TECHNICAL MANUAL

COUGAR 3 GEN SERIES
3GBPS COMPATIBLE
VIDEO ROUTING SWITCHER

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Thank You !! for purchasing your new PESA video router. We appreciate your confidence in our products. PESA produces quality, state-of-the-art equipment designed to deliver our users the highest degree of performance, dependability and versatility available anywhere. We want you to know that if you ever have a concern or problem with a PESA product, we have a team of engineers, technicians and customer service professionals available 24/7/365 to help resolve the issue.

Our commitment is to continue earning the trust and confidence of our customers throughout the industry by incorporating cutting-edge technology into the highest quality, most cost effective products on the market. And we would like to invite you to tell us how we're doing. If you have any comments or suggestions concerning your PESA equipment, please contact our Customer Service Department.

Again, thank you for choosing PESA and we look forward to a long-term partnership with you and your facility.

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As of publication, this product had not completed FCC compliance testing.

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Chapter 1 Introduction

1.1 DESCRIPTION

PESA's Cougar 3Gen Series Router is a 32 input, 32 output video router compatible with SDI video signals up to 3Gbps, 1080p resolution. Figure 1-1 is a front and rear view of a typical Cougar 3Gen with the front cover in place.

Figure 1-1 Cougar 3Gen Video Router – Typical Rack Unit (Front & Rear View)

1.2 FEATURES

- 1RU Frame supports 32 Inputs and 32 Outputs
- Available as 16X16 or 32X32
- Auto-EQ on all inputs and Auto Re-clocking on all outputs
- Supports SMPTE 259M, SMPTE 292M and SMPTE 424M to 3Gbps
- Compatible with PESA's 3500PRO and PERC2000 system controllers and the full line of Cheetah remote control panels

1.3 SPECIFICATIONS

Digital Video Specifications

INPUTS/OUTPUTS

Number	16 or 32
Type	Standard 75 Ohm, self-terminating, unbalanced BNCs with auto-EQ. conforming to SMPTE259M, SMPTE292M and SMPTE424M.
Return Loss	≥15dB 1MHz to 1.5GHz; ≥10dB, 1.5GHz to 3GHz.
Equalization	300m auto-equalization Belden 1694A or equivalent at 270Mbps.; 100m auto-equalization Belden 1694A or equivalent at 1.5Gbps; 80m auto-equalization Belden 1694A or equivalent at 3Gbps
Level	800mVpp, ±10%

SIGNAL SPECIFICATIONS

Rise/Fall	≤ 600ps +/-10% SD SMPTE259M; ≤ 270ps HD SMPTE292M; ≤ 135ps 3G SMPTE424M.
Overshoot	≤ 10% of amplitude max.
Alignment Jitter	≤ 0.2 UI from 100kHz to 150MHz SMPTE259M or SMPTE292M; ≤ 0.3 UI from 150MHz to 300MHz SMPTE424M.
Timing Jitter	≤ 1.0 UI from 10Hz to 100kHz SMPTE259M or SMPTE292M; ≤ 2.0 UI from 10Hz to100kHz SMPTE424M.
Reference Inputs	Two independent 75 ohm BNC connectors, 0.5Vpp to 2.0Vpp; PAL, NTSC or Tri-Level sync.
Data Rates	143Mbps to 3Gbps
Form Factor	1RU

Environmental & Miscellaneous

Control	Supports single-bus, multi-bus and XY control panels, using external system controller.
(Serial 422 PRC I/F)	4-wire, full duplex, multi-drop, serial RS422 port capable of accepting QuStream/PESA PRC control protocol.
AC Input Connections	IEC 320C6 socket (accepts IEC 320 C5 line cord)
Input Voltage	90-260 VAC, 47-63Hz
Operational Temp	0-40 degrees C
Operational Humidity	90% Non-condensing

Chapter 2 System Architecture

2.1 OVERVIEW OF SYSTEM ARCHITECTURE

Figure 2-1 illustrates typical component layout and locations for the Cougar 3Gen. Chassis layout consists of a Backplane Assembly, Main Circuit Card, Mid-Plane Assembly and up to two Power Supply/Fan Controller Modules.

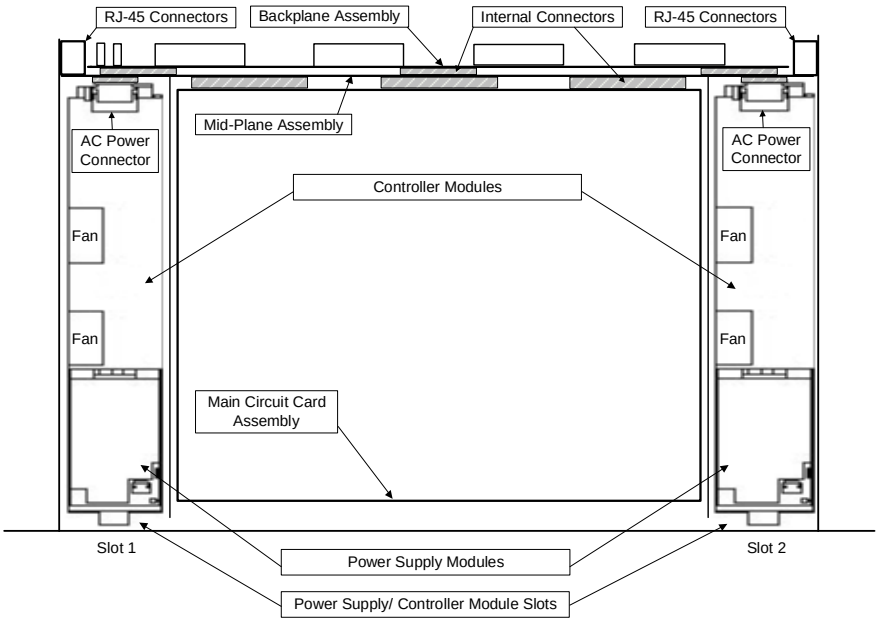

Figure 2-1 Frame Component Layout (Typical)

2.2 REAR PANEL LAYOUT

Rear panel connectors and switches are shown by Figure 2-2, and a brief introduction to their function is presented in the following paragraphs.

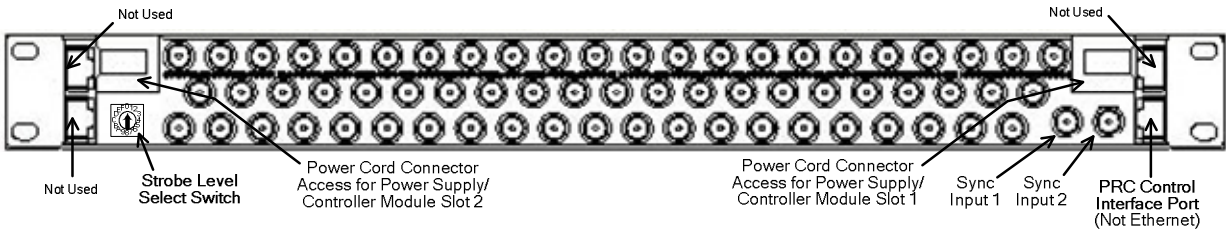

Figure 2-2 Rear Panel Connections

PESA Routing Control (PRC) Interface Port This port is the interface connection between the Cougar 3Gen router and the external system controller. When viewed from the rear of the frame the right-hand RJ-45 connector on the lower edge of the frame is the PRC Control Interface Port. A hook-up cable is provided to connect the RJ-45 connector on the Cougar 3Gen rear panel to the 9-pin "D" system controller PRC connector.

Sync Reference Connectors There is a pair of BNC connectors on the rear panel for connecting up to two independent sources of sync reference to the Cougar 3Gen. Either input may be selected as the active sync source through the controller GUI.

Strobe Level Select Switch This rotary switch selects the system strobe level for the Cougar 3Gen router. Any strobe level between 1 and 15 may be selected by rotating the switch to hexadecimal digit for the desired level setting. To set the router as strobe level 1, set the switch to position 1; to set level 15, set the switch to position F, etc.

Power Cord Connector Access Each power supply/controller module is fitted into a chassis slot (either slot 1 or slot 2). When a power supply is installed, its 3-prong input power receptacle is accessible through this opening on the frame rear panel. Each power supply carries its own dedicated power receptacle. Input power is not bussed between modules. When two power supplies are used (for redundancy) a separate power cord must be attached to each receptacle through its access port. Each access port is equipped with a harness device that secures the cord to help prevent accidentally disconnecting the frame from its power source.

There is one additional RJ-45 connector located above the PRC control interface port connector and two additional RJ-45 connectors located on the left-hand side of the rear panel, none of which are used in the current router configuration.

2.3 POWER SUPPLY/FAN CONTROLLER MODULE

This module contains the power supply circuitry, a pair of fans used to circulate cooling air through the chassis frame, and a controller circuit that controls operation and reports status of the on-board cooling fans. The power supply is constructed as a modular unit that can slide into either of the two available slots in the chassis frame. In redundant power supply applications, a power supply/fan controller module is used in both slots of a chassis frame to provide power redundancy. A typical power supply/fan controller module is shown in Figure 2-3.

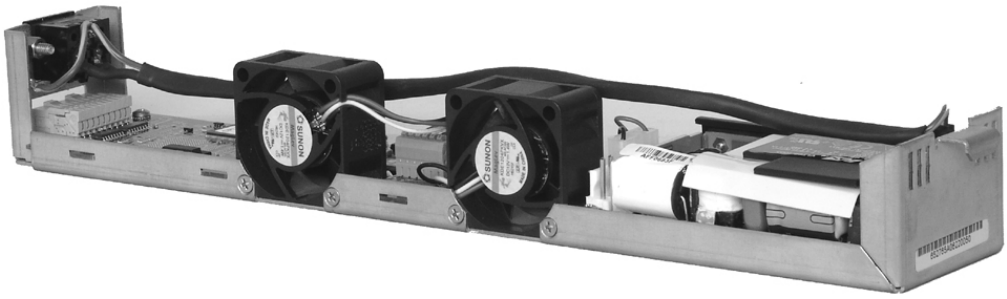

Figure 2-3 Power Supply/Fan Controller Module (Typical)

Chapter 3 Installation

3.1 MOUNT YOUR COUGAR 3GEN ROUTER IN AN EQUIPMENT RACK

	**Make sure the frame power cords are disconnected from the power source before installing the frame into an equipment rack.**
	**Fans that are mounted inside of this equipment provide forced-air cooling. Do not block airflow around these fans.**

Cougar 3Gen is designed for installation in a standard 19" equipment rack. Provide sufficient space behind the equipment racks to allow for control, signal, interconnect and power cables; and around all sides for cooling. Use all chassis mounting holes, and tighten mounting hardware securely by using the rack equipment manufacturer's suggested torque settings.

Install equipment into racks as follows:

1. Carefully remove equipment from packing container.
2. Loosen two thumbscrews on each end of the chassis front cover and move cover away from chassis. The front cover must be removed from the frame in order to gain access to mounting ears and screw holes.
3. Insert chassis frame into equipment rack and support the bottom of the chassis while mounting hardware is installed.
4. Install the bottom two chassis mounting screws.
5. Install the top two chassis mounting screws.
6. Install Rear Support Rails (Paragraph 4.2)
7. Tighten all chassis mounting screws until they are secure.

3.2 INSTALL REAR SUPPORT RAILS

Your Cougar 3Gen router is shipped with a Rear Rack Rail Kit. It is essential that this kit be installed as part of the mounting procedure for the frame. Major components included with the kit are shown in Figure 3-1. Each kit consists of two rear rack rails, two rail mounting ears and four screws (not shown) to attach rails to the frame.

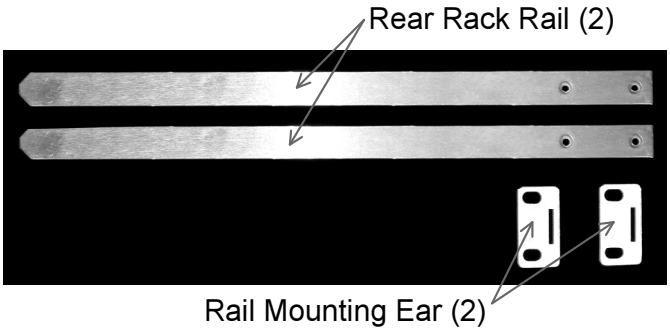

Figure 3-1 Rear Rack Rail Kit

Install the Rear Rack Rails as follows:

1. Mount chassis in equipment rack at the desired location and secure chassis into rack with four rack mounting screws (not supplied).

2. Install one Rear Rack Rail to chassis at the two Rack Rail Attachment Points using two Mounting Screws as shown in Figure 3-2.

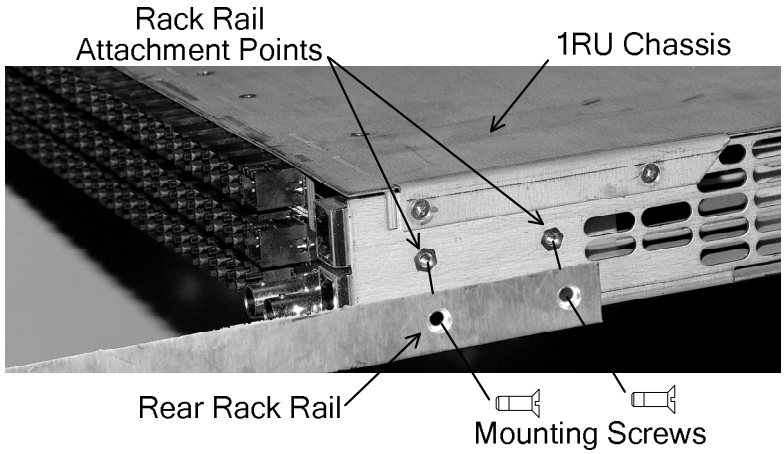

Figure 3-2 Rear Rack Rail Mounting – Typical 1 RU Chassis Installation

3. Repeat Step 2 on opposite side of Chassis using second rack rail and remaining two mounting screws.

4. Figure 3-3 shows the rear of the chassis with both rack rails installed.

Figure 3-3 Rear Rack Rails - Installed

5. Install one of the Rack Rail Mounting Ears by aligning the rectangular cutout in the mounting ear with one of the rack support rails previously installed and sliding the mounting ear onto the rail. Ensure that the two screw holes in mounting ear face to outer edge as shown in Figure 3-4

6. Secure mounting ear to rear rail of equipment rack using two rack mounting screws (not supplied) as shown in Figure 3-4. Be sure that the screw holes in the mounting ear align with screw threads in the equipment rack in such a way that the chassis is level in the equipment rack from front to rear as shown in Figure 3-5.

7. Repeat Steps 5 and 6 for the remaining mounting ear and rack rail.

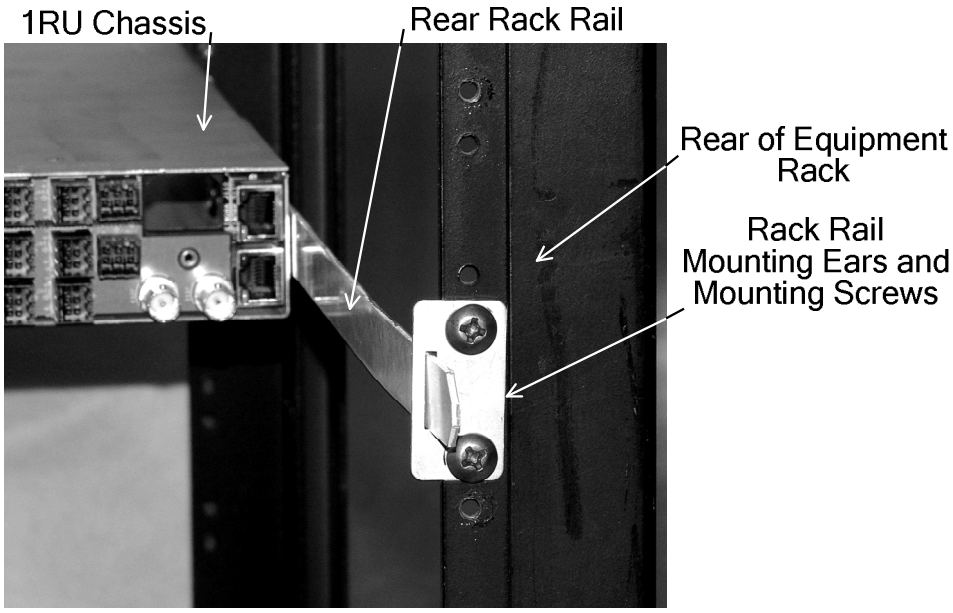

Figure 3-4 Rack Rail Mounting Ear Installation for Typical 1 RU Chassis

Figure 3-5 Installed Rear Rack Support System

3.3 CONNECT EQUIPMENT CABLES

Use the following guidelines when connecting equipment cables:

Install equipment in rack before connecting cables.

Relieve strain on all cables to prevent connector separation.

To the greatest extent possible, separate control, signal, and power cables

Route cables away from physical traffic areas to avoid creating a safety hazard (trip or shock).

3.3.1 VIDEO CONNECTIONS

There are 64 BNC I/O connectors on the Cougar 3 Gen rear panel, 32 each for video input and output signals, as shown in Figure 3-6. Carefully follow the connector layout when completing video connections to the Cougar 3Gen router to prevent inadvertent signal swapping.

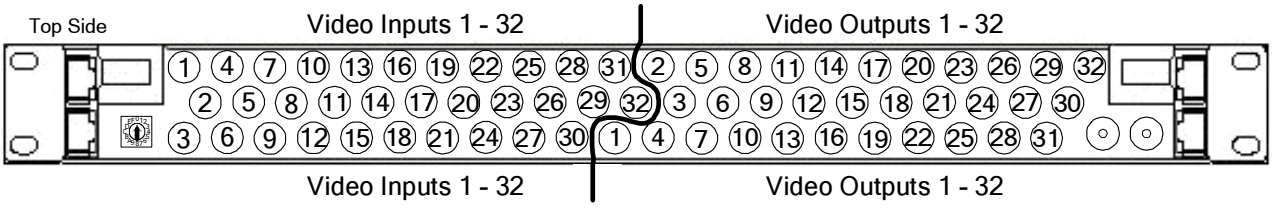

Figure 3-6 Cougar 3Gen Rear Panel – Connector and I/O Channel Identification
(Viewed From Chassis Rear)

3.3.2 CONTROL SYSTEM CONNECTION

The Cougar 3Gen must be connected to an external PESA 3500PRO or PERC2000 System Controller through the PESA Router Control (PRC) interface protocol. An adapter cable is provided with the router to connect the RJ-45 PRC Interface Port of the router to the female 9-pin "D" PRC cable. Install the adapter as shown in Figure 3-7, and connect one end of the PRC hook-up cable to the male end of the adapter.

System controller cards may be mounted in a stand-alone chassis frame, or may be installed in a Cheetah Series video matrix switcher. Regardless of where the controller is located, connect the remaining end of the PRC cable to the "COM3/PRC" port on the chassis. A single controller stand-alone chassis is shown in Figure 3-7 as an example. Regardless of which controller installation method is used in your system, the rear panel port labeled "COM3/PRC" is used to complete the connection with the Cougar 3Gen frame.

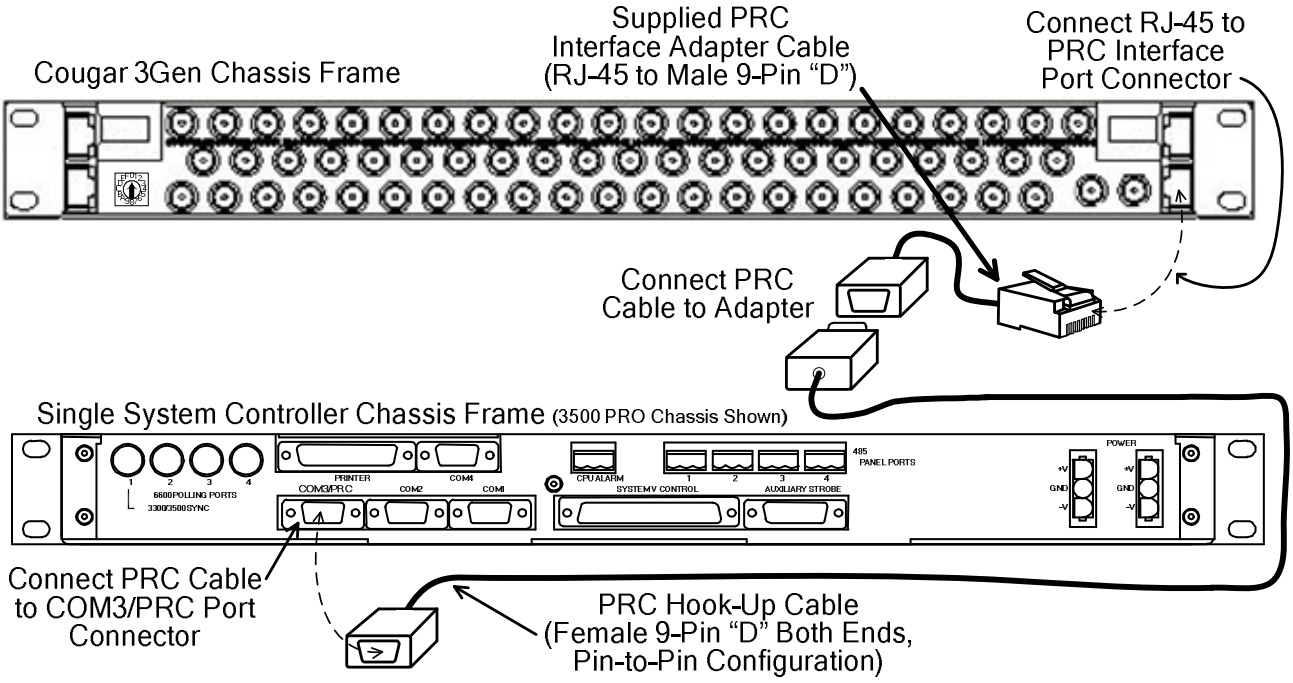

Figure 3-7 Control System Connection

3.4 SELECT FRAME STROBE LEVEL

Strobe level in router configuration files may be thought of as a hardware address. In systems with only one router, such as a stand-alone Cougar 3Gen, the strobe level is normally set to 1. In systems with multiple router frames, such as a Cheetah router for analog signals, a DRS system for audio and a Cougar 3Gen for routing SDI signals, strobe level identifies to the controller which hardware component contains a particular input or output signal for a desired switching function.

This switch setting is normally made at the factory and should not need to be changed. If for any reason you ever need to select a different strobe level for the Cougar 3Gen router, simply use a small blade screwdriver to set the switch position to the desired strobe setting. Settings are entered in a hexadecimal numbering system.

3.5 POWER CONNECTIONS

Power for the Cougar 3Gen router is derived from wall receptacles. No special direct wiring or heavy gauge wire is required for this equipment. There are two power connector access ports, one located on the upper left-hand side and the other on the upper right-hand side of the rear panel These ports allow access to the power receptacle on the power supply/controller module located in the slot associated with each. In a non-redundant power installation, only one of the slots will have a power supply module installed. Attach the power cord through the proper access port to the receptacle on the power supply module. Each power supply carries its own dedicated power receptacle. Input power is not bussed between modules. When two power supplies are used (for redundancy) a separate power cord must be attached to each receptacle through its access port.

Each access port is equipped with a harness device for the input power cord that secures the cord to prevent accidentally disconnecting the frame from its power source. To use the harness, slip the groove on the power cord connector end horizontally into the opening of the harness.

Connecting the power cord to a source of power immediately applies power to the router. Do not apply power for the first time until all signal and control connections have been made and verified.

3.6 INITIAL POWER-UP

Before applying power for the first time, please take time to go back over your installation:

- Check for electrically sound connections, proper connector placement and possible wiring errors.
- Check that the router circuit card and power supply/controller modules are securely installed.

There are no power switches on the router; power is applied simply by connecting the main power cord to a source of primary power. Systems with redundant power supply/controller modules have two main power cords per frame, each of which must be connected to source of primary power.

- Apply power to all frames in the system.
- Wait a few seconds for each frame to perform processor boot-up, and observe status of the ERROR LED located on front edge of the main circuit card as shown by Figure 3-9.
- This LED will initially light upon application of power, but should extinguish after the on-board processor has completed start-up.
- Verify that the LED is off.

Figure 3-8 ERROR LED Location

- Once the initial power-up procedure is completed, replace front panel by aligning front panel and tightening two thumbscrews, Figure 3-10.

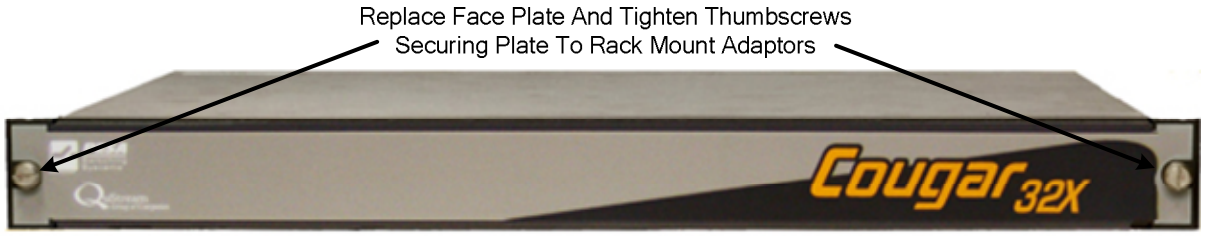

Figure 3-9 Front Panel Replacement

Chapter 4 Operation

4.1 AN INTRODUCTION TO THE PESA ROUTER CONTROL SYSTEM

There are no user operating controls contained on the Cougar 3Gen chassis frame. All router operations are performed through the router control system.

Every PESA router installation has two control system components: frame controllers and a system controller that interface with one another through a communication protocol. A frame controller is located in every router; and, as the name implies, is the control component for functions within the particular frame in which it is installed. In a typical router installation, there is only one system controller, or two in a redundant control system. The system controller interfaces with all frame controllers, remote control panels and a host computer. Its function is to oversee operation of the entire router installation through commands and communication with the individual frame controllers.

Cougar 3Gen includes the frame controller function on the main circuit card and interfaces with an external system controller through the proprietary PESA Routing Control (PRC) communication bus. Both the PESA 3500PRO and PERC2000 system controllers communicate via the PRC protocol, and either may be used with the Cougar 3Gen video router. One of the key differences between the two controllers is the ability of the PERC2000 to communicate with external devices via a 10/100 Ethernet communication protocol. Ethernet communication is required between the system controller and certain products in the PESA family, such as the Cheetah DRS audio router.

If the Cougar 3Gen is added to an installation with other PESA routers, such as a Cheetah video matrix router or a DRS audio router, the system controller for these devices may be used to control the Cougar 3Gen router. In many installations incorporating a Cheetah video matrix router, the system controller is installed in the Cheetah router frame and is interfaced with the Cougar 3Gen through connectors on the rear panel of the router. Installations using the Cougar 3Gen as a stand-alone device have the system controller located in its own chassis frame.

With both the 3500PRO and PERC2000 controllers, the name is given collectively to the system controller circuit card assembly (CCA), its associated board-resident firmware and a graphical user interface (GUI) application that resides and runs on a Microsoft Windows™ based PC platform. Typical installations are shown pictorially by Figure 4-1 for the 3500PRO controller and Figure 4-2 for the PERC2000 controller.

In order for the system controller to operate, we must write a Router configuration file and load it into controller memory. This file contains programming data for individual sources and destinations such as where (frame and physical connector) each signal connects to the system, the type of signal and names we wish to associate with each; as well as switching levels, components, source groups, destination groups, and other system functions. In many installations, remote control panels are located at operator stations or consoles; these are programmed through the router configuration file and allow an operator to control designated functions of the router from a remote station. Refer to documentation supplied with the system controller for information on writing and using configuration files.

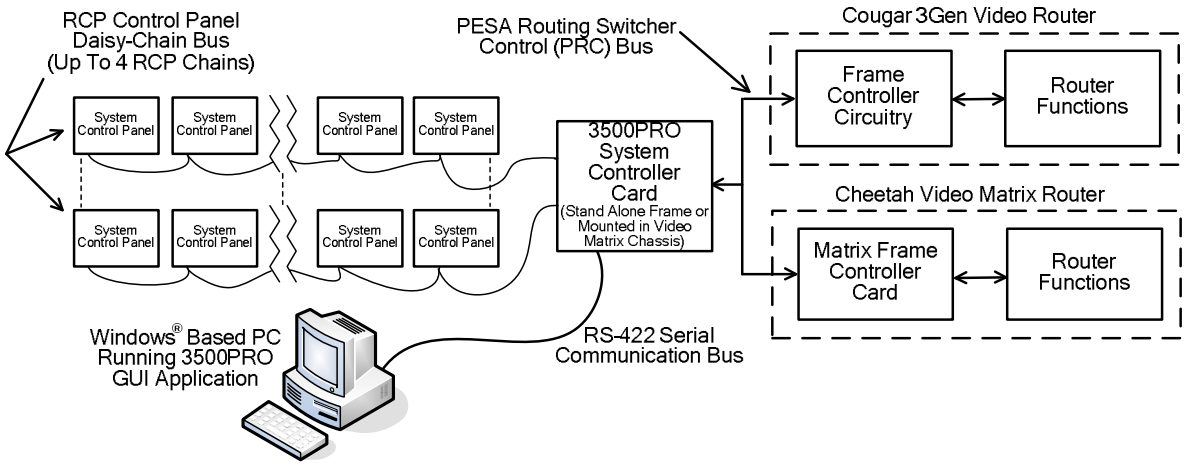

Figure 4-1 Typical Installation – 3500PRO Controller

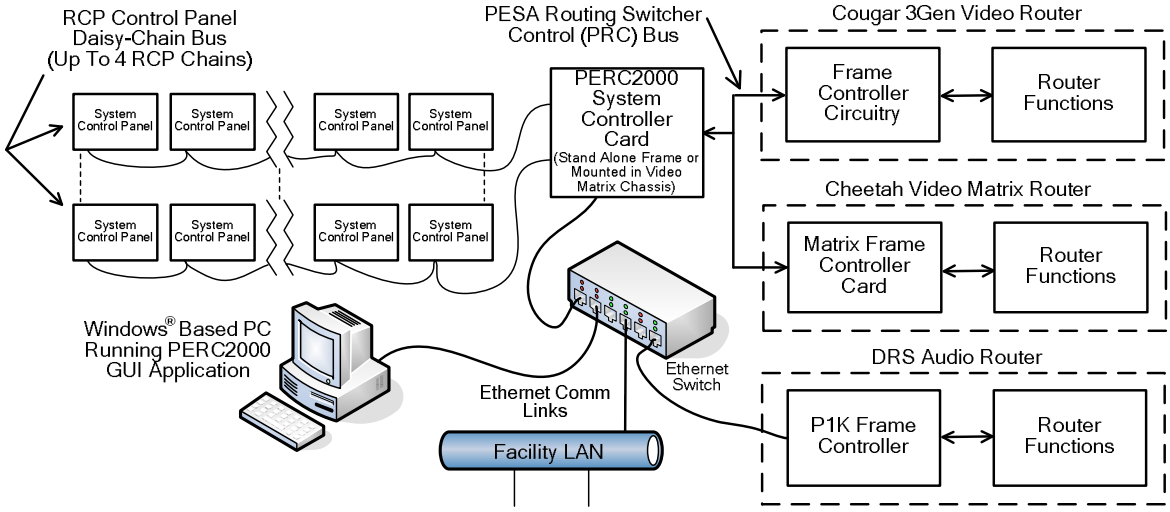

Figure 4-2 Typical Installation – PERC2000 Controller

4.2 GRAPHICAL USER INTERFACE

A major component of either system controller is the graphical user interface (GUI) software application. This application must be installed on a Windows™ based PC that serves as a "host" computer for router installation. Complete instructions for installing the GUI application are provided in documentation for the respective controller. All control and set-up operations for a Cougar 3Gen router are performed through the controller GUI.

Designing and configuring a routing switcher system, whether a single Cougar 3Gen router or a system with multiple routers, requires a thorough working knowledge of the hardware components and the operational modes and functions available to the user. Complete procedures for system configuration may be found in the technical manual for the system controller. A glossary of routing switcher terms and functions is provided in Chapter 5 of this manual.

Chapter 5 Glossary

AES/EBU AUDIO

Informal name for a digital audio standard established jointly by the Audio Engineering Society and the European Broadcasting Union.

ALL CALL

A diagnostic procedure that causes a single physical input to be switched to a range of physical outputs, for a specified component, with a single command.

Example: Assume the existence of component RED spanning physical inputs 1 through 6 and physical outputs 1 through 6. All call can be used to switch physical input 3 to physical outputs 2 through 6 with a single command.

See also: Diagonal.

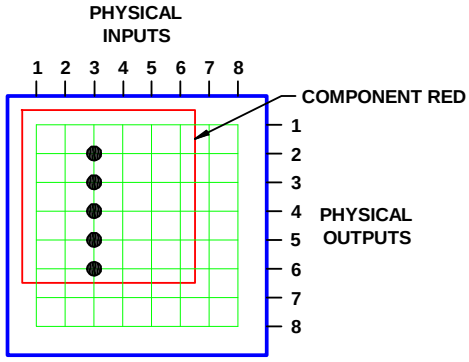

Figure 5-1 All Call

ANSI

American National Standards Institute.

BAUD

The number of times a communication signal changes state (voltage, frequency, etc.) in one second.

Generally, only one bit of information is encoded in each change of state for signals operating below 300 baud. At these speeds, baud equals the number of bits transmitted per second.

At 300 baud and above, communications standards generally allow more than one bit to be encoded in each change of state. For example, modems operating at 1200 bits per second, and conforming to the Bell 212A standard, operate at 300 baud using a modulation technique called phase modulation that transmits four bits per baud. At these speeds, data transmission rates are usually expressed in bits per second (b/s) rather than baud.

Baud was originally a unit of telegraph signaling speed, set at one Morse code dot per second. It was proposed at the International Telegraph Conference of 1927, and named after French Engineer J.M.E. Baudot (1845-1903).

BLACK BURST

A composite color video signal that has sync, color burst, and black video. It is used to synchronize other video sources to the same sync and color information.

See also: House Sync.

BLOCK

A group of contiguous crosspoints in a routing switcher that form the smallest unit on which confidence is checked.

Because of the nature of the circuits involved, individual crosspoints cannot be checked to see if they are operating correctly. Instead, the control circuitry shared by groups of crosspoints is monitored. These groups of crosspoints, called blocks, vary in size according to product type. Block size for RM5 routing switchers is 8 inputs by 2 outputs and block size for PRC routing switchers is 8 inputs by 8 outputs. If any block gives a confidence error, all crosspoints in that block are assumed to be non-functional.

BLOCK CHECKING

The continuous, sequential monitoring of confidence for each block in a routing switcher.

Block checking occurs automatically and continuously but can be disabled for troubleshooting purposes.

BLOCKED DESTINATION

See: Source Block.

BLOCKED SOURCE

See: Source Block.

BREAKAWAY SWITCH

A switch where multiple sources are switched to a single destination on multiple levels.

Example: Assume the existence of sources VTR1 and VTR2, and destination MON1, defined on levels VIDEO and AUDIO. If VTR1 is switched to MON1 on the VIDEO level, and VTR2 is switched to MON1 on the AUDIO level, a breakaway switch has been taken.

Table 5-1 Breakaway Switch

Destination	Source	
	Level: VIDEO	Level: AUDIO
MON1	VTR1	VTR2

See also: Follow Switch.

CATEGORY

Entities used to construct source, destination , and reentry names.

Categories provide an easy means of classifying and grouping switching system devices.

Example: The categories VTR, 1, 2, and 3 can be used to construct the source names VTR1, VTR2, and VTR3.

Category names:

1. Shall be created using only the following characters:

   Upper case letters A through Z

   Lower case letters A through Z if enabled in the control system software

   Numbers 0 through 9

   The following special characters: space ( ), hyphen-minus (-), exclamation mark (!), ampersand (&), plus sign (+), equals sign (=), commercial at (@), and low line (_)

2. Shall contain a minimum of one, and a maximum of eight characters.
3. Shall not begin with a space. However, they may end with a space, have embedded spaces, and consist of a single space.
4. Shall be unique in the universe of category names.

CHOP

To rapidly switch two different video signals into a monitor or other piece of test equipment. This is done to compare some signal characteristic, usually for quality control.

CHOP RATE

The parameter used to control the switching rate when chopping two signals. The signal switching rate is determined as follows:

$$\frac{\text{Video Frame Rate (frames/s)}}{\text{Chop Rate}} = \text{Signal Switching Rate (switches/s)}$$

Figure 5-2 Chop Rate

For example, a chop rate of 1 used with NTSC signals (30 Frames/Second) will cause the signals to be switched 30 times per second. A chop rate of 60 used with the same signals will cause them to be switched every two seconds.

COMPONENT

The most basic signal element that can be switched by a single crosspoint. For example, in RGB video, “Red”, “Green”, and “Blue” are components; in stereo audio, “Left” and “Right” are components.

In Matrix Space, components of like type are usually grouped together into rectangular matrices of crosspoints having contiguous inputs and outputs. These matrices are also referred to as components and are grouped together into levels.

Figure 5-3 shows a 2x2 RGB video level (VID) consisting of three components (RED, GRN, and BLU).

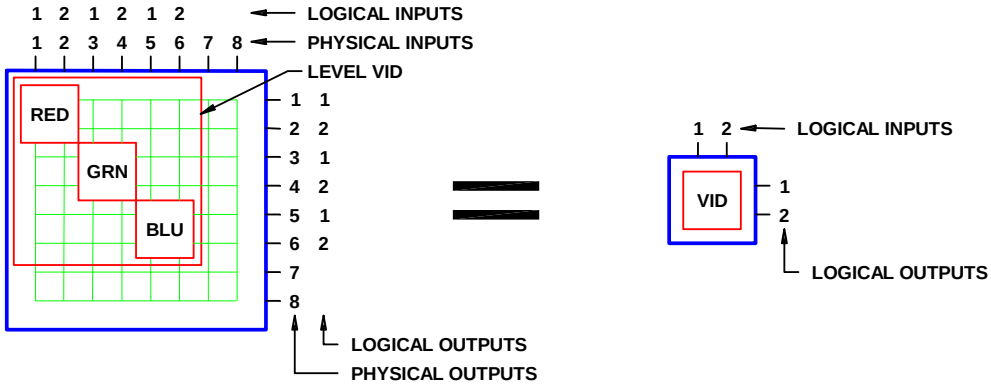

Figure 5-3. Component

As a general rule, users control the switching of levels, but component switching is handled automatically by the switching system. As shown in Figure 5-3 a user can specify a single logical switch, such as VID Input 1 to VID Output 2. This would result in the control system software taking three physical switches by activating crosspoints (1,2), (3,4), and (5,6).

Component names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

COMPOSITE VIDEO

A type of video signal that contains luminance, chrominance, blanking, and synchronizing information. NTSC, PAL, and SECAM are composite video signals, as opposed to RGB video which is not.

See also: Vertical Sync Signal.

CONFIDENCE

A property of a block that indicates whether or not the circuitry controlling the crosspoints in the block is functioning correctly.

When block checking determines that a block is not functioning correctly, the block is said to have a confidence error.

CONFIDENCE ERROR

See Confidence.

CONFIGURATION

A collection of system definitions that define the environment in which the system controller operates.

Each configuration is stored as a collection of files (.dbf or .txt) in a separate folder.

Configuration names may contain up to 32 alphanumeric characters.

CONFIGURATION LOCK

A security measure enabled when a configuration is being uploaded or downloaded.

A configuration lock is used to ensure that only one user at a time may download a configuration to the controller.

CONTROL PANEL

See: Panel.

CPU LINK

A bi-directional communication interface. A CPU link has two components: a serial port (either RS-232 or RS-422), and a protocol to govern how the port is used.

CROSSPOINT

The circuitry and components on a printed circuit board that constitute a single physical switch.

See also: Physical Switch.

DATA KEY

A user configurable control panel key, whose assigned function is used when the panel is in any mode except Salvo Select Mode.

Many control panels have user configurable keys. Each key can be assigned two functions, one as a data key and one as a salvo key. When the keys are pressed, the data key functions are used except when the panel is in salvo mode.

DATA KEY LIST

A named list of the functions assigned to each data key on a panel.

Multiple panels may share a data key list as long as they are the same type of panel. Different panel types may not use the same data key list.

Data key list names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

DEFAULT DESTINATION

The destination for which status will be displayed when power is applied to a panel, or when a new configuration is downloaded to the controller.

Although not mandatory, it is recommended that a default destination be selected for each panel.

DESTINATION

One or more logical outputs (limited to one per level), on one or more levels, that are switched together as a group.

Destination names may be created by using categories, and:

1. Shall be created using only the following characters:

   Upper case letters A through Z

   Lower case letters A through Z if enabled in the control system software

   Numbers 0 through 9

   The following special characters: space ( ), hyphen-minus (-), exclamation mark (!), ampersand (&), plus sign (+), equals sign (=), commercial at (@), and low line (_)

2. Shall contain a minimum of one, and a maximum of eight characters.
3. Shall not begin with a space. However, they may end with a space, have embedded spaces, and consist of a single space.
4. Shall be unique in the universe of destination and reentry names.

See also: Category.

DESTINATION BLOCK

See: Source Block.

DESTINATION GROUP

See: Destination.

DESTINATION INCLUDE LIST

A named list of the destinations a specific control panel is authorized to control.

A destination include list may be shared by multiple panels.

The default destination assigned to a panel may be controlled even if it is not on the destination include list.

Destination include list names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

DESTINATION NUMBER

A number assigned to each destination by the controller and used by CPU Protocol 1.

Destination numbers are also assigned to reentries.

DESTINATION STATUS

See: Status.

DIAGONAL

A diagnostic procedure that causes a range of physical inputs to be switched to a range of physical outputs, in a diagonal pattern starting from a specified coordinate and continuing until the either the inputs or outputs are exhausted, for a specified component, with a single command.

Example: Assume the existence of component RED spanning physical inputs 1 through 6 and physical outputs 1 through 6 on a routing switcher. A diagonal with a starting input of 2 and a starting output of 1 would cause the following physical switches to be taken: (2,1), (3,2), (4,3), (5,4), and (6,5).

See also: All Call.

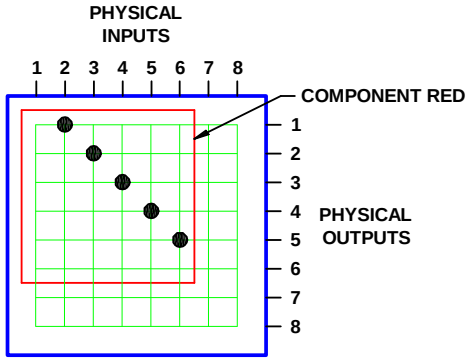

Figure 5-4 Diagonal

EIA

Electronic Industries Alliance.

FOLLOW SWITCH

A switch where a single source is switched to a single destination on all levels. An abbreviated form of audio-follow-video switch.

Example: Assume the existence of source VTR1 and destination MON1 defined on levels VIDEO and AUDIO. If VTR1 is switched to MON1 on both the VIDEO level and AUDIO level, a follow switch has been taken.

This is the most common manner in which switches are taken on a routing switcher.

Table 5-2 Follow Switch

Destination	Source	
	Level: VIDEO	Level: AUDIO
MON1	VTR1	VTR1

See also: Breakaway Switch.

HOUSE BLACK

See: House Sync.

HOUSE SYNC

A composite color video signal that has sync, color burst, and black video. It is used to synchronize video sources, and other equipment, to the same sync and color information.

INDEX

Obsolete. Prior to 3500Plus v3.0, indices were numbers used with categories to construct source, destination, and reentry names.

See also: Category.

INPUT OFFSET

In matrix space, the amount by which the origin of a component on strobe x, is offset from the origin of strobe x, measured along the input axis.

The coordinates of crosspoints in matrix space are determined by the strobe they reside on, and their input and output numbers. They are given in the form (input,output) on strobe x. The origin of a component (a matrix of crosspoints) is designated by the point that falls nearest the origin of its strobe (1,1). In Figure A below, the 3x4 component bounded by coordinates (3,2), (5,2), (5,5), and (3,5) has its origin at (3,2).

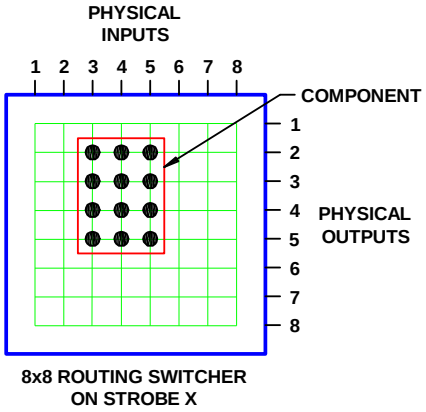

Figure 5-5 Input Offset, Single Routing Switcher

Input offset is the amount by which the origin of a component is offset from the origin of its strobe, measured along the input axis. A component whose origin coincides with that of its strobe (1,1) will have an input offset of 0. The component shown in Figure 5-5 has an input offset of 2.

When multiple routing switchers are assigned to the same strobe, the input and output connectors are renumbered to provide a unique coordinate for each crosspoint. Crosspoint coordinates are then determined in the same manner as above. The component shown in Figure 5-6 has its origin at (12,7) and an input offset of 11.

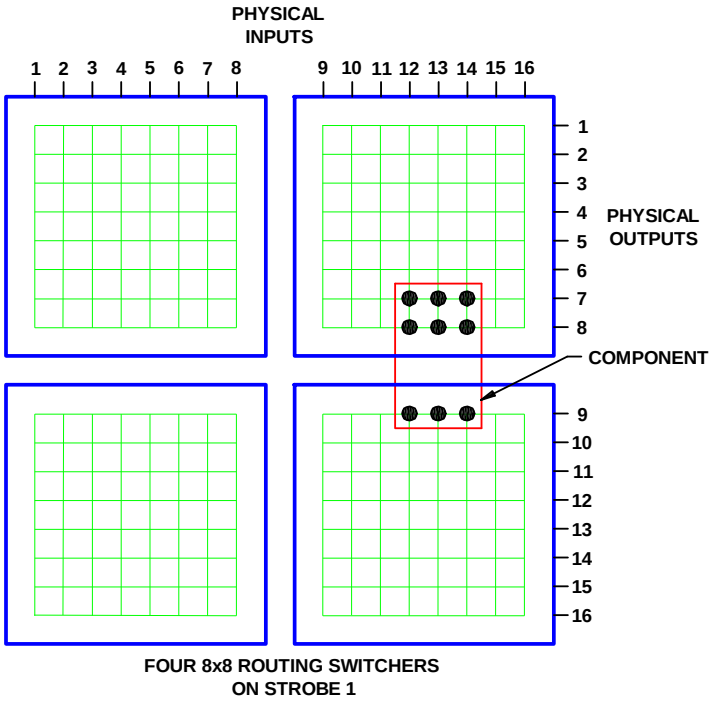

Figure 5-6. Input Offset, Multiple Routing Switchers

LEVEL

A group of related components that are switched together.

A level is sometimes referred to as a level of control and is the basic granularity seen by a user. The components that comprise a level will always be switched together except when performing diagnostic operations.

Figure 5-7 shows a 2x2 RGB video level made up of three components, “RED”, “GRN”, and “BLU”, all of which are switched together at the same time.

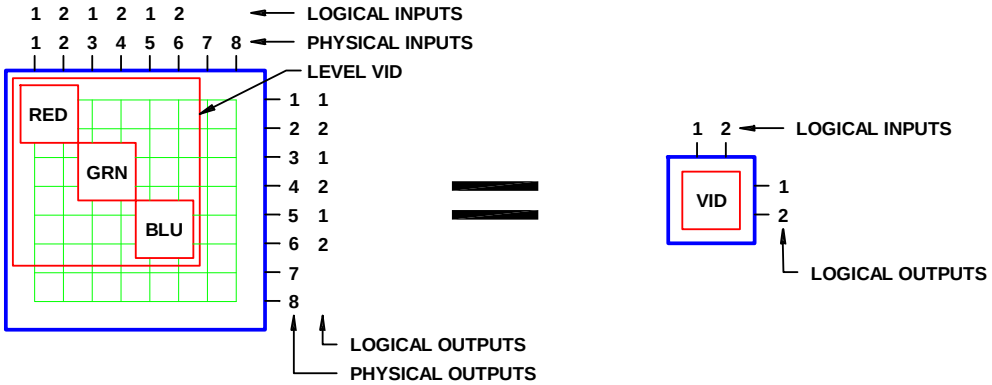

Figure 5-7 Level

As a general rule, users control the switching of levels, but component switching is handled automatically by the switching system. As shown in Figure 5-7, a user can specify a single logical switch, such as VID Input 1 to VID Output 2. This would result in the control system software taking three physical switches by activating crosspoints (1,2), (3,4), and (5,6).

Level names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

LEVEL ORDER

A property assigned to a level that controls the order of display when levels are displayed on a control panel, or addressed in CPU link protocols.

LEVELS OF CONTROL LIST

A named list of the levels a specific control panel is authorized to control.

Multiple panels may share a levels of control list.

Levels of control list names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

LOCAL MODEM

A modem connected to a PC running control system software.

See also: Remote Modem.

LOCK

A property placed on a destination that prevents all panels and ports from taking a switch on that destination, including the panel or port that locked it.

Locks may be cleared by any panel or port that has the same requester code and lock priority as the panel that locked the destination, that has a higher lock priority, or that has a lock priority of 0 (zero).

See also: Lock Priority, Protect.

LOCK PRIORITY

A property of panels and ports that allows them to be grouped with other panels or ports for the purpose of establishing lock and protect authority.

The lower the lock priority number, the higher the priority. Panel lock priorities not explicitly defined automatically default to “0” which gives absolute authority to clear any lock or protect on the system.

See also: Lock, Protect.

LOGICAL INPUT

One or more physical inputs that are switched together as a group.

Logical inputs and outputs are switched level-by-level. Since each level may have more than one component, switching a single logical input or output may involve switching more than one physical input or output.

For example, a RGB input signal represents three physical inputs because it is connected to three input connectors on the routing switcher. However, since all three components (R, G, and B) are switched together as a level, it is a single logical input.

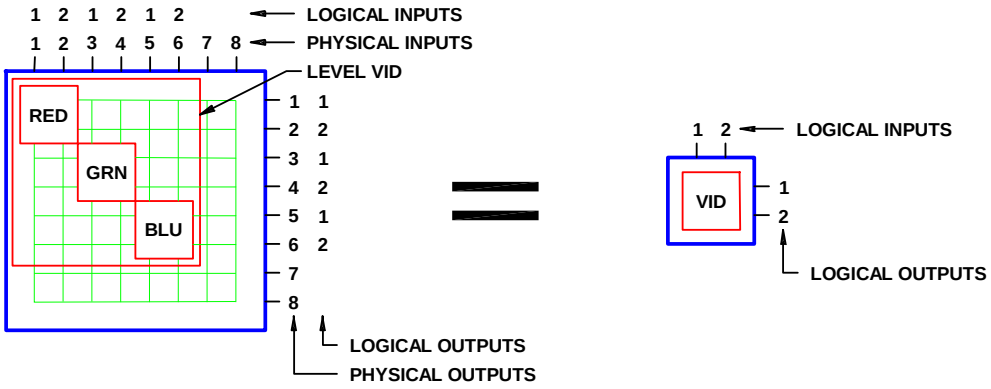

Figure 5-8 Logical Input

Logical inputs are numbered sequentially, level-by-level, beginning with 1. Input numbers are assigned in the same order as the physical inputs to the component(s) of the level. Since a routing switcher may be configured to have more than one level, it may have more than one logical input designated as number 1. However, within each level, every logical input will have a unique number. Logical outputs are numbered in the same manner. Logical input/output numbering is handled automatically by the control system software as components are configured.

See also: Physical Input.

LOGICAL OUTPUT

See: Logical Input.

LOGICAL SWITCH

The control system software command that switches a logical input to a logical output.

See also: Physical Switch.

MATRIX BREAKUP

The division of a single physical matrix into one or more components.

Matrix breakup allows complex signal types to reside within a single physical matrix. For example, a video matrix is often broken into R, G, and B components.

Matrix breakup is a software function handled by the control system software.

MATRIX SPACE

A three-dimensional mathematical model of the crosspoints in a switching system.

The coordinates of crosspoints in matrix space are given in the form (input,output) on strobe x.

When a switching system is physically made up of only one routing switcher, the crosspoint coordinates are the same as the input and output connector numbers, and the resulting matrix space has only two dimensions. For example, the coordinates of the crosspoint indicated in Figure 5-9 is (4,2) on strobe 1.

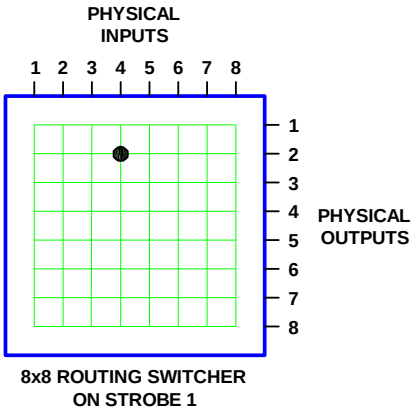

Figure 5-9 Matrix Space, One Routing Switcher on One Strobe

Two-dimensional matrix space can also be composed of the crosspoints located in multiple routing switchers. The input and output connectors on the additional routing switchers are renumbered as required to ensure that each crosspoint can be identified by a unique (input,output) coordinate. When switching systems are constructed in this manner, matrix space size is no longer constrained by routing switcher size. The switching system shown in Figure 5-10 consists of four 8x8 routing switchers assigned to the same strobe. The coordinates of the indicated crosspoint are (12,14) on strobe 1.

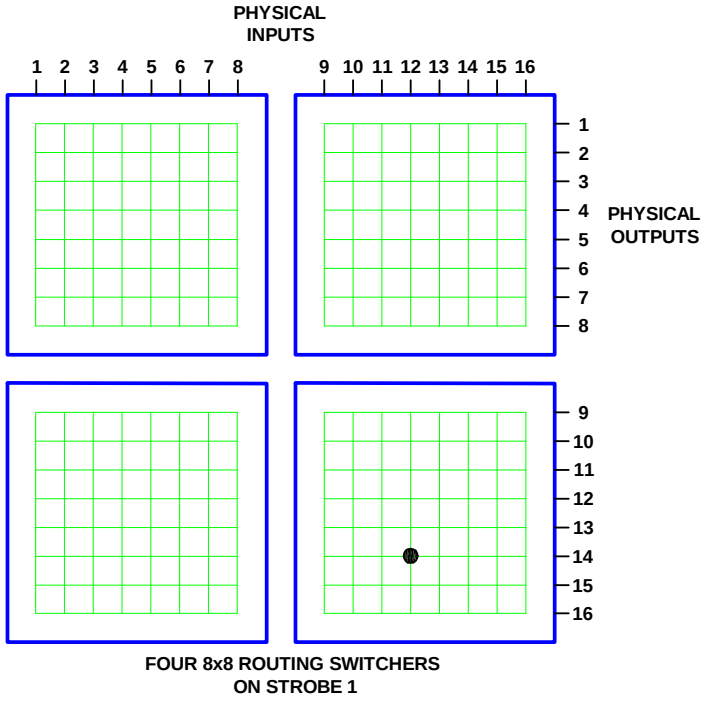

Figure 5-10 Matrix Space, Four Routing Switchers on One Strobe

Strobe numbers are used to introduce a third dimension into matrix space. Every routing switcher in a switching system is assigned to a strobe. In systems using more than one strobe (and, therefore having three-dimensional matrix space), crosspoint coordinates are given in the form (input,output) on strobe x. In Figure 5-11, the coordinates of the indicated crosspoint in the left routing switcher are (4,2) on strobe 1. The coordinates of the crosspoint on the right are (4,2) on strobe 2.

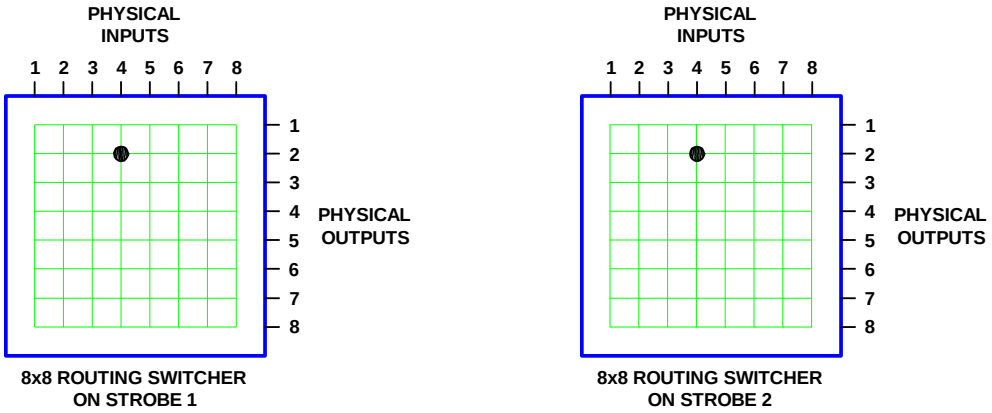

Figure 5-11. Matrix Space, Two Routing Switchers on Two Strobes

NTSC

National Television Standards Committee. The NTSC was responsible for setting television and video standards in the United States. The NTSC standard for television defines a composite video signal with a refresh rate of 60 half-frames (interlaced) per second. Each frame contains 525 lines and can contain 16 million different colors.

See also: PAL, SECAM.

OUTPUT OFFSET

In matrix space, the amount by which the origin of a component on strobe x, is offset from the origin of strobe x, measured along the output axis.

The coordinates of crosspoints in matrix space are determined by the strobe they reside on, and their input and output numbers. They are given in the form (input,output) on strobe x. The origin of a component (a matrix of crosspoints) is designated by the point that falls nearest the origin of its Strobe (1,1). In Figure 5-12 below, the 3x4 Component bounded by coordinates (3,2), (5,2), (5,5), and (3,5) has its origin at (3,2).

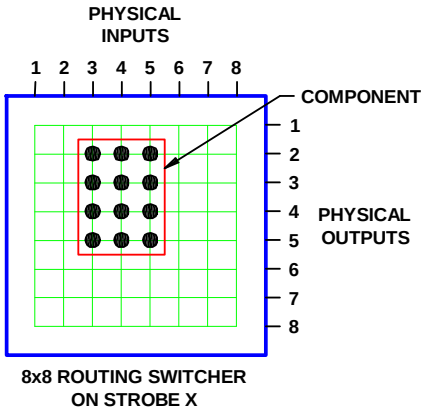

Figure 5-12 Output Offset, Single Routing Switcher

Output offset is the amount by which the origin of a component is offset from the origin of its strobe, measured along the output axis. A component whose origin coincides with that of its strobe (1,1) will have an output offset of 0. The component shown in Figure 5-12 has an output offset of 1.

When multiple routing switchers are assigned to the same strobe, the input and output connectors are renumbered to provide a unique coordinate for each crosspoint. Crosspoint coordinates are then determined in the same manner as above. The component shown in Figure 5-13 has its origin at (12,7) and an output offset of 6.

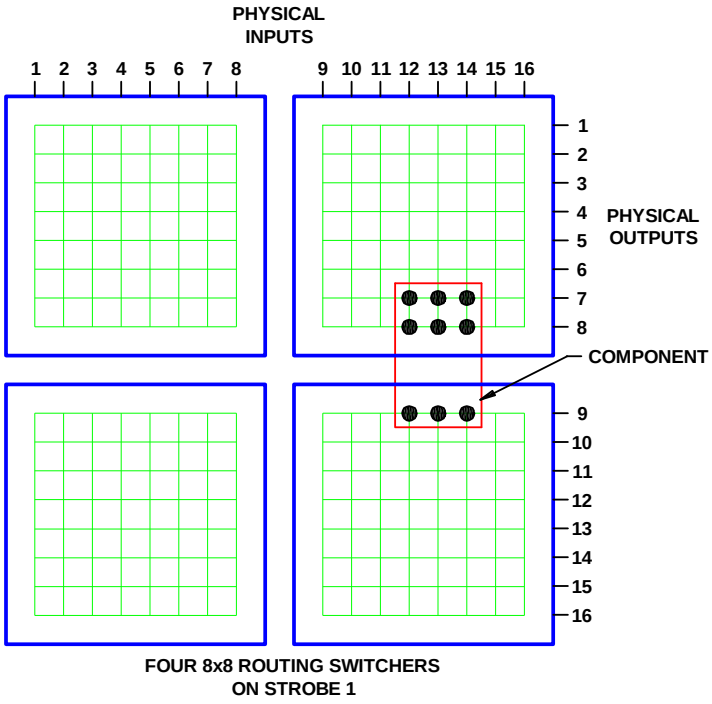

Figure 5-13 Output Offset, Multiple Routing Switchers

PAL

Phase Alternating Line, the dominant television standard in Europe. The United States uses a different standard, NTSC. Whereas NTSC delivers 525 lines of resolution at 60 half-frames per second, PAL delivers 625 lines at 50 half-frames per second.

See also: NTSC, SECAM.

PANEL

A user interface, usually mounted in a standard 19” rack, containing alphanumeric displays, push buttons, LEDs, etc. Sometimes referred to as a control panel.

A panel is used to control a switching system by taking switches, obtaining status, etc.

Panel names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

PANEL ADDRESS

A unique identifier, set by DIP switch on every panel, that allows the system controller to differentiate between panels.

PANEL NAME

An optional identifier for a control panel.

Individual panels are identified by panel address. Because of this, a panel name is not required when configuring a panel.

Panel names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

PASSWORD

Each User Account and Configuration may be protected with an eight-character, upper case, alphanumeric password.

PC

Personal computer. Typically used to run control system software such as Win3500Plus.

PESA control system software is designed to operate on any IBM® compatible personal computer (AT® or later) with a Microsoft Windows™ operating system (3.1, 95, 98, or NT).

PHYSICAL INPUT

The electrical signal coming from a device connected to an input connector on a routing switcher.

Physical inputs and outputs are the electrical signals passing through the input and output connectors of a routing switcher. Each connector represents one input or output.

For example, a RGB input signal would represent three physical inputs since it would be connected to three input connectors on the routing switcher.

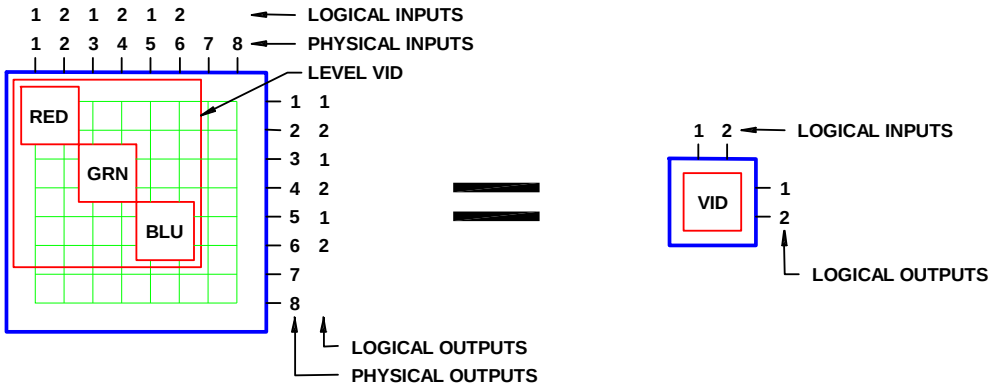

Figure 5-14 Physical Input

Physical inputs are numbered sequentially beginning with 1, and have the same number as the corresponding input connector on the routing switcher. This includes connectors that have been renumbered with input offset when multiple routing switchers have a common strobe. Physical outputs are numbered in the same manner.

See also: Logical Input.

PHYSICAL SWITCH

The hardware that switches a physical input to a physical output. Sometimes referred to as a crosspoint.

See also: Logical Switch, Crosspoint.

PHYSICAL OUTPUT

See: Physical Input.

PORT

A serial communication bus interface connector on a system controller.

Port names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter. Port names are optional because a port is identified by its address.

PRC DEVICE

A device designed to be compatible with the PESA Routing Control protocol (PRC).

Ocelot, Cougar, Jaguar, Tiger, and Cheetah routing switchers are PRC devices.

See also: RM5 Device.

PROTECT

A property placed on a destination that prevents all panels and ports from taking a switch on that destination, unless taken from a panel or port that has the same requester code as the panel or port that protected it.

Destination protection may be cleared by any panel or port that has the same requester code and lock priority as the panel or port that protected the destination, that has a higher lock priority, or that has a lock priority of 0 (zero).

See also: Lock, Lock Priority, Requester Code.

PROTECT PRIORITY

See: Lock Priority.

PROTOCOL

The format to be used when sending data between two devices.

Protocol names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

READBACK

Information received from a routing switcher reporting which physical input is currently switched to a specified physical output.

To ensure that the configuration in the controller, and the actual state of the physical switches in a routing switcher agree, the routing switcher can be made to read back the status of each physical output. Where the routing switcher reports a different physical input from that expected by the controller, a readback error is declared.

READBACK ERROR

See Readback.

REENTRY

An entity that exists as both a source and destination at the same time, whose function is to facilitate switching a single source to multiple destinations, with a single logical switch.

Reentries are virtual entities that exist in the control software only. Their creation and use does not require any physical modification to the switching system hardware.

Example: Assume the existence of source SRC1 and destinations DST1, DST2, and DST3. Reentry REENT1 is created and switched to the three destinations. With a single logical switch, SRC1 can now be switched to REENT1 and the signal will arrive at all three destinations at the same time.

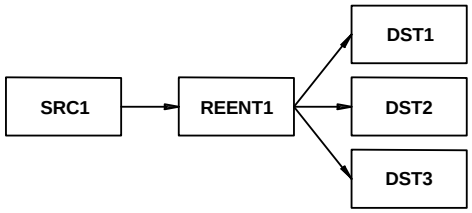

Figure 5-15. Reentry

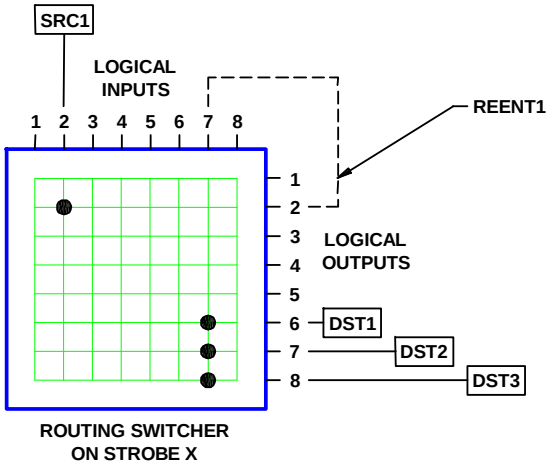

Figure 5-16 Reentry

A reentry is assigned both a source number and a destination number.

Reentry names may be created by using categories, and:

1. Shall be created using only the following characters:

   Upper case letters A through Z

   Lower case letters A through Z if enabled in the control system software

   Numbers 0 through 9

   The following special characters: space ( ), hyphen-minus (-), exclamation mark (!), ampersand (&), plus sign (+), equals sign (=), commercial at (@), and low line (_)

2. Shall contain a minimum of one, and a maximum of eight characters.

3. Shall not begin with a space. However, they may end with a space, have embedded spaces, and consist of a single space.
4. Shall be unique in the universe of source, destination, and reentry names.

See also: Category.

REMOTE CLIENT

A user connected to a networked system controller such as the e-Route.

REMOTE CLIENT NAME

A string of up to sixteen characters consisting of letters, numbers, and some symbols. A Remote Client Name must begin with a letter, and may not contain any spaces.

Symbols Permitted: - _ @ ! & + =

REMOTE CLIENT PARAMETERS

Reserved for future use.

REMOTE CLIENT PASSWORD

A string of up to eight characters consisting of letters, numbers, and some symbols. A Remote Client Password may begin with either a number or a letter, and may not contain any spaces.

Symbols Permitted: : ; < = > ? @

REMOTE MODEM

An external modem connected to a system controller.

The remote modem must be an external type capable of being configured to automatically answer incoming calls. Because the system controller does not output any modem configuration information, the remote modem must be completely transparent to the controller. The only modems tested by PESA for use as remote modems are the Practical Peripherals PM288MT II and the U.S. Robotics Sportster 28.8 using the following initialization strings:

PM288MT II: AT S0=2 Q1 X4 &C1 &D0 &K3 &S1 &W0 &Y0

Sportster 28.8: AT &F1 S0=2 &H1 &R2 &I0 L2 Q1 &C1 &D0 Y0 &W0

For more information about these modems and their initialization strings, contact Practical Peripherals or U.S. Robotics. Before using any other type of remote modem, please consult with PESA Customer Service.

See also: Local Modem.

REQUESTER CODE

A property of panels and ports that allows them to be grouped with other panels or ports for the purpose of establishing lock and protect authority.

Panel requester codes not explicitly defined automatically default to the panel address.

See also Lock, Lock Priority, Protect.

RM5 DEVICE

A device designed to be compatible with the System 5 (RM5) control protocol.

The RM4000, RM5000, and Lynx routing switcher families are RM5 devices.

See also: PRC Device.

SALVO

A group of predefined logical switches taken in the same vertical interval.

Example: Assume the existence of sources CART1 and CART2; and destinations MON1, VTR1, and VTR2, defined on levels AUD and VID.

By pressing a single control panel key, the user desires to take the following switches: audio and video from CART1 to MON1; audio from CART2 and video from CART1 to VTR1; and audio and video from CART2 to VTR2.

Table 5-3 Salvo

Salvo Entry	Destination	Source	
		Level: AUD	Level: VID
1	MON1	CART1	CART1
2	VTR1	CART2	CART1
3	VTR2	CART2	CART2

Salvo SAL1 is created and will consist of three salvo entries (one salvo entry per destination in the salvo). Each salvo entry is then configured to switch the selected sources on the appropriate levels. Once salvo SAL1 is assigned to a salvo key on the control panel, the user will be able to take all the specified switches with the press of a single key.

All switches in a salvo are taken within the same vertical interval.

Salvo names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

SALVO ENTRY

One or more logical switches assigned to a specific destination that is part of a salvo.

Salvo entry names are the same as the destination they are associated with.

SALVO INCLUDE LIST

A named list of the salvos a specific control panel is authorized to control.

A salvo include list may be shared by multiple panels.

Salvo include list names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

SALVO KEY

A user configurable control panel key, whose assigned function is used when the panel is in salvo select mode.

Many control panels have user configurable keys. Each key can be assigned two functions, one as a data key and one as a salvo key. When the keys are pressed, the data key functions are used except when the panel is in salvo mode.

When a panel is in salvo select mode, a salvo will be executed immediately when the salvo key is pressed.

SALVO KEY LIST

A named list of the functions assigned to each salvo key on a panel.

Multiple panels may share a salvo key list as long as they are the same type of panel. Different panel types may not use the same salvo key list.

Salvo key list names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

SECAM

Sequential Couleur Avec Memoire, the line sequential color system used in France, Russia, Eastern Europe, and some Middle Eastern countries. Like PAL, SECAM is based on a 50 Hz power system, displaying interlaced lines at 50 fields per second. The color information is transmitted sequentially (R-Y followed by B-Y, etc.) for each line and conveyed by a frequency modulated sub carrier that avoids the distortion arising during NTSC transmission.

See also: NTSC, SECAM.

SERIAL PORT

See: Port.

SHARED INPUT

A logical input that is used by more than one source.

Note that shared outputs are not permitted.

See also: Source Block.

SMPTE

Society of Motion Picture and Television Engineers. A professional organization that recommends standards for the television and film industries.

SOFT DESTINATION KEY

See: Soft Key.

SOFT KEY

A special type of data key whose assigned function may be changed locally by a panel user.

Control system software is used to designate a data key as either a soft source key or a soft destination key. The assignment of a specific source or destination to the soft key may then be made with either the control system software, or locally at the panel by using Store Mode.

SOFT SOURCE KEY

See: Soft Key.

SOURCE

One or more logical inputs (limited to one per level), on one or more levels, that are switched together as a group.

Destination names may be created by using categories, and:

1. Shall be created using only the following characters:

   Upper case letters A through Z

   Lower case letters A through Z if enabled in the control system software

   Numbers 0 through 9

   The following special characters: space ( ), hyphen-minus (-), exclamation mark (!), ampersand (&), plus sign (+), equals sign (=), commercial at (@), and low line (_)

2. Shall contain a minimum of one, and a maximum of eight characters.
3. Shall not begin with a space. However, they may end with a space, have embedded spaces, and consist of a single space.
4. Shall be unique in the universe of source and reentry names.

See also: Category.

SOURCE BLOCK

A means of ensuring that a particular source will not be switched to a specific.

When configuring a switching system, it may be desirable to use source blocking to restrict the switching of certain logical inputs. This may be done while configuring either sources or destinations.

Since a blocked source may contain a logical input that is shared (used by more than one source), care should be taken to ensure that all sources using the logical input are blocked from the destination to be protected.

SOURCE GROUP

See: Source.

SOURCE INCLUDE LIST

A named list of the sources a specific control panel is authorized to control.

A source include list may be shared by multiple panels.

Source include list names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

SOURCE NUMBER

A number assigned to each source by the controller and used by CPU Protocol 1.

Source numbers are also assigned to reentries.

STATUS

A list of all sources on all levels currently switched to a selected destination.

Sometimes also used to refer to the operational state of the control system (lock status, switch status, and panel status).

STATUS LEVEL

The default level to be used when displaying the status of a destination receiving signals from multiple sources, on a panel in all levels mode (ALL LEVS).

One function of the LCD display on a panel is to show which source is currently switched to a selected destination. This is known as destination status. Although more than one source can be switched to a single destination (limited to one source per level), the status display can only show one source at a time. When the panel is in all levels mode (ALL LEVS), Status Level is used to designate a default level to be used when displaying status. Only the source on this default level will be displayed. On panels that do not have LCD displays, this is indicated by a continuous, bright, pushbutton light.

If one or more other sources are also switched to the destination (on other levels), an octothorp (the "#" symbol) will be appended to the source name. The other source names can be viewed by toggling each level key in turn to show, level-by-level, which source has been switched to the destination. On panels that do not have LCD displays, this is indicated by an alternating bright/dim push button light.

STATUS METHOD

One of two possible ways to display status when a panel is in all levels (ALL LEVS) mode and the destination is not defined on the Status Level.

When a panel is in all levels mode (ALL LEVS), the status shown will be the source on the Status Level assigned to that panel. If the destination is not defined on the Status Level, Status Method is used to control the resulting display:

If DEF (Default Method) is selected, NO XXXXX will be displayed where XXXXX is the Status Level assigned to the panel.

If GRP (Group Method) is selected, the controller will examine every level sequentially, starting with the level designated as Level Order 1. The source switched on the first level found where the destination is defined, will be displayed as the destination status.

STOP BIT

In asynchronous communication, a bit that indicates that a byte of data has just been transmitted.

Every byte of data is preceded by a start bit and followed by a stop bit.

STROBE

The third dimension of matrix space.

Every routing switcher in a switching system is assigned a strobe. This is usually accomplished by setting a DIP switch on the back of the routing switcher. Strobes do not have to be unique and, in larger systems, each strobe might be associated with several routing switchers.

In many switching systems, strobes are used to group levels of the same type together. For example, video may be on Strobe 1, audio on Strobe 2, etc.

SYNC REFERENCE

A vertical sync signal used to ensure that switching occurs in the vertical interval of a video signal.

Sync Reference names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

See also: Vertical Sync Signal.

SYSTEM 5 DEVICE

See: RM5 Device.

TIA

Telecommunications Industry Association.

TIELINE

A special type of logical switch that allows a logical input on one level to be switched to a logical output on a different level.

Example 1 - Switch a signal from analog camera ANCAM into an analog-to-digital converter (A/D) and then into digital video tape recorder DIGVTR: (Figure 5-17) Connect a cable between the appropriate output connector of the analog routing switcher and the input of the A/D, and a cable between the output of the A/D and the appropriate input connector on the digital routing switcher. Configure levels ANAVID and DIGVID and tieline TLINE1 to connect them. Configure destination DIGVTR on level DIGVID. Configure source ANCAM on level ANAVID to use tieline TLINE1. ANCAM may now be switched to DIGVTR with a single logical switch even though they are on different levels.

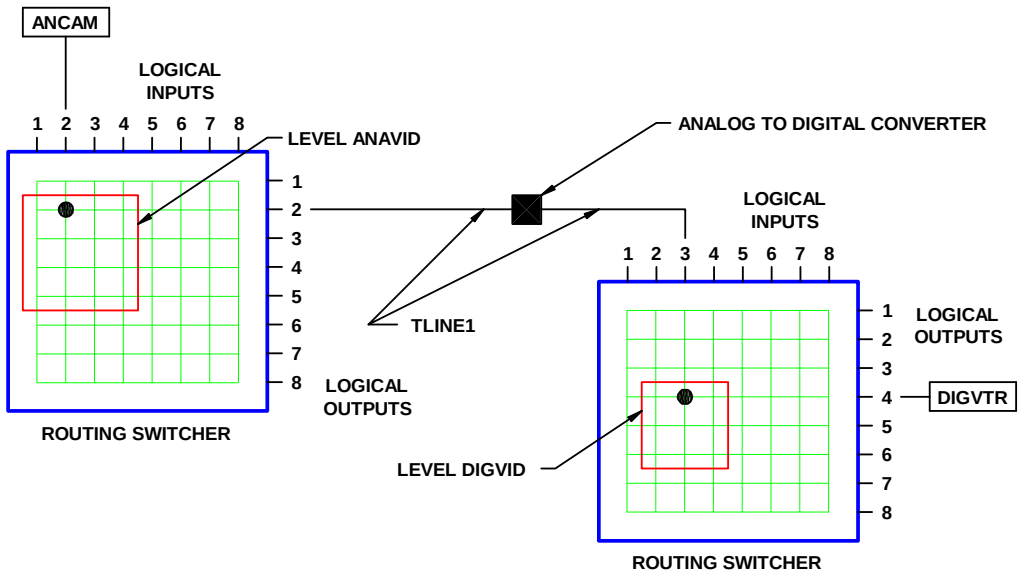

Figure 5-17 Tieline

Example 2 - Switch a signal from camera CAM1 (connected to a routing switcher in Room A) to video tape recorder VTR1 (connected to a routing switcher in Room B): (Figure 5-18) Connect a cable between the appropriate output connector of the routing switcher in Room A and the appropriate input connector on the routing switcher in Room B. Create levels VIDA and VIDB and configure a

tieline connecting the output of VIDA to the input of VIDB. Define source CAM1 on level VIDA and destination VTR1 on level VIDB. CAM1 may now be switched to VTR1 with a single logical switch even though they (and their respective routing switchers) are located in two separate rooms.

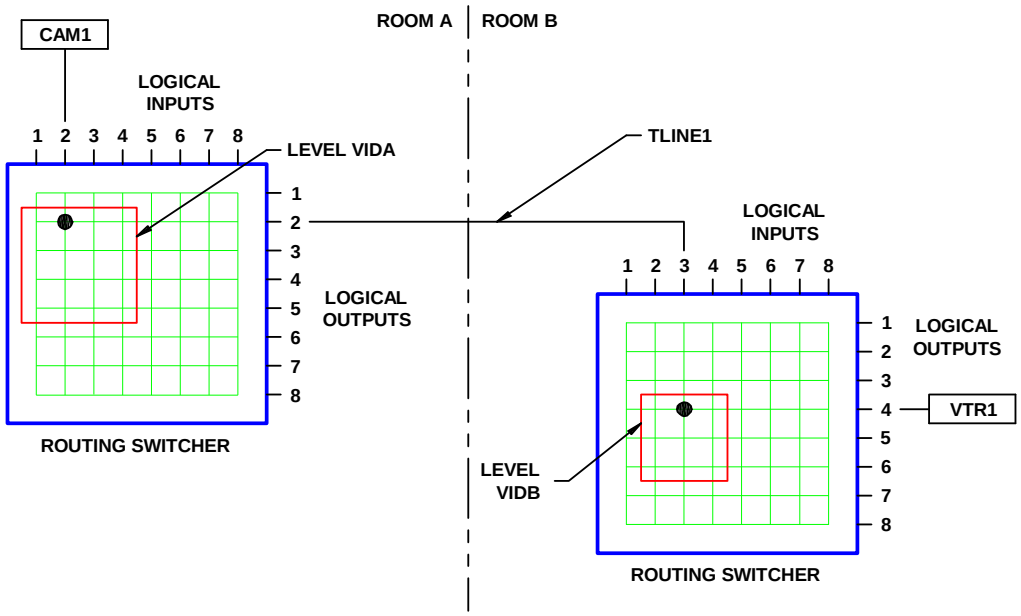

Figure 5-18 Tieline

Tieline names are one to eight characters in length and are constructed using uppercase letters, numbers, and spaces. The first character must be a letter.

USER ACCOUNT

A set of privileges and an optional user password saved as a user name.

User accounts provide a means of restricting access to certain system functions on a user-by-user basis.

USER NAME

A string of up to eight characters consisting of upper case letters, numbers, spaces, and some symbols:

Permitted: ! @ # $ % ^ & * _ + - = [ ] \ : " ; ' < > . ? /

Forbidden: { } | , ( )

USER PASSWORD

A string of up to eight characters consisting of letters, numbers, and spaces. A User Password may begin with either a number or a letter. Leading spaces are discarded.

VERTICAL INTERVAL

The portion of the video signal in which image information is absent to allow for the video device to prepare for the next frame of information.

VERTICAL SYNC SIGNAL

A short pulse generated at the beginning of each video timing frame that tells the video monitor when to start a new video timing field. For switching purposes, the vertical sync signal may be derived from house sync.

See also: Sync Reference.

VERTICAL TRIGGER

See: Vertical Sync Signal.

VIDEO TIMING FIELD

A package of information that contains information required to complete a full scan across a video monitor. There are two types of video fields denoted as odd and even.

VIDEO TIMING FRAME

A package of information that contains all the information required to draw an image on a video device. Generally considered with respect to NTSC and PAL signals where the information is transmitted over a fixed time frame. A frame consists of two video timing fields denoted odd and even.

WORKING DIRECTORY

The location on the PC hard drive where control system software such as Win3500Plus is installed.

If the default settings of the Win3500Plus installation program were used, this will be c:\win3500p for 16-bit versions of the Microsoft Windows OS, and c:\program files\win3500p for 32-bit versions. Configurations may not be saved in the working directory or any subdirectory of the working directory.