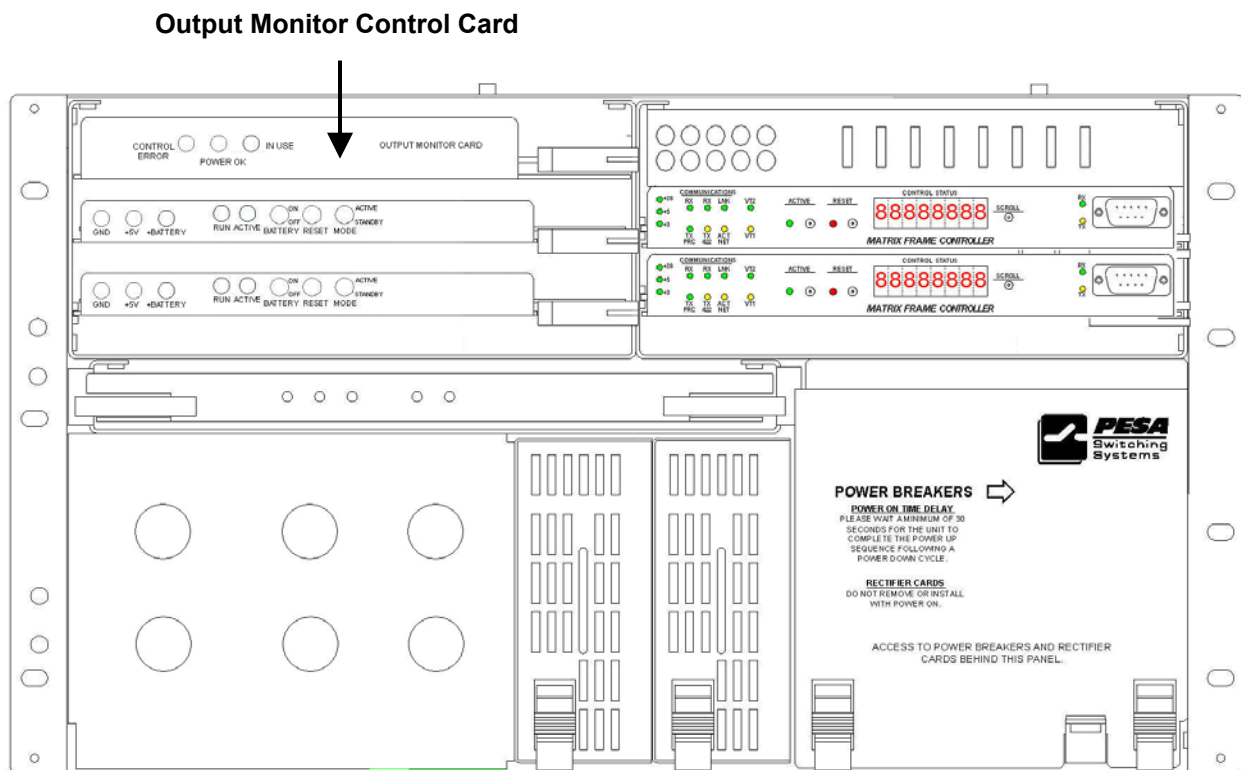


Figure 10. Output Monitor Control Card (front view)

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 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.

For detailed information about this card, see section 3.4, 3500 System Controller Cards on page 40.



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.

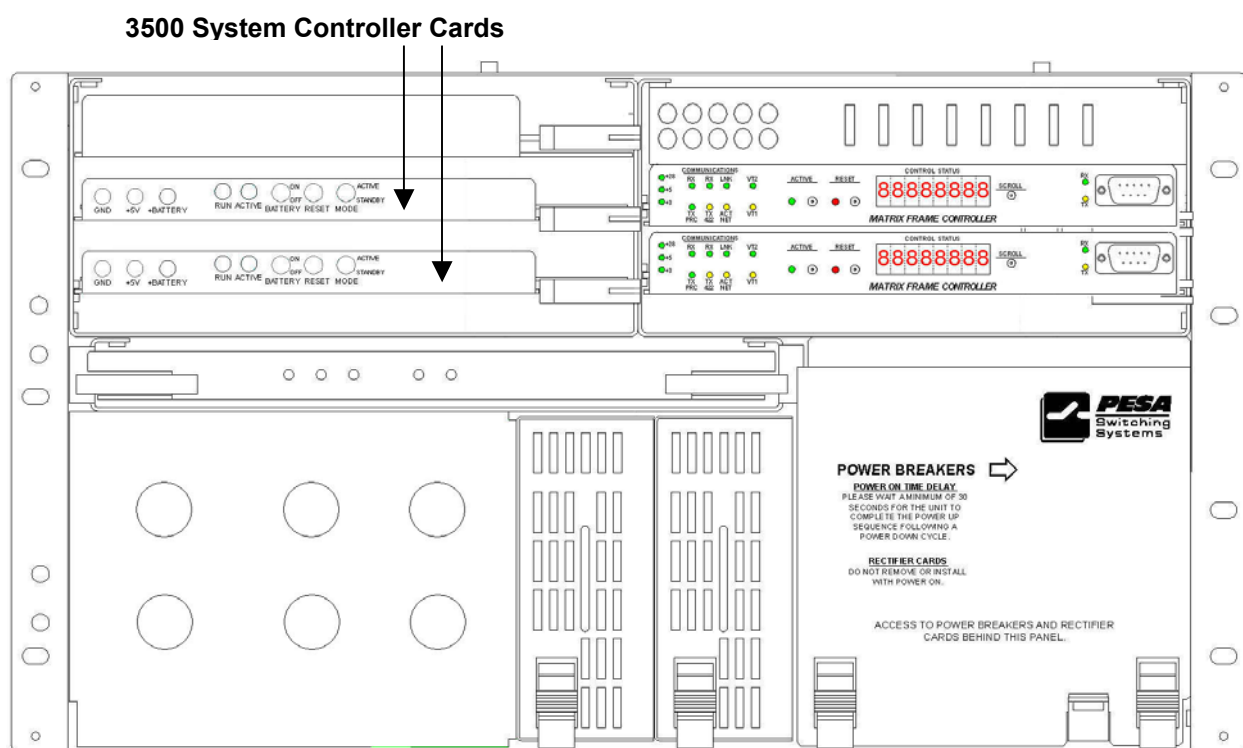


Figure 11. System Controller Card Locations (front view)

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 64x64 Digital Video Matrix Card

The 64x64 digital video matrix card is located as shown in the following figure. See page 42 for detailed information about the matrix card.

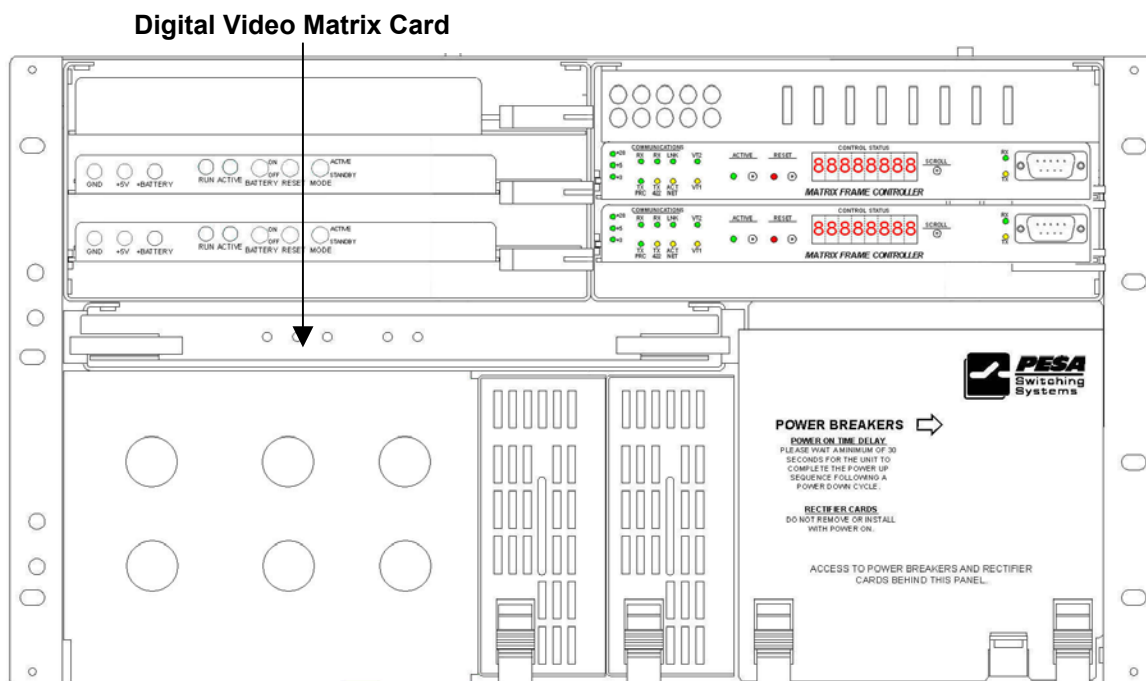


Figure 12. Matrix Card Location (front view)

Install the card as follows:

5. Align the card with the card guides in the chassis.
6. Carefully insert the card into the chassis until the latches on the top and bottom the card make contact with the frame.
7. Insert the latches into the frame.
8. Push the front of the latches in towards the frame until the card is secured.

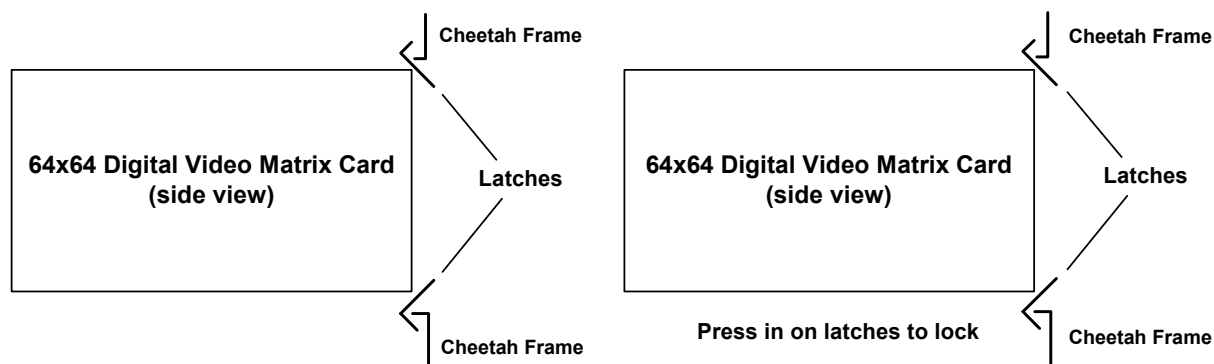


Figure 13. Installing the 64x64 Digital Video Matrix Cards

2.14 Installing the Matrix Frame Controllers



Set the level codes (strobes) **BEFORE** installing the matrix frame controller cards. See page 13.

The Matrix Frame Controllers are located as shown in the following figure. For detailed information about the matrix frame controller card, see page 43.

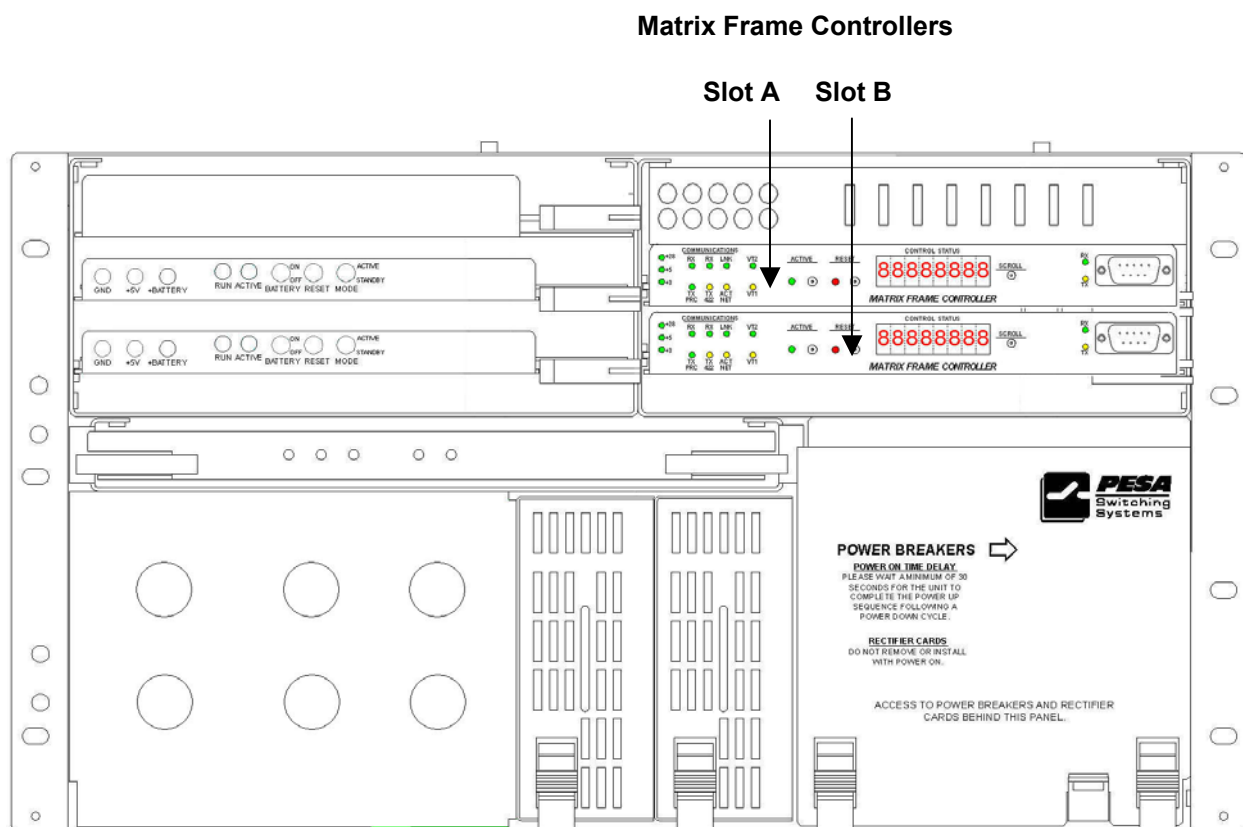


Figure 14. Matrix Frame Controllers (front view)

To install the matrix frame controllers in the Cheetah 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.
4. Repeat for the second matrix frame controller.

2.15 Installing Input/Output Buffer Cards

Install the input/output buffer cards as follows:

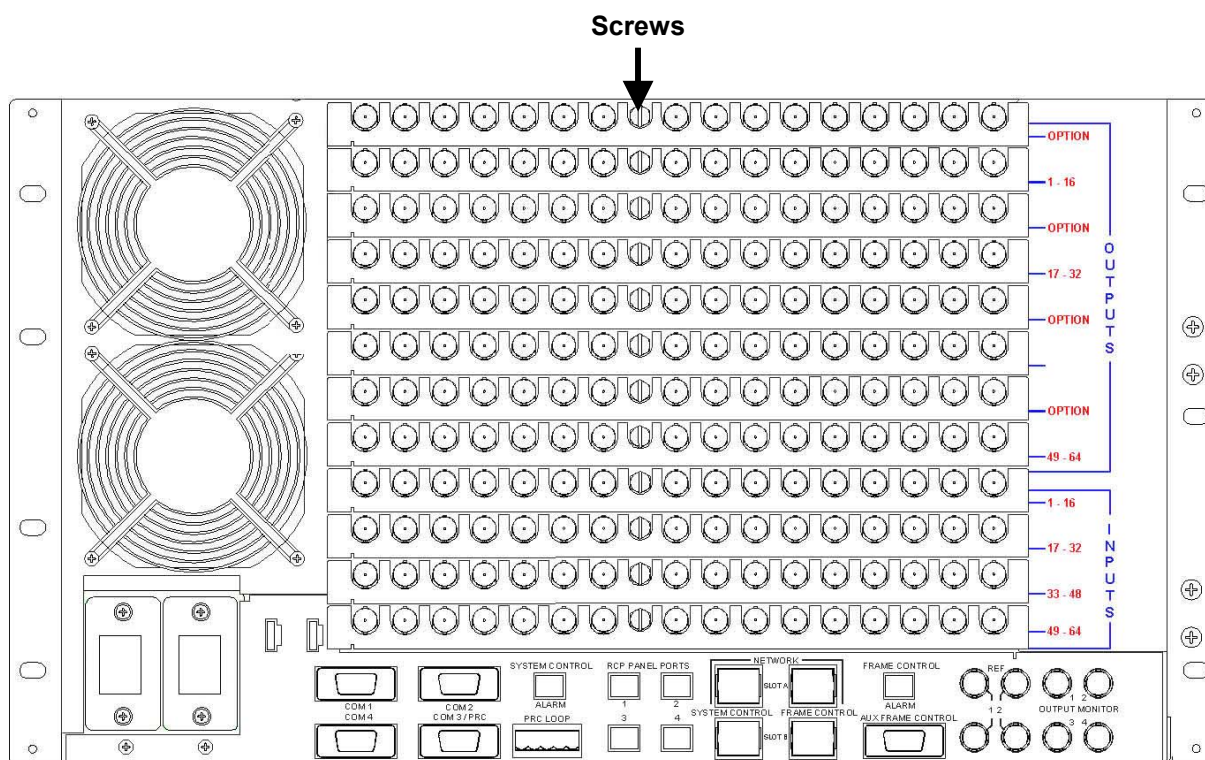


Figure 15. Input/Output Signal Connectors (rear view)

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.

Dip switch settings (for information only) are detailed in *Input/Output Backplane* on page 35.



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

2.16 Rear Panel Connections

All system interface connectors are located on the rear of this equipment as shown in the following figure. The following sections provide in-depth information about each connector.

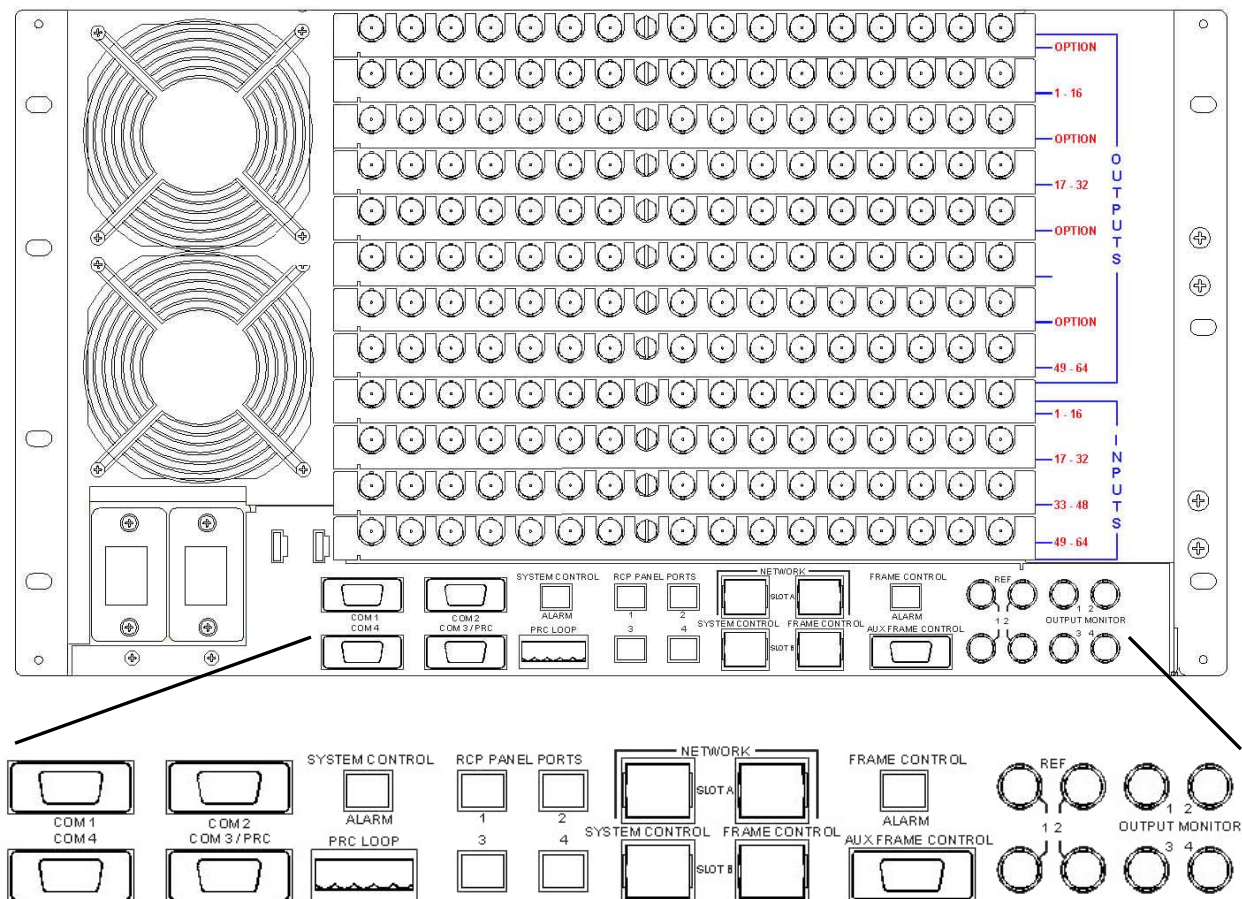


Figure 16. System Interface Connector Panel Location (rear view)

2.16.1 RS-232 Control Connectors COM1 and COM2

COM 1 and COM 2 are DB9-Male connectors that provide RS-232 serial communication interfaces. Pinouts are shown in Table 4 on page 24.

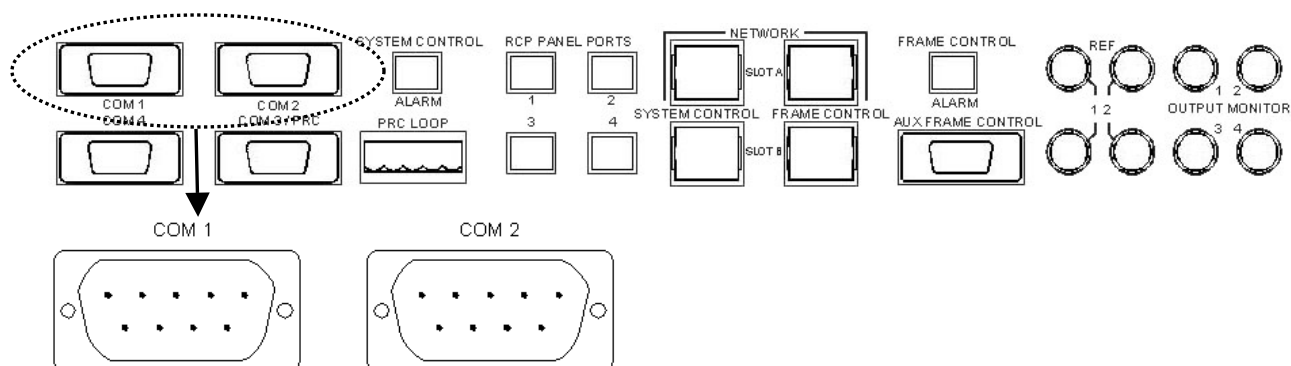


Figure 17. RS-232 COM 1 and COM 2 Control Connectors

- 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 3 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

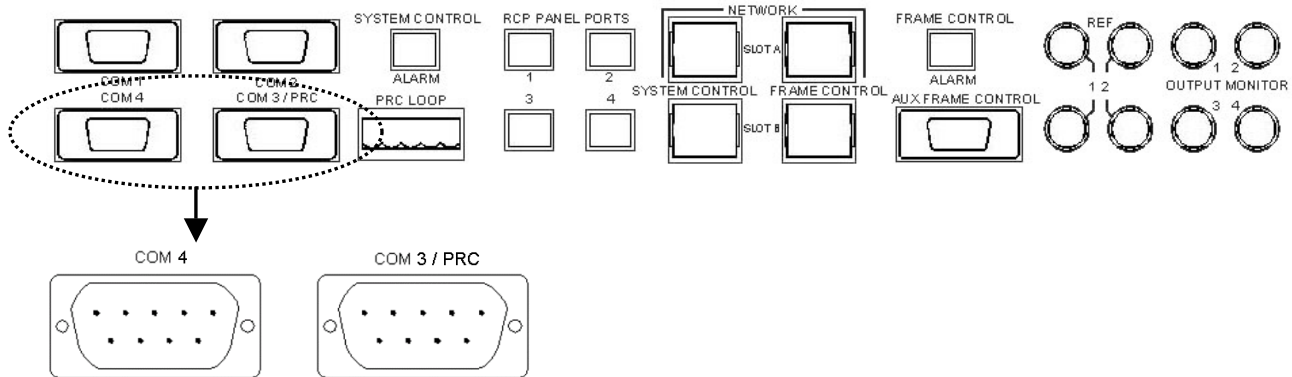
Protocol	Document Number
CPU Link Protocol No. 1 Extensions (P1E)	81-9062-0408-0
Unsolicited Status Protocol (USP)	81-9062-0409-0

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 18. 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 3 on page 23.

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. The 3500Plus operating software determines when an alarm condition is declared. 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 19. The alarm is activated if it:

- 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).

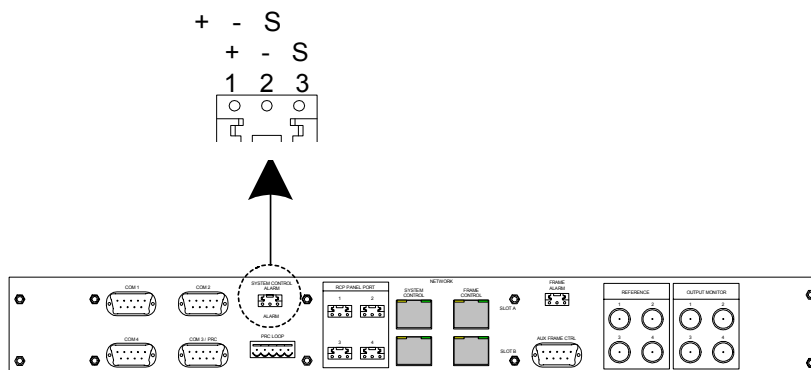
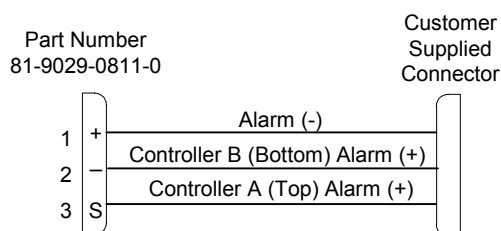
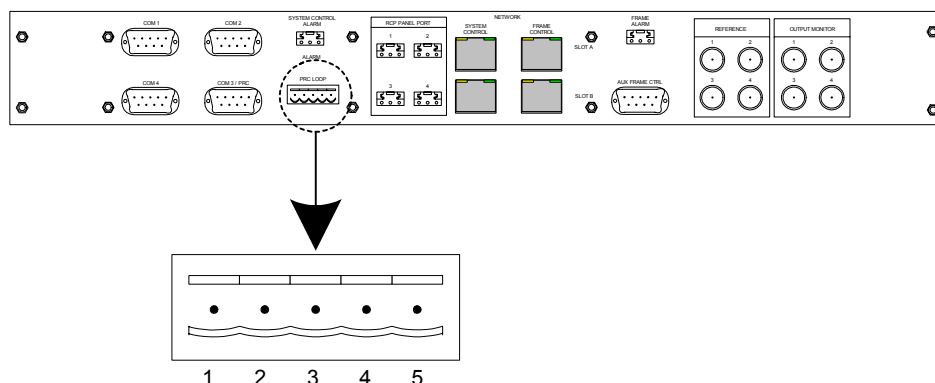


Figure 19. System Control Alarm Connector

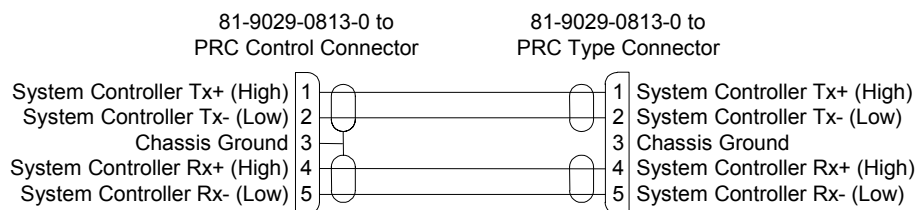
**Figure 20. Alarm cable**

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 Figure 19.

**Figure 21. 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 22. 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 figures, provide RS-485 serial communication interfaces using the PESA RCP Protocol (Document No. 81-9062-0300-0).

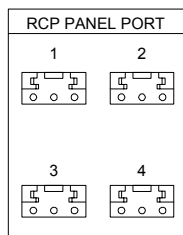
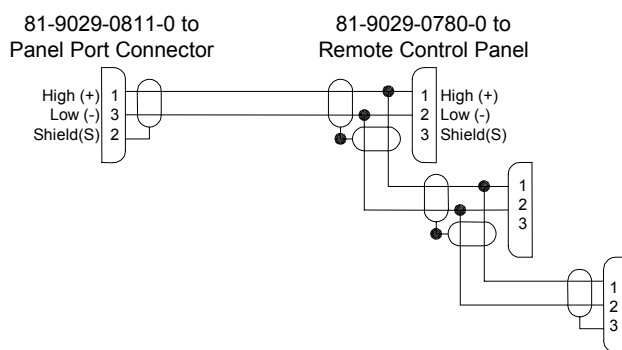


Figure 23. RCP Panel Port Connectors

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 that requires the use of a nylon cable tie included with the connector. If this cable tie is not available, use PESA Part No. 81-9021-0028-8.



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

Figure 24. 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 55.

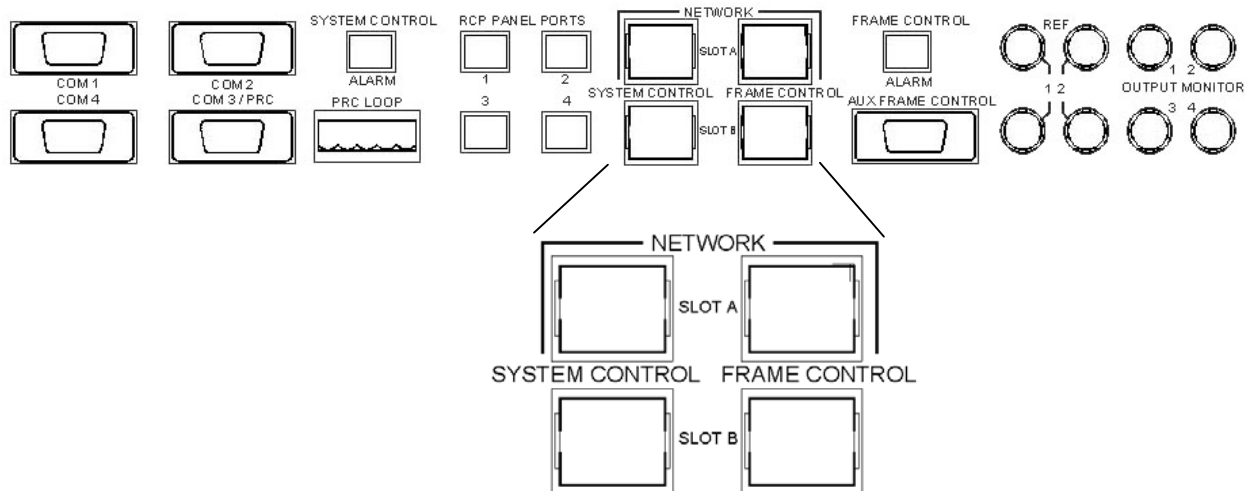


Figure 25. Network Connectors

LED indicators are provided as follows:

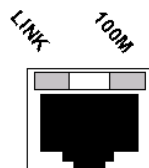


Table 9. Ethernet LED Indicators

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.

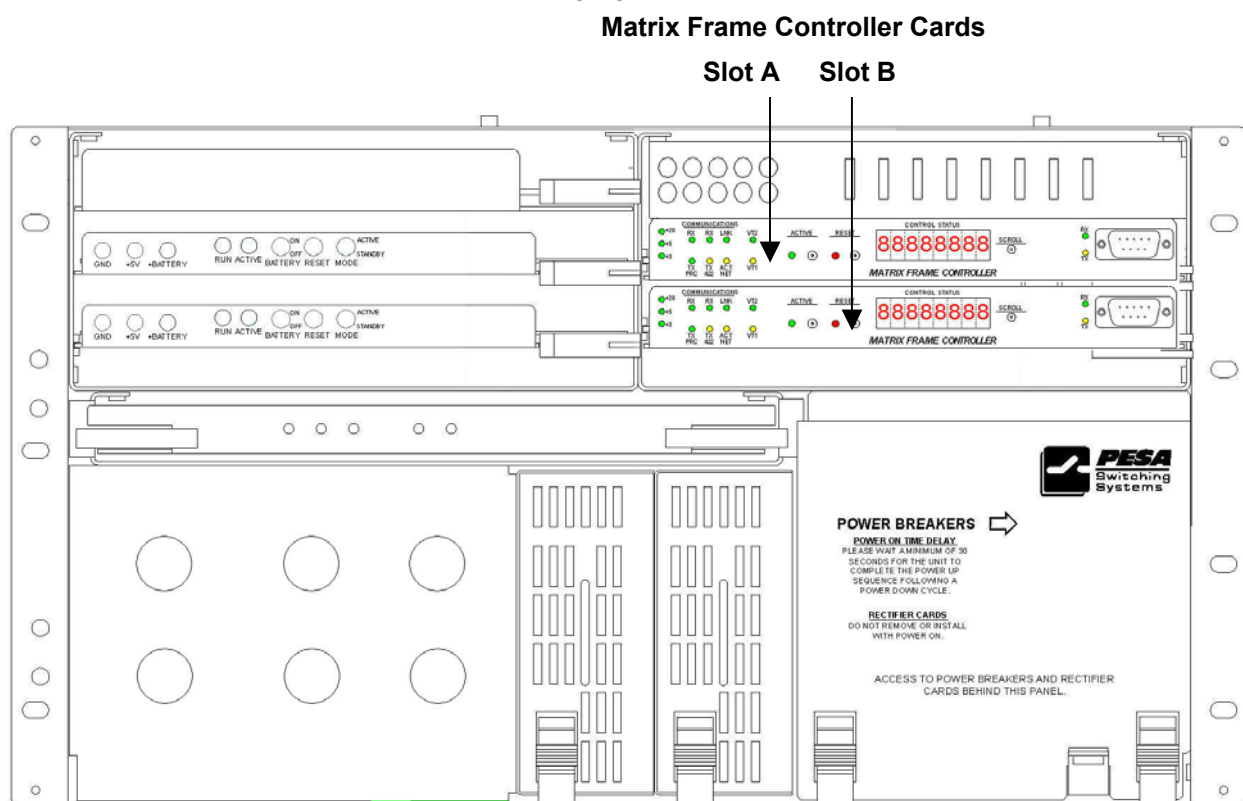


Figure 26. Matrix Frame Controller Cards, Slot A and Slot B

2.16.7 Frame Control Alarm Connector

This three-pin connector, illustrated in Figure 24, provides an interface for an external, customer-supplied frame control alarm. Alarm contact locations are illustrated in Figure 25. The 3500Plus operating software determines when an alarm condition is declared. 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 25. The alarm is activated if it:

- 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.

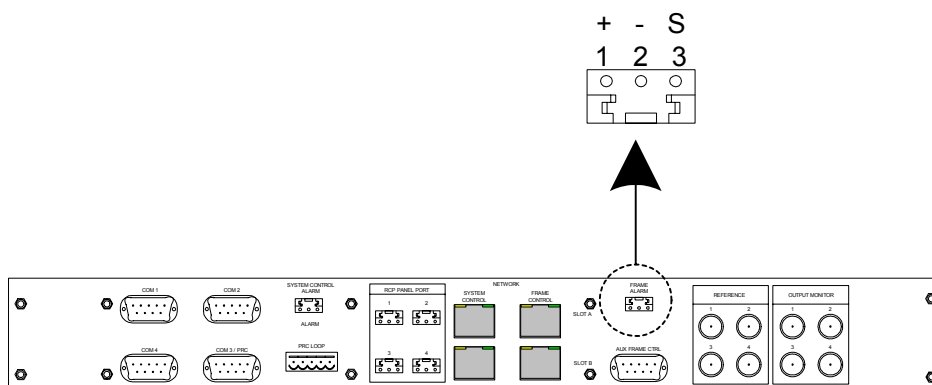


Figure 27. Frame Alarm Connector

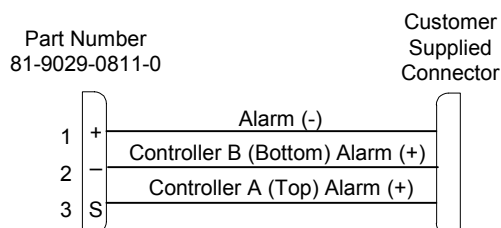


Figure 28. Alarm cable

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 58.

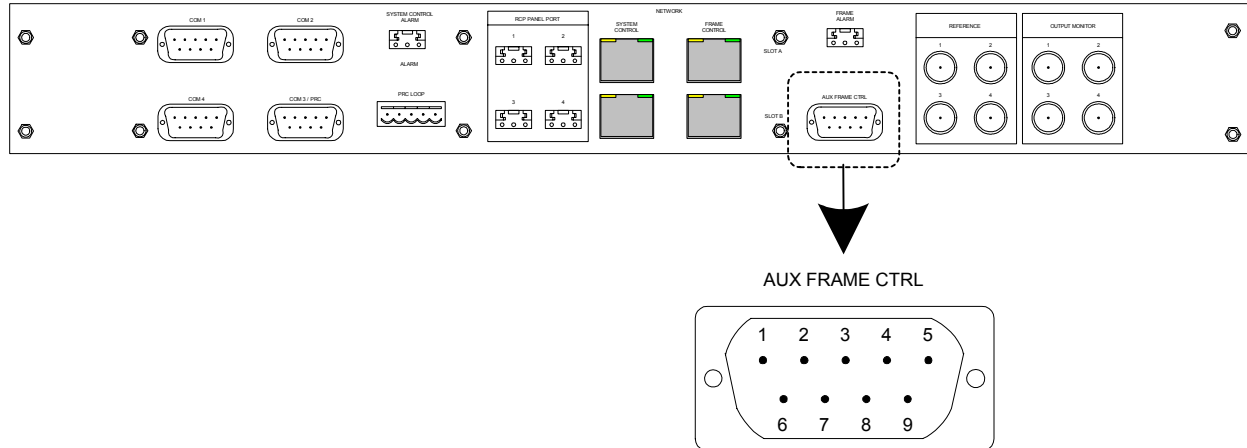


Figure 29. Aux Frame Control Connector

Table 10. Aux Frame Control 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 Reference Input Connectors

These BNC coaxial connectors, illustrated in the following figure, provide the interface for two pairs of house sync (analog only) signals (NTSC, PAL, 1080i, 1080P, and 720P only). The connects labeled “1” are a pair, and the connectors labeled “2” are a pair. Each pair can use any of the signals listed above. Each house sync input connector is a pair of BNC connectors wired in parallel. This allows the signal to be daisy-chained from one routing switcher to another.

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

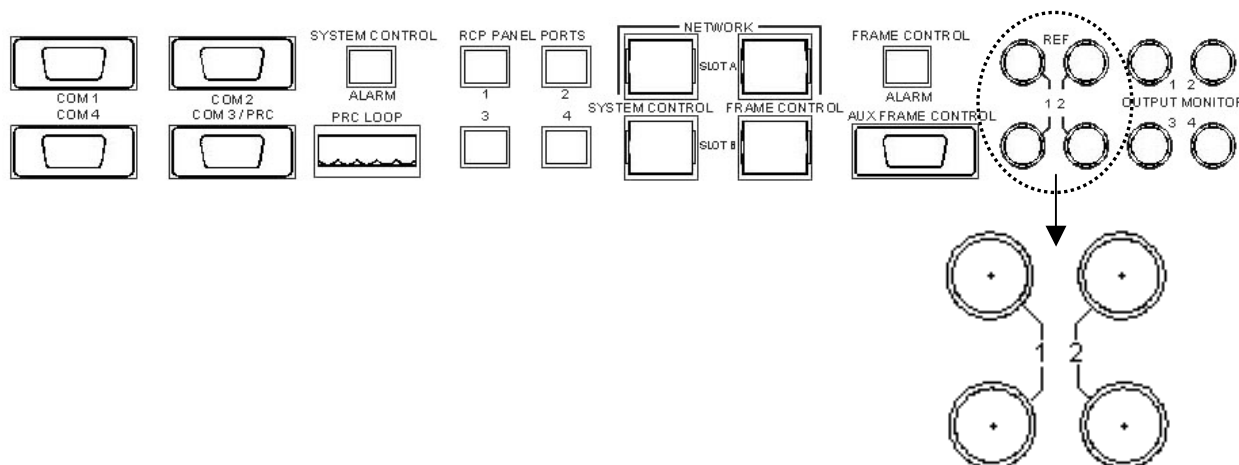


Figure 30. Reference Input Connectors

2.16.10 Output Monitor Connectors

These BNC coaxial connectors, illustrated in the following figure, provide the interface for evaluating the output signals. 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. Make sure the Output strobe is set correctly before using this option (see page 13 for details). Install 75 ohm terminators on all unused connectors. Do not allow these connectors to float unterminated

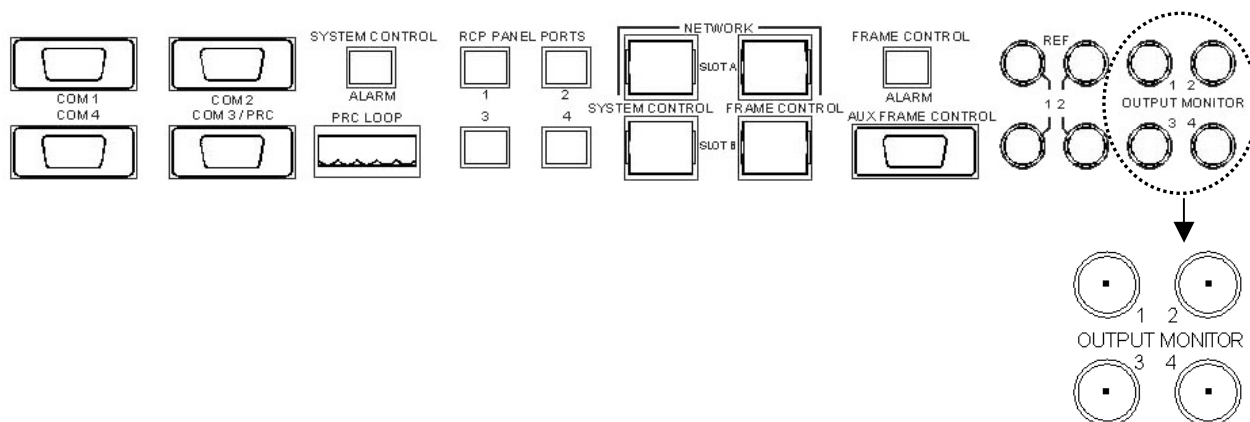


Figure 31. Output Monitor Connectors

2.17 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 connectors are numbered 1 through 16, starting at the left of each card, as shown below.

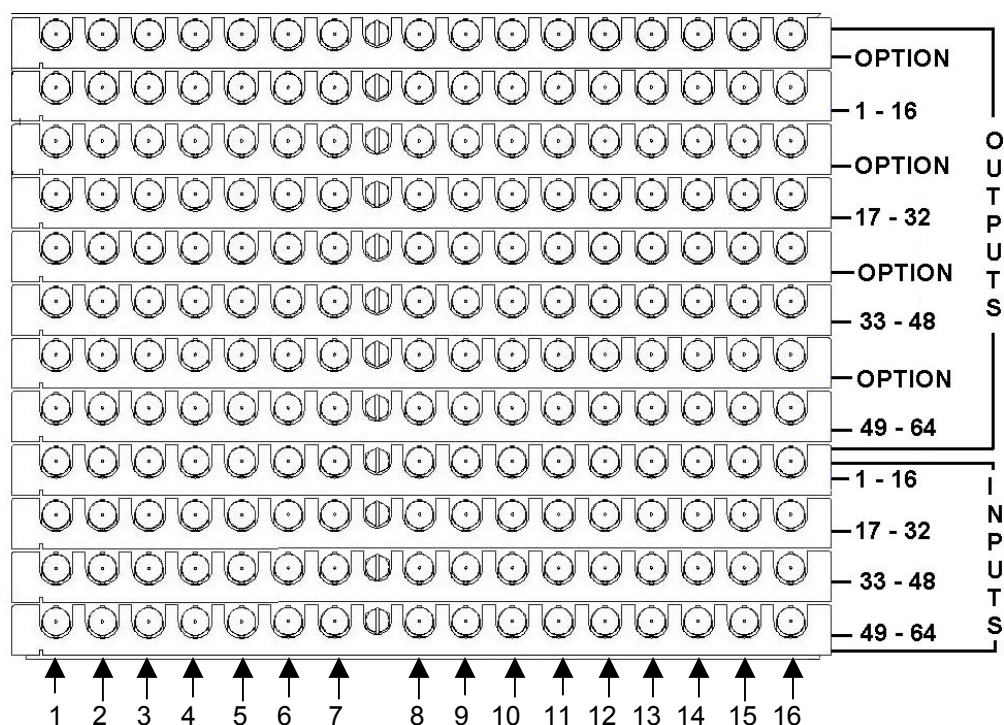


Figure 32. Input/Output Signal Connectors (rear view)

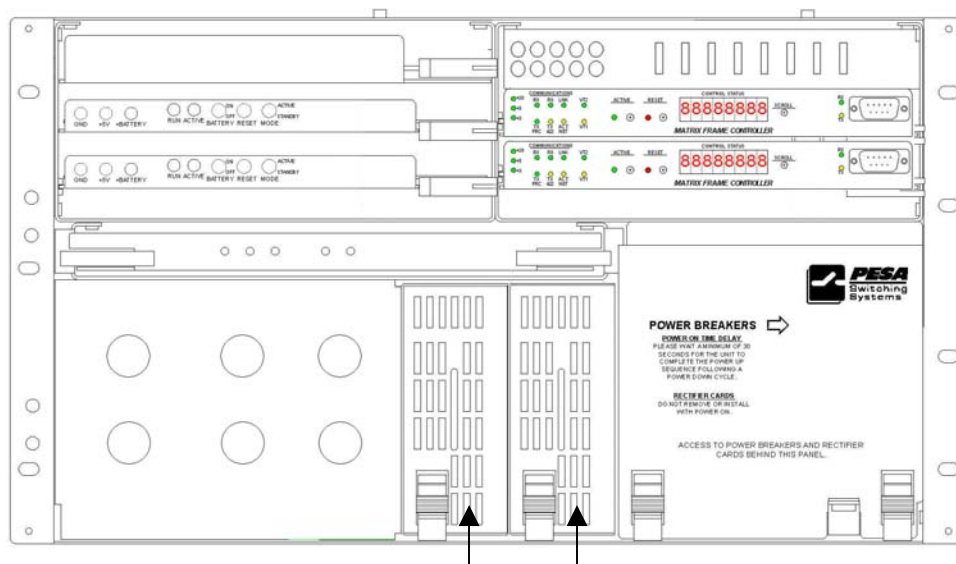
2.18 Switch Locations and Settings

2.18.1 Power Supply Backplane Dip Switches

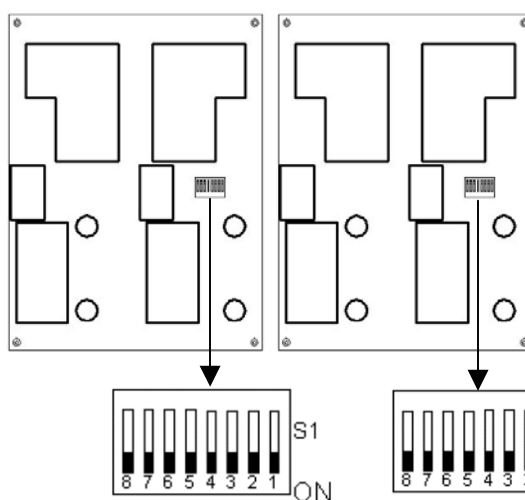
Each power supply backplane has one eight-position, slide-style switch consisting of eight single-pole single-throw (SPST) switches numbered 1 through 8. The following figure depicts the location of these switches with the power supplies removed, and the dip switch settings. See Figure 4 on page 9 for power supply locations.



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



Power Supplies



**Dipswitch locations
(behind the power
supplies)**

Figure 33. Power Supply Backplane Dip Switch Locations and Settings (viewed from the front of the frame)

2.18.2 Input/Output Backplane Dip Switches

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



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

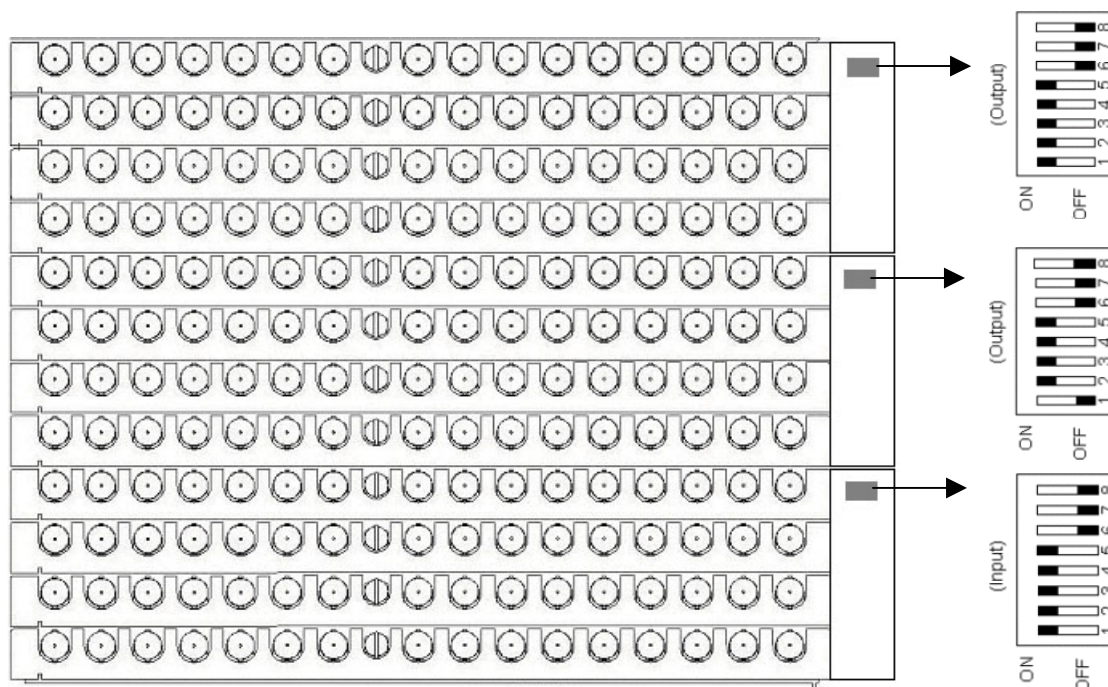


Figure 34. Input/Output Backplane Dip Switch Locations and Settings (viewed from the rear of the frame)

2.19 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 28 on page 30.
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.

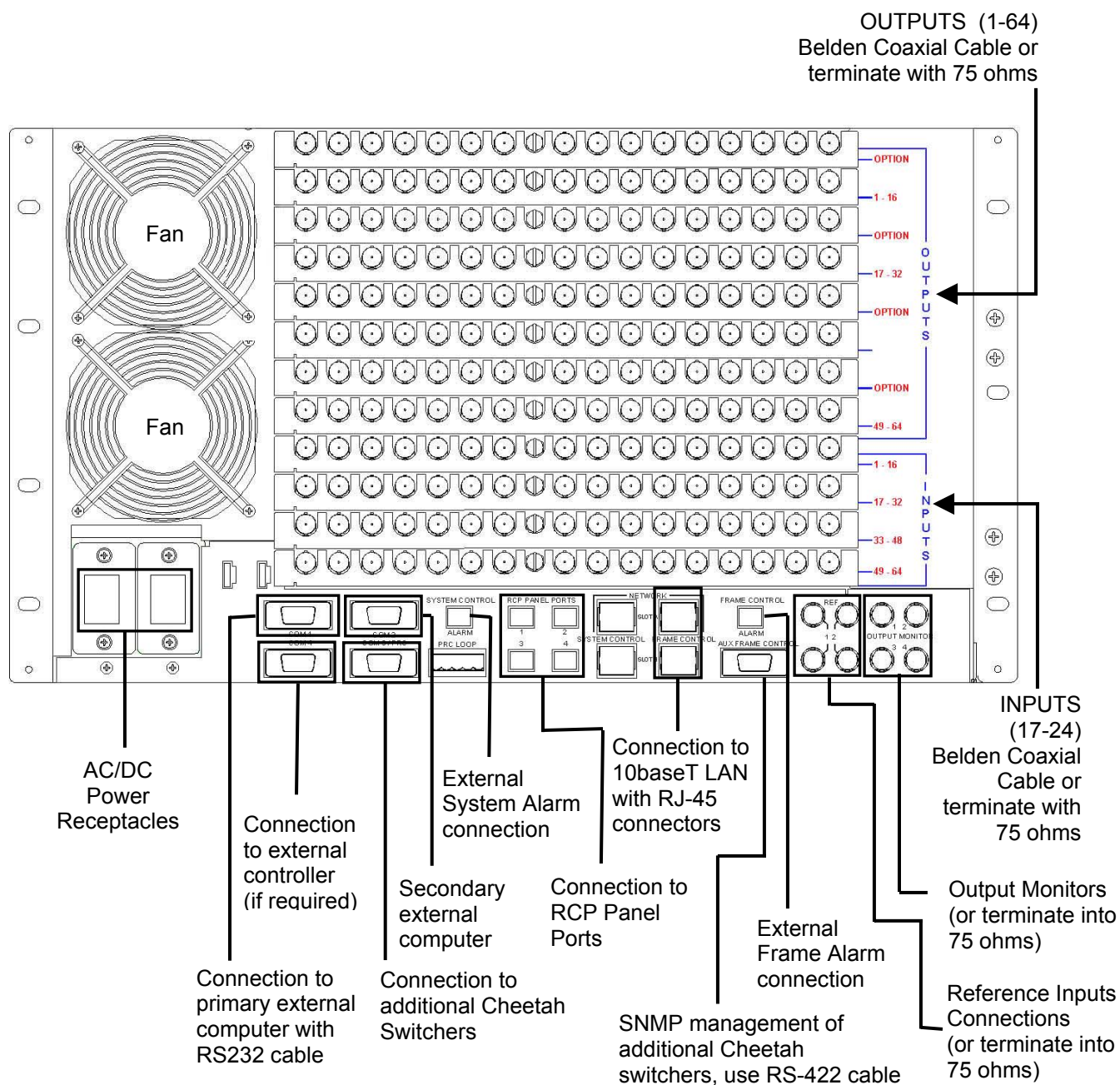


Figure 35. Rear Panel Connections

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 LED Indicators

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

Table 11. 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 LED Indicators

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

Table 12. 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 Connectors 1 and 2 located on the back (lower right) of the Cheetah. See section 2.16.10, Output Monitor Connectors, on page 32 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 13.

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.

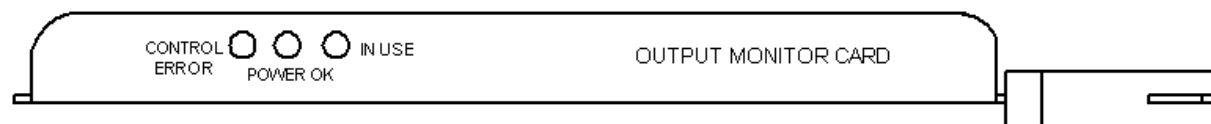


Figure 36. Output Monitor Card

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 13.

Table 13. 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.

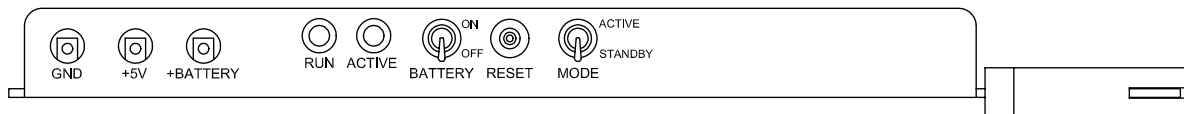


Figure 37. 3500Plus System Controller Board Assembly Front View

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 14. 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	<p>Indicates that input voltage to this board is within design parameters.</p> <p><u>If LED is OFF:</u></p> <ol style="list-style-type: none"> 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	<p>Indicates that the board is currently in active control of a routing switcher system.</p> <div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 10px;">  <p>NOTE</p> </div> <p>In a dual controller system, the primary controller ACTIVE LED will be ON and the backup controller ACTIVE LED will be OFF.</p> </div> <p><u>If the LED is OFF:</u></p> <ol style="list-style-type: none"> 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.

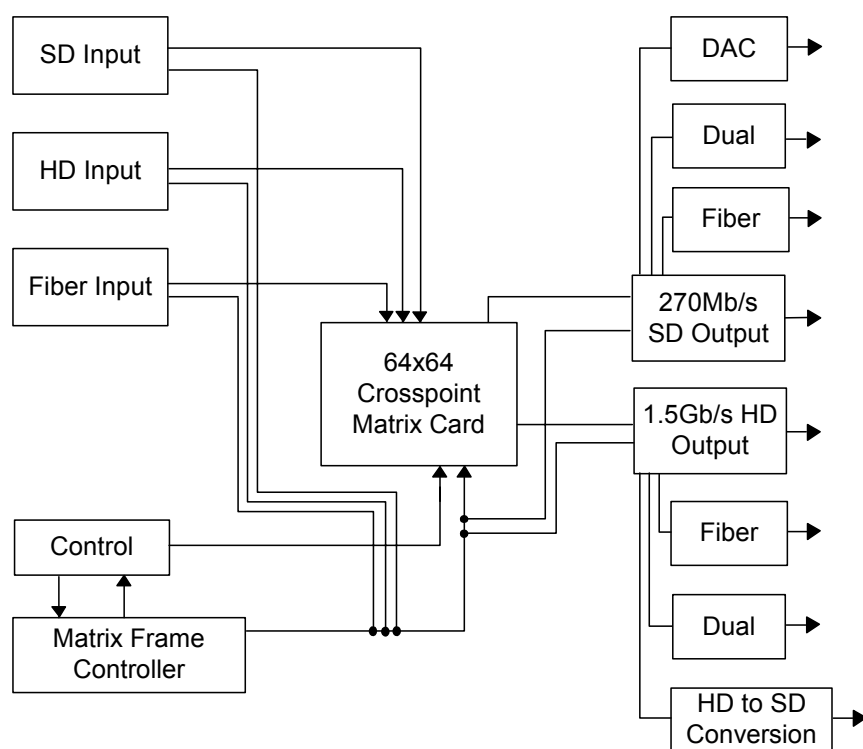


Figure 38. 64x64 Crosspoint Matrix Card Diagram

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 13.

**Figure 39. 64x64 Matrix Card LEDs****Table 15. Matrix Card LED Descriptions**

LED	Color	Status	Description
+28V	Green	On	Indicates that the +28V power 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 +3.3V power 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 +2.5V power 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 92.

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 58 for details on Ethernet configuration options.

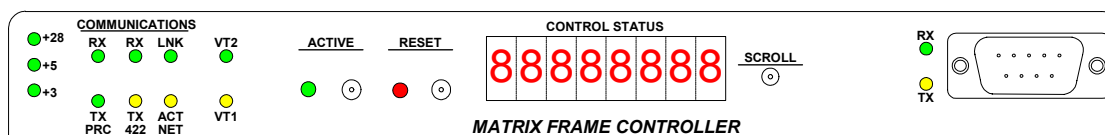


Figure 40. Matrix Frame Controller

3.6.1 LED Indicators

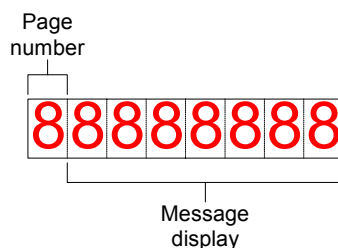
The matrix frame controller LED indicators are described in Table 9.

Table 16. 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 41. 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 10 on the next page.

Table 17. 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!

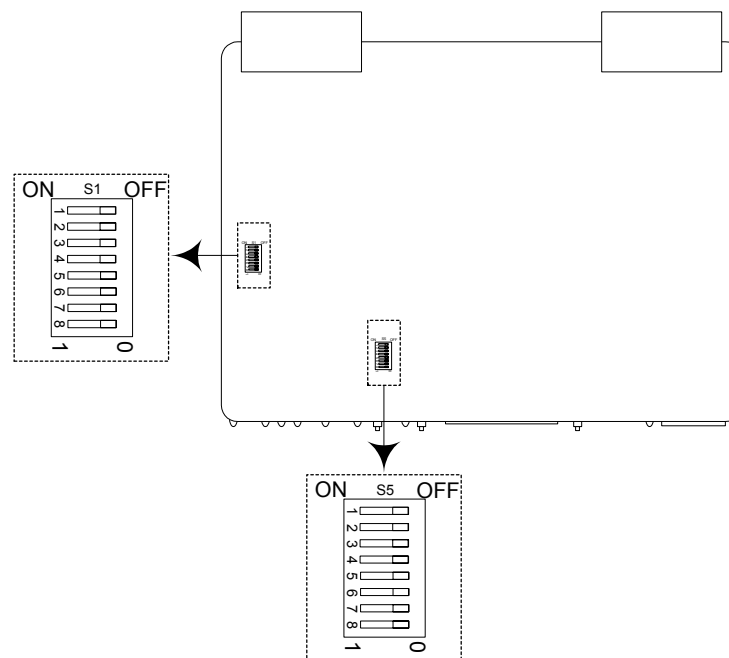


Figure 42. Matrix Frame Controller Dip Switch Locations

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.

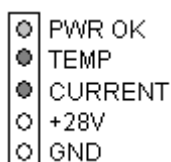


Figure 43. Power Supply LED Indicators and Test Points

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 14. See Table 19 on page 49 for troubleshooting information.

Table 18. 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 19. 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 and 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 20. 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 +28V power 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 21. 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 22. 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

Table 23. Input Board LEDs Continued

LED	Color	Status	Description	Action Required
+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
81-9059-0426-0	3500Plus Control Software Manual

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 24. 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 # : EEEEEEE000000001
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-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 D. - 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.

D.1 Port Setup

Baud Rate: 38,400

Data Bits: 8

Stop Bits: 1

Parity: None

Flow Control: None

D.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.

D.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.

D.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.

D.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 [<FAIL>]

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

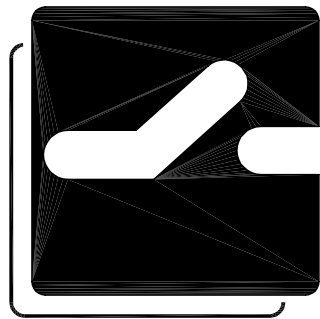
CF – Clear All Flags

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