TECHNICAL MANUAL

MODULAR ROUTING SWITCHER SYSTEM

Publication: 81-9059-0390-0, Rev. P
July, 2009

Thank You !! for purchasing your new Ocelot signal routing equipment from PESA. 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 a PESA product and we look forward to a long-term partnership with you and your facility.

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July, 2009

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: PESA SWITCHING SYSTEMS, INC.

Manufacturer's Address: 330A Wynn Drive
Huntsville, AL. 35805
USA

The manufacturer hereby declares that the product(s)

Product Name: Ocelot Analog Routing Switchers

Model Number(s): 8x8 Analog Video; 8x8 Analog Audio; 8x8 Analog High-Level; 8x8 Remote Panel; 8x2 Dual Remote Panel; 16x16 Analog Video; 8x8 Analog Audio; 16x16 Analog Sync; 16x16 Remote Panel; 16x1 Remote Panel

conforms to the following standards or other normative documents:

Electromagnetic Emissions: **EN 50081-1:1992**
EN 55022:1993

Electromagnetic Immunity: **EN 50082-1:1997**
EN 61000-4-2:1995
EN 61000-4-3:1995
EN 61000-4-4:1995
EN 61000-4-5:1995
EN 61000-4-6:1996
EN 61000-4-8:1994
EN 61000-4-11:1994
ENV 50204:1996

The product herewith complies with the requirements of: **EMC Directive 89/336/EEC**

Supplementary Information:

Test reports and compliance documents are on file at the corporate office of PESA Switching Systems, Inc. in Huntsville, Alabama, USA.

Huntsville, March 11,1999
Place and Date

Paul Ethridge
Paul Ethridge
Quality Control Engineer

81905904240 REV. A

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: PESA SWITCHING SYSTEMS, INC.

Manufacturer's Address: 330A Wynn Drive
Huntsville, AL. 35805
USA

The manufacturer hereby declares that the product(s)

Product Name: Ocelot Digital Routing Switchers

Model Number(s): 8x8 Digital Video; 8x8 Digital Audio; 8x8 X/Y Local Panel; 8x1 Remote Panel

conforms to the following standards or other normative documents:

Electromagnetic Emissions: **EN 50081-1:1992**
EN 55022:1993

Electromagnetic Immunity: **EN 50082-1:1997**
EN 61000-4-2:1995
EN 61000-4-3:1995
EN 61000-4-4:1995
EN 61000-4-5:1995
EN 61000-4-6:1996
EN 61000-4-8:1994
EN 61000-4-11:1994
ENV 50204:1996

The product herewith complies with the requirements of: **EMC Directive 89/336/EEC**

Supplementary Information:

Test reports and compliance documents are on file at the corporate office of PESA Switching Systems, Inc. in Huntsville, Alabama, USA.

Huntsville, August 9,1999
Place and Date

Paul Ethridge
Paul Ethridge
Quality Control Engineer

81905904430 REV. A 8/99

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: PESA SWITCHING SYSTEMS, INC.

Manufacturer's Address: 330A Wynn Drive
Huntsville, AL. 35805
USA

The manufacturer hereby declares that the product(s)

Product Name: Ocelot Digital Routing Switchers

Model Number(s): 16x16 Digital Video; 16x16 Digital Audio; 16x16 X/Y
Local Panel; 16x2 Dual Remote Panel

conforms to the following standards or other normative documents:

Electromagnetic Emissions: **EN 50081-1:1992**
EN 55022:1993

Electromagnetic Immunity: **EN 50082-1:1997**
EN 61000-4-2:1995
EN 61000-4-3:1995
EN 61000-4-4:1995
EN 61000-4-5:1995
EN 61000-4-6:1996
EN 61000-4-8:1994
EN 61000-4-11:1994
ENV 50204:1996

The product herewith complies with the requirements of: **EMC Directive 89/336/EEC**

Supplementary Information:

Test reports and compliance documents are on file at the corporate office of PESA Switching Systems, Inc. in Huntsville, Alabama, USA.

Huntsville, July 28,1999
Place and Date

Paul Ethridge
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Chapter 1 About This Manual

1.1 DOCUMENTATION AND SAFETY OVERVIEW

This manual provides instructions for the installation, operation, and maintenance of the Ocelot Series – Modular Routing Switcher System built by PESA.

It is the responsibility of all personnel involved in the installation, operation, and maintenance of the equipment to know all the applicable safety regulations for the areas they will be working in. ***Under no circumstances should any person perform any procedure or sequence in this manual if the procedural sequence will directly conflict with local Safe Practices. Local Safe Practices shall remain as the sole determining factor for performing any procedure or sequence outlined in this document.***

1.2 WARNINGS, CAUTIONS, AND NOTES

Throughout this document, you should notice various Warnings, Cautions, and Notes. These addendum statements supply necessary information pertaining to the text or topic they address. It is imperative that audiences read and understand the statements to avoid possible loss of life, personal injury, and/or destruction/damage to the equipment. These additional statements may also provide added information that could enhance the operating characteristics of the equipment (i.e., Notes). Examples of the graphic symbol used to identify each type of statement and the nature of the statement content are shown in the following paragraphs:

WARNING

STOP	**Warning statements identify conditions or practices that can result in loss of life or permanent personal injury if the instructions contained in the statement are not complied with.**

CAUTION

CAUTION	**Caution statements identify conditions or practices that can result in personal injury and/or damage to equipment if the instructions contained in the statement are not complied with.**

NOTE

NOTE	**Notes are for information purposes only. However, they may contain invaluable information important to the correct installation, operation, and/or maintenance of the equipment.**

Chapter 2 Introduction

2.1 DESCRIPTION

PESA's Ocelot is a modular routing switcher system available in 8-input and 16-input versions; with modules available for audio and video signals - in both analog and digital formats. Analog video modules are available for NTSC/PAL, wideband analog and high level/sync analog sources. Digital video modules are available for SMPTE 259M, 292M, 372M and 424M compliant video signals from 143Mbps to 3Gbps. Digital audio modules for AES signals are available as 8X8 or 16X16 routers in both 110 Ohm balanced and 75 Ohm unbalanced configurations. Routing modules are installed in a standard 1RU mainframe chassis with built in power and control distribution. Modules may be assembled into systems capable of controlling up to four switching levels with up to 16 control panels. Control panels may be mounted directly to the front of the 1RU chassis, located remotely from the router chassis, or both. Although many systems can be configured in a single chassis, multiple mainframes and remote control panels may be interconnected using a common, shared system controller to create larger and more complex systems.

While an Ocelot system may be utilized as a stand-alone unit, the system controller module also allows it to be integrated into any routing switcher system that uses the PESA Routing Control (PRC) bus protocol. This capability allows an Ocelot installation to be seamlessly integrated into larger systems, such as a Cheetah video or DRS audio router, through a 3500PRO or PERC2000 system controller. An Ocelot system may also be controlled with a PC through the CPU Link™ on the system controller module, by using control system software such as Virtual Panel™.

Figure 2-1 illustrates a typical 16X16 Ocelot mainframe with local control panel and a single 3Gbps video module installed.

Figure 2-1 Typical Ocelot Mainframe – Front and Rear View

2.2 OCELOT SYSTEM DESIGN CONSTRAINTS

When specifying, installing or upgrading an Ocelot system, the following design constraints must be observed:

Mainframe Interface Connectors: Every Ocelot system must have one, and only one, system controller module. The system controller module may be installed in any of the mainframes. One connector interface module must be installed in all remaining mainframes.

System Topology: All mainframes and remote control panels (RCPs) in an Ocelot system are interconnected in a bus topology using PESA's Ocelot Communication Bus (OCB) Protocol through the RJ-45 connector pairs located on the rear of each panel assembly (see Figure 2-2). Jack splitters cannot be used. All mainframes should be contiguous along the bus, and located in close proximity to each other. An OCB Bus Terminator must be installed in every unused external RJ-45 connector.

Remote Control Panels: An Ocelot system cannot have more than two remote control panel (RCP) buses; and the total amount of cable per RCP bus cannot exceed 300 feet. The total number of control panels in an Ocelot system, mainframe and remote combined, cannot exceed 16.

Modules: An Ocelot system can control up to four switching levels, and each level may contain multiple modules. All modules plug into connectors located on the mainframe mid-plane, which is seven module slot units in width (i.e., has seven interface connectors). Modules vary in width from one to six interface units depending on module type (see Table 2-1). Each mainframe may contain multiple modules as long as the sum of all module widths – including the system controller or connector interface module - does not exceed seven interface units.

Power Supply, Mainframe, Dual power connectors are provided in pairs on system controller modules, and connector interface modules. Only one power supply is required for frame operation, however a second supply may be added to the second connector for power redundancy. A power supply may be connected to either of the power connectors.

Power Supply, Remote Control Panel: Every RCP is powered by a dedicated power supply.

Power Regulator, Mainframe, Standard Definition: Two types of mainframe power regulators exist: audio and video. Either or both may be used in a mainframe, depending on the type of modules installed. Table 2-1 identifies the power regulator required for each module type.

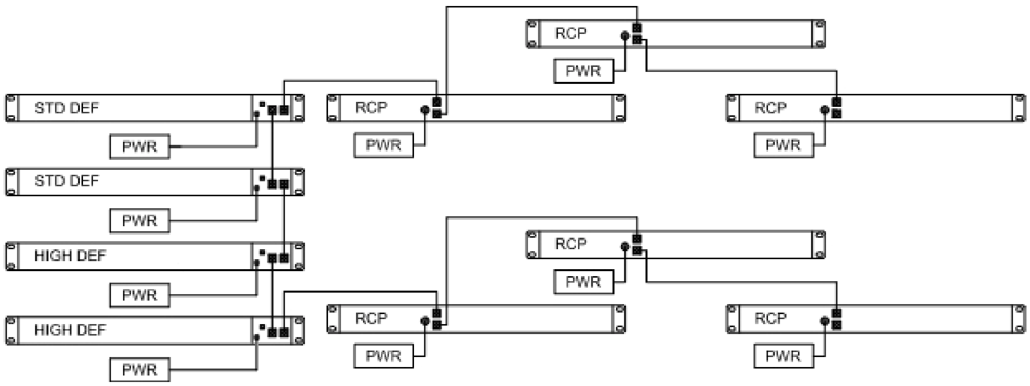

Figure 2-2 Typical Ocelot System Interconnection

Table 2-1 Module Width and Internal Power Regulator Requirements

Module Type	Mid-Plane Interface Units Required	Internal Power Regulator Required
System Controller Module	1	Either
Connector Interface Module	1	None
8x8 Analog Audio Module	1	Audio
8x8 Digital Audio Module, 110 Ohm balanced	1	Either
8x8 Digital Audio Module, 75 Ohm unbalanced – BNC connectors	2	Video
16x16 Analog Audio Module	2	Audio
16x16 Digital Audio Module, 110 Ohm balanced	2	Either
16x16 Digital Audio Module, 75 Ohm unbalanced – BNC connectors	4	Video
8x8 Analog Video Module	2	Video
8x8 Analog Video Module, High Level/Sync	2	Audio
8x8 Digital Video Module, No Re-Clockers	2	Either
16x16 Analog Video Module	4	Video
16x16 Analog Video Module, Wideband	4	Either
16x16 Analog Video Module, High Level/Sync	4	Either
16x16 Digital Video Module, No Re-Clockers	4	Either
16x8 Digital Video, HD – 3Gbps	4	Video
16x16 Digital Video, HD – 3Gbps	4	Video

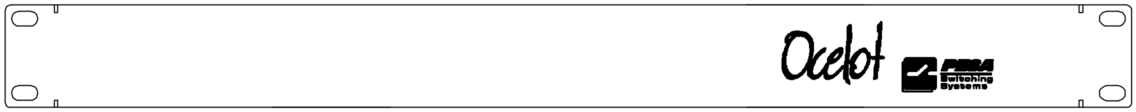

Figure 2-3. Mainframe without Control Panel

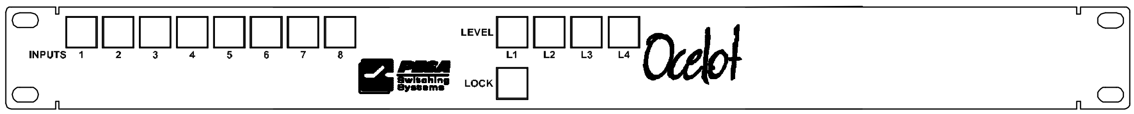

Figure 2-4. 8x1 Control Panel (Remote Only)

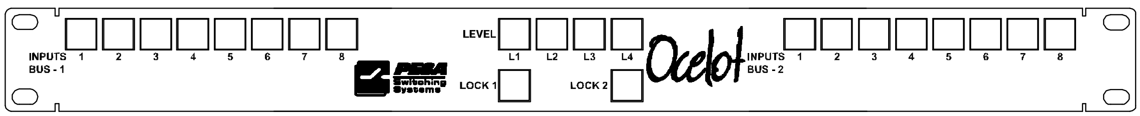

Figure 2-5. 8x1 Dual Control Panel (Remote Only)

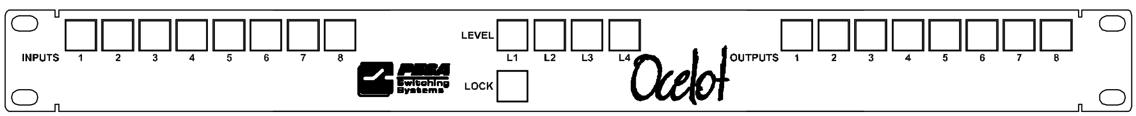

Figure 2-6. 8x8 Control Panel (Mainframe or Remote)

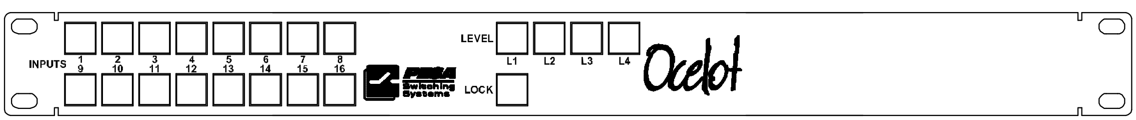

Figure 2-7. 16x1 Control Panel (Remote Only)

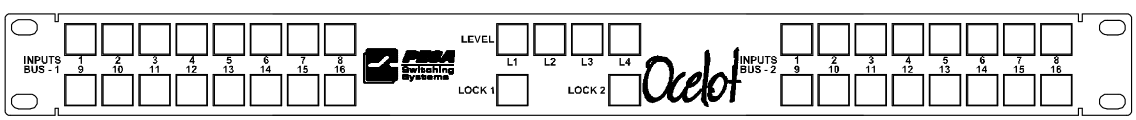

Figure 2-8. 16x1 Dual Control Panel (Remote Only)

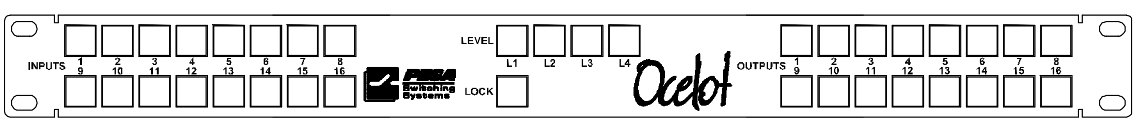

Figure 2-9. 16x16 Control Panel (Mainframe or Remote)

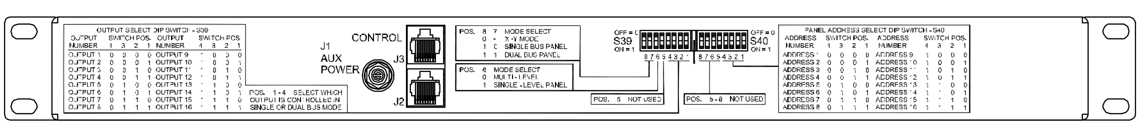

Figure 2-10. Typical Remote Control Panel Rear View

2.3 SPECIFICATIONS

2.3.1 GENERAL

Operational Environment

Temperature .... 0-40°C
Humidity .... 0-90% Non-Condensing

Physical Dimensions

Height	1.75 in (44 mm) (1 Rack Unit)	
Width	19 in (483 mm)	
Depth		
Mainframe		9.7 in (246 mm)
Remote Control Panel		1.3 in (33 mm)

2.3.2 ANALOG AUDIO (8X8, 16X16)

Input

Level .... +26 dBm maximum
Impedance .... ≥60 kΩ
Type .... Electrically Balanced
Coupling .... Direct (DC)
Common Mode Rejection Ratio .... -80 dB (50-60 Hz)
Connector Type .... 3-pin, 2-part, detachable plug (one per input)

Output

Level .... +24 dBm into 600 Ω
Level Variation Between Inputs .... <±0.1 dB
Impedance .... ≤56 Ω
Type .... Electrically Balanced
Coupling .... Direct (DC)
DC on Outputs .... ±20 mV
Load @ 24 dBm .... ≥600 Ω
Connector Type .... 3-pin, 2-part, detachable plug (one per output)

Gain

Gain .... Adjustable to ±0.1 dB
Gain Adjust Range .... ±1.0 dB

Frequency

(Reference 1 KHz)
Sine Wave Response .... <±0.1 dB, 20 Hz to 20 kHz
<-3.0 dB to 200 kHz
Square Wave Response .... <±5%, 3 kHz, 100 μs rise time (20 V p-p)
(Overshoot and Ringing) <±10%, 100 kHz, 1 μs rise time (5 V p-p)

Distortion

Total Harmonic Distortion.............. <0.05% @ 24 dBm, 20 Hz to 20 kHz
Intermodulation Distortion .... <0.06% @ 24 dBm

Crosstalk

10 Hz to 20 kHz .... <-85 dB (all inputs and outputs hostile)

Hum and Noise

Wideband 10 Hz to 300 kHz.. <-73 dBm
80 kHz Low Pass Filter .... <-78 dBm
30 kHz Low Pass Filter .... <-86 dBm
15 kHz Low Pass Filter .... <-89 dBm
“A” Weighted.. <-90 dBm

2.3.3 DIGITAL AUDIO (8X8, 16X16), 110OHM UNBALANCED

Input

Impedance.. 110 Ω, ±20%, 0.1-6.0 MHz
Signal Amplitude ....0.5-7.0 V p-p terminated into 110 Ω
Connector Type.................. 3-pin, 2-part, detachable plug (one per input)

Output

Impedance.. 110 Ω, ±20%, 0.1-6.0 MHz
Signal Amplitude ....2.0-7.0 V p-p terminated into 110 Ω
Common Mode Rejection Ratio≥30 dB below output signal (DC to 6 MHz)
Rise/Fall Time..5-30 ns, 10-90% amplitude
Jitter..<±20 ns
Data Rate ....20 kbps to 10 Mbps
Connector Type................ 3-pin, 2-part, detachable plug (one per output)
Standard..AES3-1993 Serial Digital

2.3.4 DIGITAL AUDIO (8X8, 16X16), 75OHM BALANCED – BNC CONNECTORS

Input

Impedance.. 75 Ω, ±20%, 0.1-6.0 MHz
Signal Amplitude ....0.5-7.0 V p-p terminated into 110 Ω
Connector Type...BNC (one per input pair)

Output

Impedance..75 Ω, ±20%, 0.1-6.0 MHz
Signal Amplitude ....2.0-7.0 V p-p terminated into 110 Ω
Common Mode Rejection Ratio≥30 dB below output signal (DC to 6 MHz)
Rise/Fall Time...5-30 ns, 10-90% amplitude
Jitter...<±20 ns
Data Rate ....20 kbps to 10 Mbps
Connector Type..BNC (one per output)
Standard...AES3-1993 Serial Digital

2.3.5 ANALOG VIDEO (8X8)

Input

Level..1 V p-p nominal
2 V p-p maximum (without obvious distortion)
Impedance...75 Ω internally terminated
Return Loss...>40 dB to 5 MHz
>15 dB to 100 MHz
Coupling ....Direct (DC)
Type... Differential
Connector Type..BNC (one per input)

Output

Level..1 V p-p nominal
2 V p-p maximum (without obvious distortion)
Impedance.. 75 Ω
Return Loss...>40 dB to 5 MHz
>15 dB to 100 MHz
Coupling ....Direct (DC)
DC on Outputs ....<±20 mV maximum
Connector Type..BNC (one per output)

Gain

Gain .... Unity
Gain Adjust Range ....±0.5 dB

Linear Distortion

Frequency Response (8x8)... ±0.1 dB to 10 MHz
±0.75 dB to 100 MHz
+1.5 dB, -3.0 dB to 250 MHz
Vertical Tilt...0.25% (50 Hz square wave)
Horizontal Tilt.. 0.25%

Non-Linear Distortion

(All tests, 10-90%, 3.58 MHz or 12.5-87.5%, 4.43 MHz)
Differential Gain .... 0.1% @ 4.43 MHz
Envelope Delay..<2 ns, 50 MHz to 85 MHz
Differential Phase...0.1° @ 4.43 MHz

Crosstalk

Video-to-Video .... <-60 dB to 5 MHz (all inputs and outputs hostile)

Switching

Differential Delay, Input-to-Input, Same Output ....±1.0° @ 4.43 MHz
Differential Delay, Output-to-Output, Same Input.......±1.5° @ 4.43 MHz

Signal-to-Noise

Video Filter (low pass to 5 MHz)...-73 dB
Luminance Weighting Filter ....-81 dB

2.3.6 ANALOG VIDEO (16X16)

Input

Level..1 V p-p nominal
2 V p-p maximum (without obvious distortion)
Impedance..75 Ω internally terminated
Return Loss..>40 dB to 5 MHz
>15 dB to 100 MHz
Coupling ....Direct (DC)
Type.. Differential
Connector Type...BNC (one per input)

Output

Level..1 V p-p nominal
2 V p-p maximum (without obvious distortion)
Impedance.. 75 Ω
Return Loss..>40 dB to 5 MHz
>15 dB to 100 MHz
Coupling ....Direct (DC)
DC on Outputs ....<±20 mV maximum
Connector Type...BNC (one per output)

Gain

Gain .... Unity
Gain Adjust Range ....±0.5 dB

Linear Distortion

Frequency Response (16x16) .... ±0.1 dB to 10 MHz
±0.75 dB to 75 MHz
+1.5 dB, -3.0 dB to 150 MHz
Vertical Tilt ....0.25% (50 Hz square wave)
Horizontal Tilt 0.25%

Non-Linear Distortion

(All tests, 10-90%, 3.58 MHz or 12.5-87.5%, 4.43 MHz)
Differential Gain .... 0.1% @ 4.43 MHz
Envelope Delay ....<2 ns, 50 MHz to 85 MHz
Differential Phase ....0.1° @ 4.43 MHz

Crosstalk

Video-to-Video .... <-60 dB to 5 MHz (all inputs and outputs hostile)

Switching

Differential Delay, Input-to-Input, Same Output ....±1.0° @ 4.43 MHz
Differential Delay, Output-to-Output, Same Input.......±1.5° @ 4.43 MHz

Signal-to-Noise

Video Filter (low pass to 5 MHz)..-73 dB
Luminance Weighting Filter ....-81 dB

2.3.7 ANALOG VIDEO, WIDEBAND (16X16)

Input

Level ....1 V p-p nominal
2 V p-p maximum (without obvious distortion)
Impedance...75 Ω internally terminated
Return Loss ....>40 dB to 5 MHz
>15 dB to 400 MHz
Coupling ....Direct (DC)
Type.. Differential
Connector Type..BNC (one per input)

Output

Level ....1 V p-p nominal
2 V p-p maximum (without obvious distortion)
Impedance.. 75 Ω
Return Loss ....>40 dB to 5 MHz
>20 dB to 400 MHz
Coupling ....Direct (DC)
DC on Outputs .... <±20 mV maximum
Connector Type..BNC (one per output)

Gain

Gain .... Unity
Gain Adjust Range ....±0.5 dB

Linear Distortion

Frequency Response.. ±0.1 dB to 10 MHz
±0.5 dB to 20 MHz
+1.0 dB, -3.0 dB to 40 MHz
Vertical Tilt..0.25% (50 Hz square wave)
Horizontal Tilt.. 0.25%

Crosstalk

Video-to-Video .... <-60 dB to 5 MHz (all inputs and outputs hostile)

Switching

Differential Delay, Input-to-Input, Same Output ....±1.0° @ 4.43 MHz
Differential Delay, Output-to-Output, Same Input.......±1.5° @ 4.43 MHz

Signal-to-Noise

Video Filter (low pass to 5 MHz)...-73 dB
Luminance Weighting Filter ....-81 dB

2.3.8 ANALOG VIDEO HIGH LEVEL/SYNC (8X8, 16X16)

Input

Level...±5 V referenced to ground
Impedance..75 Ω internally terminated
Return Loss..>40 dB to 5 MHz
Coupling ....Direct (DC)
Type... Differential
Connector Type...BNC (one per input)

Output

Level...±5 V referenced to ground
Impedance.. 75 Ω
Return Loss..>40 dB to 5 MHz
Coupling ....Direct (DC)
DC on Outputs ....<±20 mV maximum
Connector Type...BNC (one per output)
Equalization for 150 ft Belden 8281................<-2 dB to 400 MHz typical

Gain

Gain .... Unity
Gain Adjust Range ....±0.5 dB

Linear Distortion

Frequency Response .... ±0.1 dB to 10 MHz
±1.0 dB to 200 MHz
+1.5 dB, -3.0 dB to 400 MHz
Vertical Tilt...0.25% (50 Hz square wave)
Horizontal Tilt... 0.25%

Crosstalk

Video-to-Video .... <-60 dB to 5 MHz (all inputs and outputs hostile)

Signal-to-Noise

Video Filter (low pass to 5 MHz)...-73 dB
Luminance Weighting Filter ....-81 dB

2.3.9 SD-SDI DIGITAL VIDEO (8X8, 16X16), NON-RECLOCKED

Input

Impedance... 75 Ω
Return Loss ....>15 dB, 5-270 MHz
Automatic Equalization for Belden 8281to 100 m for 560 Mbps maximum
to 200 m for 360 Mbps maximum
to 300 m for 270 Mbps maximum
Connector Type...BNC (one per input)

Output

Impedance... 75 Ω
Return Loss ....>15 dB, 5-270 MHz
Signal Amplitude ....800 mV ±10%, terminated into 75 Ω
DC Offset...±0.5 V, terminated into 75 Ω
Rise/Fall Time.................. 0.6 ns ±100 ps (20-80%) terminated into 75 Ω
Timing Jitter.. <0.2 Unit Intervals p-p
Alignment Jitter..........................<0.2 Unit Intervals p-p (SMPTE 259M)
Connector Type..BNC (one per output)

2.3.10 HD/3G-SDI DIGITAL VIDEO (16X8, 16X16)

INPUTS/OUTPUTS

Number	16 inputs, 16 or 8 outputs
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
Operational Modes	AUTO, BY-PASS
Reference Inputs	Two independent 75 ohm BNCs, 0.5Vpp to 2.0Vpp; PAL or NTSC – through Ocelot system controller
Data Rates	143Mbps to 3Gbps
Form Factor	4 module slots in Ocelot mainframe

2.3.11 ENVIRONMENTAL AND MISCELLANEOUS

AC Input Connections	Wall transformer w/ 3-pin two-part DC power connector to Ocelot mainframe
Input Voltage	130 VAC or 240 VAC, 47-63Hz to Ocelot power supply
NOTE:	Operating voltages for 3Gen module received from Ocelot main frame power
Operational Temp	0-40 degrees C
Operational Humidity	90% Non-condensing

Chapter 3 Installation

3.1 DESCRIPTION

Ocelot video and audio routing modules install in a standard Ocelot mainframe chassis and derive power from the system controller or controller interface module. Figure 3-1 illustrates a mainframe chassis and its module slots. There are a total of seven slots available in every mainframe; however, each frame must have either a system controller (one frame only) or controller interface module installed, usually in slot 7, leaving six available slots for modules in the frame. Every Ocelot system must have one system controller installed. If more than one frame is used in the installation, all other frames receive a controller interface module. Routing modules may be installed in the remaining six open slots. If any slots are unused, fill the space with a blank cover panel.

Multiple frames are interconnected in a daisy-chain fashion using cables equipped with RJ-45 connectors on each end, beginning with the frame containing the system controller and ending with an OCB terminator installed in the loop-thru connector on the last frame.

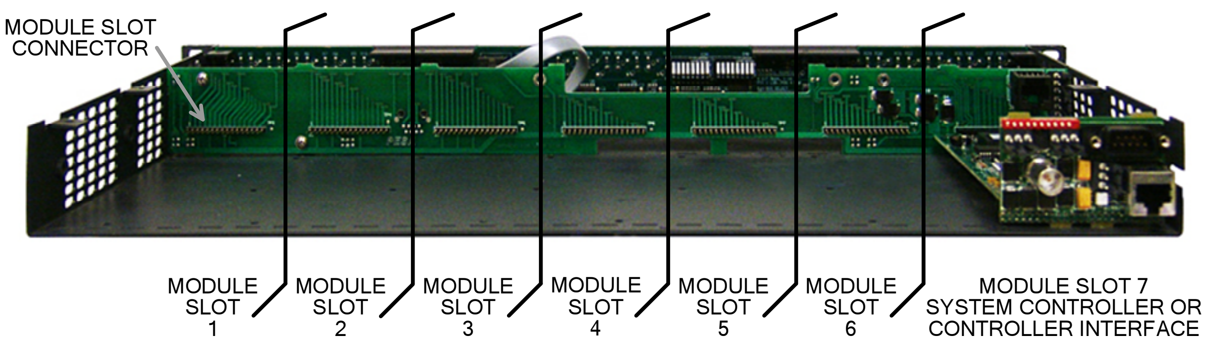

Figure 3-1 Typical Ocelot Mainframe Chassis

3.2 INSTALLATION IN EQUIPMENT RACK

Ocelot mainframe chassis equipment is designed to be installed in a standard 19-inch equipment rack. Sufficient space must be provided behind the equipment racks to allow for control, signal, and power cables. All panel mounting holes should be utilized and mounting hardware tightened securely.

1. Install the equipment into the rack as follows:
2. Insert mainframe assembly into the equipment rack and support the bottom of the assembly until all mounting screws have been installed and properly tightened.
3. Install bottom two panel mounting screws.

4. Install top two panel mounting screws.
5. Install any remaining panel mounting screws.
6. Tighten all panel mounting screws until they are secure.

3.3 INTERFACE CONNECTIONS

For reasons of personal safety, and to prevent damage to the equipment or cables, the following guidelines should be followed when connecting cables to this equipment:

1. Install the equipment in the rack before connecting cables.
2. All cables should be carefully strain relieved to prevent connector separation.
3. To the extent possible, separate control, signal, and power cables to minimize crosstalk and interference.
4. The liberal use of nylon cable ties to secure cables to the rack is encouraged. This will minimize the amount of force transmitted to the equipment and help route cables away from hazardous areas.
5. Route cables away from walk areas to avoid creating a safety hazard.
6. All interface connections are made at the rear of this equipment.

3.4 INPUT AND OUTPUT SIGNAL CONNECTORS

3.4.1 AUDIO

These 3-contact connectors provide the audio input and output signal interfaces. See Figure 3-2 for an orientation view showing contact locations.

These connectors are connected to the audio sources and destinations with cables constructed with 3 -contact connectors (Part No. 81-9029-0811-0) and shielded, twisted-pair audio cable (Part No. 81-9028-0043-2, Belden 8451, or equivalent) as shown in Figure 3-3.

The connector body has an integral strain relief which requires the use of a nylon cable tie (Part No. 81-9021-0028-8).

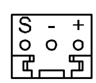

Figure 3-2 Audio Input/Output Signal Connectors

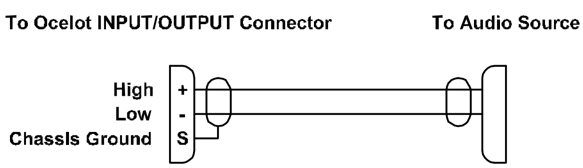

Figure 3-3 Audio Input/Output Signal Cable

Ocelot audio modules rear panel I/O connector layouts are shown in Figure 3-4 thru 3-7.

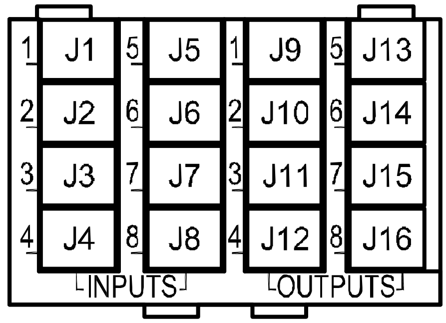

Figure 3-4 8x8 Analog and Digital (110 Ohm Balanced) Audio Module Rear View

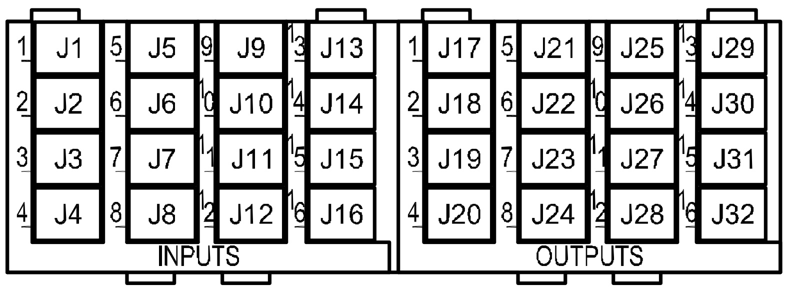

Figure 3-5 16x16 Analog and Digital (110 Ohm Balanced) Audio Module Rear View

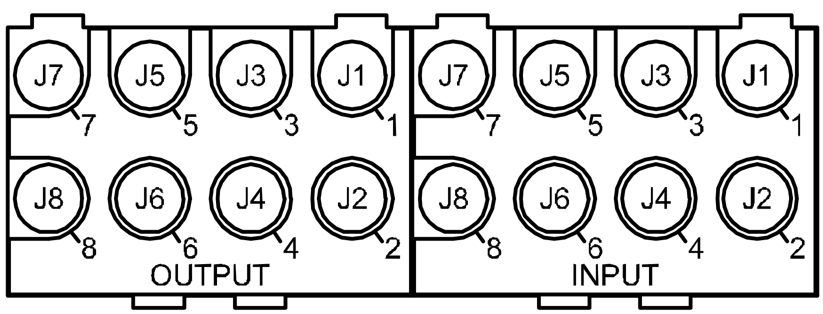

Figure 3-6 8x8 Digital Audio (75 Ohm Unbalanced) Module Rear View

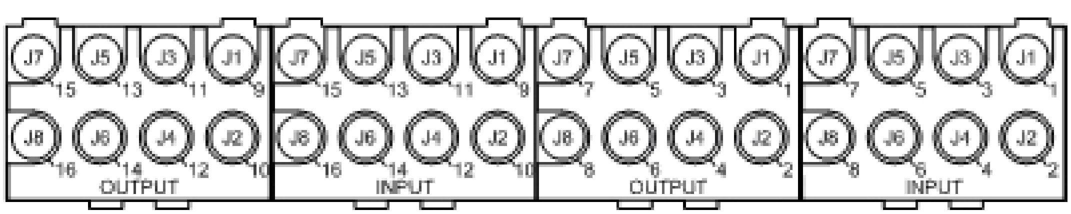

Figure 3-7 16x16 Digital Audio (75 Ohm Unbalanced) Module Rear View

3.4.2 VIDEO

Rear panel BNC connectors provide the video input and output signal interfaces. Use coaxial cable and a standard BNC connector to connect to each source and destination.

Ocelot video module rear panel I/O connector layouts are shown in Figure 3-8 thru 3-16.

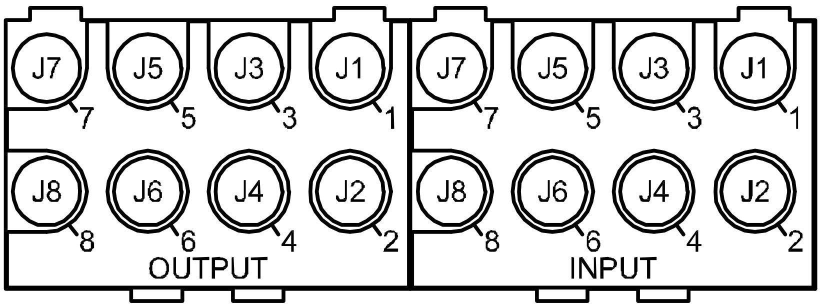

Figure 3-8 8x8 Analog Video Module Rear View

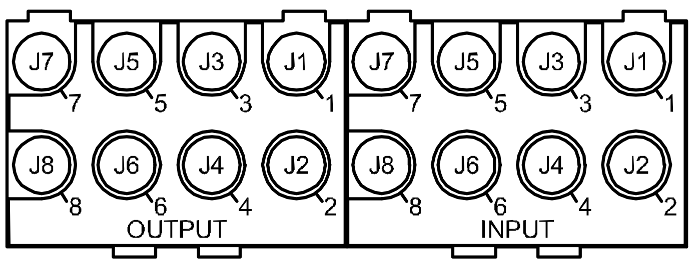

Figure 3-9 8x8 Analog Video (High Level/Sync) Module Rear View

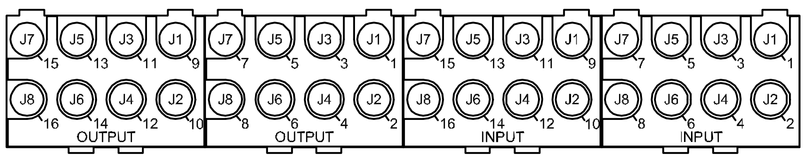

Figure 3-10 16x16 Analog Video Module Rear View

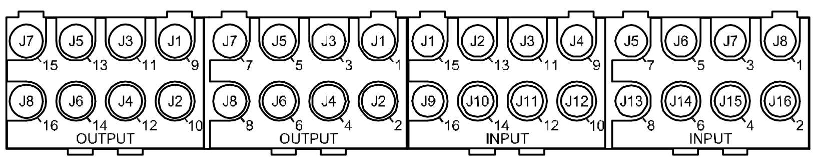

Figure 3-11 16x16 Analog Video (Wideband) Module Rear View

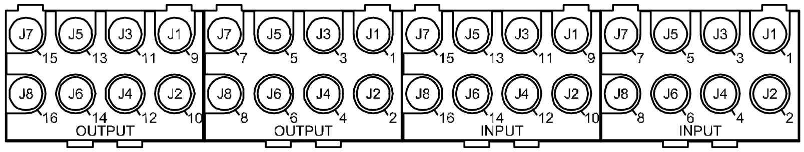

Figure 3-12 16x16 Analog Video (High Level/Sync) Module Rear View

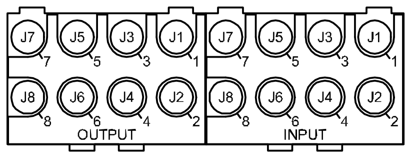

Figure 3-13 8x8 SD-SDI Digital Video Module Rear View

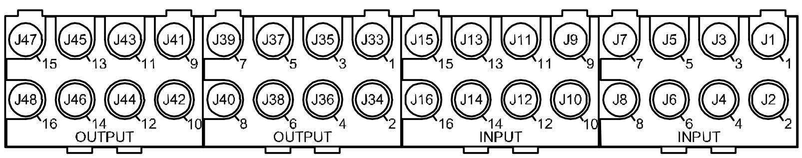

Figure 3-14 16x16 SD-SDI Digital Video Module Rear View

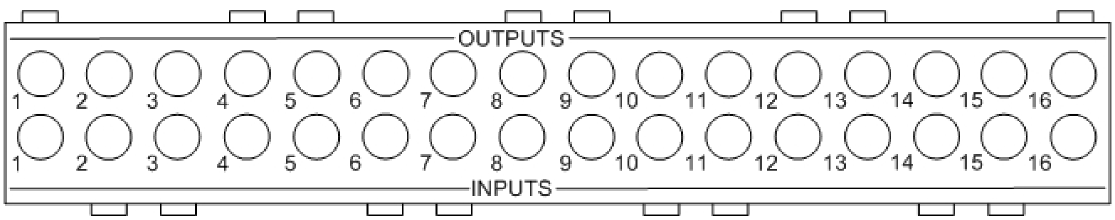

Figure 3-15 16x16 3Gbps-SDI Digital Video Module Rear View

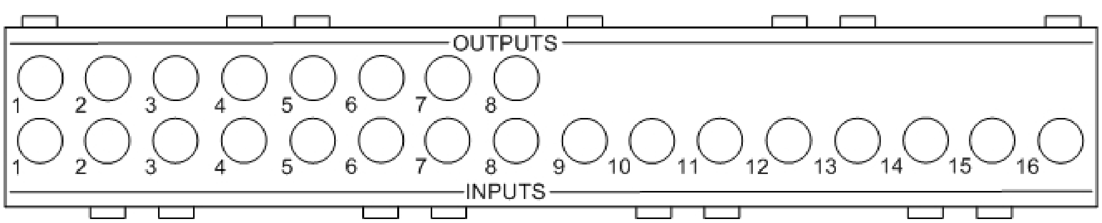

Figure 3-16 16x8 3Gbps-SDI Digital Video Module Rear View

3.5 MAINFRAME CONTROL SIGNAL CONNECTORS

NOTE	**All mainframes and remote control panels (RCPs) in an Ocelot system are interconnected using PESA's Ocelot Communication Bus (OCB) protocol, through the RJ-45 connectors located on the rear of each panel assembly. Jack splitters cannot be used, and all mainframes must be contiguous along the bus and located in close proximity to one other. An OCB bus terminator must be installed in every unused external RJ-45 connector.** **An Ocelot system cannot have more than two RCP buses, and the total amount of cable per RCP bus cannot exceed 300 feet. The total number of control panels in an Ocelot system, mainframe and remote combined, cannot exceed 16.**

All mainframe control signals are routed through either a system controller module, or a connector interface module. A system controller module is installed in the first mainframe of the bus; connector interface modules are installed in all other mainframes. Figures 3-17 and 3-18 illustrate the rear panel connectors of the system controller and controller interface modules, respectively. Refer to these illustrations when completing control signal connections to the Ocelot mainframe.

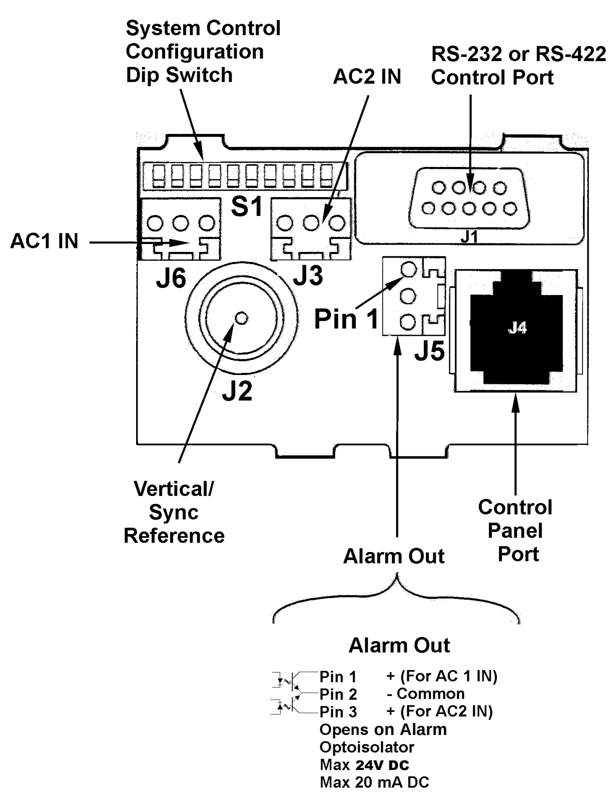

Figure 3-17. System Controller Module Rear View

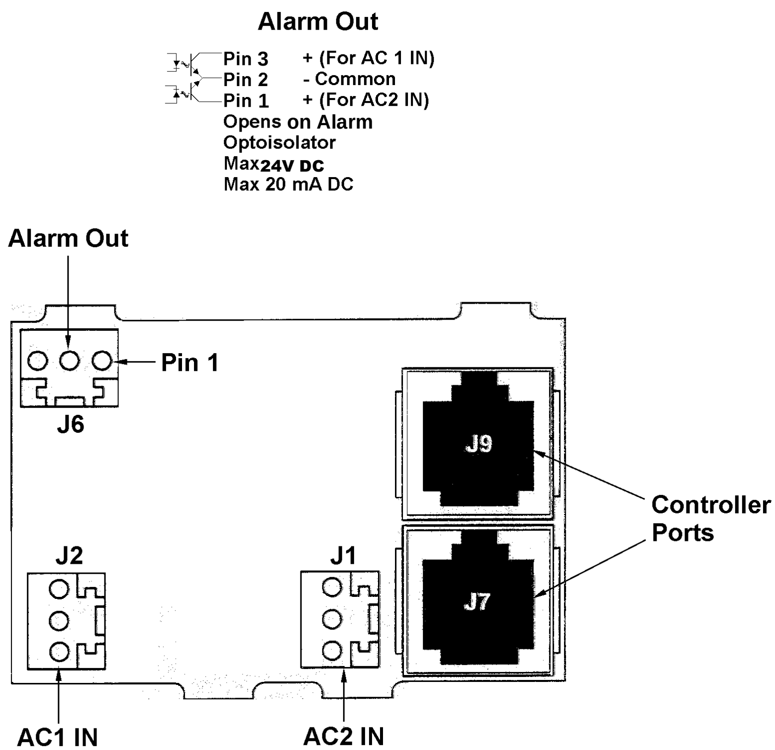

Figure 3-18. Connector Interface Module Rear View (Connectors J4, J5)

3.5.1 COMMUNICATION BUS CONNECTORS

(System Controller J4, Connector Interface J7 and J9)

Rear panel RJ-45 connectors provide serial communication interface using the Ocelot Communication Bus (OCB) Protocol. Connectors on the connector interface module are wired in parallel to allow mainframes and remote control panels to be daisy-chained together.

Ocelot mainframes and remote control panels are interconnected with OCB cables available in two lengths: 1 ft (Part No. 81-9028-0386-0) and 25 ft (Part No. 81-9028-0385-0).

Ocelot panels may also be interconnected with eight-conductor UTP patch cables conforming to TIA/EIA 568-A, Category 5.

If necessary, OCB cables may be spliced together using an RJ-45 female-to-female coupler (Part No. 81-9029-0787-0).

Install an OCB Bus Terminator (Part No. 81-9065-2189-0) in all unused RJ-45 connectors.

3.5.2 VERTICAL/SYNC REFERENCE INPUT CONNECTOR

(System Controller J2)

Connector J2 (BNC) on the rear of the system controller module provides an interface for a house sync signal (NTSC, PAL, etc.) using coaxial cable and a standard BNC connector.

3.5.3 EXTERNAL CONTROL PORT CONNECTOR

(System Controller J1)

This DB-9 Male connector provides an external system control interface. See Paragraph 3.9.16 “System Controller Module” on Page 3-40 for the switch and jumper settings necessary to configure this connector for use.

RS-232 CPU Link Interface (PC)

Connect J1 to a serial port on a PC with a null modem cable (Part No. 81-9028-0393-0). If necessary, a cable up to 50 feet in length may be fabricated in the field as shown in Figure 3-19.

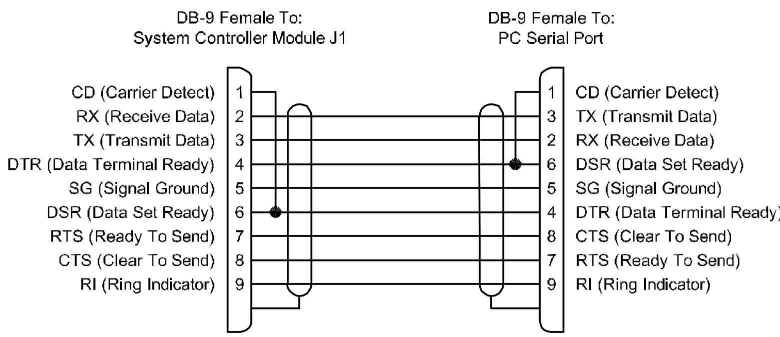

Figure 3-19 RS-232 CPU Link Interface (Null Modem) Cable

RS-232 CPU Link Interface (External Modem)

Connect J1 to an external modem with an AT serial modem cable (Part No. 81-9028-0400-0). If necessary, a cable up to 50 feet in length may be fabricated in the field as shown in Figure 3-20.

Use the following initialization strings:

PM288MT: 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 on the use of an external modem, consult the manual that came with your control system software.

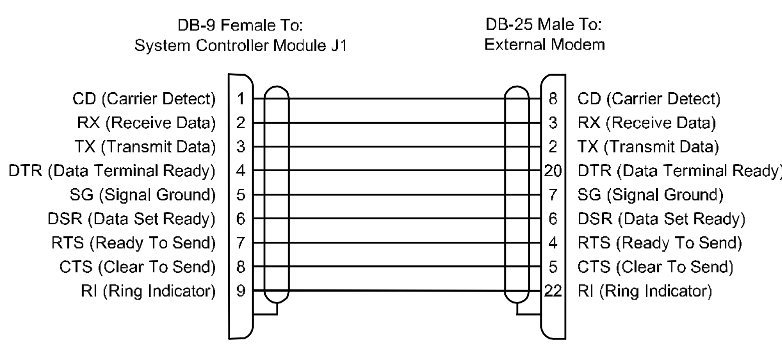

Figure 3-20 RS-232 CPU Link Interface (AT Serial Modem) Cable

RS-422 CPU Link Interface (Point-to-Point)

Connect J1 to a serial port on a PC with an AT serial modem cable (Part No. 81-9028-0400-0). If necessary, a cable up to 4000 feet in length may be fabricated in the field as shown in Figure 3-21.

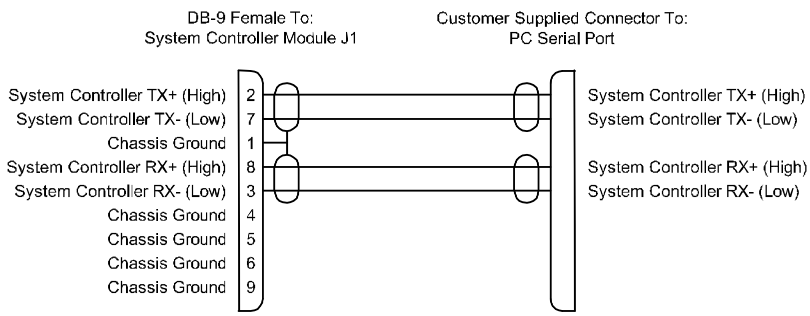

Figure 3-21 RS-422 CPU Link Interface (Point-to-Point) Cable

RS-422 CPU Link Interface (Multi-Drop)

Multiple Ocelot systems may be controlled by a single computer when RS-422 Multi-Drop Mode is selected. Using cables constructed as shown in Figure 3-21, the system controller modules are daisy-chained together, and then connected to the PC as shown in Figure 3-22. The total amount of cable in the RS-422 bus may not exceed 4000 feet.

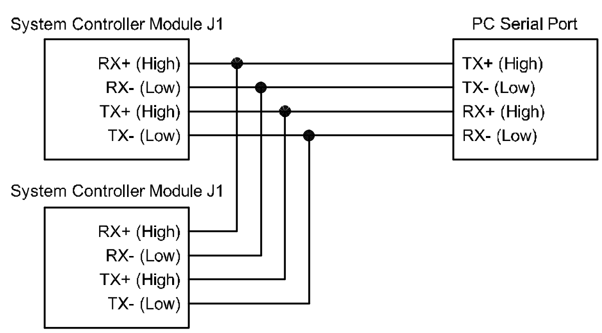

Figure 3-22 RS-422 CPU Link Interface (Multi-Drop) Cable

RS-422 PRC Interface

Connect J1 to the PRC interface connector on any PESA routing switcher or system controller with an AT serial modem cable (Part No. 81-9028-0400-0). If necessary, a cable up to 4000 feet in length may be fabricated in the field as shown in Figure 3-23.

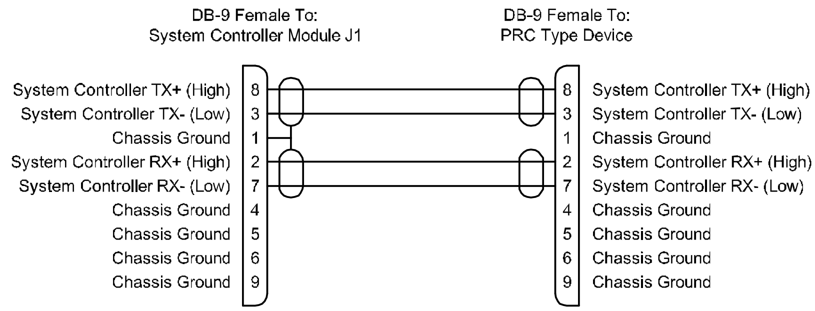

Figure 3-23. RS-422 PRC Interface Cable

3.6 CONTROL PANEL SIGNAL CONNECTORS

3.6.1 MAINFRAME CONTROL PANEL

Control signals for mainframe control panels are routed through connectors located on the rear of each panel as shown in Figure 3-24.

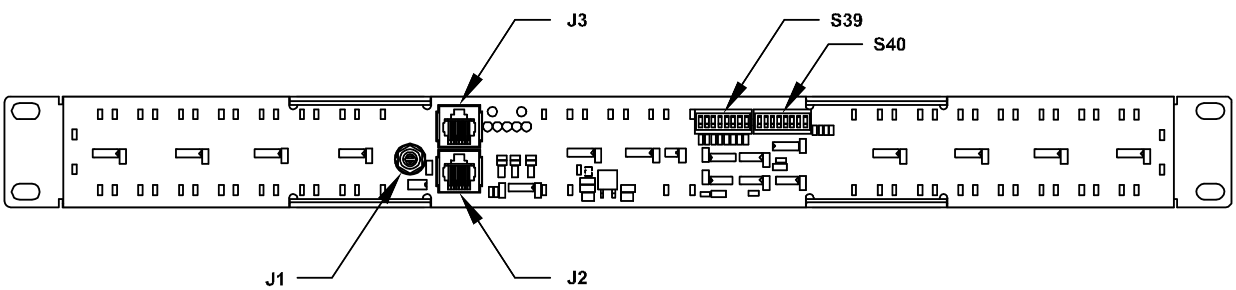

Figure 3-24 Mainframe Control Panel Rear View (Connectors J2, J3)

Communication Bus Connectors (J2, J3)

These RJ-45 connectors are wired in parallel, and are used to provide a serial communication interface using the Ocelot Communication Bus (OCB) Protocol.

Connect either J2 or J3 to the RJ-45 connector (J14) located on the front side of the Ocelot mid-plane, with a 1 ft OCB Cable (Part No. 81-9028-0386-0).

An eight-conductor UTP patch cable conforming to TIA/EIA 568-A, Category 5 may also be used.

It is not necessary to install an OCB Bus Terminator in the unused RJ-45 connector on the rear of the mainframe control panel.

3.6.2 REMOTE CONTROL PANEL

Control signals for remote control panels are routed through connectors located on the rear of each panel as shown in Figure 3-25.

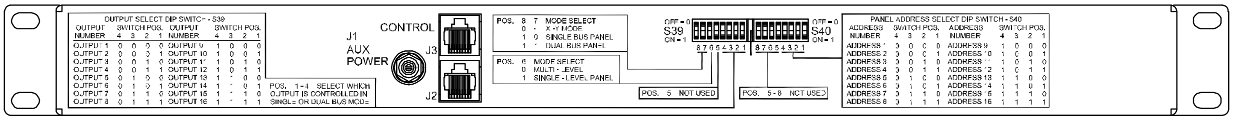

Figure 3-25 Typical Remote Control Panel Rear View (Connectors J2, J3)

Communication Bus Connectors (CONTROL) (J2, J3)

These RJ-45 connectors are used to provide a serial communication interface using the Ocelot Communication Bus (OCB) Protocol. They are wired in parallel to allow mainframes and remote control panels to be daisy-chained together.

Ocelot mainframes and remote control panels are interconnected with OCB cables available in two lengths: 1 ft (Part No. 81-9028-0386-0) and 25 ft (Part No. 81-9028-0385-0).

Ocelot panels may also be interconnected with eight-conductor UTP patch cables conforming to TIA/EIA 568-A, Category 5.

If necessary, OCB cables may be spliced together using an RJ-45 female-to-female coupler (Part No. 81-9029-0787-0).

Install an OCB Bus Terminator (Part No. 81-9065-2189-0) in all unused RJ-45 connectors.

3.7 POWER CONNECTORS

3.7.1 MAINFRAME STANDARD POWER SUPPLY

	**When only one power supply unit is connected to a system controller or controller interface module with dual power connectors, the exposed contacts on the unused power connector are energized with 18 VAC. While this voltage level does not present a hazard to personal safety, care should be taken not to short these contacts to each other, or ground. Doing so will damage the power supply.**

Mainframe power supplies are connected to a mainframe through either a system controller module, or a connector interface module. There are two power connectors, labeled AC1 IN and AC2 IN, on the rear panel of both module types. Connect the voltage output from the external power supply to either of the input connectors. The remaining connector may be used to connect a second power supply for redundancy. Figures 3-26 and 3-27 illustrate the rear panel connectors of the system controller and controller interface modules, respectively. Refer to these illustrations when completing power connections to the Ocelot mainframe.

Ocelot mainframes are powered by external power supplies that connect to AC mains, and are available in both US and Non-US configurations. Power supplies for use in the US are of the wall-mounted transformer type that plug into AC mains; non-US power supplies are each equipped with a pigtail for connection to the mainframe connectors, and a line cord for connection to the AC mains.

The power supply is connected to J3 or J6 on the system controller module, or J1 or J2 on the connector interface module as shown in Figures 3-26 and 3-27.

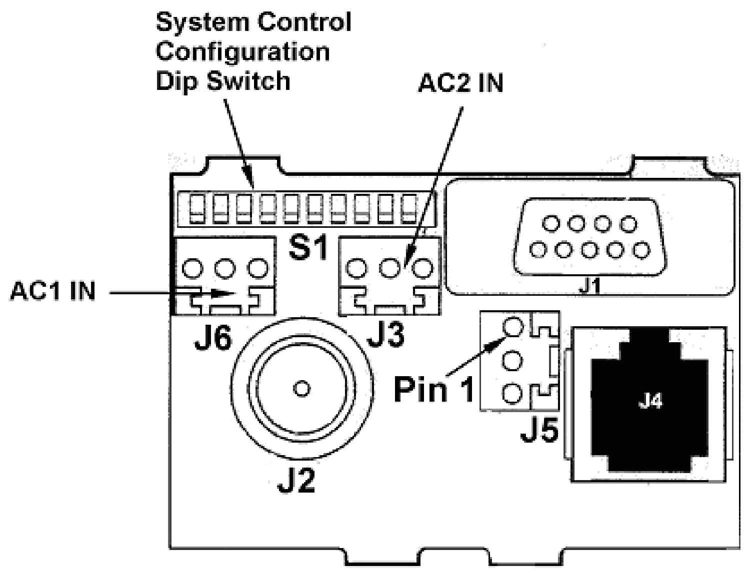

Figure 3-26 System Controller Module Rear View (Power Connectors J3, J6)

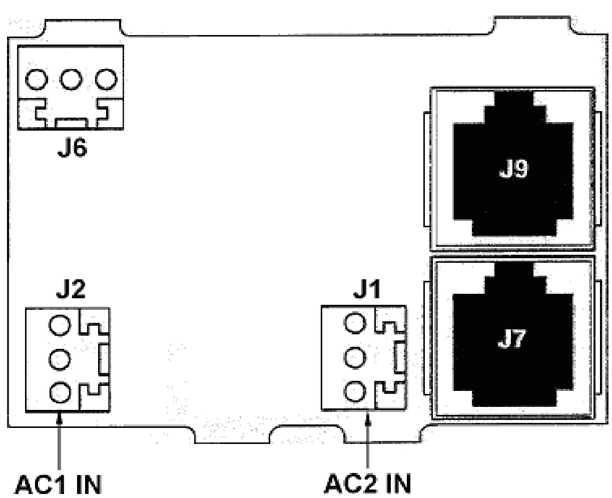

Figure 3-27 Connector Interface Module Rear View (Power Connectors J1, J2)

3.7.2 BACKUP POWER SUPPLIES

Dual power system controller and controller interface modules are equipped with two power supply connectors. The main power supply may be attached to either connector, and a second supply may be attached to the remaining connector for power redundancy.

3.7.3 CONTROL PANEL POWER SUPPLIES

Remote Control Panel (J1)

Ocelot remote control panels are powered by external power supplies that plug into the AC mains, and are available in both US and Non-US configurations. Connect the output voltage from the power supply to connector J1 on the remote control panel rear panel as shown in Figure 3-28. One power supply is required for every RCP.

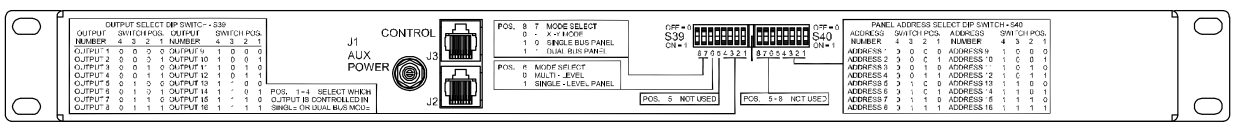

Figure 3-28 Typical Remote Control Panel Rear View (Connector J1)

Mainframe Control Panel (J1)

Mainframe control panel power is supplied from the mainframe mid-plane, through the communication bus cable, connectors J2 or J3 as shown by Figure 3-29. No connection is made to J1 on a mainframe control panel.

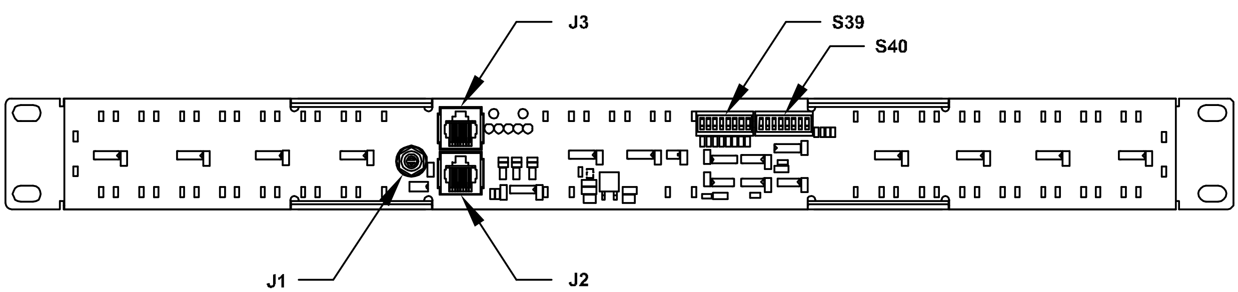

Figure 3-29. Mainframe Control Panel Rear View (Connector J1)

3.8 SWITCH AND JUMPER SETTINGS

Control Panel switches (S39 and S40) are used to select the panel output, panel type, panel address, and switching mode. Figures 3-30 and 3-31 show the location and orientation of these switches. Switch functions discussed in the following paragraphs are applicable to both mainframe and remote control panels.

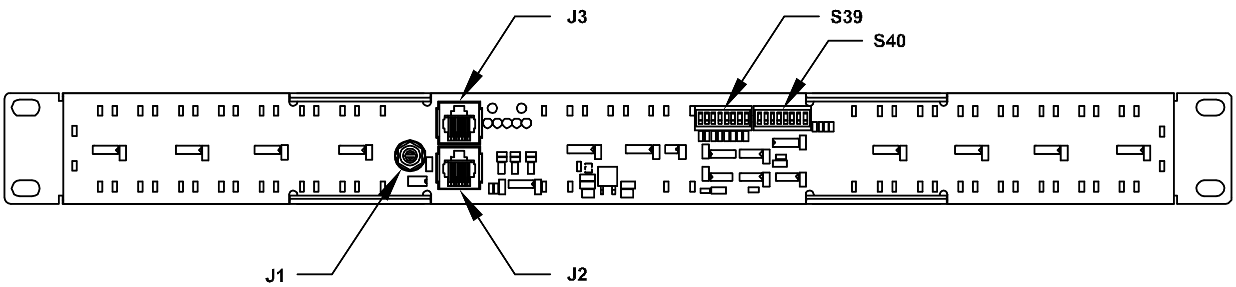

Figure 3-30. Mainframe Control Panel Rear View

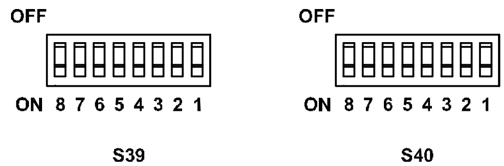

Figure 3-31. Mainframe Control Panel Switches S39, S40

3.8.1 PANEL OUTPUT (S39-1 THRU S39-4)

When configuring a single output panel (8x1, 16x1), these switches are used to select the output to be controlled.

When configuring a dual output panel (8x1 Dual, 16x1 Dual), these switches are used to select the output to be controlled by Bus-1. The next output in numeric sequence will be controlled by Bus-2.

When configuring an X/Y panel (8x8, 16x16), these switches should be in the OFF position. Refer to Table 3-1.

For example, if a 16x1 Dual panel is configured by setting S39-1 and S39-2 in the ON position, and S39-3 and S39-4 in the OFF position, Bus-1 (the input keys on the left) will control Output 4, and Bus-2 (the input keys on the right) will control Output 5.

Table 3-1 Control Panel Output (S39-1 Through S39-4)

Mainframe Control Panel Panel Output	Switch S39-1	Switch S39-2	Switch S39-3	Switch S39-4
Output 1	OFF	OFF	OFF	OFF
Output 2	ON	OFF	OFF	OFF
Output 3	OFF	ON	OFF	OFF
Output 4	ON	ON	OFF	OFF
Output 5	OFF	OFF	ON	OFF
Output 6	ON	OFF	ON	OFF
Output 7	OFF	ON	ON	OFF
Output 8	ON	ON	ON	OFF
Output 9	OFF	OFF	OFF	ON
Output 10	ON	OFF	OFF	ON
Output 11	OFF	ON	OFF	ON
Output 12	ON	ON	OFF	ON
Output 13	OFF	OFF	ON	ON

Output 14	ON	OFF	ON	ON
Output 15	OFF	ON	ON	ON
Output 16	ON	ON	ON	ON

3.8.2 SWITCH S39-5

S39-5 is reserved for future use and should be in the **OFF** position.

3.8.3 SWITCHING MODE (S39-6)

Single Level Switching mode allows switches to be taken on only one level at a time. Multi-Level Switching mode allows switches to be taken on multiple levels at the same time. Refer to Table 3-2 for switch settings.

Table 3-2 Control Panel Switching Mode (S39-6)

Mainframe Control Panel Switching Mode	Switch S39-6
Multi-Level Switching Mode	OFF
Single Level Switching Mode (Default)	ON

3.8.4 PANEL TYPE (S39-7, S39-8)

Switches 7 and 8 on S39 select the panel type as shown in Table 3-3.

Table 3-3 Control Panel Type (S39-7, S39-8)

Mainframe Control Panel Panel Type	Switch S39-7	Switch S39-8
X/Y Panel (8x8, 16x16)	OFF	OFF
Single Output Panel (8x1, 16x1)	OFF	ON
Dual Output Panel (8x1 Dual, 16x1 Dual)	ON	ON

3.8.5 PANEL ADDRESS (S40-1 THRU S40-4)

Switches 1 thru 4 on S40 assign the control panel address. Every Ocelot control panel, whether mainframe or remote, must be assigned a unique address as shown in Table 3-4.

Table 3-4 Control Panel Address (S40-1 through S40-4)

Mainframe Control Panel Panel Address	Switch S40-1	Switch S40-2	Switch S40-3	Switch S40-4
Panel Address 1	OFF	OFF	OFF	OFF
Panel Address 2	ON	OFF	OFF	OFF
Panel Address 3	OFF	ON	OFF	OFF
Panel Address 4	ON	ON	OFF	OFF
Panel Address 5	OFF	OFF	ON	OFF
Panel Address 6	ON	OFF	ON	OFF

Panel Address 7	OFF	ON	ON	OFF
Panel Address 8	ON	ON	ON	OFF
Panel Address 9	OFF	OFF	OFF	ON
Panel Address 10	ON	OFF	OFF	ON
Panel Address 11	OFF	ON	OFF	ON
Panel Address 12	ON	ON	OFF	ON
Panel Address 13	OFF	OFF	ON	ON
Panel Address 14	ON	OFF	ON	ON
Panel Address 15	OFF	ON	ON	ON
Panel Address 16	ON	ON	ON	ON

3.8.6 SWITCH S40 5 THRU 8

S40-5 through S40-8 are reserved for future use and should be in the **OFF** position.

3.9 ROUTING MODULES

3.9.1 8X8 ANALOG AUDIO MODULE

J2, J8 and J9 are jumpers used to assign the module to a level, and select the input power source. Figures 3-32 and 3-33 show the location and orientation of these jumpers.

CR1 is a green LED that is ON when ±15 VDC input power is present.

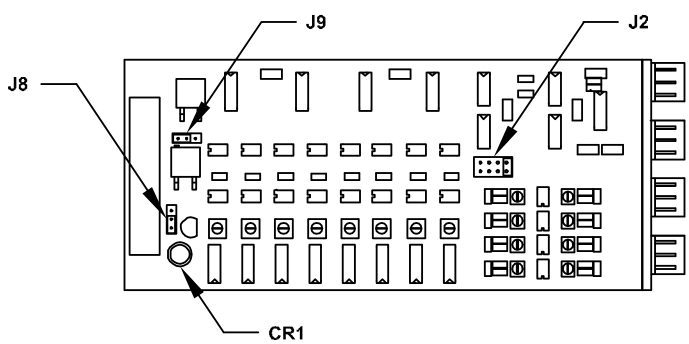

Figure 3-32 8x8 Analog Audio Module - Top View

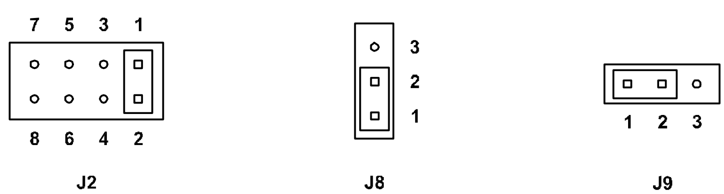

Figure 3-33. 8x8 Analog Audio Module Jumpers J2, J8, J9

Level Assignment (J2)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-5.

Table 3-5 8x8 Analog Audio Module Level Assignment (J2)

8x8 Analog Audio Level Assignment	Jumper J2
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

+15 VDC Source(J8)

J8 selects the +15 VDC input power source. Jumper positions are shown in Table 3-6; however, this jumper should not be changed from the default position.

Table 3-6 8x8 Analog Audio Module +15 VDC Source (J8)

8x8 Analog Audio +15 VDC Source	Jumper J8
External (Default)	1-2
Internal	2-3

-15 VDC Source (J9)

Jumper J9 selects the -15 VDC input power source. Jumper positions are shown in Table 3-7; however, this jumper should not be changed from the default position.

Table 3-7 8x8 Analog Audio Module -15 VDC Source (J9)

8x8 Analog Audio -15 VDC Source	Jumper J9
External (Default)	1-2
Internal	2-3

3.9.2 16X16 ANALOG AUDIO MODULE

Jumpers J10, J11 and J12 assign the module to a level, and select the input power source. Figures 3-34 and 3-35 show the location and orientation of these jumpers.

J7, J8 and J9 are connectors reserved for future use.

CR5 is a green LED that is ON when ±15 VDC input power is present.

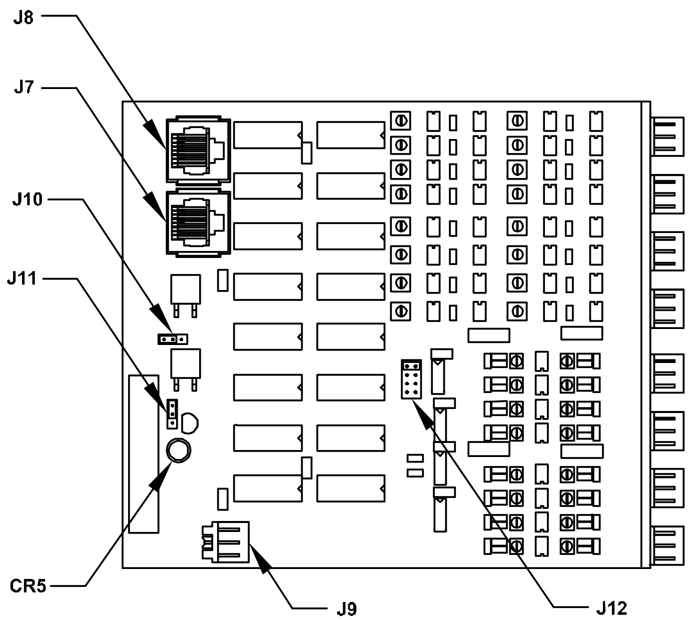

Figure 3-34 16x16 Analog Audio Module Top View

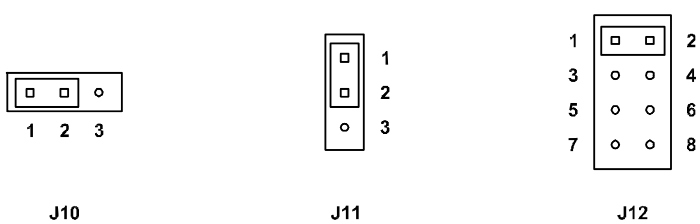

Figure 3-35 16x16 Analog Audio Module Jumpers J10, J11, J12

Level Assignment (J12)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-8.

Table 3-8 16x16 Analog Audio Module Level Assignment (J12)

16x16 Analog Audio Level Assignment	Jumper J12
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

+15 VDC Source (J11)

J11 is used to select the +15 VDC input power source. Jumper positions are shown in Table 3-9; however, this jumper should not be changed from the default position.

Table 3-9 16x16 Analog Audio Module +15 VDC Source (J11)

16x16 Analog Audio +15 VDC Source	Jumper J11
External (Default)	1-2
Internal	2-3

-15 VDC Source (J10)

J10 is used to select the -15 VDC input power source. Jumper positions are shown in Table 3-10; however, this jumper should not be changed from the default position.

Table 3-10 16x16 Analog Audio Module -15 VDC Source (J10)

16x16 Analog Audio -15 VDC Source	Jumper J10
External (Default)	1-2
Internal	2-3

3.9.3 8X8 DIGITAL AUDIO (110 OHM BALANCED) MODULE

J10 and J11 are jumpers used to assign the module to a level, and select the input power source. Figures 3-36 and 3-37 show the location and orientation of these jumpers.

J2, J3 and J3A are connectors reserved for future use.

CR20 is a green LED that is ON when +5 VDC input power is present.

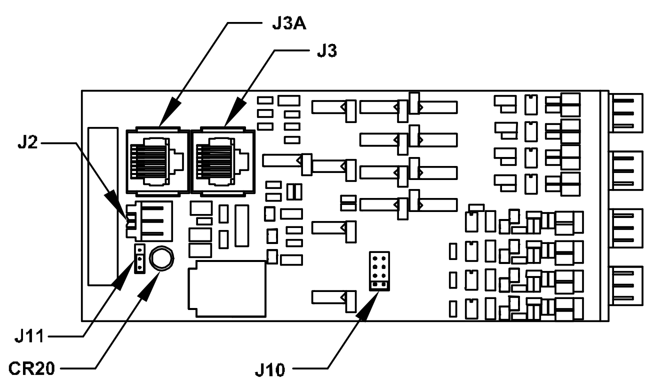

Figure 3-36 8x8 Digital Audio Module Top View

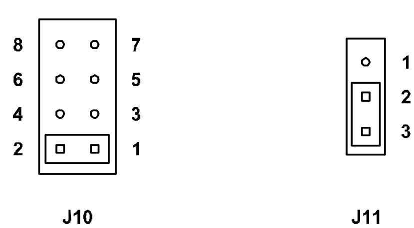

Figure 3-37 8x8 Digital Audio Module Jumpers J10, J11

Level Assignment (J10)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-11.

Table 3-11 8x8 Digital Audio Module Level Assignment (J10)

8x8 Digital Audio Level Assignment	Jumper J10
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

+5 VDC Source (J11)

J11 is used to select the +5 VDC input power source. Jumper positions are shown in Table 3-12; however, this jumper should not be changed from the default position.

Table 3-12 8x8 Digital Audio Module +5 VDC Source (J11)

8x8 Digital Audio + 5 VDC Source	Jumper J11
External	1-2
Internal (Default)	2-3

3.9.4 16X16 DIGITAL AUDIO (110 OHM BALANCED) MODULE

J2 is a jumper used to assign the module to a level. Figures 3-38 and 3-39 show the location and orientation of this jumper.

J1, J3 and J4 are reserved for future use.

LED1 is a green LED that is ON when +5 VDC input power is present.

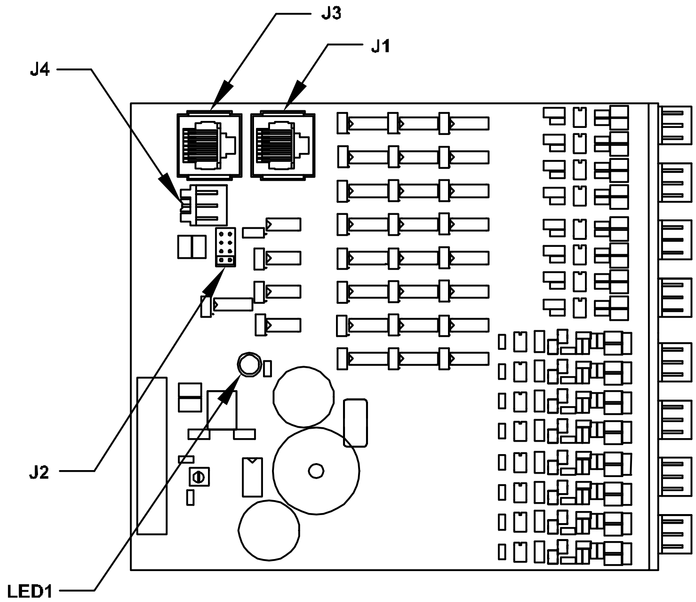

Figure 3-38. 16x16 Digital Audio Module Top View

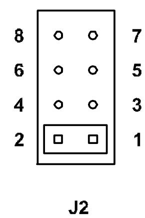

Figure 3-39. 16x16 Digital Audio Module Jumper J2

Level Assignment (J2)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-13.

Table 3-13 16x16 Digital Audio Module Level Assignment (J2)

16x16 Digital Audio Level Assignment	Jumper J2
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

3.9.5 8X8 DIGITAL AUDIO (75 OHM UNBALANCED – BNC CONNECTORS) MODULE

S1 is a four position DIP switch used to assign the module to a level. Figures 3-40 and 3-41 show the location and orientation of this switch.

J11 is a receptacle for a ribbon cable connector used to connect two 8X8 75 Ohm unbalanced modules together and form a 16X16 matrix.

LED1 is a green LED that is ON when +5 VDC input power is present.

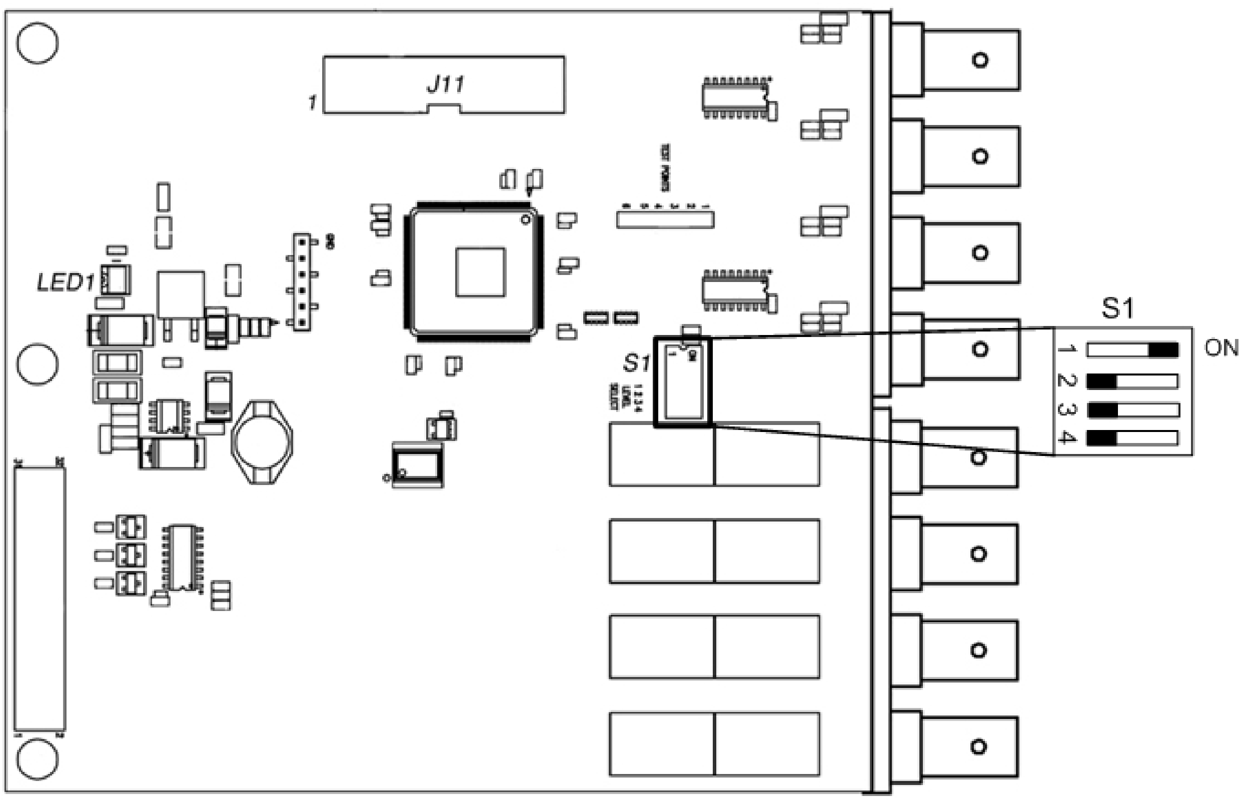

Figure 3-40 8x8 Digital Audio (75 Ohm Unbalanced) Module Top View

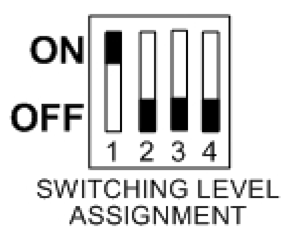

Figure 3-41 8x8 Digital Audio (75 Ohm Unbalanced) Module DIP Switch S1

Level Assignment (S1)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-14.

Table 3-14 8x8 Digital Audio (75 Ohm Unbalanced) Module Level Assignment (S1)

16x16 Digital Audio (75 Ohm) Level Assignment	Switch S1 - 1	Switch S1 - 2	Switch S1 - 3	Switch S1 – 4
Level 1 (Default)	ON	OFF	OFF	OFF
Level 2	OFF	ON	OFF	OFF
Level 3	OFF	OFF	ON	OFF
Level 4	OFF	OFF	OFF	ON

3.9.6 16X16 DIGITAL AUDIO (75 OHM UNBALANCED) MODULE

The 16X16 75 Ohm unbalanced module is formed from two 8X8 75 Ohm modules connected to one another by a ribbon cable as shown by Figure 3-43.

S1 is a four position DIP switch used to assign the module to a level; Figures 3-42 and 3-43 show the location and orientation of this switch. There is a switch S1 on each module of the 16X16 pair. Each switch must be set to the same level assignment.

LED1 is a green LED that is ON when +5 VDC input power is present.

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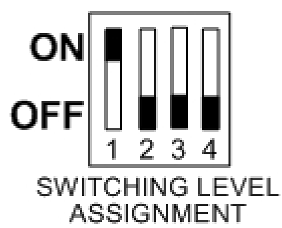

Figure 3-42 75 Ohm Digital Audio Module Switch S1 (On Each Module)

Level Assignment (S1)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-15.

Table 3-15 16x16 Digital Audio Module Level Assignment (S1)

16x16 Digital Audio (75 Ohm) Level Assignment	Switch S1 - 1	Switch S1 - 2	Switch S1 - 3	Switch S1 – 4
Level 1 (Default)	ON	OFF	OFF	OFF
Level 2	OFF	ON	OFF	OFF
Level 3	OFF	OFF	ON	OFF
Level 4	OFF	OFF	OFF	ON

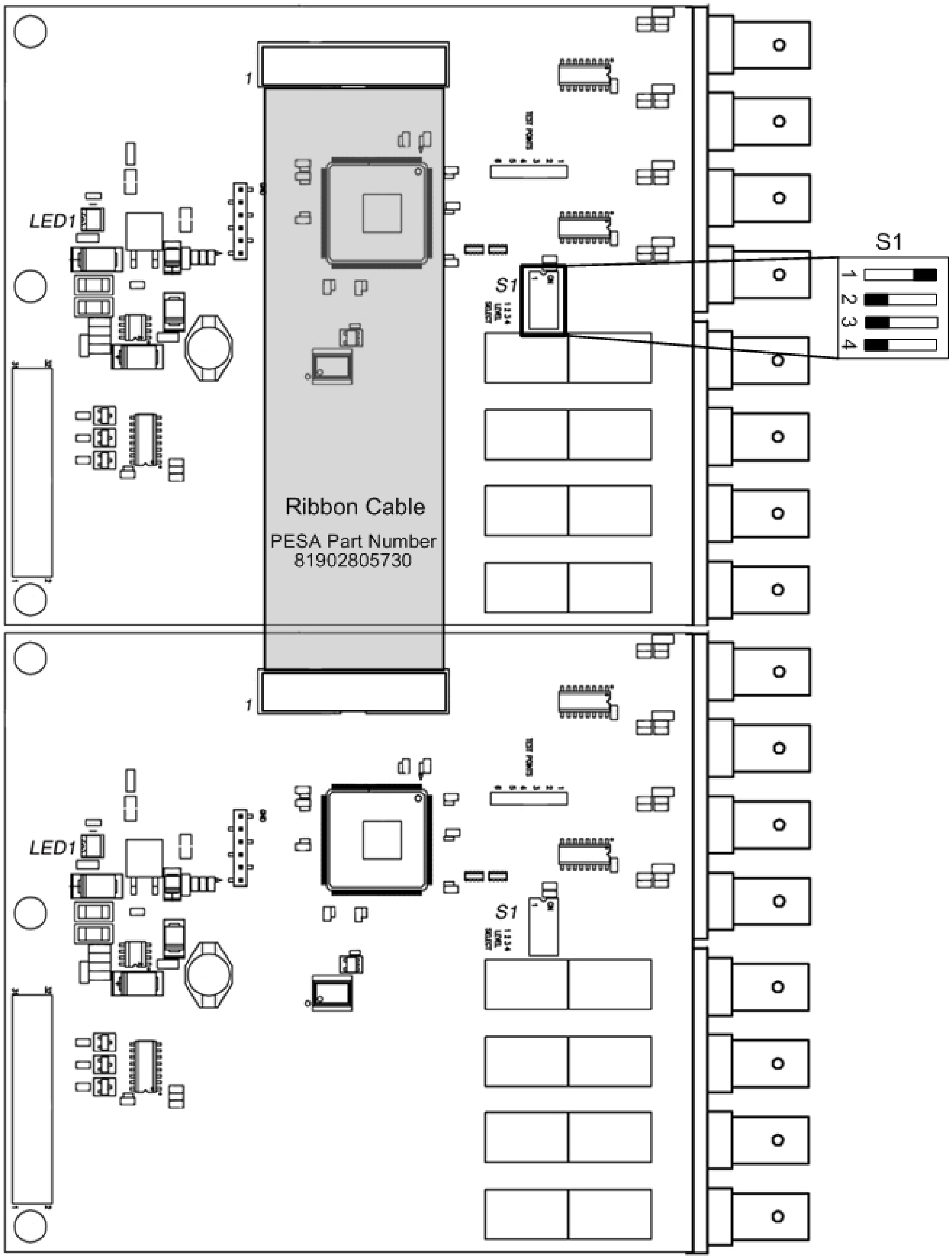

Figure 3-43. 16x16 75 Ohm Unbalanced Digital Audio Module Pair - Top View

3.9.7 8X8 ANALOG VIDEO MODULE

J1, J2 and J3 are jumpers used to assign the module to a level, and select the input power source. Figures 3-44 and 3-45 show the location and orientation of these jumpers.

J4, J5 and J6 are reserved for future use.

CR5 is a green LED that is ON when ±5 VDC input power is present.

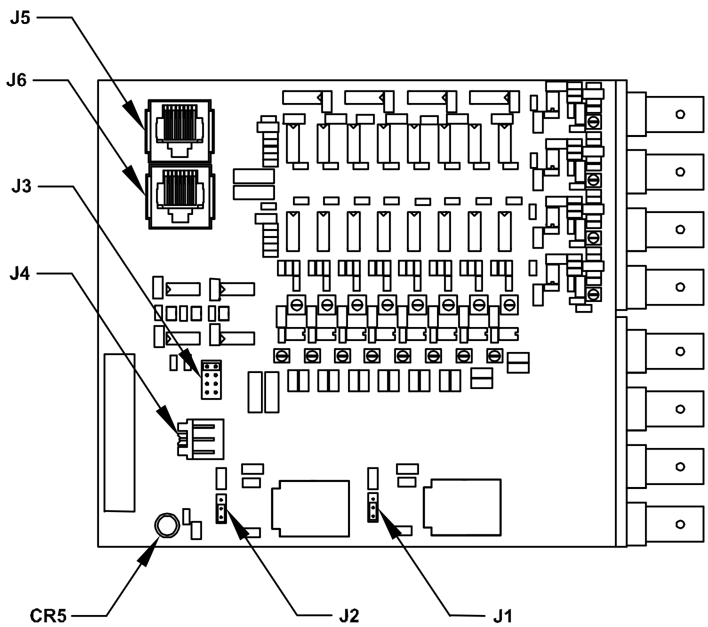

Figure 3-44. 8x8 Analog Video Module Top View

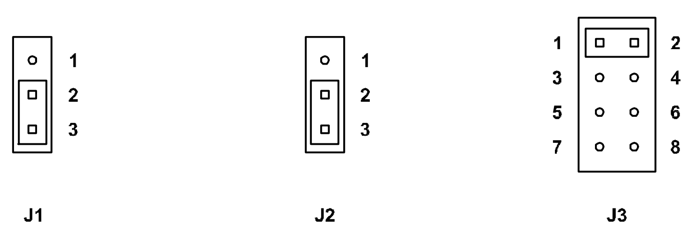

Figure 3-45. 8x8 Analog Video Module Jumpers J1, J2, J3

Level Assignment (J3)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-16.

Table 3-16 8x8 Analog Video Module Level Assignment (J3)

8x8 Analog Video Level Assignment	Jumper J3
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

+5 VDC Source (J1)

J1 is used to select the +5 VDC input power source. Jumper positions are shown in Table 3-17; however, this jumper should not be changed from the default position.

Table 3-17 8x8 Analog Video Module +5 VDC Source (J1)

8x8 Analog Video +5 VDC Source	Jumper J1
External	1-2
Internal (Default)	2-3

-5 VDC Source (J2)

J2 is used to select the -5 VDC input power source. Jumper positions are shown in Table 3-18; however, this jumper should not be changed from the default position.

Table 3-18 8x8 Analog Video Module -5 VDC Source (J2)

8x8 Analog Video -5 VDC Source	Jumper J2
External	1-2
Internal (Default)	2-3

3.9.8 8X8 ANALOG VIDEO (HIGH LEVEL/SYNC) MODULE

J1, J2 and J3 are jumpers used to assign the module to a level, and select the input power source. Figures 3-46 and 3-47 show the location and orientation of these jumpers.

J4, J5 and J6 are connectors reserved for future use.

CR5 is a green LED that is ON when ±5 VDC input power is present.

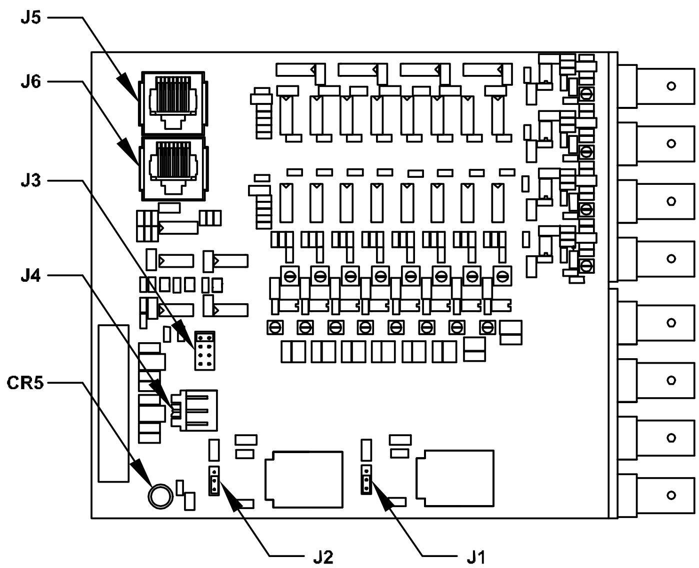

Figure 3-46 8x8 Analog Video (High Level/Sync) Module Top View

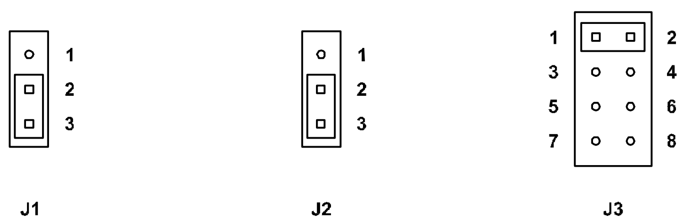

Figure 3-47 8x8 Analog Video (High Level/Sync) Module Jumpers J1, J2, J3

Level Assignment (J3)
An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-19.

Table 3-19 8x8 Analog Video (High Level/Sync) Module Level Assignment (J3)

8x8 Analog Video (High Level/Sync) Level Assignment	Jumper J3
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

+5 VDC Source (J1)
J1 is used to select the +5 VDC input power source. Jumper positions are shown in Table 3-20; however, this jumper should not be changed from the default position.

Table 3-20 8x8 Analog Video (High Level/Sync) Module +5 VDC Source (J1)

8x8 Analog Video (High Level/Sync) +5 VDC Source	Jumper J1
External	1-2
Internal (Default)	2-3

-5 VDC Source (J2)
J2 is used to select the -5 VDC input power source. Jumper positions are shown in Table 3-21; however, this jumper should not be changed from the default position.

Table 3-21 8x8 Analog Video (High Level/Sync) Module -5 VDC Source (J2)

8x8 Analog Video (High Level/Sync) -5 VDC Source	Jumper J2
External	1-2
Internal (Default)	2-3

3.9.9 16X16 ANALOG VIDEO MODULE

J18, J19 and J20 are jumpers used to assign the module to a level, and select the input power source. Figures 3-48 and 3-49 show the location and orientation of these jumpers.

J21, J22 and J23 are connectors reserved for future use.

CR2 is a green LED that is ON when ±5 VDC input power is present.

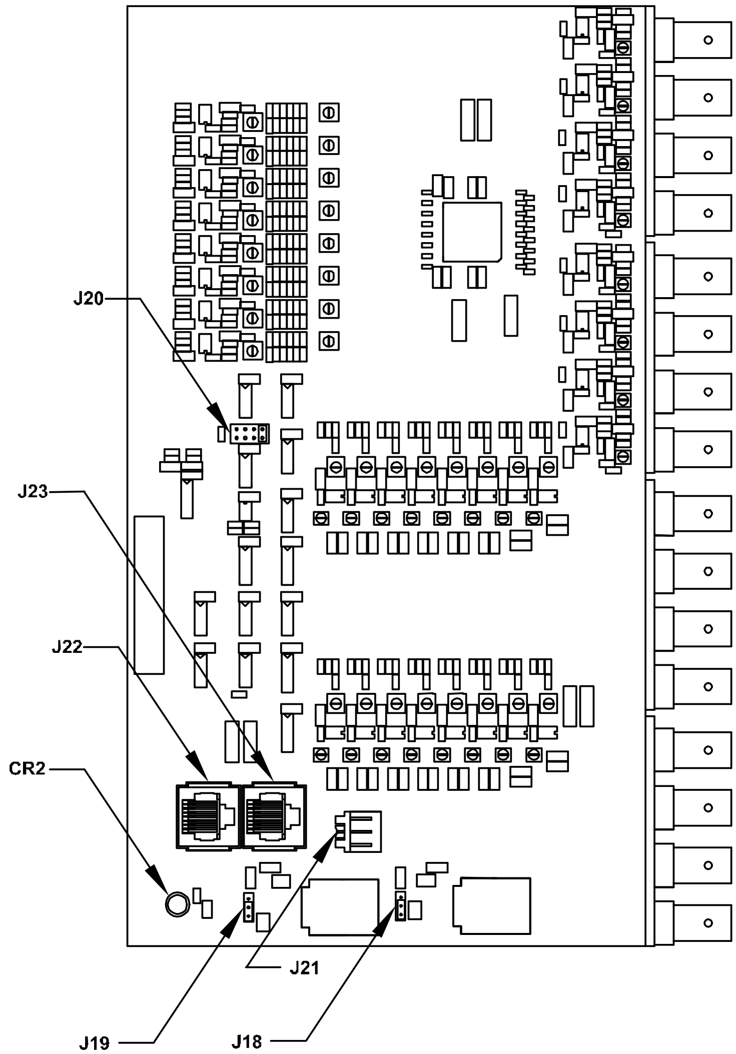

Figure 3-48 16x16 Analog Video Module Top View

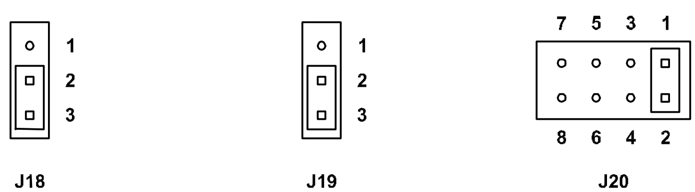

Figure 3-49. 16x16 Analog Video Module Jumpers J18, J19, J20

Level Assignment (J20)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-22.

Table 3-22 16x16 Analog Video Module Level Assignment (J20)

16x16 Analog Video Level Assignment	Jumper J20
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

+5 VDC Source (J19)

J19 is used to select the +5 VDC input power source. Jumper positions are shown in Table 3-23; however, this jumper should not be changed from the default position.

Table 3-23 16x16 Analog Video Module +5 VDC Source (J19)

16x16 Analog Video +5 VDC Source	Jumper J19
External	1-2
Internal (Default)	2-3

-5 VDC Source (J18)

J18 is used to select the -5 VDC input power source. Jumper positions are shown in Table 3-24; however, this jumper should not be changed from the default position.

Table 3-24 16x16 Analog Video Module -5 VDC Source (J18)

16x16 Analog Video -5 VDC Source	Jumper J18
External	1-2
Internal (Default)	2-3

3.9.10 16X16 ANALOG VIDEO (WIDEBAND) MODULE

J1, J3 and J6 are jumpers used to assign the module to a level, and select the input power source. Figures 3-50 and 3-51 show the location and orientation of these jumpers.

J2, J4 and J5 are connectors reserved for future use.

LED1 is a green LED that is ON when ±5 VDC input power is present.

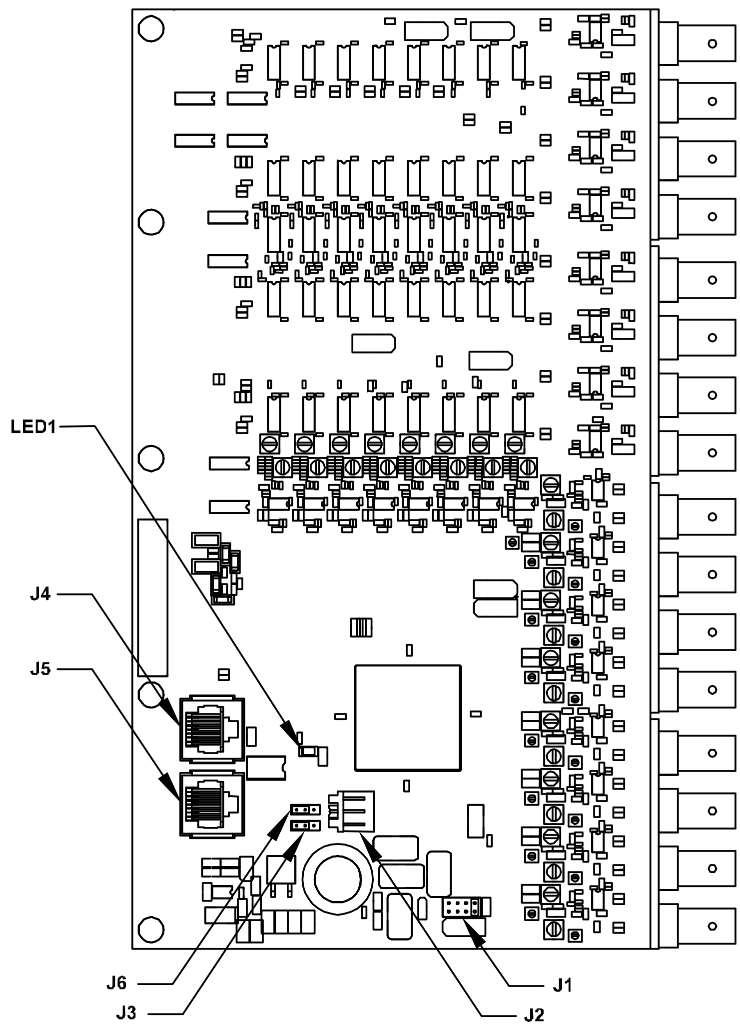

Figure 3-50 16x16 Analog Video (Wideband) Module Top View

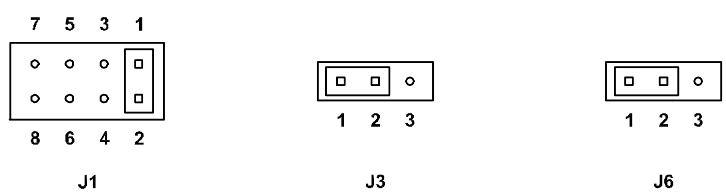

Figure 3-51 16x16 Analog Video (Wideband) Module Jumpers J1, J3, J6

Level Assignment (J1)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-25.

Table 3-25 16x16 Analog Video (Wideband) Module Level Assignment (J1)

16x16 Analog Video (Wideband) Level Assignment	Jumper J1
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

+5 VDC Source (J3)

J3 is used to select the +5 VDC input power source. Jumper positions are shown in Table 3-26; however, this jumper should not be changed from the default position.

Table 3-26 16x16 Analog Video (Wideband) Module +5 VDC Source (J3)

16x16 Analog Video (Wideband) +5 VDC Source	Jumper J3
External (Default)	1-2
Internal	2-3

-5 VDC Source (J6)

J6 is used to select the -5 VDC input power source. Jumper positions are shown in Table 3-27; however, this jumper should not be changed from the default position.

Table 3-27 16x16 Analog Video (Wideband) Module -5 VDC Source (J6)

16x16 Analog Video (Wideband) -5 VDC Source	Jumper J6
External (Default)	1-2
Internal	2-3

3.9.11 16X16 ANALOG VIDEO (HIGH LEVEL/SYNC) MODULE

J20 assigns the module to a switching level. Figures 3-52 and 3-53 show the location and orientation of this jumper.

J21, J22 and J23 are connectors reserved for future use.

J100, J119, J125, J139, J147, J155, J163, J171, J195, J203, J221, J229, J245, J253, J277, J280, J496, J499, J510, J513, J524, J527, J530, J533, J536, J539, J550, J553, J556, J559, J594, and J597 (not shown) are jumpers used to select the output voltage.

CR7 is a green LED that is ON when ±5 VDC input power is present.

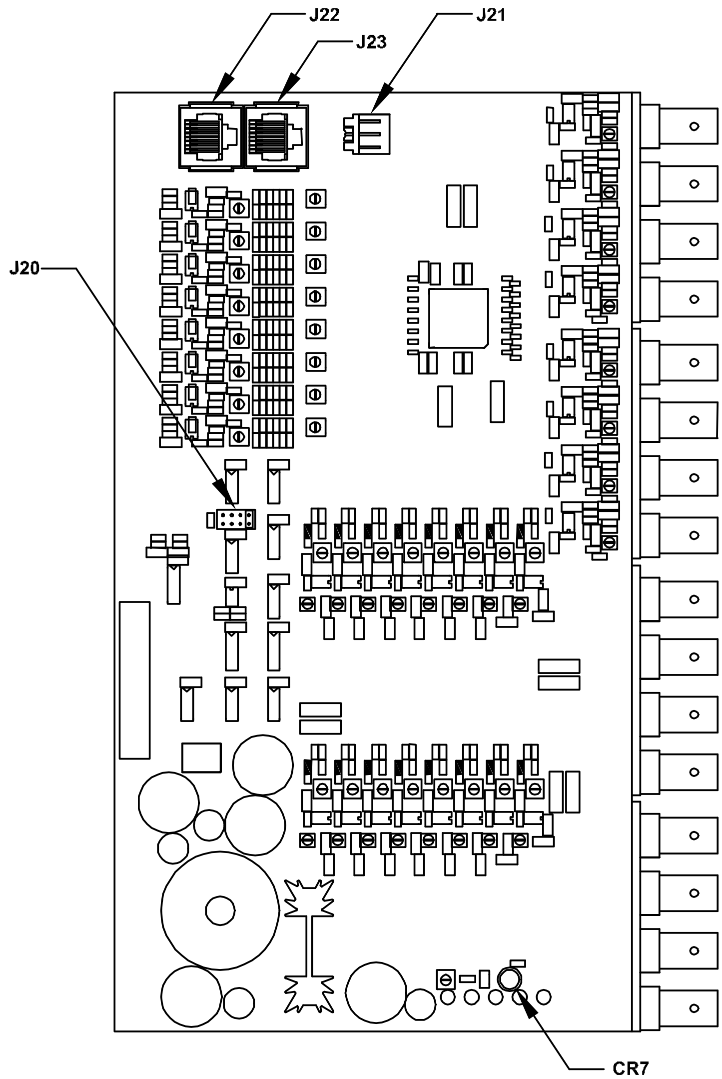

Figure 3-52 16x16 Analog Video (High Level/Sync) Module Top View

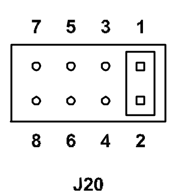

Figure 3-53 16x16 Analog Video (High Level/Sync) Module Jumper J20

Level Assignment (J20)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-28.

Table 3-28 16x16 Analog Video (High Level/Sync) Module Level Assignment (J20)

16x16 Analog Video (High Level/Sync) Level Assignment	Jumper J20
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

Module Output Voltage (J100 → J597)

CAUTION

J100, J119, J125, J139, J147, J155, J163, J171, J195, J203, J221, J229, J245, J253, J277, J280, J496, J499, J510, J513, J524, J527, J530, J533, J536, J539, J550, J553, J556, J559, J594, and J597 are not typical jumpers.

They are 10 Ω SMT (Surface Mount Technology) resistors soldered in place at the factory. Special tools are required to reposition these components without causing damage to adjacent areas.

Failure to consult with Customer Service prior to repositioning these resistors may void the warranty on this equipment.

Table 3-29 16x16 Analog Video (High Level/Sync) Module Output Voltage (J100 → 597)

16x16 Analog Video (High Level/Sync) Module Output Voltage Select	Jumper J100 → J597
±12 VDC for use with high level input (Default)	1-2
±5 VDC for use with standard level input	2-3

3.9.12 8X8 DIGITAL VIDEO (SD-SDI) MODULE

J9 assigns the module to a level. Figures 3-54 and 3-55 show the location and orientation of these jumpers.

J10, J10A and J11 are connectors reserved for future use.

CR26 is a green LED that is ON when ±5 VDC input power is present.

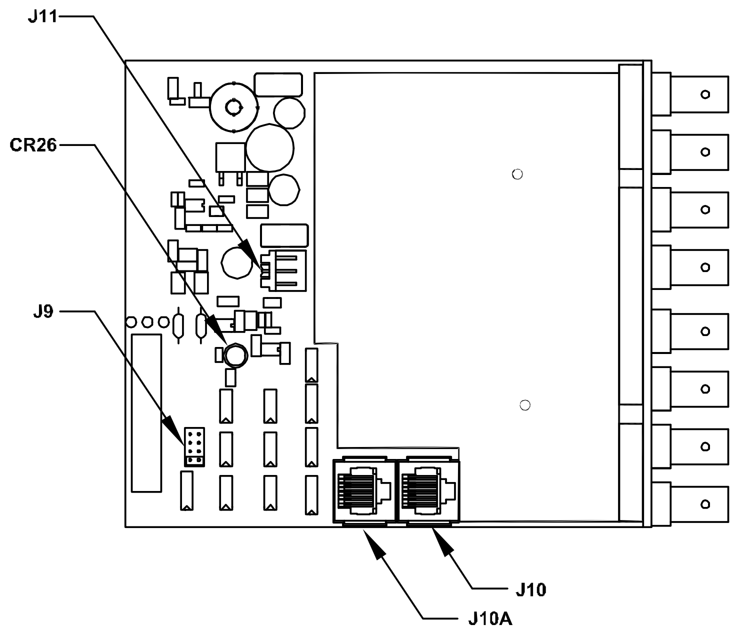

Figure 3-54 8x8 Digital Video (SD-SDI) Module Top View

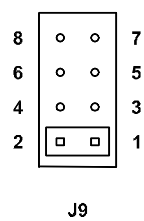

Figure 3-55 8x8 Digital Video (SD-SDI) Module Jumper J9

Level Assignment (J9)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-30.

Table 3-30 8x8 Digital Video (SD-SDI) Module Level Assignment (J9)

8x8 Digital Video Level Assignment	Jumper J9
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

3.9.13 16X8 DIGITAL VIDEO (HD/3G - SDI) MODULE

DIP switch S1 assigns the module to a switching level. Figures 3-56 and 3-57 show the location and orientation of this switch.

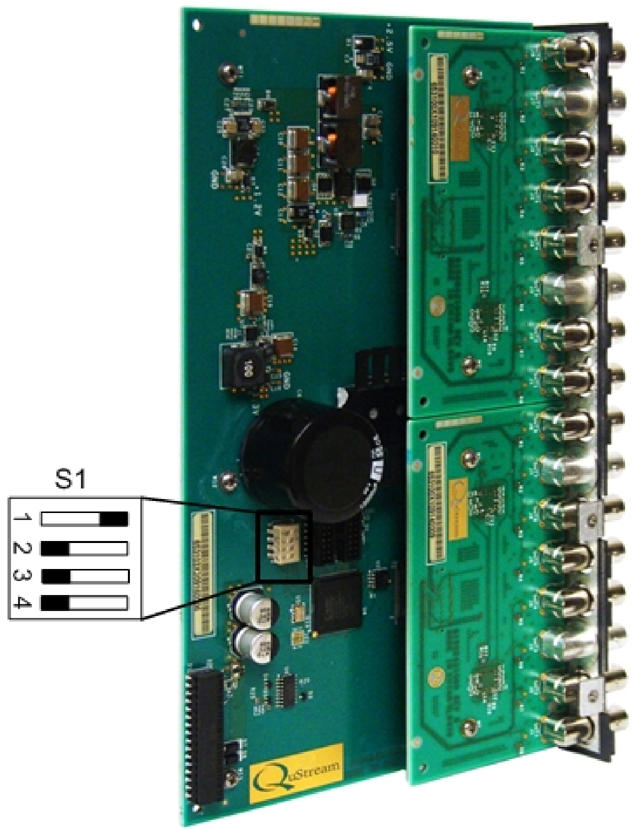

Figure 3-56 Digital Video (HD/3G - SDI) Module Top View

(16X16 Module Shown for Reference)

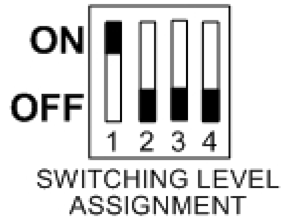

Figure 3-57 Digital Video (HD/3G - SDI) Module Switch S1

Level Assignment (S1)
An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-31.

Table 3-31 16x8 Digital Video (HD/3G - SDI) Module Level Assignment (S1)

16x8 Digital Video (3Gbps) Level Assignment	Switch S1 - 1	Switch S1 - 2	Switch S1 - 3	Switch S1 – 4
Level 1 (Default)	ON	OFF	OFF	OFF
Level 2	OFF	ON	OFF	OFF
Level 3	OFF	OFF	ON	OFF
Level 4	OFF	OFF	OFF	ON

3.9.14 16X16 DIGITAL VIDEO (SD-SDI) MODULE

J4 is a jumper used to assign the module to a level. Figures 3-58 and 3-59 show the location and orientation of these jumpers.

J1, J2 and J3 are connectors reserved for future use.

CR26 is a green LED that is ON when ±5 VDC input power is present.

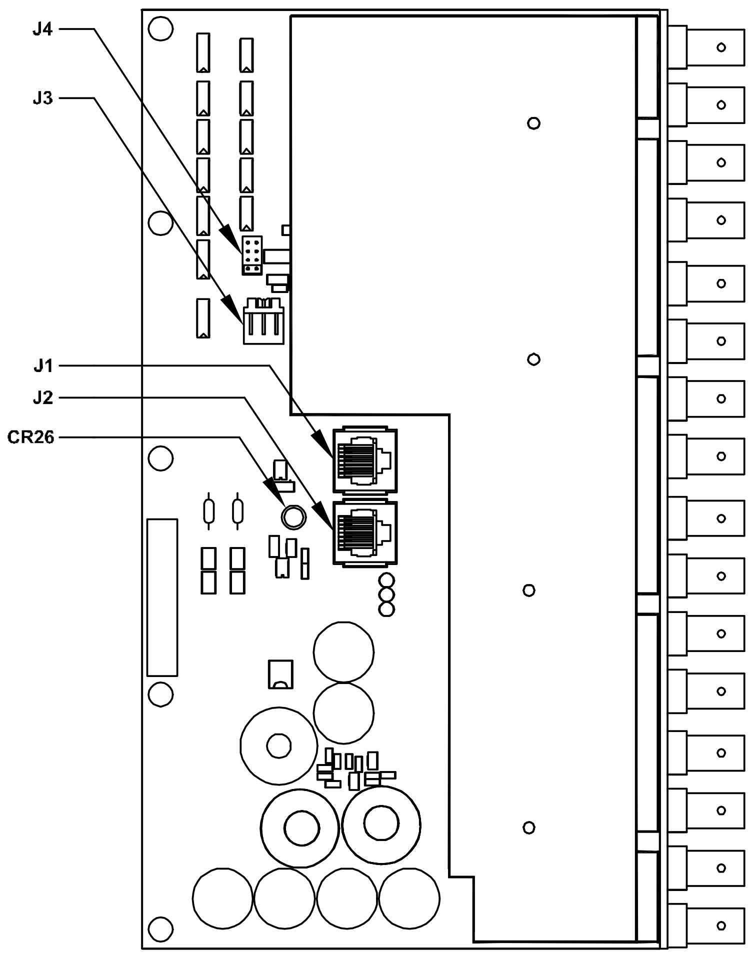

Figure 3-58 16x16 Digital Video (SD-SDI) Module Top View

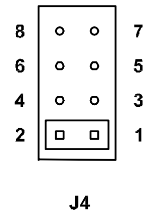

Figure 3-59 16x16 Digital Video (SD-SDI) Module Jumper J4

Level Assignment (J4)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-32.

Table 3-32 16x16 Digital Video (SD-SDI) Module Level Assignment (J4)

16x16 Digital Video Level Assignment	Jumper J4
Level 1 (Default)	1-2
Level 2	3-4
Level 3	5-6
Level 4	7-8

3.9.15 16X16 DIGITAL VIDEO (HD/3G-SDI) MODULE

DIP switch S1 assigns the module to a switching level. Figures 3-60 and 3-61 show the location and orientation of this switch.

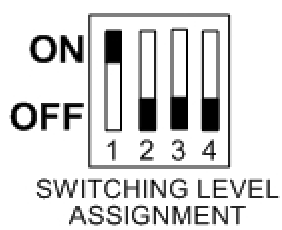

Figure 3-60 16x16 Digital Video (HD/3G-SDI) Module Switch S1

Level Assignment (S1)

An Ocelot system may have up to four levels. Each module must be assigned to one of these levels, as shown in Table 3-33.

Table 3-33 16x16 Digital Video (HD/3G-SDI)) Module Level Assignment (S1)

16x16 Digital Video (HD/3G) Level Assignment	Switch S1 - 1	Switch S1 - 2	Switch S1 - 3	Switch S1 – 4
Level 1 (Default)	ON	OFF	OFF	OFF
Level 2	OFF	ON	OFF	OFF
Level 3	OFF	OFF	ON	OFF
Level 4	OFF	OFF	OFF	ON

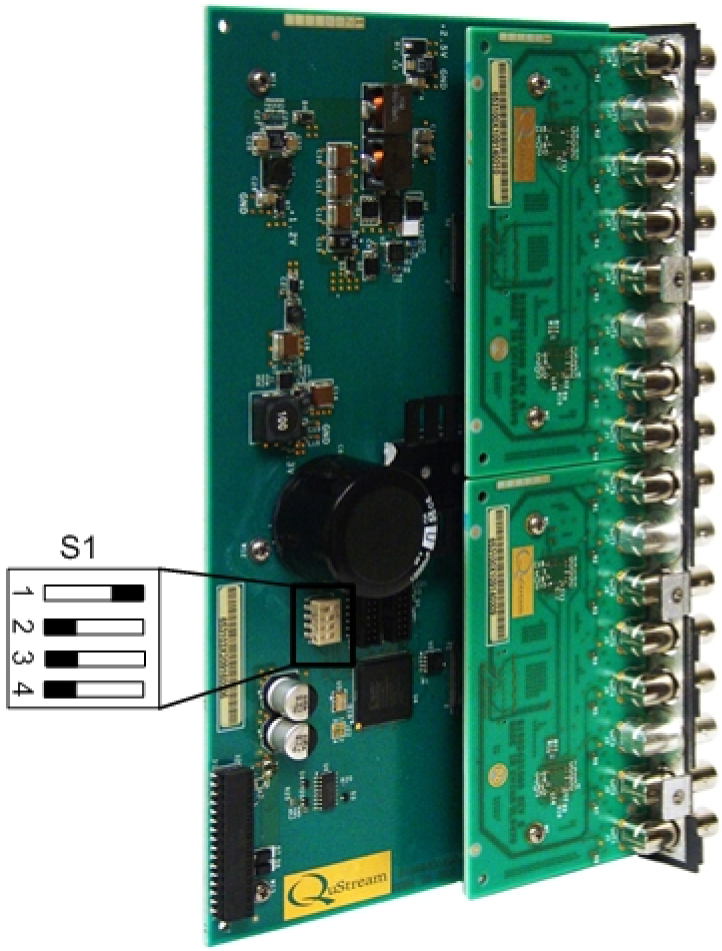

Figure 3-61 16x16 Digital Video (HD/3G-SDI) Module Top View

3.9.16 SYSTEM CONTROLLER MODULE

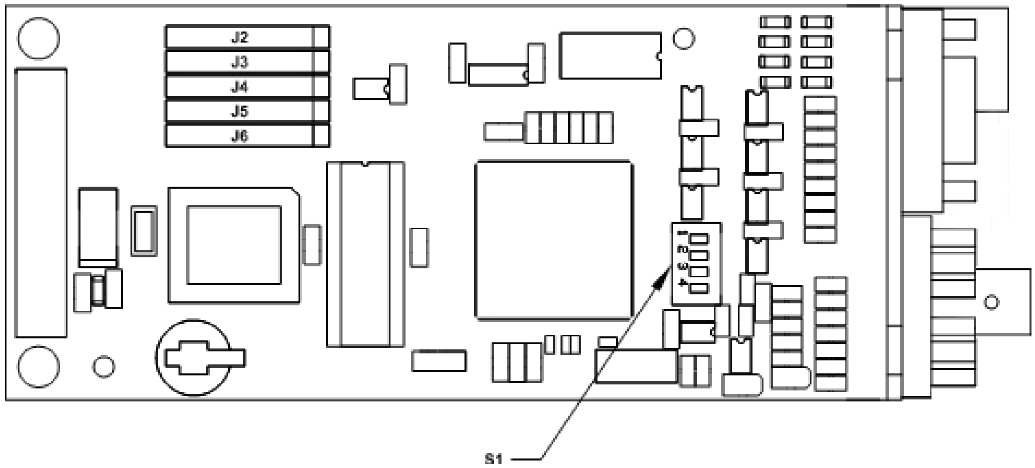

Figure 3-62 System Controller Module Top View

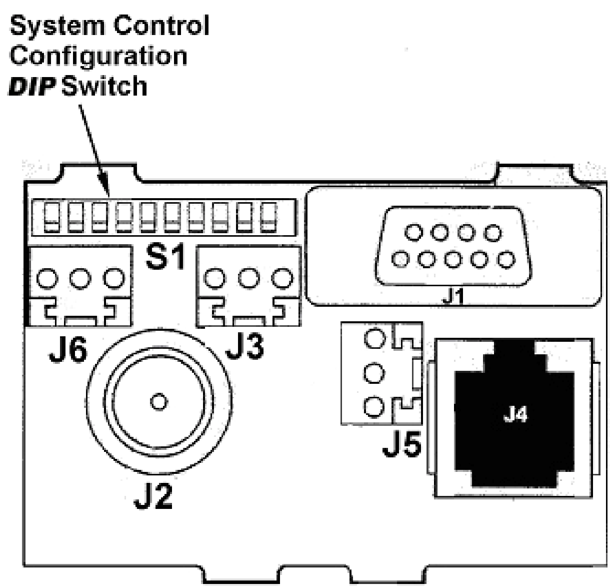

Figure 3-63 System Controller Module Rear View

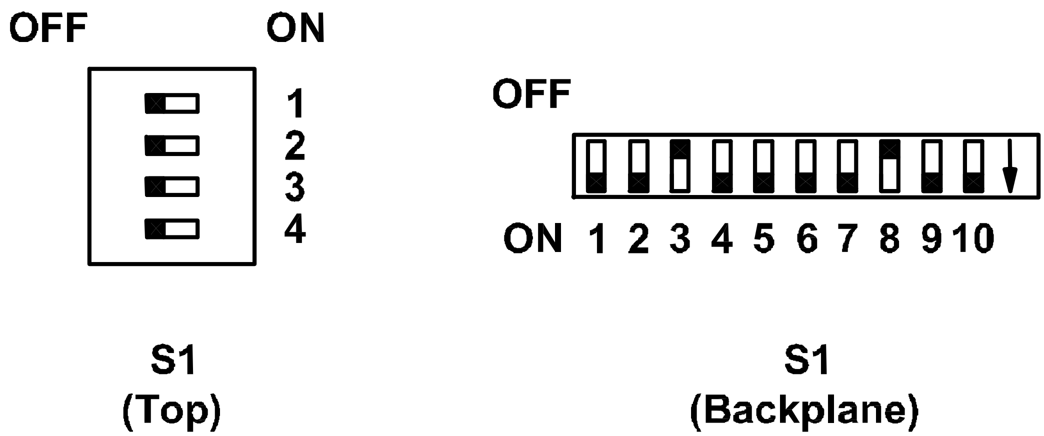

Figure 3-64 System Controller Module Switches S1, S1

S1 (On Top)

S1 is a four-position DIP switch consisting of four single-pole, single-throw (SPST) switches numbered 1 through 4. Figure 3-62 and Figure 3-64 show the location and orientation of this switch.

Diagnostic Mode Enable (S1-1)

S1-1 should be in the OFF position unless directed otherwise by PESA Customer Service. For more information, refer to "Ocelot Onboard Diagnostic Program."

Table 3-34 Diagnostic Mode Enable (S1-1)

System Controller (Top) Diagnostic Mode Enable	Switch S1-1
Diagnostic Mode Enable	ON
Diagnostic Mode Disable (Default)	OFF

Reserved for Future Use (S1-2)

S1-2 is reserved for future use and should be in the OFF position.

Checksum Disable Switch (S1-3)

S1-3 is used to disable the communication protocol checksums as shown in Table 3-35.

Enabled: Checksums are required for CPU Link commands/messages.

Disabled: Checksums, if present, will be ignored.

Table 3-35 Checksum Enable (S1-3)

System Controller (Top) Checksum Enable	Switch S1-3
Checksum Enable (Default)	ON
Checksum Disable	OFF

Reserved for Future Use (S1-4)

S1-4 is reserved for future use and should be in the OFF position.

External Control Interface Mode Select Jumper (J2, J3, J4, J5, J6)

The external control interface mode is selected by moving a 10-position DIP jumper, to one of three positions provided by the five 10-position SIP sockets J2 through J6, located as shown by Figure 3-62.

J2 to J4 (RS232) — This RS-232 CPU Link interface is used to control the Ocelot system with a PC running software such as Virtual Panel. The interface cable may be up to 50 feet in length. Protocol P1E is used.

J3 to J5 (RS422 MATRIX) — This RS-422 PRC interface is used to allow the Ocelot system to be controlled by a PRC system controller such as the 3500Plus™. Protocol PRC is used.

J4 to J6 (RS422 CNTRL) — This RS-422 CPU Link interface is similar to the RS-232 CPU Link interface, except the cable may be up to 4000 feet in length. To use this interface, the PC must have an RS-422 interface card installed in the expansion bus. Protocol P1E is used.

See also:

“External Control Interface Type (S1-4)”

“PRC Base Strobe (S1-5, S1-6, S1-7, S1-8)”

"CPU Link Mode (S1-5, S1-6, S1-7, S1-8)”

S1 (On Backplane)

S1 is a ten-position SIP switch consisting of ten single-pole, single-throw (SPST) switches numbered 1 through 10, all of which share a common input. Figure 3-63 and 3-64 show the location and orientation of this switch.

Number of System Levels (S1-1, S1-2)

An Ocelot system may control up to four levels. S1-1 and S1-2 are used to set the number of levels in the Ocelot system.

Table 3-36 Number of System Levels (S1-1, S1-2)

System Controller (Backplane) Number of System Levels	Switch S1-1	Switch S1-2
1 Level in System (Default)	OFF	ON
2 Levels in System	ON	OFF
3 Levels in System	OFF	OFF
4 Levels in System	ON	ON

Number of System Inputs (S1-3)

Ocelot modules are available in both 8 input and 16 input versions. Both types may be mixed in a system. This switch is used to select the maximum number of inputs supported by the system controller.

Table 3-37 Number of System Inputs (S1-3)

System Controller (Backplane) Number of System Inputs	Switch S1-3
8 Inputs	OFF
16 Inputs (Default)	ON

External Control Interface Type (S1-4)

This switch is used to select one of two possible external control interface types:

PRC – For use with a PRC-type System Controller such as the 3500Plus.

CPU Link – For use with a PC running control software such as Virtual Panel.

Table 3-38 External Control Interface Type (S1-4)

System Controller (Backplane) External Control Interface Type	Switch S1-4
PRC	OFF
CPU Link (Default)	ON

See also:

“External Control Interface Mode Select Jumper (J2, J3, J4, J5, J6)”

“PRC Base Strobe (S1-5, S1-6, S1-7, S1-8)”

“CPU Link Mode (S1-5, S1-6, S1-7, S1-8)”

PRC Base Strobe (S1-5, S1-6, S1-7, S1-8)

This section only applies when S1-4 is OFF (PRC External Control Interface).

When the PRC interface is used, strobe numbers must be assigned to each level. These switches control the strobe number assigned to Level 1, as shown in Table 3-39. Successive levels are assigned the next sequential strobe numbers. For example if PRC Base Strobe 7 is selected for a four level Ocelot system, Level 1 is Strobe 7, Level 2 is Strobe 8, Level 3 is Strobe 9, and Level 4 is Strobe 10.

Table 3-39 PRC Base Strobe (S1-5, S1-6, S1-7, S1-8)

System Controller (Backplane) PRC Base Strobe	Switch S1-5	Switch S1-6	Switch S1-7	Switch S1-8
PRC Base Strobe 1 (Default)	ON	ON	ON	ON
PRC Base Strobe 2	OFF	ON	ON	ON
PRC Base Strobe 3	ON	OFF	ON	ON
PRC Base Strobe 4	OFF	OFF	ON	ON
PRC Base Strobe 5	ON	ON	OFF	ON
PRC Base Strobe 6	OFF	ON	OFF	ON
PRC Base Strobe 7	ON	OFF	OFF	ON
PRC Base Strobe 8	OFF	OFF	OFF	ON
PRC Base Strobe 9	ON	ON	ON	OFF
PRC Base Strobe 10	OFF	ON	ON	OFF
PRC Base Strobe 11	ON	OFF	ON	OFF
PRC Base Strobe 12	OFF	OFF	ON	OFF
PRC Base Strobe 13	ON	ON	OFF	OFF
PRC Base Strobe 14	OFF	ON	OFF	OFF
PRC Base Strobe 15	ON	OFF	OFF	OFF
PRC Base Strobe 16	OFF	OFF	OFF	OFF

See also:

“External Control Interface Mode Select Jumper (J2, J3, J4, J5, J6)”

"External Control Interface Type (S1-4)”

"CPU Link Mode (S1-5, S1-6, S1-7, S1-8)”

CPU Link Mode (S1-5, S1-6, S1-7, S1-8)

This section only applies when S1-4 is ON (CPU Link External Control Interface).

When CPU Link has been selected for the External Control Interface type, three different modes are available, refer to Table 3-40:

Standard Mode – Standard Mode is used when connecting one Ocelot system to one PC. It may be used with either the RS-232 CPU Link or the RS-422 CPU Link.

Modem Mode – Modem Mode is used when connecting one Ocelot system to one external modem.

Multi-Drop Mode (RS-422 Only) – RS-422 Multi-Drop Mode is used when connecting multiple Ocelot systems to one PC.

Table 3-40 CPU Link Mode (S1-5, S1-6, S1-7, S1-8)

System Controller (Backplane) CPU Link Mode	Switch S1-5	Switch S1-6	Switch S1-7	Switch S1-8
Standard Mode (Default)	ON	ON	ON	ON
Multi-Drop Mode Address 1	OFF	ON	ON	ON
Multi-Drop Mode Address 2	ON	OFF	ON	ON
Multi-Drop Mode Address 3	OFF	OFF	ON	ON
Multi-Drop Mode Address 4	ON	ON	OFF	ON
Multi-Drop Mode Address 5	OFF	ON	OFF	ON
Multi-Drop Mode Address 6	ON	OFF	OFF	ON
Multi-Drop Mode Address 7	OFF	OFF	OFF	ON
Multi-Drop Mode Address 8	ON	ON	ON	OFF
Multi-Drop Mode Address 9	OFF	ON	ON	OFF
Reserved for Future Use	ON	OFF	ON	OFF
Reserved for Future Use	OFF	OFF	ON	OFF
Reserved for Future Use	ON	ON	OFF	OFF
Reserved for Future Use	OFF	ON	OFF	OFF
Reserved for Future Use	ON	OFF	OFF	OFF
Modem Mode	OFF	OFF	OFF	OFF

See also:

“External Control Interface Mode Select Jumper (J2, J3, J4, J5, J6)”

"External Control Interface Type (S1-4)”

"PRC Base Strobe (S1-5, S1-6, S1-7, S1-8)”

CPU Link Lock Override Enable (S1-9)

S1-9 enables the CPU Link Lock Override, as shown in Table 3-41. When enabled, this permits the control system software running on the PC (e.g., Virtual Panel), to take a switch on a locked destination.

Table 3-41 CPU Link Lock Override (S1-9)

System Controller (Backplane) CPU Link Lock Override	Switch S1-9
CPU Link Lock Override Enabled	OFF
CPU Link Lock Override Disabled (Default)	ON

Control Panel Generation (S1-10)

There are two generations of Control Panels:

First Generation control panels have small (0.32") keys.

Second Generation control panels have large (0.50") keys with removable legends.

If an Ocelot system contains any First Generation control panels, the system may not have more than eight control panels total (mainframe and remote), and S1-10 must be ON, refer to Table 3-42.

If an Ocelot system contains only Second Generation control panels, the system may have up to 16 control panels total (mainframe and remote), and S1-10 must be OFF.

Table 3-42 Control Panel Generation (S1-10)

System Controller (Backplane) Control Panel Generation	Switch S1-10
Second Generation Control Panels (Default)	OFF
First Generation Control Panels	ON

3.10 SUBASSEMBLY INSTALLATION

If specified when ordered, switches and jumpers on the subassemblies will already be properly configured. Otherwise, please refer to Paragraph 3-8 “Switch and Jumper Settings” on page 3-13 prior to installation.

3.10.1 MODULES

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

Standard Definition

Modules are installed in a standard definition mainframe as follows:

1. Remove power from the mainframe.

2. Use a No. 0 Phillips screwdriver to remove the 10 screws that secure the top cover to the chassis.

3. Slide the rear filler panel up and out of the chassis, and modify it to provide an opening for the new module. The rear filler panel is made of phenolic, and is perforated so sections can easily be removed to provide additional openings.

4. Install the module in the chassis so that the front connector engages one of the mid-plane interface connectors.

5. Reinstall the rear filler panel and top cover.

High Definition

All high definition mainframes contain 2 modules: one switching module (either 16x8 or 16x16); and one interface module (either a system controller module or a connector interface module). There is no rear filler panel on high definition mainframes.

Modules are installed in a high definition mainframe as follows:

1. Remove power from the mainframe.

2. Use a No. 0 Phillips screwdriver to remove the 14 screws that secure the top cover to the chassis.

3. Install the module in the chassis so that the front connector engages one of the mid-plane interface connectors.

4. Reinstall the top cover.

3.10.2 MAINFRAME POWER REGULATOR INSTALLATION

Some Ocelot modules require that a power regulator be installed in the mainframe (see Table 2-1 on Page 2-3). Power regulators are installed as follows:

1. Remove power from the mainframe.

2. Use a No. 0 Phillips screwdriver to remove the 10 screws that secure the top cover to the chassis.

3. Remove all modules from the mainframe.

4. Slide the mid-plane up and out of the chassis.

5. The mid-plane can accommodate up to two power regulators, one at each end of the front surface. Attach the power regulator so that the power regulator connectors J1 (audio and video), J2 (video only), J3 (audio only) and J4 (audio and video), mate with the corresponding mid-plane connectors.

6. Use a No. 0 Phillips screwdriver to install the two screws that secure the power regulator to the mid-plane.

7. Reinstall the mid-plane, modules and top cover.

Audio Power Regulator

Figures 3-59 and 3-60 illustrate connector locations on the audio power regulator.

J1, J3 and J4 mate with the following connectors on the front of the mid-plane:

J11, J15 and J18 when installed on the left side of the mid-plane.

J13, J12 and J19 when installed on the right side of the mid-plane.

CR1 is a green LED that is ON when ±15 VDC output power is present.

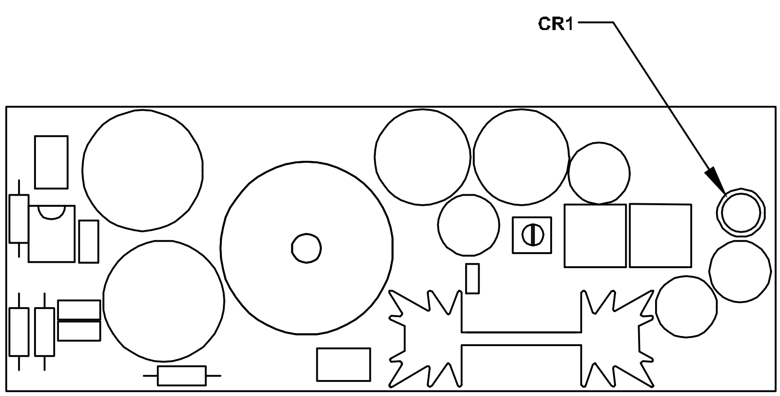

Figure 3-65 Power Regulator, Audio Module, Front View

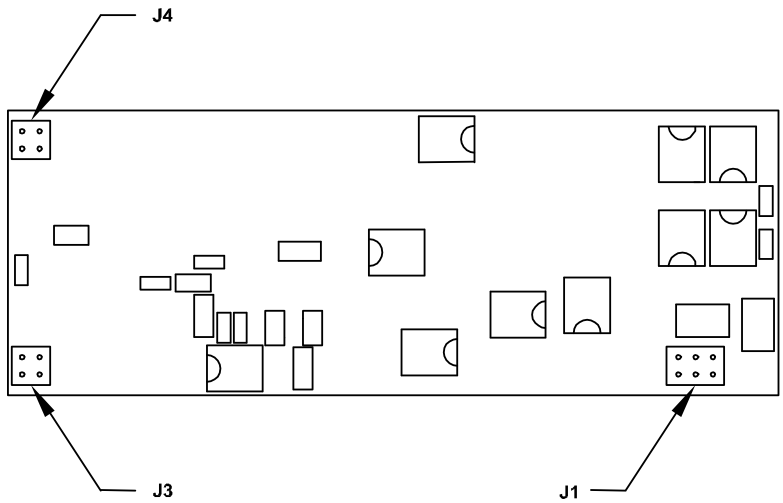

Figure 3-66 Power Regulator, Audio Module, Rear View

Video Power Regulator

Figures 3-61 and 3-62 illustrate connector locations on the video power regulator.

J1, J2 and J4 mate with the following connectors on the front of the mid-plane:

J11, J10 and J18 when installed on the left side of the mid-plane.

J13, J16 and J19 when installed on the right side of the mid-plane.

CR1 is a green LED that is ON when ±5 VDC output power is present.

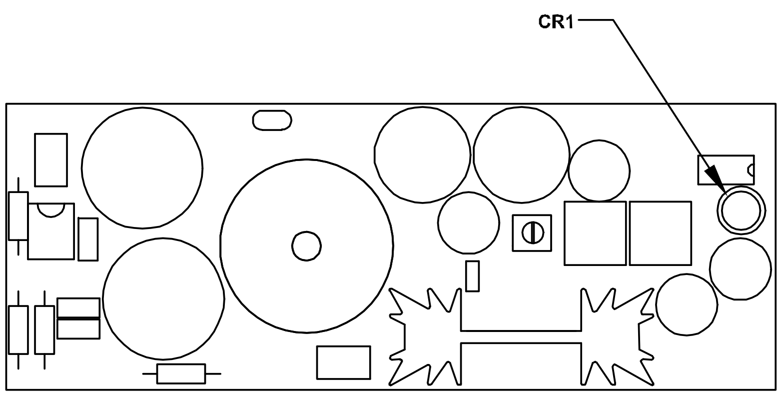

Figure 3-67 Power Regulator, Video Module, Front View

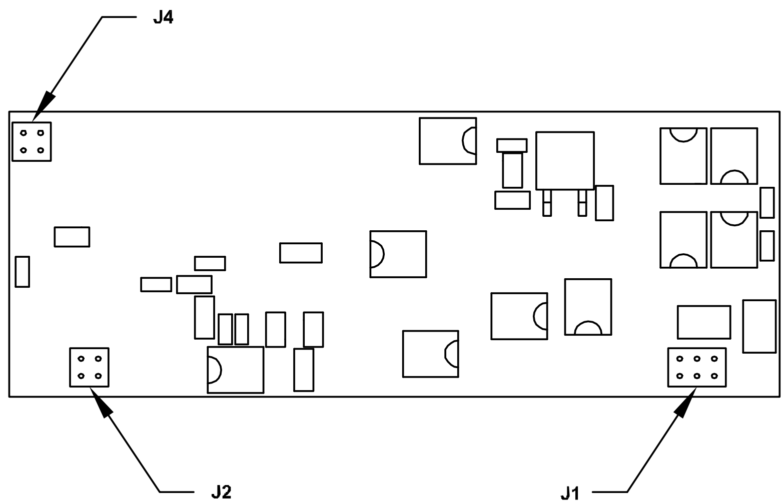

Figure 3-68 Power Regulator, Video Module, Rear View

Chapter 4 Operation

4.1 INTRODUCTION

An Ocelot system may be controlled by using the following:

Ocelot Control Panels

CPU Link – The Ocelot system controller module is connected to a PC running software such as Virtual Panel. The connection is made using either of the following methods:

Direct Connection – The Ocelot system controller module is connected to a local PC with a serial cable.

Modem Connection – The Ocelot system controller module is connected to an external modem with a serial cable. A remote PC, also equipped with a modem, may then control the Ocelot system through a dial-up connection.

PRC System Controller – The Ocelot system controller module is connected to a PRC system controller such as the 3500Plus.

4.2 OCELOT CONTROL PANELS

An Ocelot system may be controlled by using Ocelot control panels. A control panel may either be installed on the front of a mainframe, or situated remotely in a separate chassis. Each Ocelot system may have up to 16 control panels.

There are three types of control panels available:

Single Output Panels – These are the 8x1 and 16x1 control panels. These panels have only one output which is selected by setting a DIP switch as described in "Panel Output (S39-1 Thru S39-4)

."

Dual Output Panels – These are the 8x1 Dual and 16x1 Dual control panels. These panels have two outputs which are selected by setting a DIP switch as described in "Panel Output (S39-1 Thru S39-4)

." Different inputs may be switched to each output.

X/Y Panels – These are the 8x8 and 16x16 control panels. These panels may switch any input to any output.

Control panels may be set to operate in two different modes.

Single Level Switching Mode

Multi-Level Switching Mode

4.2.1 SINGLE LEVEL SWITCHING MODE

Single level switching mode allows a switch to be taken on only one level at a time. This operating mode is selected by setting a DIP switch on the control panel as described in "Switching Mode (S39-6)".

Single level switching mode only allows one level to be selected at a time.

Example: If Level 1 is currently selected, pressing the Level 2 key will automatically deselect Level 1 and select Level 2.

While in single level switching mode, control panels operate as follows:

Follow Switch

A follow switch is one where a single source is switched to a single destination on all levels.

When making follow switches in Single Level mode, each level is switched serially, not simultaneously.

Example: To switch:

Input 1 to Output 1 on Level 1

Input 1 to Output 1 on Level 2

Input 1 to Output 1 on Level 3

Press the following keys:

1. Output 1 key, Level 1 key, Input 1 key
2. Level 2 key, Input 1 key
3. Level 3 key, Input 1 key

Breakaway Switch

A breakaway switch is one where more than one source is switched to a single destination on multiple levels.

When making breakaway switches in Single Level mode, each level is switched serially, not simultaneously.

Example: To switch:

Input 1 to Output 1 on Level 1

Input 2 to Output 1 on Level 2

Input 3 to Output 1 on Level 3:

Press the following keys:

1. Output 1 key, Level 1 key, Input 1 key
2. Level 2 key, Input 2 key.
3. Level 3 key, Input 3 key.

Lock

Pressing the Lock key will toggle the lock ON and OFF for a selected output.

4.2.2 MULTI-LEVEL SWITCHING MODE

Multi-level switching mode allows a switch to be taken on multiple levels at the same time. This operating mode is selected by setting a DIP switch on the control panel as described in “Switching Mode (S39-6).”

Multi-level switching mode allows multiple levels to be selected at the same time.

Example: If Level 1 is currently selected, pressing the Level 2 key will not deselect Level 1. Level 1 and Level two will both be selected.

While in multi-level switching mode, control panels operate as follows:

Follow Switch

A follow switch is one where a single source is switched to a single destination on all levels.

When making follow switches in Multi-Level mode, each level is switched simultaneously, not serially.

Example: To switch:

Input 1 to Output 1 on Level 1

Input 1 to Output 1 on Level 2

Input 1 to Output 1 on Level 3

Ensure that all levels are selected (all Level LEDs OFF) and press the following keys:

1. Output 1 key, Level 1 key, Level 2 key, Level 3 key, Input 1 key

Breakaway Switch

A breakaway switch is one where more than one source is switched to a single destination on multiple levels.

When making breakaway switches in multi-level mode, each level is switched serially, not simultaneously.

Example: To switch:

Input 1 to Output 1 on Level 1

Input 2 to Output 1 on Level 2

Input 3 to Output 1 on Level 3

Ensure that all levels are selected (all Level LEDs OFF) and press the following keys:

1. Output 1 key, Level 1 key, Input 1 key
2. Level 1 key, Level 2 key, Input 2 key.
3. Level 2 key, Level 3 key, Input 3 key.

Lock

Pressing the Lock key will toggle the lock ON and OFF for a selected output.

4.3 CPU LINK CONTROL

To control an Ocelot system with the CPU Link, the Ocelot system controller module is connected to a PC running control software such as Virtual Panel. The connection is made using either a serial cable to a local PC, or a modem to a remote PC.

NOTE	**For more information on operating the Ocelot system through the CPU Link, consult the manual that came with your control system software.**

Serial Cable

Connect the system controller module to the PC using a serial cable as described in "**Error! Reference source not found.**."

Modem

Connect the system controller module to the external modem using a serial cable as described in "RS-232 CPU Link Interface (External Modem)."

4.4 PRC CONTROL

To control an Ocelot system through the PESA Router Control (PRC) protocol, with a system controller such as the 3500PRO or PERC2000, the Ocelot system controller module is connected to the PRC system controller. The connection is made with an AT serial modem cable as described in "
RS-422 PRC Interface."

The PRC system controller may be either a dedicated unit controlling only the Ocelot system, or one embedded in a larger system containing other PRC components such as a Cheetah routing switcher.

NOTE	**For more information on operating the Ocelot system through the PRC interface, consult the manual that came with your PRC system controller.**

Chapter 5 Maintenance and Repair

5.1 PERIODIC MAINTENANCE

No periodic maintenance is required.

5.2 TROUBLESHOOTING

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

5.2.1 VOLTAGE REGULATOR LEDS

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

and both power regulators, have green LEDs that indicate the presence of input power. These LEDs can only be seen when the top cover is removed. If these LEDs are not ON:

Check the power supply for correct operation.

Ensure that all mid-plane interface connectors for the module or regulator are correctly mated.

Contact Customer Service.

5.2.2 OCELOT ONBOARD DIAGNOSTIC PROGRAM

Each Ocelot system contains an onboard diagnostic program embedded in the system controller module. While designed for factory use prior to system shipment, this program may yield some benefit in the field when used as directed by PESA Customer Service. The diagnostic program is activated as follows:

1. Connect the System Controller Module to a PC as described in "RS-232 CPU Link Interface (PC)."
2. Set System Controller Module DIP Switch S1-1 to ON. This is S1 on the top of the module, not S1 on the backplane.
3. Start HyperTerminal on the PC, or other terminal emulation software, and configure as follows:

    Speed: 9600 BPS

    Data Bits: 8

    Parity: None

    Stop Bits: 1

    Flow Control: None

4. Restart the System Controller Module by disconnecting, and then reconnecting, the Ocelot system from its power source.
5. HyperTerminal will display the Ocelot Diagnostics Menu.
6. Press the number key for the test to be performed, or Q to quit.

5.2.3 PESA CUSTOMER SERVICE

If the troubleshooting information above has not solved your problem, please contact the PESA Customer Service Department. Skilled technicians are available to assist you 24 hours per day, seven days per week.

5.3 REPAIR

Before attempting to repair this equipment, please consult your warranty documents and the PESA Customer Service Department. Unauthorized repairs may void your warranty.

WARNING

Ocelot Power Supply

In the event of failure, this power supply should be replaced, not repaired. Attempting to repair this power supply could create a safety hazard.

WARNING

RCP Power Supply

In the event of failure, this power supply should be replaced, not repaired. Attempting to repair this power supply could create a safety hazard.

The PC boards in this equipment may contain Surface Mount Technology components. Special tools are required to replace these components without causing damage to adjacent areas.

Failure to consult with Customer Service before attempting to repair these boards may void your warranty.

5.4 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. Please consult our Customer Service Department before installing any parts not purchased from PESA.

5.5 FACTORY SERVICE

Before returning any equipment to our factory for service or repair, please contact our Customer Service Department for an RMA number.

Chapter 6 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.

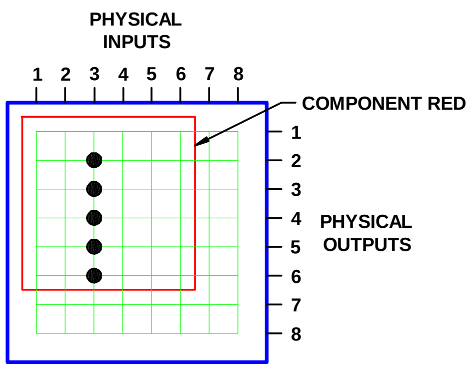

Figure 6-1 All Call

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 6-1 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 6-2 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 6-3 shows a 2x2 RGB video level (VID) consisting of three components (RED, GRN, and BLU).

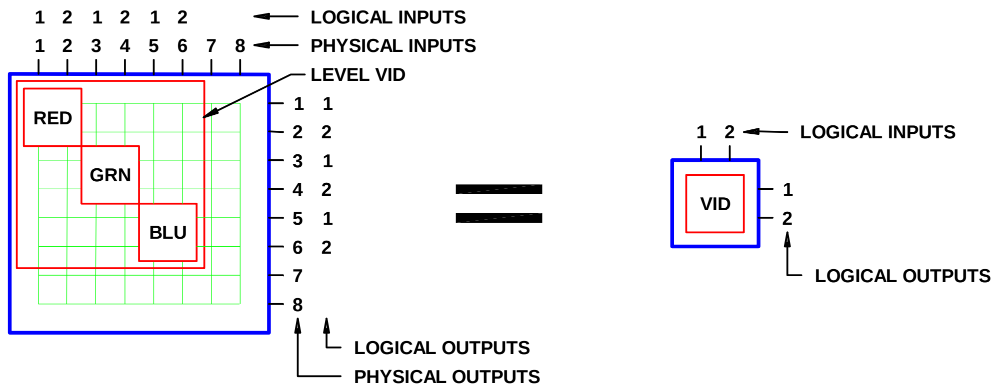

Figure 6-3. Component

As a general rule, users control the switching of levels, but component switching is handled automatically by the switching system. As shown in Figure 6-3 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.

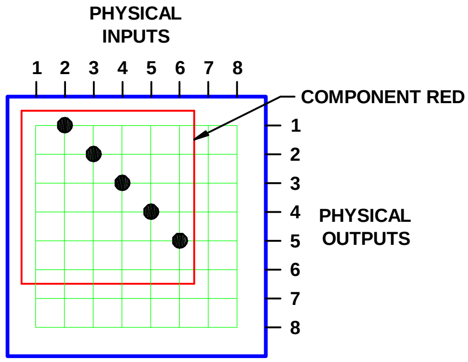

Figure 6-4 Diagonal

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 6-2 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).

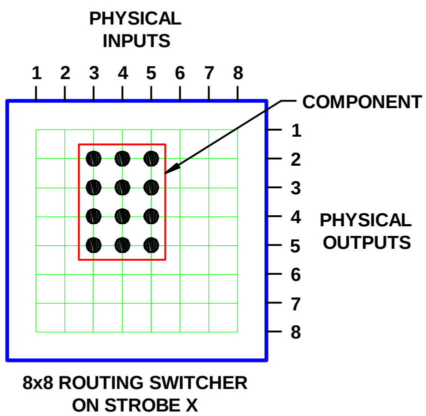

Figure 6-5 Input Offset, Single Routing Switcher

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 6-5 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 6-6 has its origin at (12,7) and an input offset of 11.

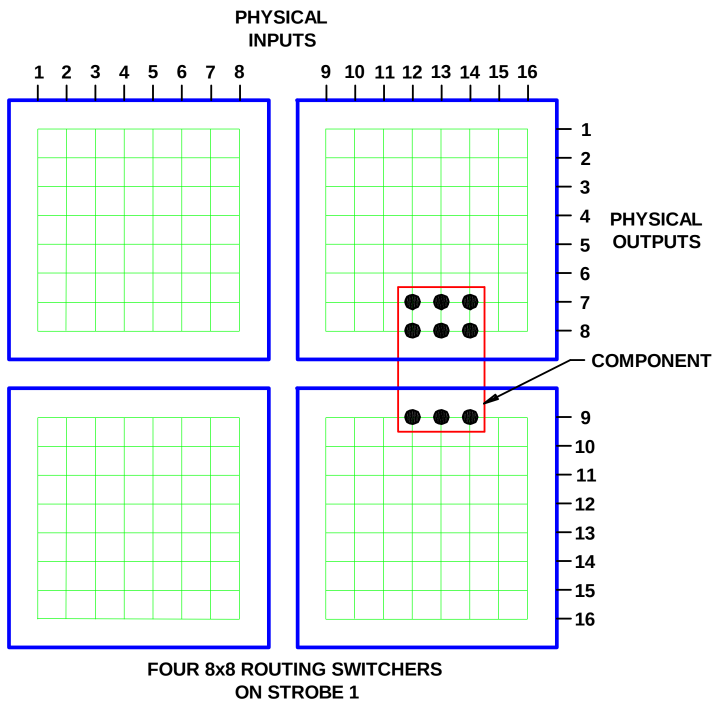

Figure 6-6. Input Offset, Multiple Routing Switchers

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 6-7 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.

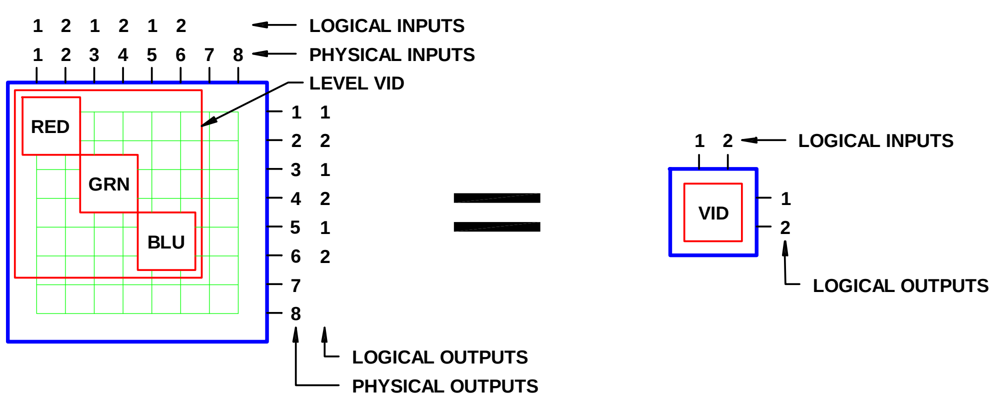

Figure 6-7 Level

As a general rule, users control the switching of levels, but component switching is handled automatically by the switching system. As shown in Figure 6-7, 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.

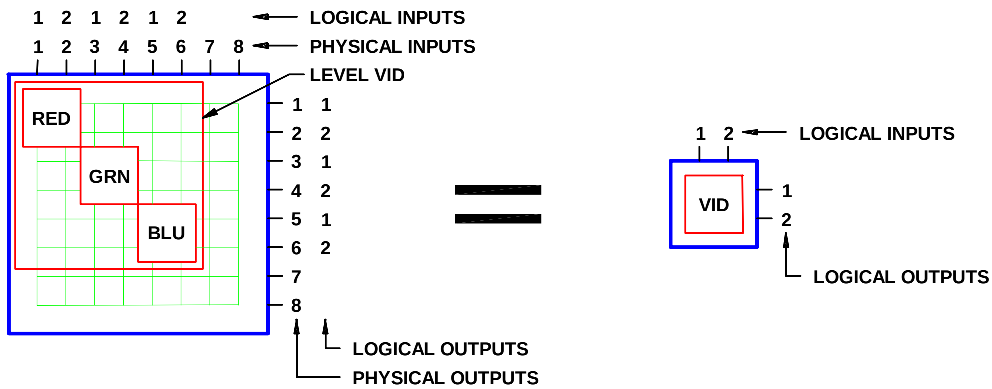

Figure 6-8 Logical Input

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 6-9 is (4,2) on strobe 1.

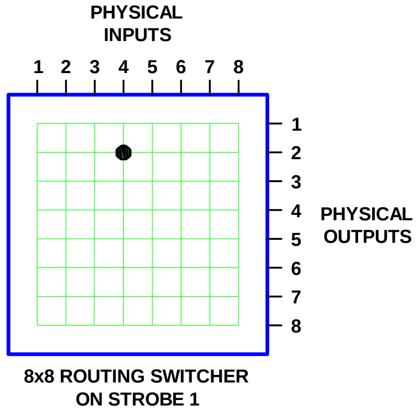

Figure 6-9 Matrix Space, One Routing Switcher on One Strobe

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 6-10 consists of four 8x8 routing switchers assigned to the same strobe. The coordinates of the indicated crosspoint are (12,14) on strobe 1.

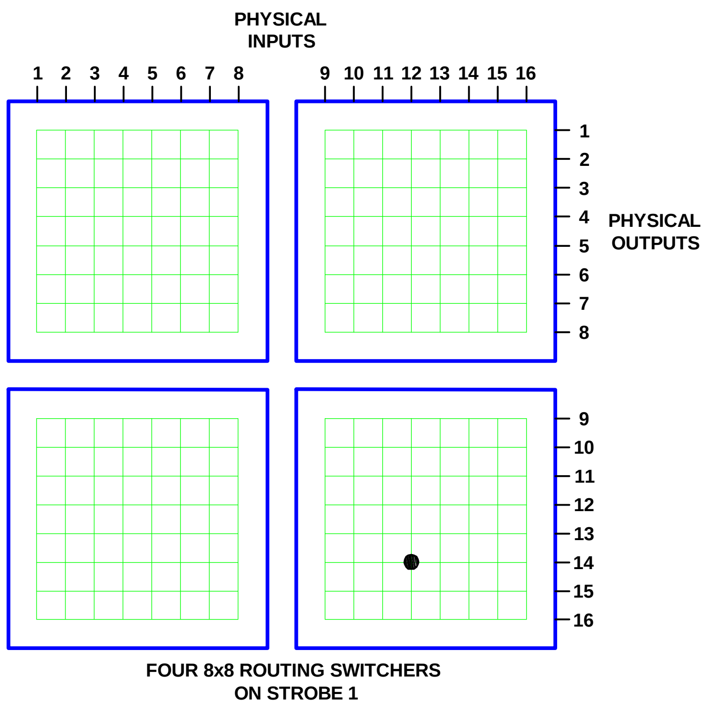

Figure 6-10 Matrix Space, Four Routing Switchers on One Strobe

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 6-11, 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.

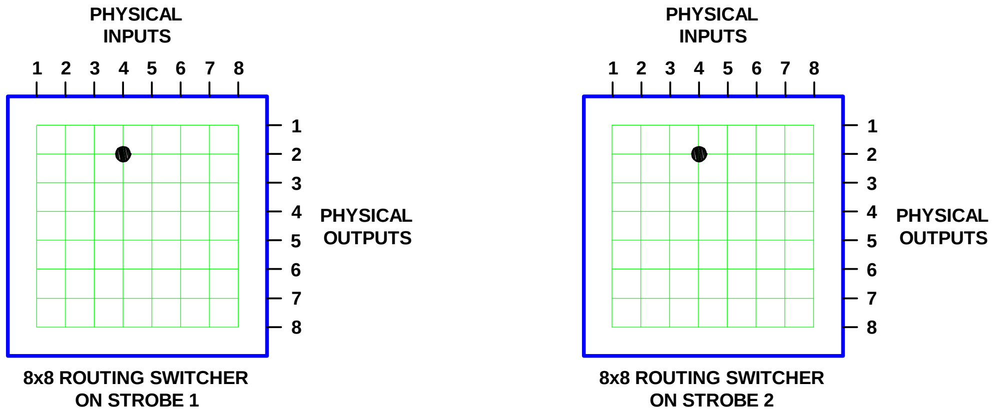

Figure 6-11. Matrix Space, Two Routing Switchers on Two Strobes

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 6-12 below, the 3x4 Component bounded by coordinates (3,2), (5,2), (5,5), and (3,5) has its origin at (3,2).

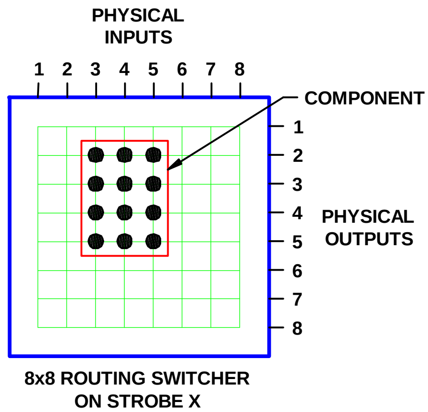

Figure 6-12 Output Offset, Single Routing Switcher

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 6-12 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 6-13 has its origin at (12,7) and an output offset of 6.

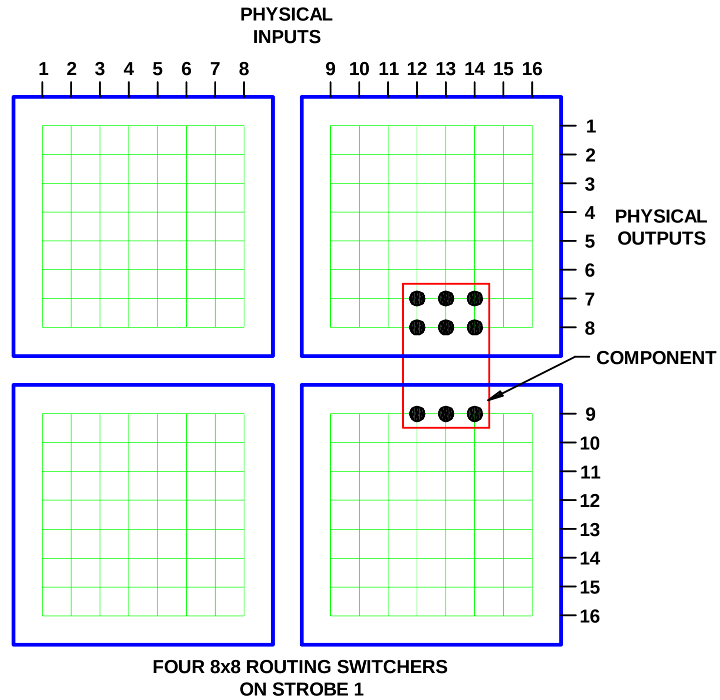

Figure 6-13 Output Offset, Multiple Routing Switchers

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.

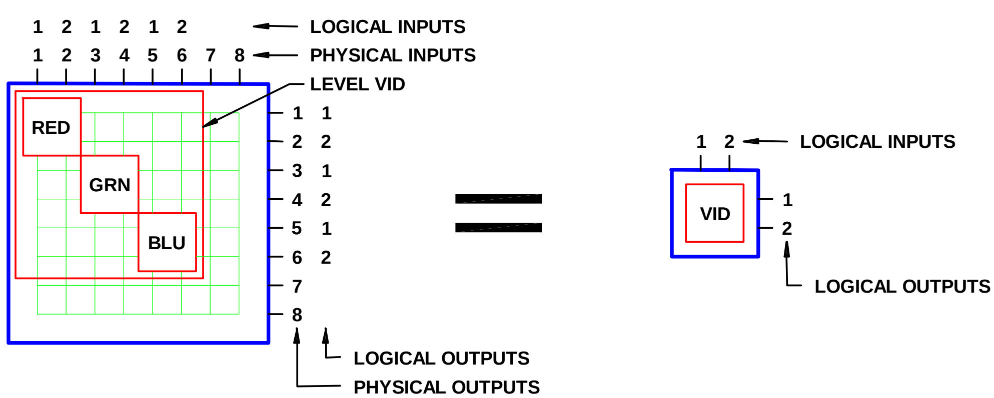

Figure 6-14 Physical Input

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.

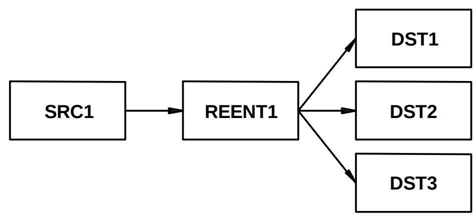

Figure 6-15. Reentry

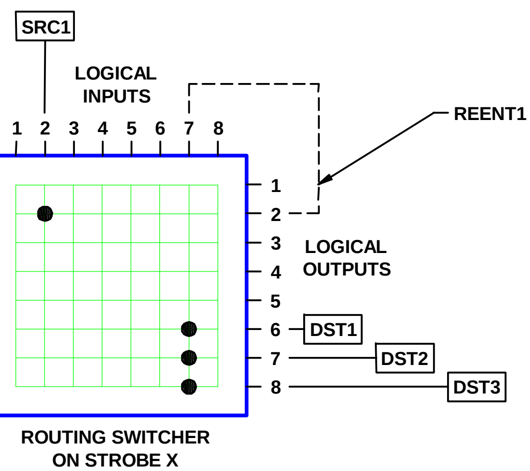

Figure 6-16 Reentry

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 6-3 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 6-17) 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.

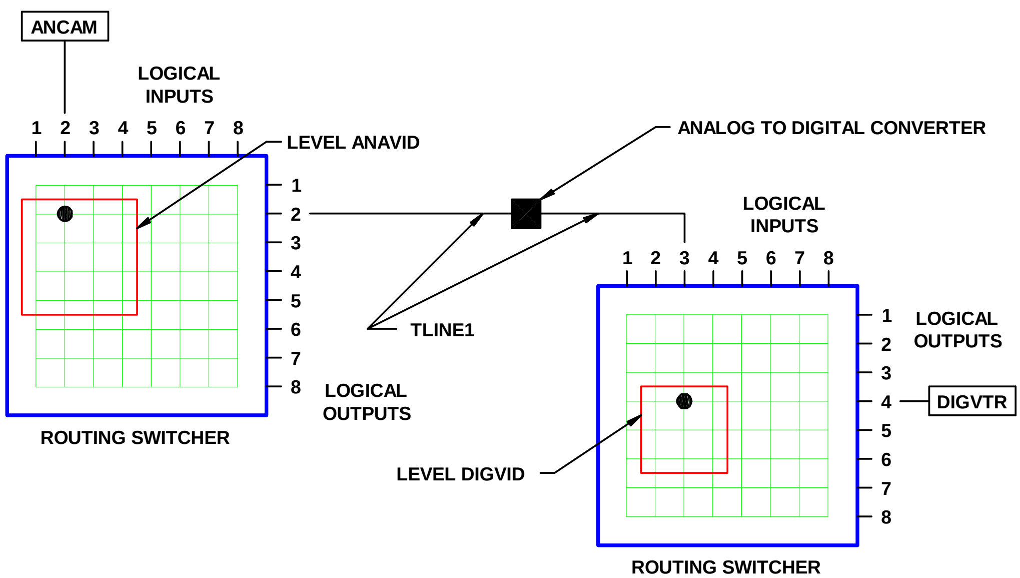

Figure 6-17 Tieline

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 6-18) 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.

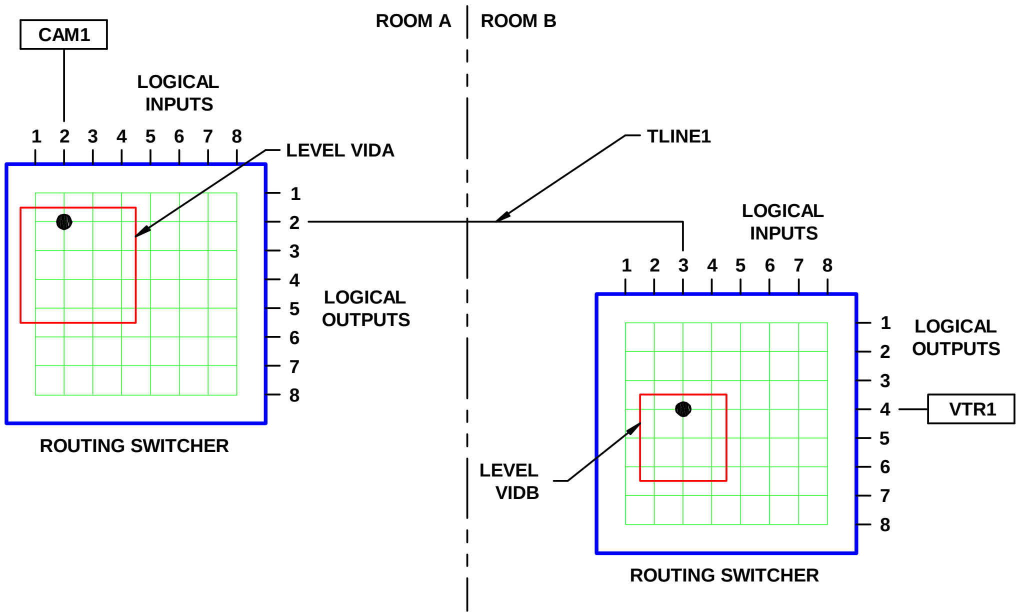

Figure 6-18 Tieline

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.

PESA