Installation Manual

Tektronix

Profile

PDR100
Video Disk Recorder

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EC DECLARATION OF CONFORMITY

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Tektronix, Inc., Video Networking Division, declares on 4 October, 1995, under our sole responsibility, that the PDR100 Video Disk Recorder to which this declaration relates, is in conformity with the following standard(s) or other normative document(s):

EMC Directive 89/336/EEC

EC EN55022	Limits and methods of measurement of radio interference characteristics of Information Technology Equipment
EC 50 082-1 1992	Electromagnetic compatibility generic immunity standard Part 1: Residential, commercial, and light industry.

Environmental Phenomena	Test Specification	Basic Standard
Radio-Frequency Electromagnetic Field	27-500 MHz 3V/m (unmodulated)	IEC801-3
Electrostatic Discharge	8kV (charge Voltage)	IEC801-2
Fast Transients common mode on Signal lines AC mains ports	0.5kkV (peak) 5/50 Tr/Th ns 5kHz Rep. Frequency	IEC801-4

Low Voltage Directive 73/23/EEC

EC EN60950	Safety of Information Technology Equipment including Electrical Business Equipment (includes Appendix ZB)

Manual Part Number: 070-9040-06

Manual Revision Status

PRODUCT: Profile PDR100 Video Disk Recorders

REV DATE	DESCRIPTION
February 1995	Original Issue. Manual part number 070-9040-01.
May 1995	Manual part number rolls to 070-9040-02.
August 1995	Updated to include 4-LTC Ref. Genlock and EMI modifications. Manual part number rolls to 070-9040-03.
October 1995	Reorganized and revised extensively. Includes Embedded Audio and Software Rev. 1.3. Manual part number rolls to 070-9040-04.
September 1996	Revised to reflect new CPU board, added CAV Input board information, updated specifications. Manual part number rolls to 070-9040-05.
August 1997	Revised to reflect new LAN and VGA boards. Manual part number rolls to 070-9040-06.

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

Only qualified personnel should perform service procedures.

While using this product, you may need to access other parts of the system. Read the *General Safety summary* in other system manuals for warnings and cautions related to operating the system.

Injury Precautions

Use Proper Power Cord

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

Ground the Product

This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Do Not Operate Without Covers

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

Use Proper Fuse

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

Do Not operate in Wet/Damp Conditions

To avoid electric shock, do not operate this product in wet or damp conditions.

Do Not Operate in an Explosive Atmosphere

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

Avoid Exposed Circuitry

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

Product Damage Precautions

Use Proper Power Source

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

Provide Proper Ventilation

To prevent product overheating, provide proper ventilation.

Do Not Operate With Suspected Failures

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

Safety Terms and Symbols

Terms in This Manual

These terms may appear in this manual:

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

CAUTION: Caution statements identify conditions or practices that can result in damage to the equipment or other property.

Terms on the Product

These terms may appear on the product:

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

WARNING indicates a personal injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product

The following symbols may appear on the product:

DANGER high voltage

Protective ground (earth) terminal

ATTENTION – refer to manual

Certifications and Compliances

Canadian Certified Power Cords

Canadian approval includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

FCC Emission Control

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by Tektronix can affect emission compliance and could void the user's authority to operate this equipment.

Canadian EMC Notice of Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

EN55022 Class A Warning

For products that comply with Class A. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Service Safety Summary

⚠ ***WARNING: These instructions are for use by qualified service personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries before performing service.***

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power

To avoid electric shock, disconnect the main power by means of the power cord. or, if provided, the power switch.

Use Care When Servicing With Power On

Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections

Chapter 1

Introduction

This manual is part of a set of manuals provided to support installation and operation of the Tektronix PDR 100 Professional Disk Recorder. The set consists of the User Manuals along with this Installation manual.

In addition to the PDR100 information, there are installation instructions for the PDX103 Disk Expansion Unit, and the XLR100 Audio Bypass Unit. Each of these has its own set of instructions but for ease of installation, mounting and cabling information has been included in this manual.

Product Description

The PDR 100 is a disk-based video record and playback system yielding a quality equal to beta machines using metal oxide tape. Aside from the obvious advantage of not having to load tape, it occupies less rack space and is fully computer controlled. Record/playback applications for the PDR 100 run on the Windows NT™ operating system. The system's total amount of program material storage depends on the number of hard-disk drives and the video storage rate (number of bytes/field). With the optional PDX103 Disk Expansion Unit and lowest video storage rate (50,000 bytes/field), it is possible to store up to nine hours of material.

The PDR 100 is mounted on rack slides for installation in either a standard or "TELCO" rack. The unit is roughly the configuration of a large personal computer (PC) with 16 Extended Industry Standard Architecture (EISA) slots, one ISA slot, up to 32 Gbytes of disk storage, and a 32 by 32 CCIR 601 eight-bit routing switch. Three control interfaces are supported: RS-232, RS-422, and keyboard/ mouse with VGA output. The PDR 100 RS-422 interface has eight separate ports which require the RS-422 Connector Panel (supplied with the PDR 100).

The system is controlled by an internal computer card with dedicated (system) hard disk storage and a $3^1/_2$-inch floppy disk drive. It can be addressed through any of the three interfaces. A VGA circuit card supports an optional SVGA monitor for use with the internal system controlling computer. The Microsoft Windows NT™ operating software is loaded on the system hard disk.

Operation Overview

Program video is input to the system in component serial digital, component analog, or composite analog format, converted to parallel digital format, and routed to the Disk Recorder circuit board by the on board video router. The parallel digital signal is compressed (JPEG) and stored on the hard disk.

Upon recovery, the compressed parallel digital component video is decompressed and routed to the output circuitry where it is converted back to serial digital or analog format. The composite output undergoes an additional conversion back to either the NTSC or PAL format. The composite output circuit board supports up to four composite program outputs and a monitor channel. The monitor channel can have time code burned in.

Each video channel can be supported by up to four channels of audio. A separate audio circuit board is required for each four channels of audio input or output. The audio signal is stored on a hard disk along with the video. For playback, the audio is recovered from its storage location and output with the same video signal relationship it had when recorded.

Control of the hard disks is accomplished by the Disk Recorder circuit boards, which also provide the JPEG compression/decompression. The Master Disk Recorder can control as few as 4 and as many as 12 hard disks. A Slave Disk Recorder can be added to control between 4 and 12 additional hard disks. The total number of hard disks that can be accommodated by a single PDR 100 (with PDX103 Disk Expansion unit) is 24.

The PDX103 is an optional Disk Expansion Unit containing its own power supply and as many as 16 additional hard disks in a 7-inch (four rack units) high by 25.5-inch deep, and 19-inch wide unit. The Disk Expansion Unit is delivered with either 8 hard disks (2 banks of 4 to support 2 Disk Recorder boards in the PDR 100, a single bank of 8 to support 1 Disk Recorder board), or with 16 hard disks to fully utilize the capacity of 2 Disk Recorder boards.

Accessories

There are two types of accessories for the PDR 100. Standard Accessories are those items required to place the video disk recorder in service; they are shipped with the VDR. Optional accessories are those available through Tektronix that will expand VDR capabilities, simplify the installation, or aid in servicing.

Standard Accessories

The following items were included for shipment with the PDR 100:

- 1 Manual, Users (Tektronix part number 070-9042-XX)
- 1 Manual, Installation (Tektronix part number 070-9040-XX)
- Software Package
- 1 Windows NT instruction book (Tektronix part number 063-2284-XX)
- 1 Keyboard (Tektronix part number 119-4254-XX)
- 1 Mouse (Tektronix part number 119-4330-XX)
- 2 Packages (12 pieces) EMI Suppression Gaskets for BNC Connectors (Tektronix part number 016-1448-XX)
- 1 Cable Assembly, Power (161-0216-00 for US and Japan; 161-0066-09 for Europe; 161-0066-10 for the United Kingdom; or 161-0066-11 for Australia)
- 1 SCSI Terminator (011-0166-00)
- 1 RS-422 Control panel, with interconnecting cable (039-0028-XX)
- 1 Set of rack-mounting slides

Optional Accessories

The following items are available from Tektronix, Inc. Contact your nearest field office or distributor for more information.

- SVGA Monitor
- Service Manual (Tektronix part number 070-9041-XX)
- XLR100 Audio Bypass and Breakout Unit
- PDX103 Disk Drive Expansion Unit
- Additional Hard Disk Drives for either PDR 100-Series or PDX103
- Eight-connector DB25-XLR breakout cable for audio or longitudinal time code I/O (Tektronix part number 174-3249-XX)
- Eight-connector breakout cable, with DB25 connector and tinned leads (Tektronix part number 174-3481-XX)

Chapter **2**

Configuration

The PDR100 Mother board with its connectors for the circuit boards allows the PDR100 to be configured in a number of ways. Any configuration of the PDR100 consists of circuit boards that are required in all configurations and circuit boards specific to a particular configuration.

On the Mother board, the connectors are arranged into the EISA bus and Video Router as shown in Figure 2-1. All of the circuit boards plug into the EISA bus. (Slot J2, which is on the EISA bus, is limited to ISA only.) A number of the circuit boards, such as the Master or Slave Disk Recorder and the Input/Output (I/O) boards, require connection to both the EISA bus and the Video Router, which is provided by slots J5-J16.

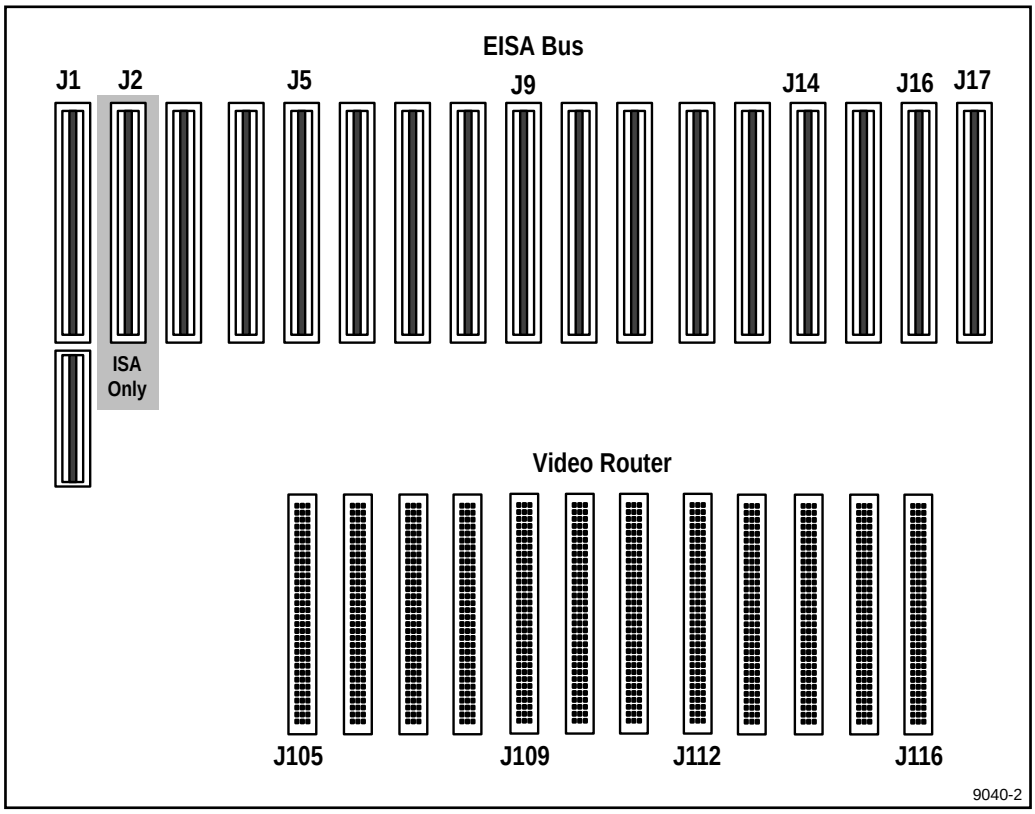


Figure 2-1. Circuit Board Slot Nomenclature

Configuration Guidelines

The information given here is to help install circuit boards in configurations that differ from factory configurations. This information can be useful when adding a new circuit board to the PDR100 and you need to move boards around to make room. Some of the circuit boards must be installed in specific locations, others are installed in locations that are dictated by the configuration.

Circuit Board Installation Rules

In order to ensure correct operation of the PDR100, it is necessary to follow some specific rules involving the installation of the various circuit boards.

- Processor and VGA boards must be installed in Mother board slots J1 and J2 respectively.
- Slots J5 through J16 have access to both the EISA bus and the Video Router; however, the number of router connections accessible from specific slots varies, making it necessary to arbitrarily assign some configuration-specific boards to designated slots.
- Disk Recorder circuit boards must be in Mother board slots J14 (Master) and J15 (Slave).
- Slot J17 on the Mother board is EISA only and is dedicated to the RS-422 board.
- The Reference Genlock circuit board must be installed in Mother board slot J16.
- Analog Composite Output circuit boards (for NTSC or PAL) can only be installed in Mother board slots J11 or J12.
- Audio circuit boards need to be close enough to their respective input or output boards to allow clock cabling. In most cases, the audio board will be adjacent to the input board and no more than two slots away from the output board.
- Serial I/O boards cannot be installed adjacent to Analog Composite Output boards.

Circuit Boards Required for All Configurations

The following circuit boards are required in every PDR100:

- Processor
- VGA-I/O
- Reference Genlock
- Master Disk Recorder
- RS-422 Interface

Processor

The Processor is always installed in slot J1. It communicates with the outside world through the RS-422 Interface circuit board (that is installed in J17), RS-232 interface, VGA, mouse keyboard combination, and if installed, a Local Area Network (LAN) circuit board.

VGA-I/O

The VGA-I/O board is always installed in slot J2 next to the Processor board. In addition to the video interface for the monitor, this board provides internal connections to the PDR100's RS-232 Serial port, the system hard disk drive, and the floppy disk drive. There is also a parallel port, the IDE interface for the system hard disk, and the floppy disk driver.

Reference Genlock

Slot J16 is assigned to the Reference Genlock circuit board. It requires both EISA bus and Video Router connections. Like its neighbor the RS-422 Interface circuit board, it is required for all configurations.

Master Disk Recorder

Each Disk Recorder circuit board requires a set of four or eight hard disk drives. This can be as many as 12 hard disk drives per Disk Recorder, when the PDX103 is also used. The Master Disk Recorder circuit board is always located in slot J14. It controls 4, 8, or 12 hard disk drives, depending on the number of hard disk drives installed and whether the PDX103 is in use.

Circuit Boards that Support Configurations

Some of the circuit boards can be loaded into almost any of the slots, while others must go into specified locations. The slots that are available for configuration-specific circuit boards are J3 through J13. See Figure 2-2.

J14 through J17 are also dedicated slots, used for the Disk Recorders, Reference Genlock, and RS422A Interface circuit boards.

Slave Disk Recorder

When the PDR100 is configured for four channel operation, a Slave Disk Recorder circuit board is required. This circuit board is always located in slot J15.

Analog Composite Input

The Analog Composite Video Input is a two circuit board set requiring two EISA/ Video Router slots (between J5 and J13.) One slot is occupied by the Decoder circuit board, while the second slot has the one video-channel Input circuit board.

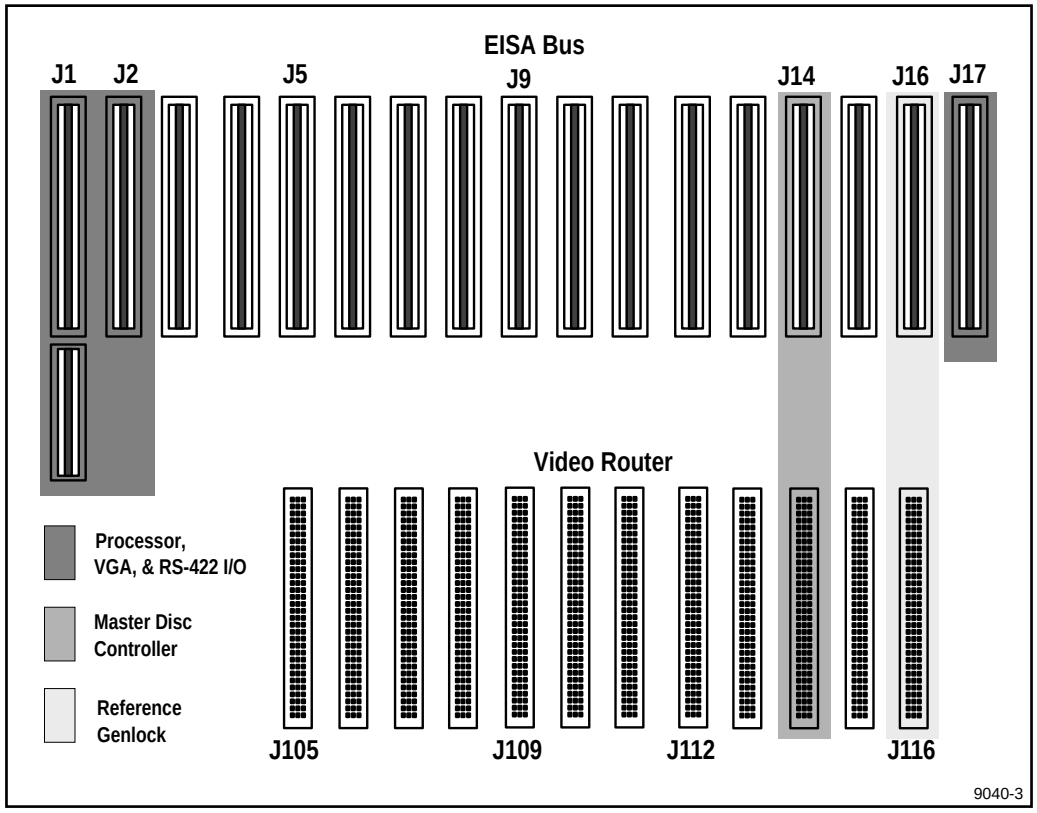


Figure 2-2. Required Circuit Boards for All Configurations

Serial Digital Component Input/Output

A single Serial Digital Component Input/Output circuit board provides two input and two output channels. Up to two boards (four video channels) can be installed in any available slot(s) with connections to the Video Router.

Component Analog Video (CAV) Input

The Component Analog Video (CAV) Input board accepts a single source of component analog video input. The CAV Input board can be installed in any available slot that includes connection to the Video Bus (slots that include the Video bus are slots J5-J16).

Analog Composite Output

The Analog Composite Output circuit board supports up to four channels of video. Only slots J11 and J12 with four Video Router connections can support these circuit boards.

Audio Input/Output

Each Audio Input/Output circuit board provides four-channel analog audio input and output. Up to four Audio circuit boards can be installed in a single PDR100. Audio circuit boards do not require connection to the Video Router, which also allows them to be used in slots J3 and J4 (EISA only.) However, they do need to be adjacent to a Video Input or Output for cabling.

Additional Configurations

Not all of the available configurations of the PDR100 require the addition of circuit boards; however, in some cases, both circuit boards and external items are part of the appropriate configuration. For example, adding a monitor requires both an SVGA monitor along with the installed VGA circuit board.

Keyboard and Mouse

The processor can be controlled externally using a keyboard and mouse.

Monitor (VGA)

Slot J2 is the location of the VGA circuit board. When an SVGA monitor is used, it is cabled to the D-type connector on the back of the VGA circuit board.

Local Area Network (LAN)

Interface card for access to a local area network. Requires an EISA slot. It should be installed in J3.

Typical Configurations

The majority of the PDR100's will use one of the following typical configurations. Processor and Disk Recorder circuit boards remain constant throughout the configurations.

Serial Four-Channel In and Four-Channel Out

This is Option 40 in the standard factory configurations. The Serial I/O circuit boards have two-channel input and output each; two I/O circuit boards and four audio circuit boards are required for this configuration. See Table 2-1. This configuration uses eight hard disk drives and two Disk Recorder (Master and Slave) circuit boards to support four-channel operation.

Table 2-1. Circuit Boards for Serial Four-CH In/Four-CH Out

Slot	Board Name	Dedicated Location	Miscellaneous
J1	Processor	Yes	EISA & ISA
J2	VGA-I/O	Yes	ISA
J3	Empty	—	
J4	Empty	—	
J5	Empty	—	
J6	Empty	—	
J7	Empty	—	
J8	Serial I/O	No	Two Video Channels In & Two Video Channels Out
J9	Audio	No	Four Audio Channels
J10	Audio	No	Four Audio Channels
J11	Serial I/O	No	Two Video Channels In & Two Video Channels Out
J12	Audio	No	Four Audio Channels
J13	Audio	No	Four Audio Channels
J14	Master Disk Recorder	Yes	Controls four, eight, or twelve hard disks
J15	Slave Disk Recorder	Yes	Controls four, eight, or twelve hard disks
J16	Reference Genlock	Yes	
J17	RS-422 I/O	Yes	

Analog Composite Two Channels In and Four Channels Out

This is Option 43 in the standard factory configurations. This configuration uses two analog composite inputs and four analog composite outputs. The configuration is shown with two Disk Recorder circuit boards and a minimum of eight hard disk drives. See Table 2-2.

Table 2-2. Circuit Boards for Analog Composite Two-CH In/Four-CH Out

Slot	Board Name	Dedicated Location	Miscellaneous
J1	Processor	Yes	EISA & ISA
J2	VGA	Yes	ISA
J3	Empty	—	
J4	Decoder	No	Two board set that must be kept together.
J5	Composite Analog Input	No	
J6	Audio	No	Four Audio Channels
J7	Empty	—	
J8	Decoder	No	Two board set that must be kept together.
J9	Composite Analog Input	No	
J10	Audio	No	Four Audio Channels
J11	Composite Analog Output	Yes	Requires four video connections at the Video Router bus
J12	Audio	No	Four Audio Channels
J13	Audio	No	Four Audio Channels
J14	Master Disk Recorder	Yes	Controls four, eight, or twelve hard disks
J15	Slave Disk Recorder	Yes	Controls four, eight, or twelve hard disks
J16	Reference Genlock	Yes	
J17	RS-422 I/O	Yes	

Note that there is an Audio circuit board adjacent to each Analog Input circuit boards for audio input/output. In addition, there are Audio circuit boards in J12 and J13 next to the Composite Analog Output circuit board to accommodate the third and fourth audio output channels.

Analog Composite One Channel In and Four Channels Out

This is Option 42 in the standard factory configurations. This configuration takes in one video channel (with 4-channel audio) and outputs four video channels. It has a minimum of eight hard disk drives and both Master and Slave Disk Recorder circuit boards to support four-channel operation. See Table 2-3.

Table 2-3. Circuit Boards for Analog Composite One-CH In/Four-CH Out

Slot	Board Name	Dedicated Location	Miscellaneous
J1	Processor	Yes	EISA & ISA
J2	VGA	Yes	ISA
J3	Empty	—	
J4	Decoder	No	Two board set that must be kept together.
J5	Composite Analog Input	No	
J6	Audio	No	Four Audio Channels
J7	Empty	—	
J8	Empty	—	
J9	Empty	—	
J10	Audio	No	Four Audio Channels
J11	Composite Analog Output	Yes	Requires four video connections at the Video Router bus
J12	Audio	No	Four Audio Channels
J13	Audio	No	Four Audio Channels
J14	Master Disk Recorder	Yes	Controls four, eight, or twelve hard disks
J15	Slave Disk Recorder	Yes	Controls four, eight, or twelve hard disks
J16	Reference Genlock	Yes	
J17	RS-422 I/O	Yes	

Note that there is an Audio circuit board adjacent to the Composite Analog Input circuit board for audio input. In addition, there are Audio circuit boards on both sides of the Composite Analog Output circuit board to accommodate three separate four-channel audio outputs.

Chapter **3**

Mechanical Installation

The installation instructions in this chapter are for the PDR100 Video Disk Recorder and its companion units, the PDX103 Disk Expansion Unit, the RS-422 Connector Panel, and the XLR100 Audio Bypass Unit. This equipment is designed to be rack mounted. The PDR100 and the PDX103 are mounted to the rack with rack slides and face forward in the rack. The RS 422 Control Panel and the XLR100 mount at the rear of the rack using front panel attaching screws. Figure 3-1 shows an installation that includes the PDR100 and the PDX 103 mounted in a rack.

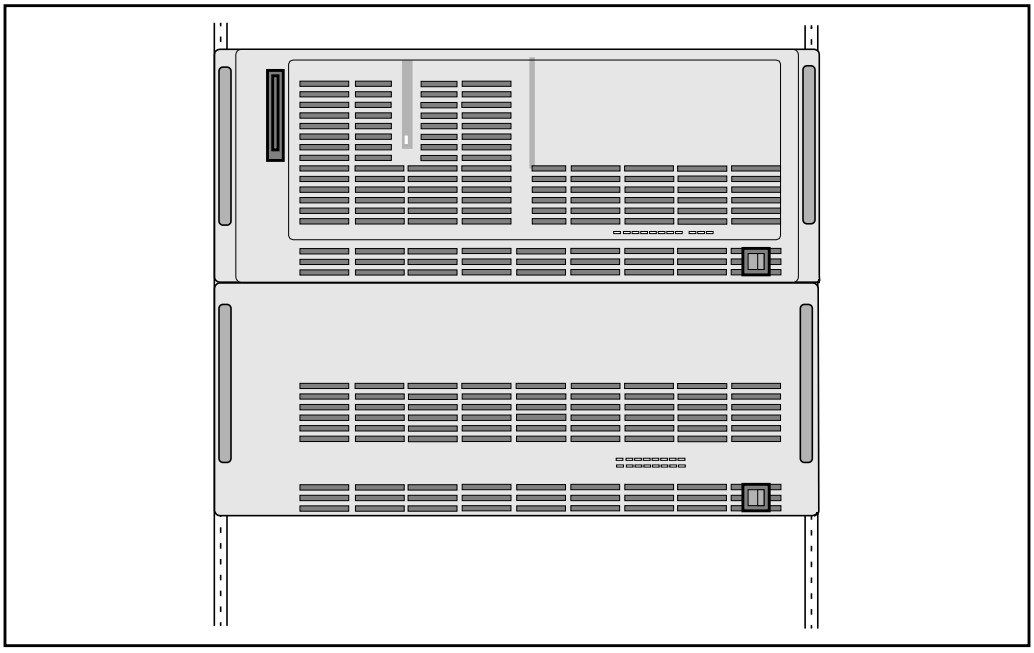


Figure 3-1. Typical PDR100 Installation with PDX103 Disk Drive Expansion Unit

The position of the units in the rack must be considered because of their weight. If the rack is not firmly mounted to the floor or vertically supported, the units should be located low enough to not cause the rack to tip when the cabinets are pulled out on the rack mounting slides.

Rack Dimensions

The PDR100 Disk Recorder, PDX103 Disk Expansion Unit, XLR100, and the RS-422 Connector Panel are all shipped with hardware for rack mounting. The major dimensions for all four units are shown in Figures 3-2, 3-3, 3-4, and 3-5. All four units fit in a standard 19-inch (48.3 centimeter) rack. Spacing inside the front rails of the rack must be at least 17 $^{3}/_{4}$ (45.1 centimeter) inches to allow clearance for the slide-out tracks used for the PDR100 and the PDX103.

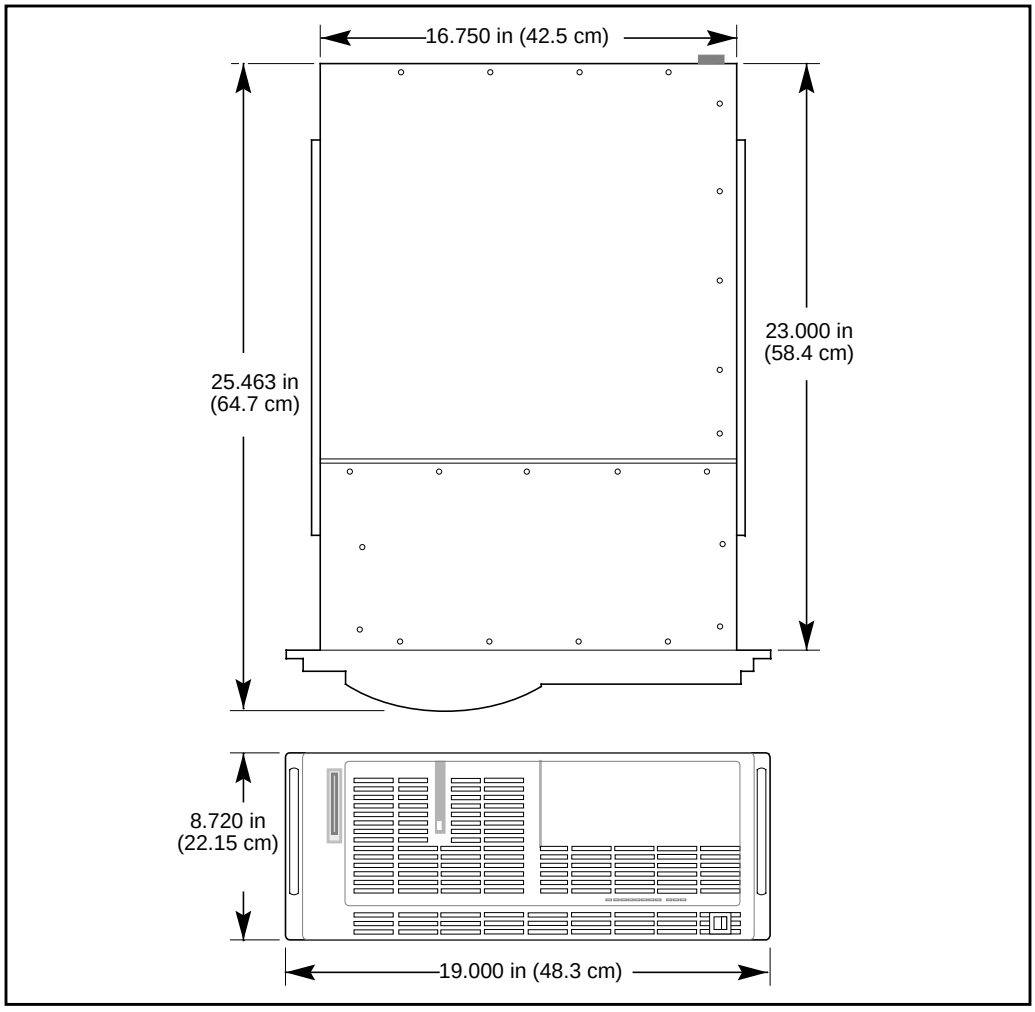


Figure 3-2. PDR100 Dimensions for Rack Mounting

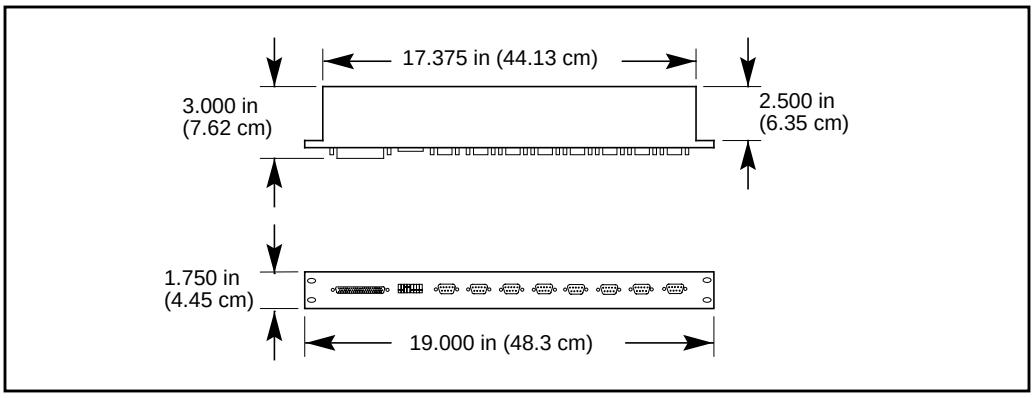


Figure 3-3. Dimensions of the RS-422 Connector Panel for Rack Mounting

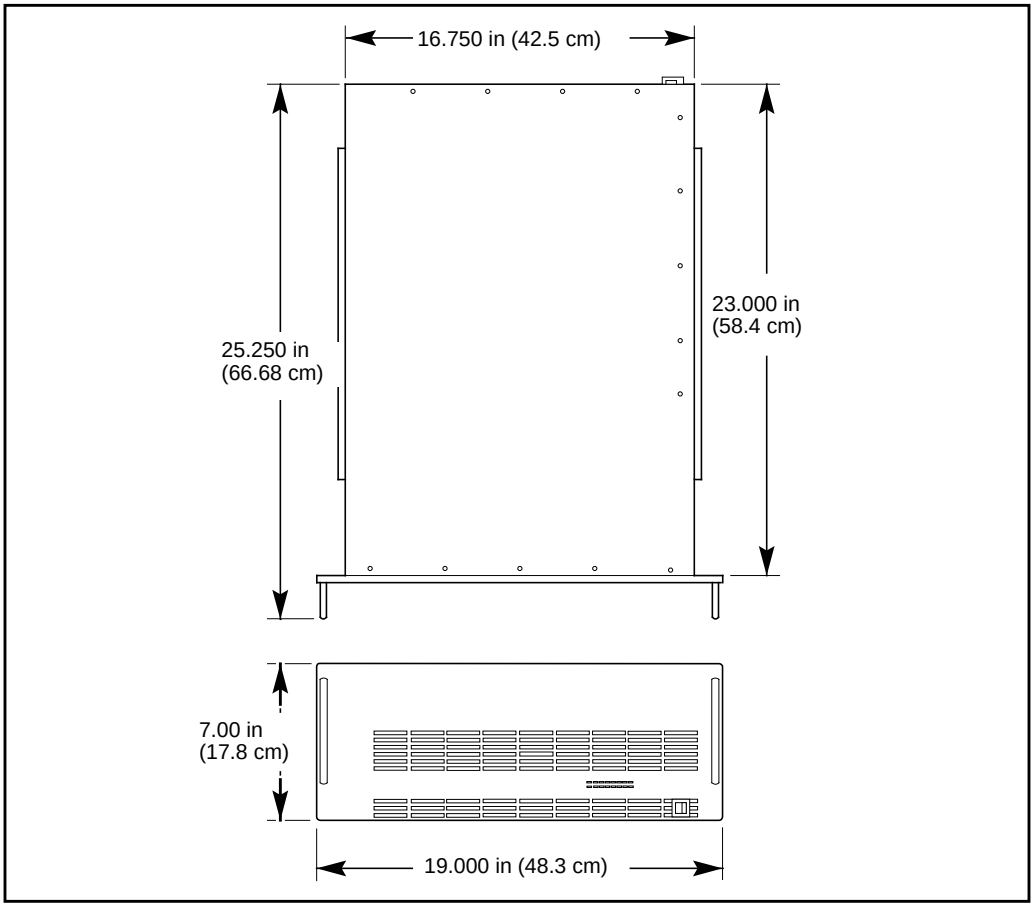


Figure 3-4. Dimensions of the PDX103 for Rack Mounting

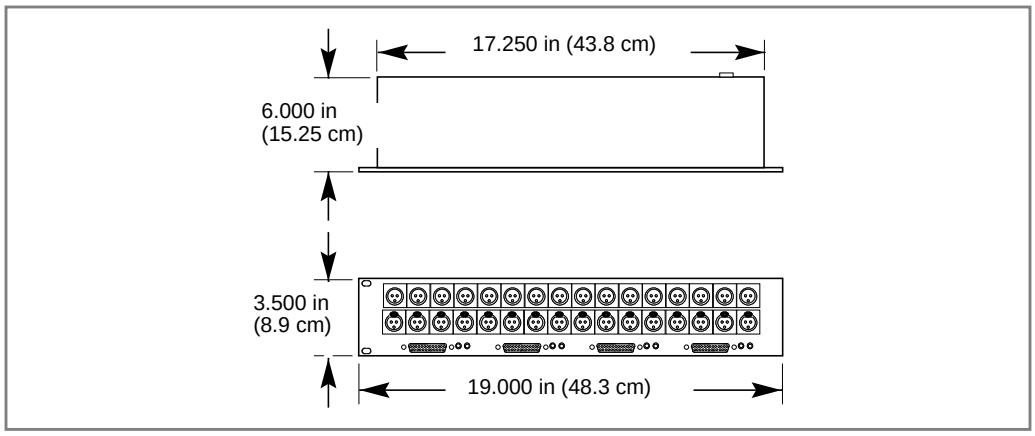


Figure 3-5. Dimensions of the XLR100 Audio Bypass Unit for Rack Mounting

Mounting the PDR and PDX Units

The rack slides mount in any rack that has a front-to-rear rail spacing between 15.50 and 28 inches (39.4 and 71.1 cm). Six inches (15.25 cm) of clearance between the PDR100 rear panel and any rear cabinet panel is required for connectors and cable bends. In addition, adequate air flow must be assured around the cabinet to provide sufficient cooling. (Operating ambient temperature will effect the amount of air circulation required to keep the PDR100 within its temperature limitations.)

The rack slide set for each side of the cabinet consists of three major sections and mounting hardware. Figure 3-6 shows the rack slide for the right side of the cabinet.

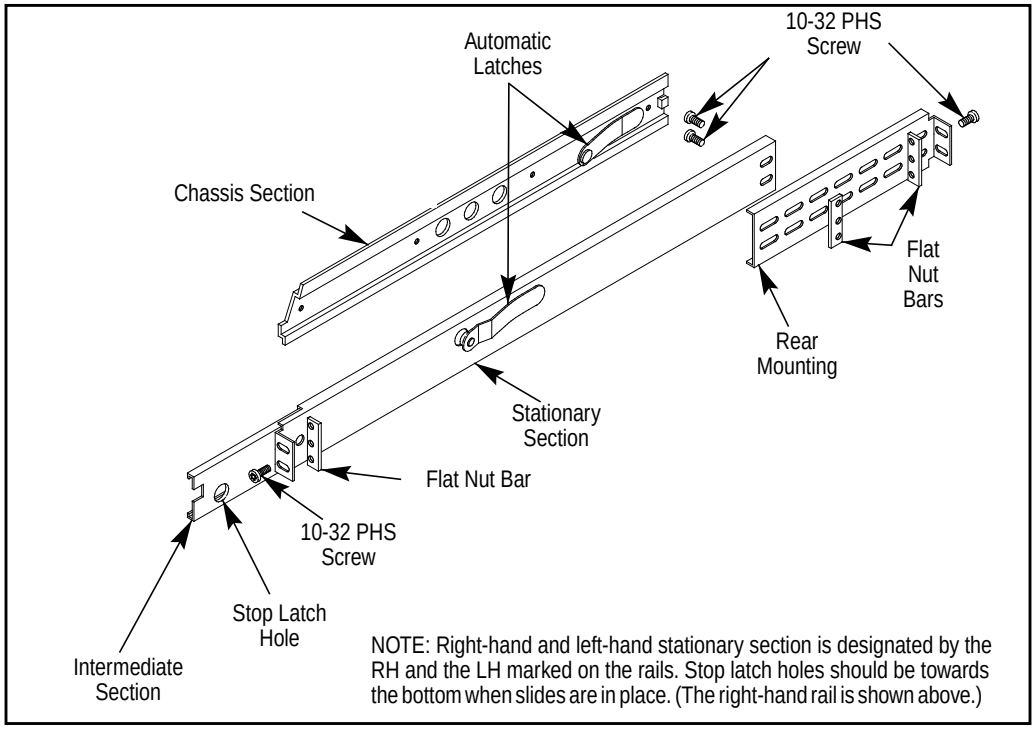


Figure 3-6. Complete Rack Slide Set for Right Side of Cabinet and Rack

Mounting the Slide Tracks in the Rack

Locate the proper rack holes as shown in Figure 3-7. Notice that the hole spacing can vary with the rack type. When installing the slides in racks with EIA spacing, make sure that the slides are attached to the 0.5 inch spaced holes.

Mount the rails using the enclosed hardware as shown in Figure 3-6. Figures 3-8 and 3-9 show the front and rear rail mounting details for both deep and shallow racks. Make sure the stationary sections are horizontally aligned and are level as well as parallel to each other.

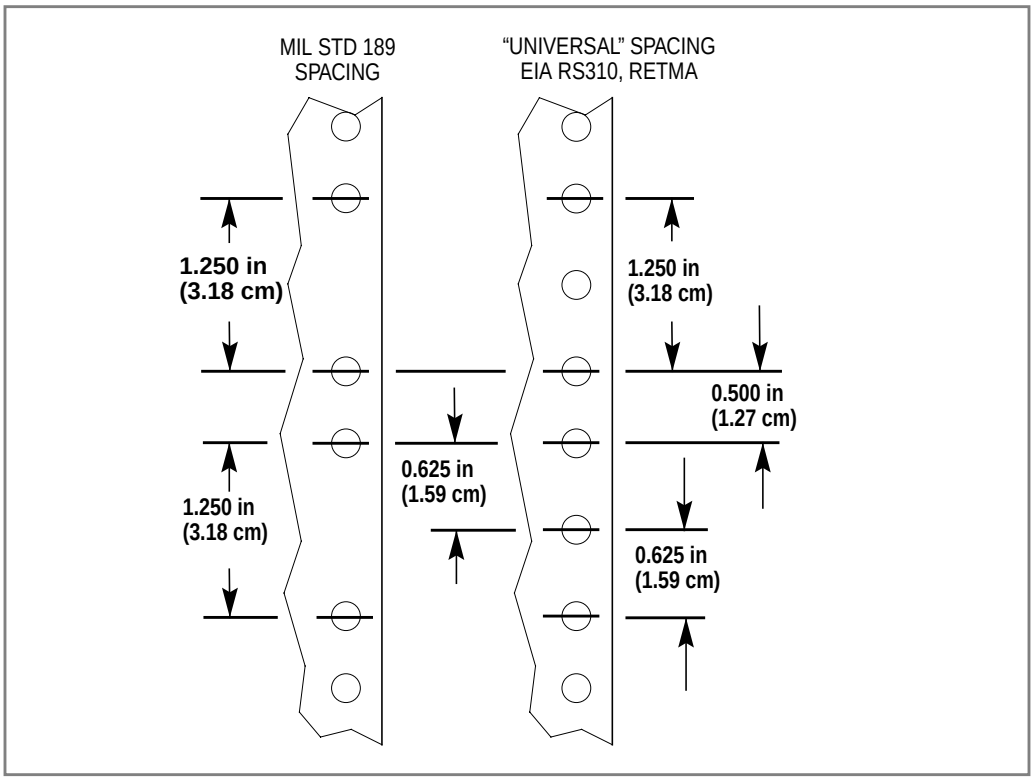


Figure 3-7. Spacing for Mounting Holes in a Standard Rack

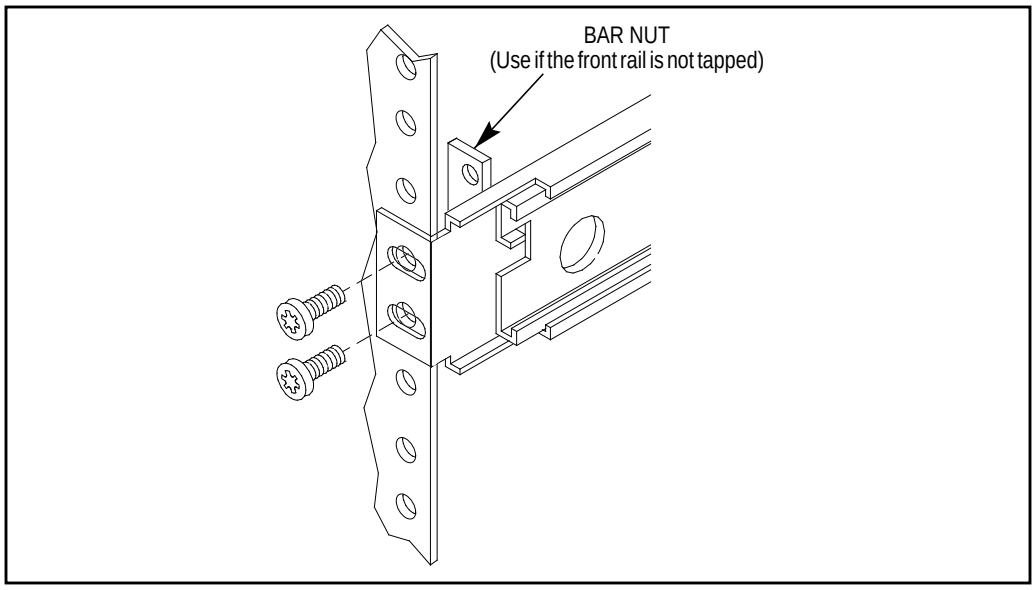


Figure 3-8. Front Slide Mounting Detail

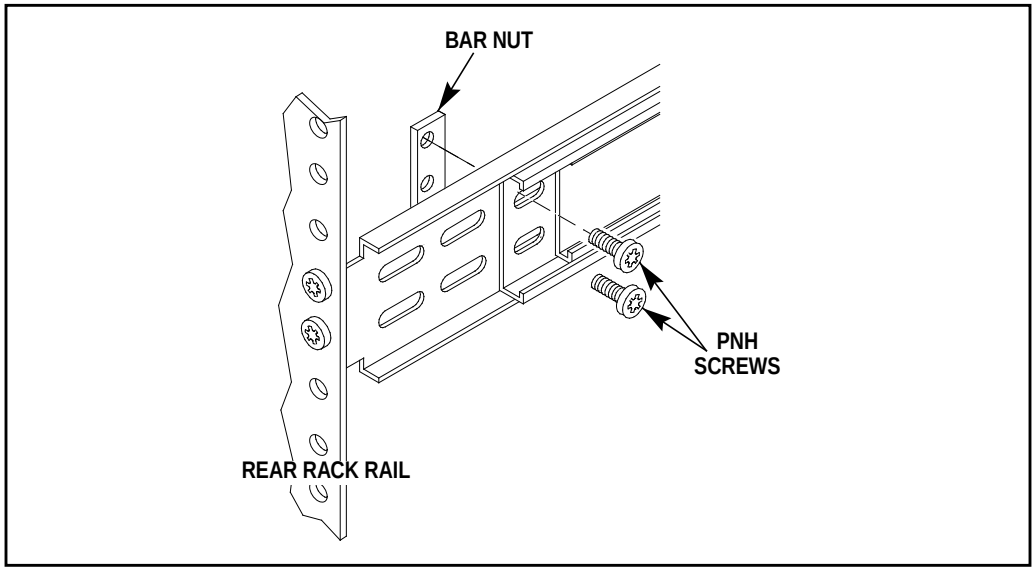


Figure 3-9. Rear Slide Mounting Detail

Installing the PDR100 or PDX103in the Rack Slides

1. Pull the slide-out track section to the fully extended position. See Figure 3-10.
2. Insert the ends of the cabinet chassis sections into the slide-out sections.
3. Push the cabinet toward the rack until the chassis sections lock into the intermediate sections.
4. Press the stop latches in the intermediate sections and push the cabinet toward the rack until the latches snap into their holes.
5. Again press the stop latches and push the cabinet fully into the rack.
6. Tighten the front-panel retaining screws.

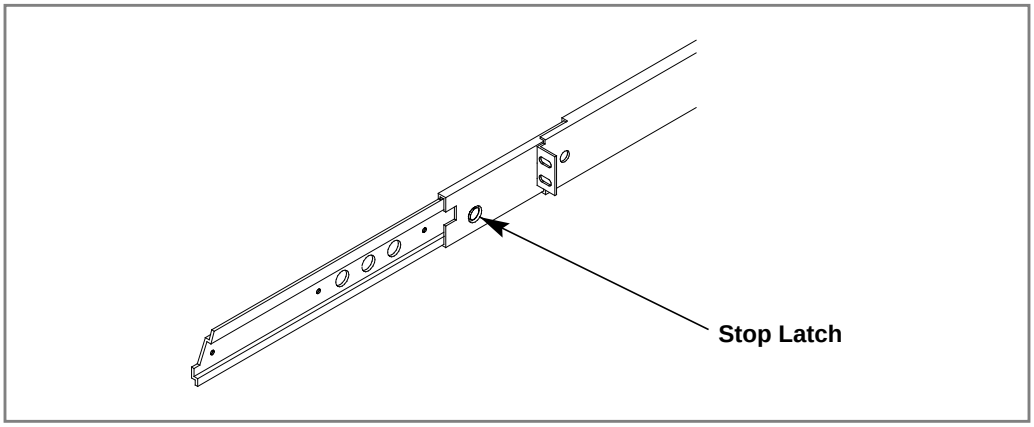


Figure 3-10. Rack Slide Stop Latch

Rack Slide Adjustments

After installation binding may occur if the slide tracks are not properly adjusted. To adjust the tracks:

1. Slide the cabinet out about 10 inches.
2. Loosen slightly the screws holding the tracks to the front of the rails, and allow the tracks to seek an unbound position.
3. Tighten the mounting screws and check the tracks for smooth operation by sliding the cabinet in and out of the rack several times.
4. Tighten the front panel retaining screws once the cabinet is in place within the rack to complete the installation.

Rack Slide Maintenance

The slide-out sections of the tracks do not require lubrication. The dark gray finish on the tracks is a permanent lubricating coating. The track sections should be checked periodically for build-ups of dust or foreign material that might cause them to bind.

Removing the Unit

⚠ ***CAUTION: Be sure all cables are disconnected from the PDR100 or PDX103 prior to attempting to remove the unit.***

⚠ ***WARNING: Both the PDR100 and the PDX103 are considered to be too heavy for one person to remove. PDR100 exceeds 70 pounds when equipped with eight hard disks. PDX103 weight is similar.***

1. Loosen retaining screws and pull cabinet outward until all three slide sections latch.
2. Press both track stop latch buttons (visible in the stop latch holes) and carefully slide the cabinet free of the tracks.

Mounting the RS-422 Connector Panel and XLR100

The RS-422 Connector Panel and XLR100 Audio Bypass are designed to mount at the back of the rack. They are held in place by four pan head screws. The RS-422 panel is one rack unit high with the mounting holes spaced 1.250 inches (3.175 cm) apart. The XLR100 panel is two rack units high with holes spaced 3.000 inches (7.62 cm) apart. For rack hole spacing see Figure 3-7. This connector panel has no cooling requirements; it contains all passive circuitry. The Audio Bypass Unit has no special cooling requirements, but does require mains power to operate.

Electrical Installation

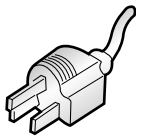
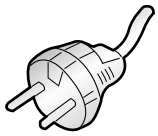
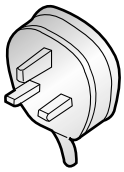
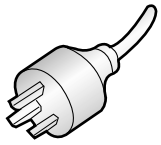
Power Source

The PDR100, PDX103, and XLR100 are designed to operate from a single-phase power source having one of its current-carrying conductors at or near earth ground (the neutral conductor). Only the line conductor is fused for over-current protection. Systems that have both current carrying conductors live with respect to ground, such as phase-to-phase in multi-phase systems, are not recommended as power sources.

Mains Frequency and Voltage Ranges

The PDR100, PDX103, and XLR100 operate at line frequencies of 50 or 60 Hz at nominal mains voltages from 100 to 240 Vac. Table 3-1 lists the power cord options available.

Table 3-1. Power Cord Options for the PDR100, PDX103, and XLR100

Power Plug	Description
	Standard 120 V, 3-prong power plug on a 2.5 meter long power cord. For use with common ground systems in North America.
	Option A1 Universal European 220V/16A power plug on a 2.5 meter long power cord.
	Option A2 United Kingdom 240V/15A power plug on a 2.5 meter long power cord.
	Option A3 Australian 240V/10A power plug on a 2.5 meter long power cord.

Cabling for All Applications

In order to install the PDR100, it is necessary to connect a number of cables. Most of the cabling is straightforward; however, there are some subtleties that need to be considered.

To ensure compliance with EMI certification requirements, the mesh washers supplied must be used when connecting BNC connectors to the rear panel. Install the washers as shown in Figure 3-11.

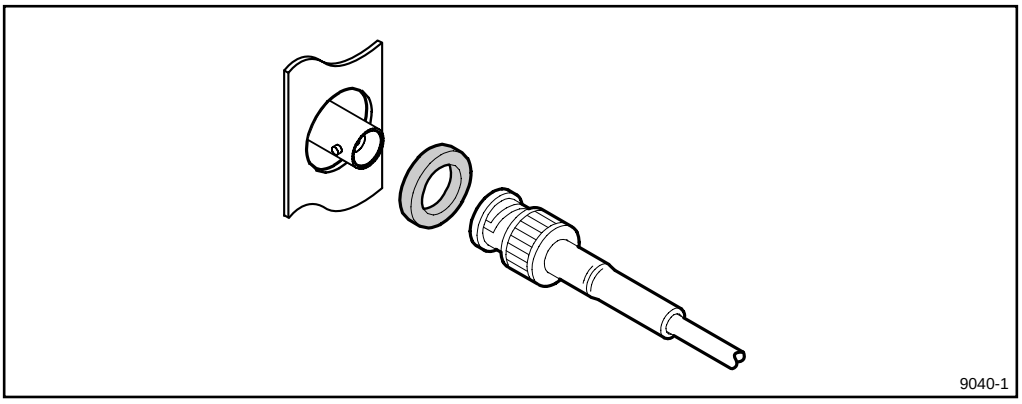


Figure 3-11. Installing Mesh EMI Washers

PDR100 Rear Panel Connections

There are a number of rear-panel connections that must be made to use the PDR100. Each connector on the rear panel will be discussed with any required terminations. Figure 3-12 shows the connections required from the four circuit boards mounted in slots 14 through 17. Slot 17 has the RS-422 Interface circuit board. Slot 16 contains the Reference Genlock circuit board. Slot 15 is reserved for the Slave Disk Recorder circuit board. Slot 14 has the Master Disk Recorder circuit board. Boards must be in the assigned slots for the PDR100 to operate correctly.

The SCSI interface(s) in the PDR100 Video Disk Recorder must be terminated on the PDR100 rear panel to operate correctly. If a PDX103 is used, the SCSI interface is terminated at the SCSI connectors on the expansion unit. (See “Extending the SCSI Bus” on page 3-17.) One terminator is supplied with the PDR100 as a standard accessory if just a Master Disk Recorder circuit board is installed; two terminators are supplied if there is also a Slave Disk Recorder circuit board installed.

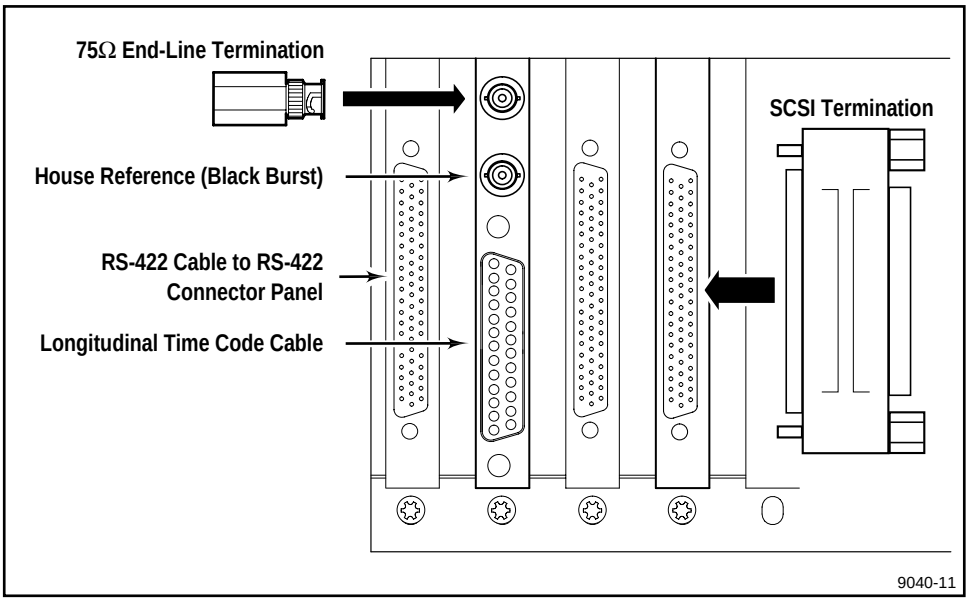


Figure 3-12. Connections and Terminations for Slots 14 - 17

Connecting the Reference Genlock

The Reference Genlock circuit board is in slot 16. It has two BNC connectors that form a bridging high impedance loop-through for the house reference signal. The reference signal is used to synchronize the 27 MHz video clock and to provide the field reference. The bridging loop-through connection is compensated for a 75Ω line, which means that the line must be terminated, at some point, in its characteristic impedance to operate correctly. See Figure 3-12.

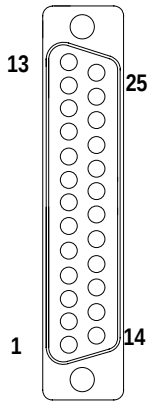
Connecting Linear Time Code

There are eight Longitudinal Time Code (LTC) interfaces (four inputs and four outputs) incorporated in the DB25 connector on the rear panel of the Reference Genlock circuit board. Table 3-2 lists the pin assignments for the DB25 connector.

An eight-connector DB25-XLR breakout cable (shown in Figure 3-13 is available as an optional accessory. The XLR connectors are labeled to correspond with the inputs and outputs listed in Table 3-2.

NOTE: The DB25-XLR breakout cable is also used to connect the Audio circuit board to the XLR100 as described on page 3-14.

Table 3-2. Pin Assignments for the DB25 - XLR Adaptor Cable



Input Channel	+ Signal	-Signal	Common
0	Pin 1	Pin 2	Pin 3
1	Pin 4	Pin 5	Pin 6
2	Pin 7	Pin 8	Pin 9
3	Pin 10	Pin 11	Pin 12
Output Channel			
0	Pin 15	Pin 16	Pin 14
1	Pin 18	Pin 19	Pin 17
2	Pin 21	Pin 22	Pin 20
3	Pin 24	Pin 25	Pin 23

Power-On Indicator Pin 13 when used with Audio card

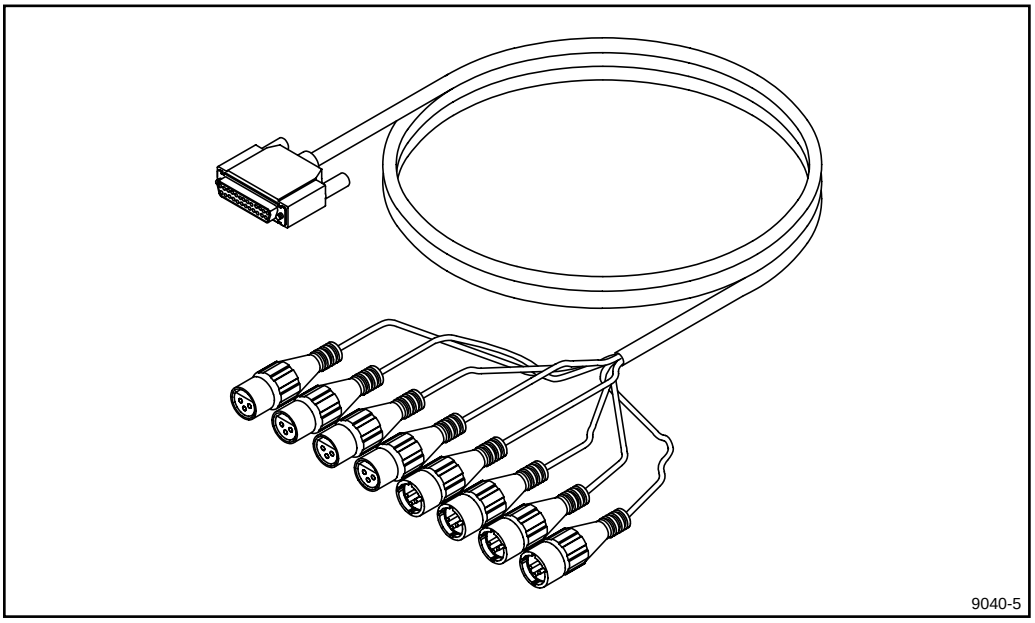


Figure 3-13. Breakout Cable for the PDR100

Connecting the RS-422 Connector Panel

The RS-422 Interface is located in slot 17. This is an EISA-only slot. The rear-panel connector is the receptacle for the cable from the RS-422 Connector Panel, which provides eight addressable RS-422 ports. See Figure 3-14.

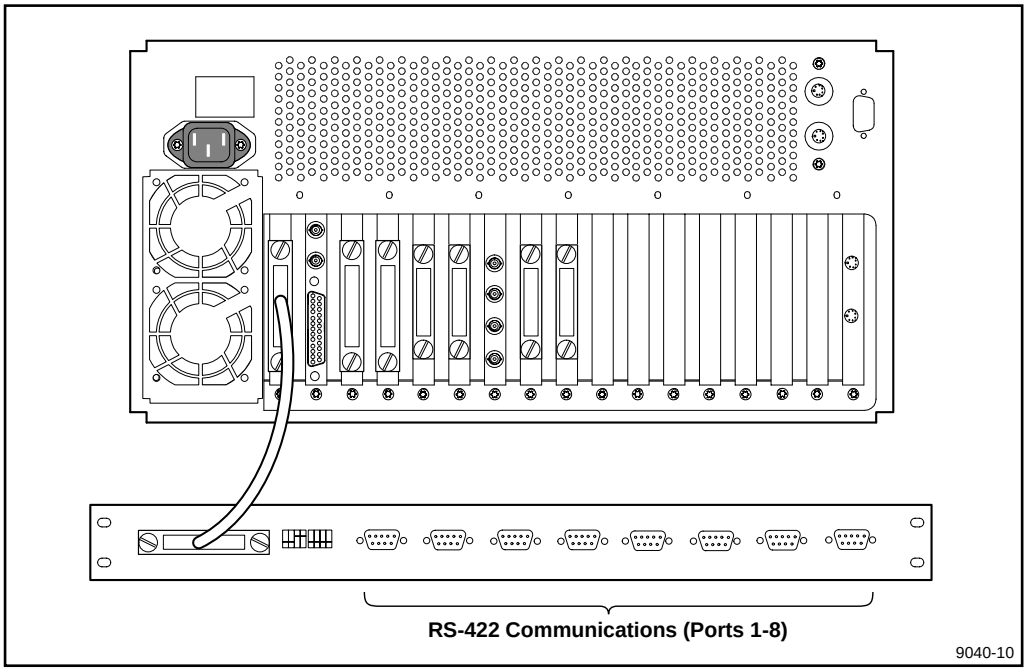


Figure 3-14. Cable Connection Between the PDR100 and RS-422 Connector Panel

Connecting the XLR100 Audio Bypass Unit

The Audio Input/Output circuit cards can be located in most slots from 3 to 13. Audio cards are labeled by Banks. Each of the rear panel audio I/O connectors provides four inputs and four outputs from and to a bank of audio through the XLR100 Audio Bypass Unit. See Figure 3-15. Connections shown here are for four full banks of audio. In addition, any cable that adapts the 25-pin sub-miniature D-type (DB-25) connector to XLR connectors can also be used.

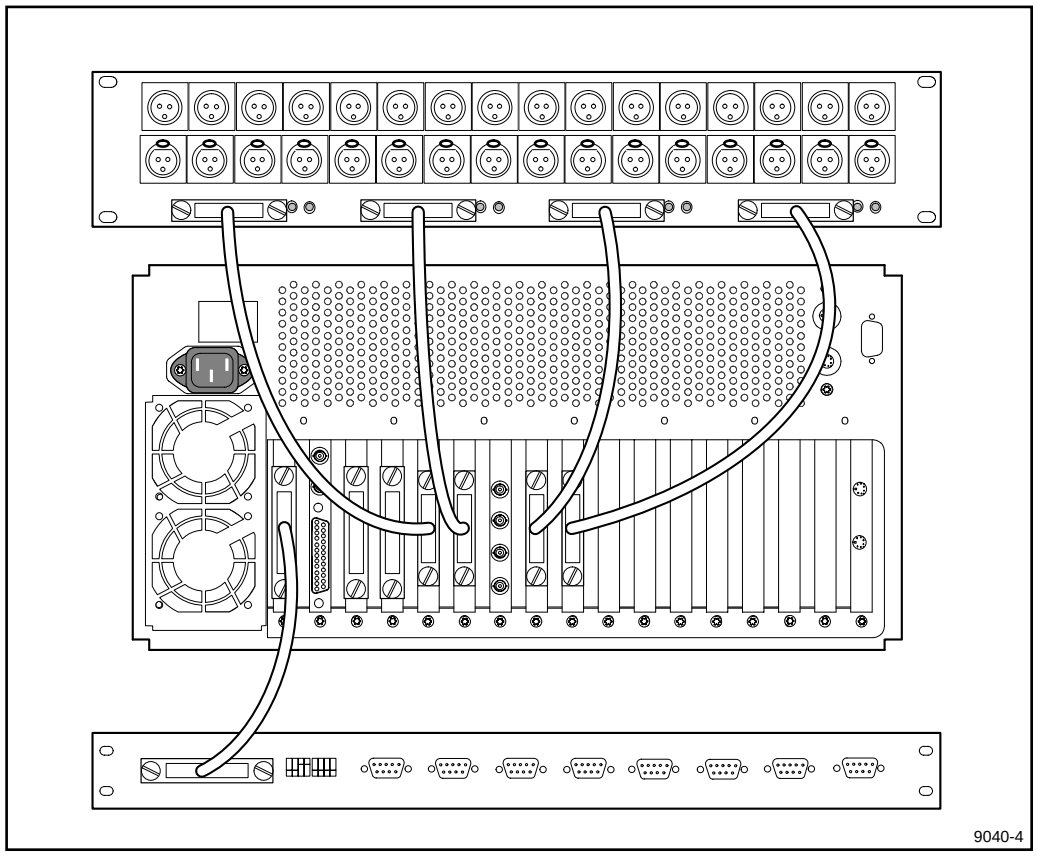


Figure 3-15. Audio Cabling Between the XLR100 and the PDR100 Audio I/O Cards

Pin number assignments for the PDR100 rear-panel Audio DB-25 connectors are shown in Table 3-2, “Pin Assignments for the DB25 - XLR Adaptor Cable,” on page 3-12.

In addition to the audio bypass unit, an eight-connector breakout cable can be used to bring the audio signals into the PDR100 audio interface. Figure 3-13 shows one of two optional cables. The XLR connectors are labeled to correspond with the Input and Output Channels shown in Table 3-2. The other cable is 20 feet long with a DB25 connector and tinned leads.

Connecting to a Local Area Network (LAN)

Slot J3 is an EISA slot that is the most convenient location for the Local Area Network circuit board. If the PDR100 was ordered with Option 1L, it will have the LAN circuit board in that slot. See Figure 3-16.

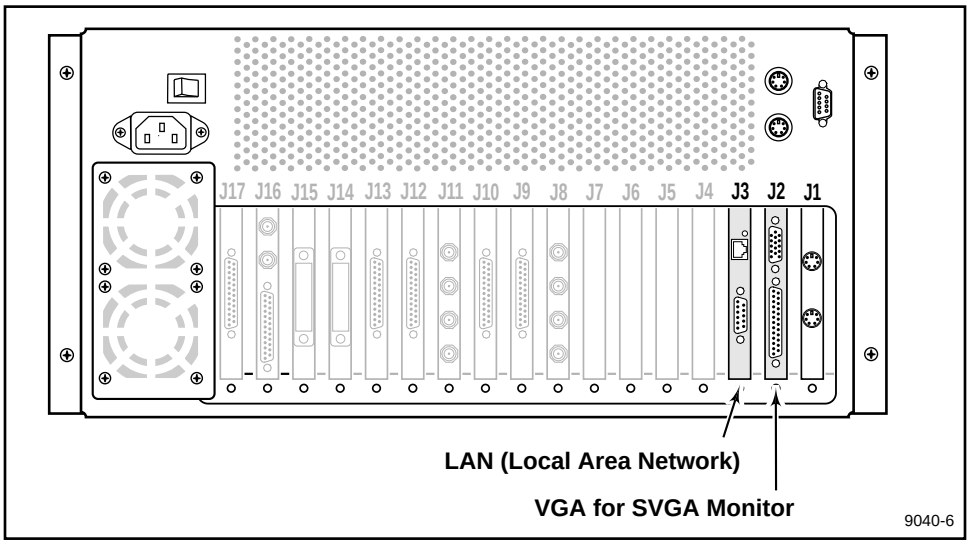


Figure 3-16. Location of the Local Area Network (LAN) and VGA Circuit Boards

Connecting to an SVGA Monitor

Slot J2 is an ISA-only interface. It is used by the PDR100 for the SVGA monitor interface. It accepts a standard VGA cable with a DB-15 connector from the monitor. See Figure 3-17.

Connecting the Keyboard and Mouse

The keyboard and mouse provide direct communication with the processor in slot J1. Two sets of plugs are provided; however, some early models only have the connectors on the Processor card. If both sets of connectors are present, it is recommended that the set on the PDR100 rear panel be used, they have additional EMI suppression built in. Connectors for the mouse and keyboard are identical 6-pin types. Be sure that they are plugged into the correct connectors.

NOTE: Connect only one keyboard and one mouse to the PDR100.

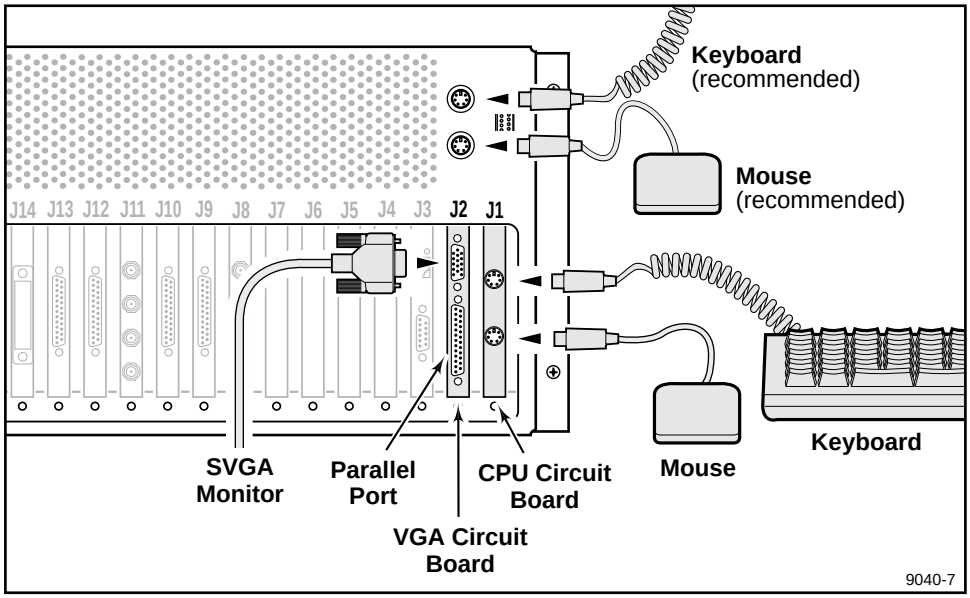


Figure 3-17. Connectors for the Keyboard, Mouse Cabling to the PDX103

Extending the SCSI Bus

The PDX103 extends one or both SCSI buses to include four or eight additional hard disk drives. The extended bus must be terminated, just as the internal bus is terminated.

To connect the disk drives in the PDX103, run a SCSI cable from the PDR100 SCSI A (and, where applicable SCSI B) connector to the PDX103 rear panel connector. Note that there are four connectors on the rear panel, two for each of the SCSI channels. See Figure 3-18.

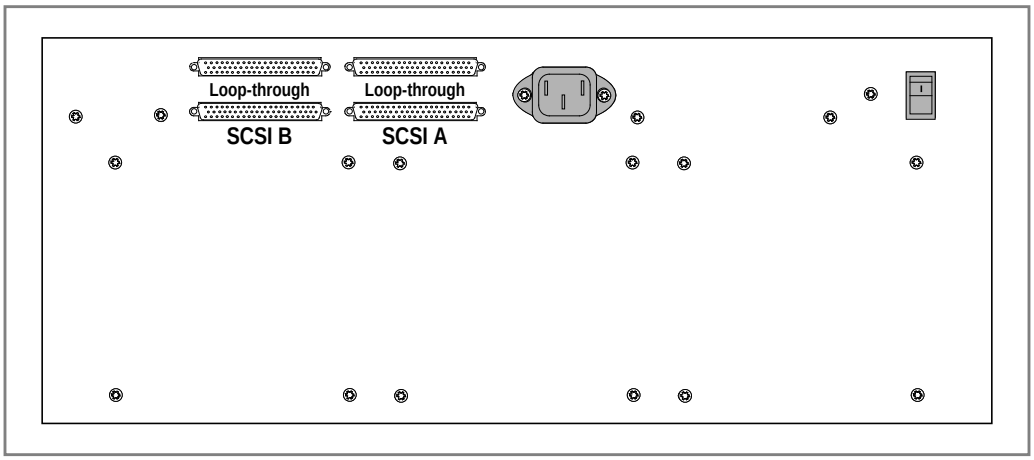


Figure 3-18. Rear Panel Drawing of the PDX103 Showing the 4 SCSI Connectors

One connector for each channel serves as the input while the other is then terminated with the passive termination. See Figure 3-19. The termination is the same one shipped with the PDR100, which must now be on the PDX103 end of the SCSI bus.

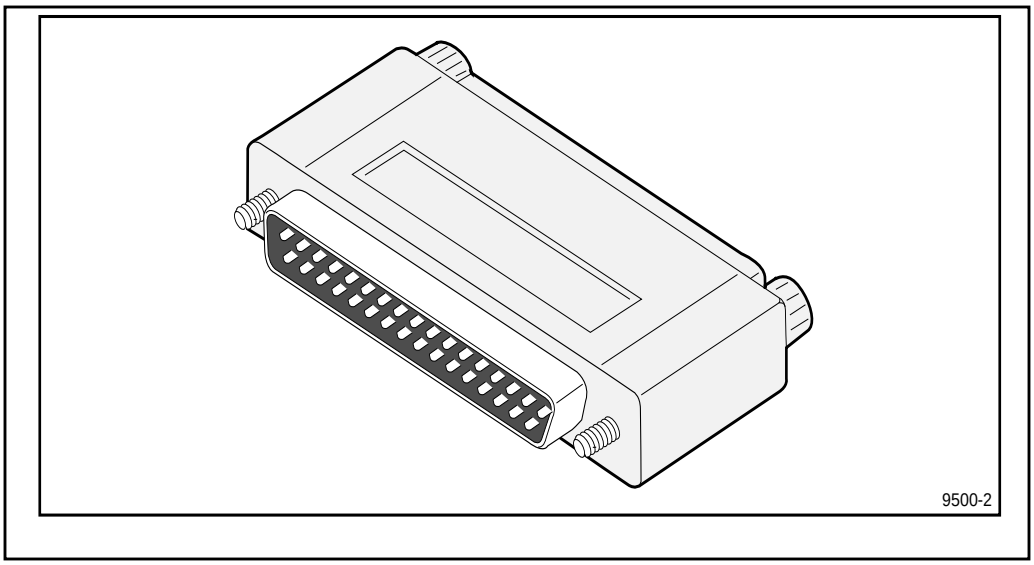


Figure 3-19. Passive SCSI Bus Termination

When the PDX103 is added, connect it as shown in Figure 3-20.

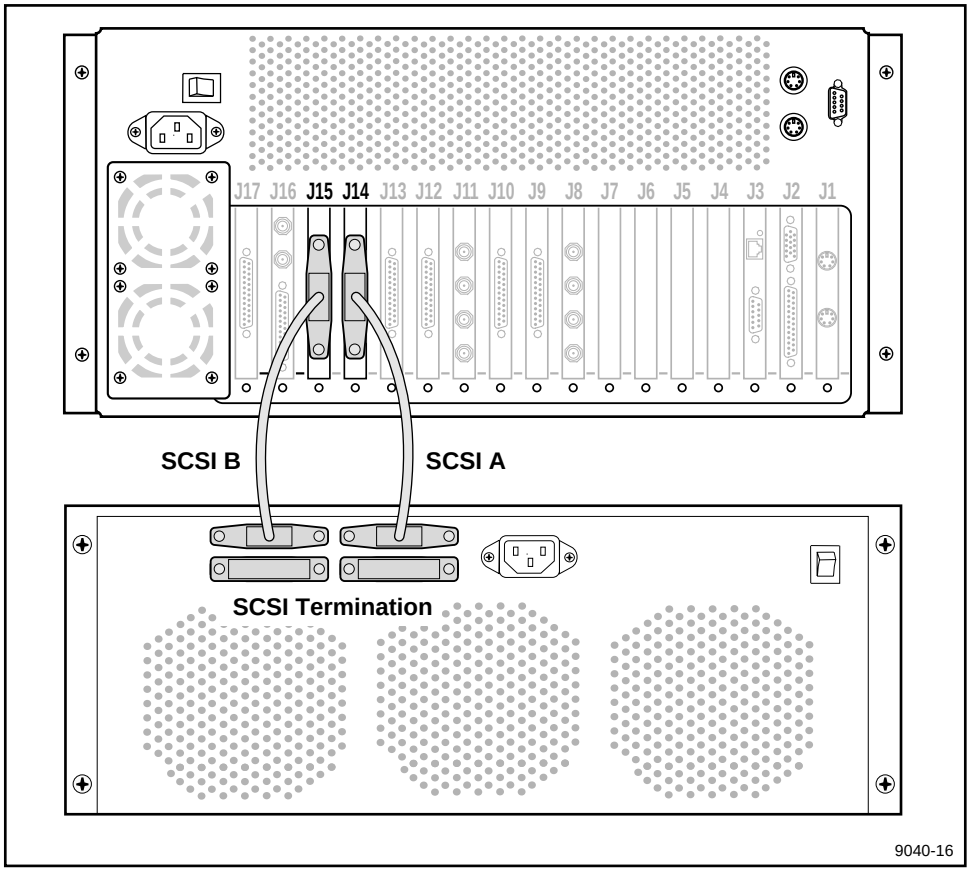


Figure 3-20. Cabling in a PDX103 Disk Drive Expansion Unit

Cabling for Specific Video Standards

The PDR100 supports a number of video standards by having several variations of input and output circuit cards that can be installed. Some of the more common applications and the cabling to support them are discussed in the pages that follow.

Serial Digital (CCIR 601)

Connecting Serial Video In and Video Out

The Serial Video Interface, which can be installed in any slots between J5 and J13, has two inputs and two outputs. The inputs are terminated in 75Ω. They are not bridging loop-through connectors. No external termination is required. Up to two Serial Video Interface circuit boards can be installed in a PDR100 unit to provide four video channels. See Figure 3-21. This illustration shows two serial digital interfaces with accompanying audio, to provide four video inputs and outputs. The software scans the bus from right to left as viewed from the back of the PDR100, and assigns the board numbers in that order. The video connectors are labeled as the software would initially configure them. Note that each Serial Digital circuit board has its two companion audio circuit boards to its left.

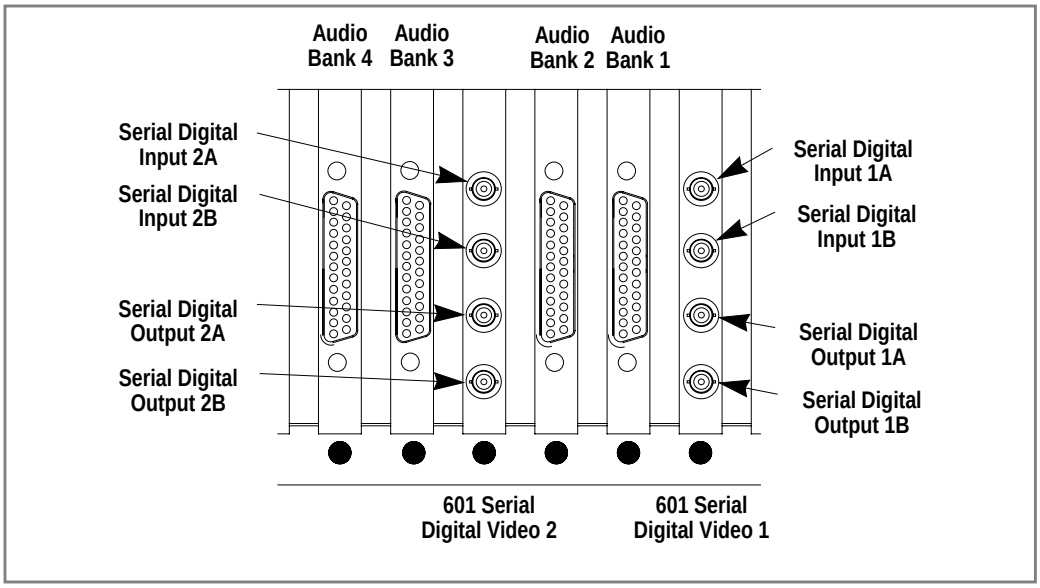


Figure 3-21. Connections for 601 Serial Digital Video and Analog Audio

NOTE: Serial digital boards with embedded audio capability do not have companion audio boards.

Connecting the Audio In and Audio Out for Serial Video

Each Analog Audio circuit board supports four channels of audio input or output. The channels or banks of audio are labeled A through D. Two internal clock cables synchronize the Audio circuit board to its associated Serial Video circuit board. (There are two boards assigned to each Serial Video circuit board for this application.) The Audio circuit boards accept DB-25 connector-equipped cables. In order to interface with standard XLR connectors, either a “breakout box,” such as the Tektronix XLR100 Audio Bypass Unit, or a special cable that provides eight XLR connectors from a single DB-25 connector will be required. The adaptor cable can also be ordered from Tektronix. See “Optional Accessories.”

Analog Composite (NTSC or PAL)

Connecting Composite Video Input

The composite input circuitry requires two circuit board slots. One slot is used for the input circuitry and one for the composite decoder circuitry. The Input circuit board requires connection to the Video Router, while the Decoder circuit board does not; however, they must reside in adjacent slots. In addition, an Analog Audio circuit board is required and must be located next to either the Video Input or Decoder circuit boards. Since a Decoder board requires only an EISA bus connection, it can be installed in slot J4 with an Analog Audio circuit board in slot J3, and the Video Input circuit board in slot J6 (which is on the Video Router.)

The configuration shown in Figure 3-22 is three video inputs and four video outputs. Note that the Video Input circuit boards have high impedance bridging loop-through inputs, which require termination in 75Ω, or the characteristic impedance of the video program line. Note also that there is an Audio circuit board for each Video Input circuit board, and they are shown numbered as the software would initially configure them. The circuit boards are scanned from right to left, by the software, and assigned numbers accordingly.

Connecting Composite Analog Video Output

There are four channels of Composite Analog Video Output along with one Video Monitor output. The Video Monitor Output is channel four video with Time Code burn in available. See Figure 3-22. The outputs have a characteristic impedance of 75Ω, and require external termination. Note that there is an adjacent Analog Audio circuit board to provide output audio. Only two slots in the Video Router J11 and J12 have the required four in video connections; therefore, these are the only two slots that can have the Composite Analog Video Output circuit board.

Connecting the Audio In and Audio Out for Analog Composite Video

Each Analog Audio circuit board supports four channels of audio input or output. Two internal clock cables provide the audio circuit board with the clock to synchronize it to the associated video I/O circuit board, either Input or Output. The Audio circuit boards accept DB-25 connector equipped cables. In order to interface with standard XLR connectors either a “breakout box,” such as the Tektronix XLR100 Audio Bypass Unit, or a special cable that provides eight XLR connectors from a single DB-25 connector will be required. The adaptor cable can also be ordered from Tektronix (see “Optional Accessories”).

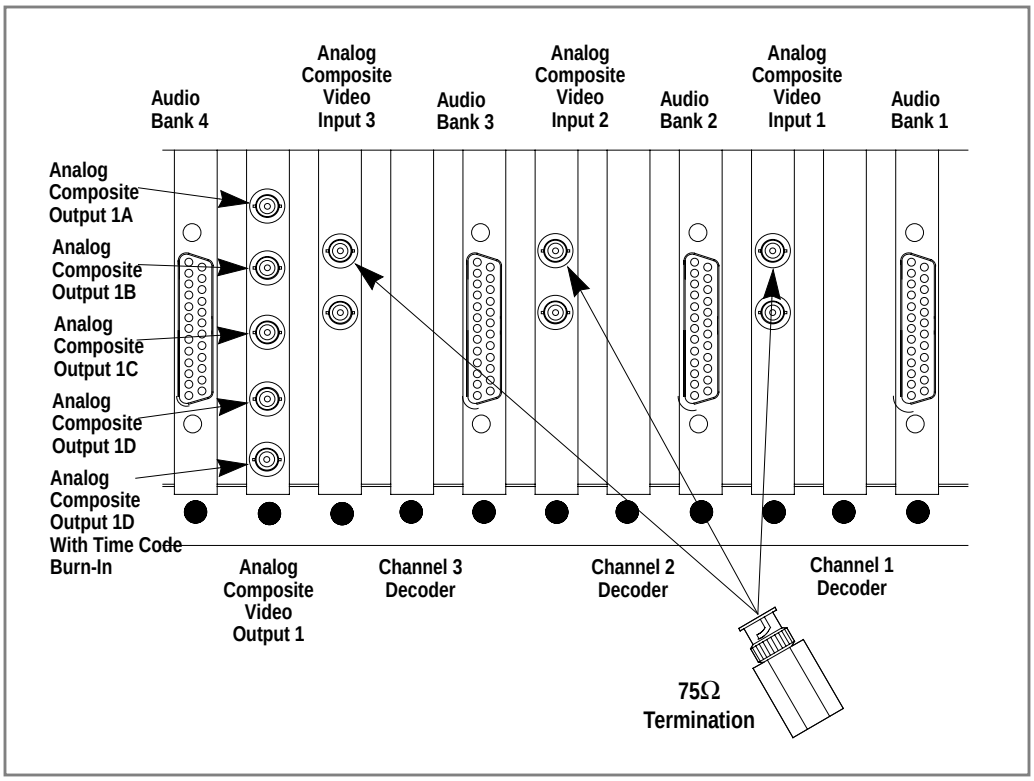


Figure 3-22. Connections for the Analog Composite Operation

Internal Jumpers, Switches, and Audio Cables

The PDR100 is designed to provide as much flexibility as possible. To accomplish this, plug jumpers and DIP (dual in-line package) switches have been designed in to allow for a number of operating conditions. The factory settings are optimum for most applications. However, it is always possible that the PDR100 may be required to operate in a slightly altered operating environment.

The following paragraphs provide the information on how plug-jumpers and the DIP switches for each of the circuit boards can be re-configured or returned to the correct positions if they have been moved.

Processor Circuit Board

Jumpers on the Processor circuit board allow the board to be used in a variety of systems. Figure 3-23 shows the jumper locations and the factory settings for use in the PDR100.

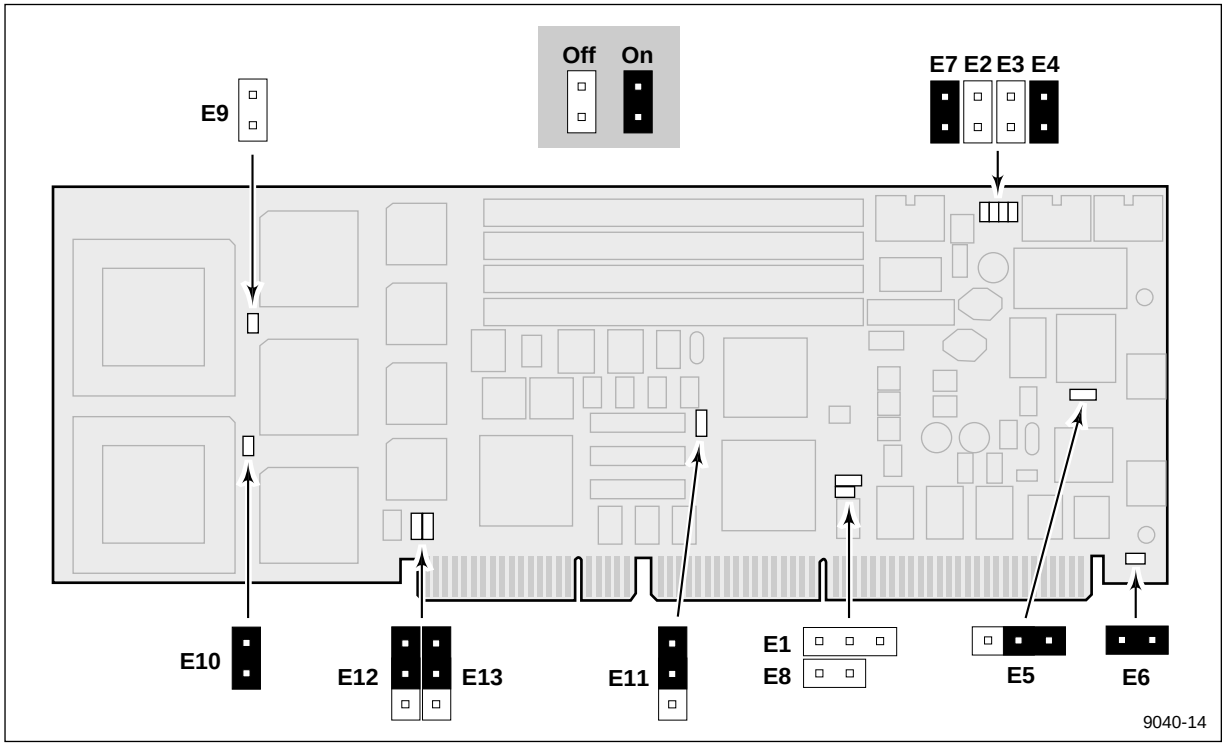


Figure 3-23. Processor Circuit Board Showing the Jumper Locations

Table 3-3 lists each jumper and its function. The shaded listings are the factory settings for the jumpers. A position of “On” or “Off” indicates whether or not the jumper is installed. A position of “1-2” or “2-3” indicates the pins on which the jumper is installed.

Table 3-3. Processor Board Jumper Settings

Jumper	Position	Function
E1	Off	No Interrupt
	1-2	IRQ11
	2-3	IRQ10
E2	On	/XT Keyboard
	Off	PS/2 or /AT Keyboard
E3	On	Manufacturing Test
	Off	Normal Mode
E4	On	Color Display
	Off	Monochrome Display
E5	1-2	Disable BIOS 12 Volts
	2-3	Enable FLASH programming
E6	On	Connect mounting bracket to CPU ground.
	Off	Disconnect mounting bracket from CPU ground.
E7	On	Serial Port Mode: DTE (connect to a modem -/AT standard)
	Off	Serial Port Mode: DCE (connect to a CPU)
E8	On	Dual CPU
	Off	Single CPU
E9	On	Select 133MHz clock speed
	Off	
E10	On	
E11	1-2	CPU takes priority on EISA bus.
	2-3	EISA master takes priority on EISA bus - EISA bus throughput increased
E12	1-2	Select 512K Cache
	2-3	
E13	1-2	
	2-3	

VGA-I/O Circuit Board

Jumpers and DIP switches on the board configure it for use in various systems. Figure 3-24 shows the jumper and DIP switch locations and the factory settings for use in the PDR100.

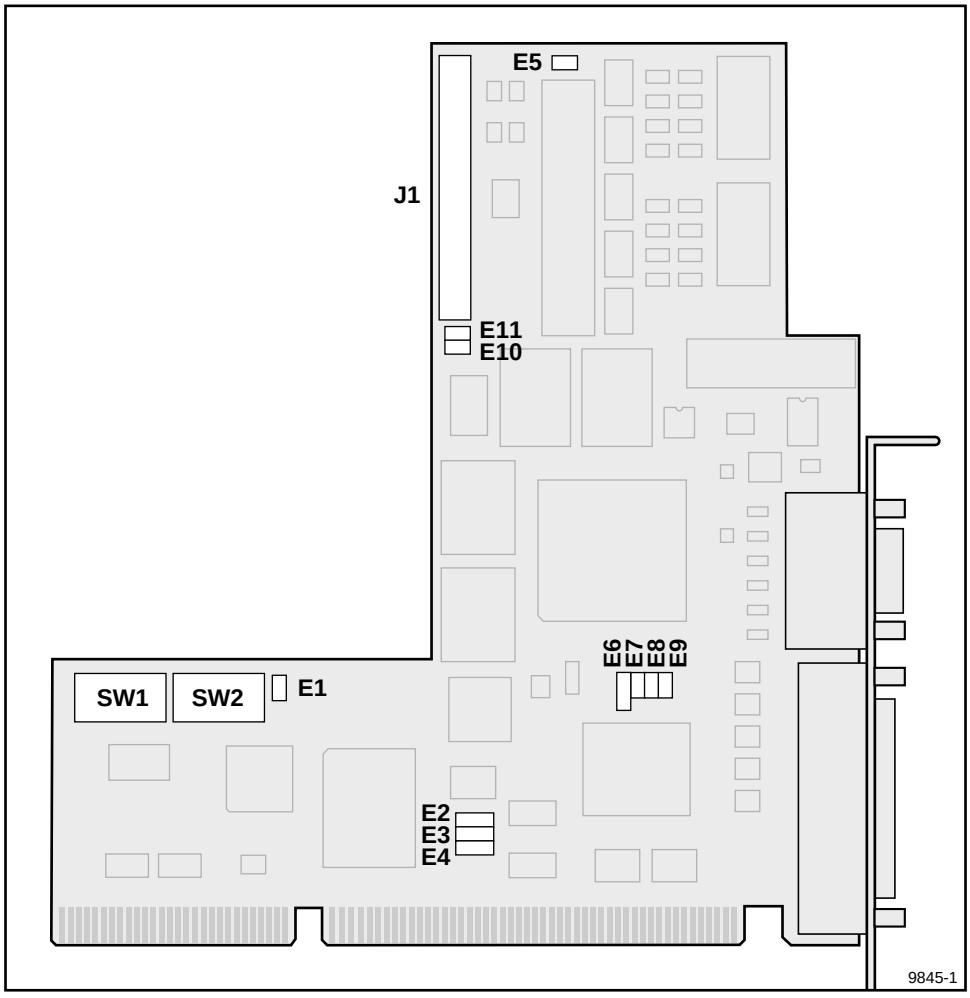


Figure 3-24. Jumper and DIP Switch Locations and Settings on the VGA-I/O Circuit Board

Jumper Settings

Table 3-4 lists each jumper and its function. The shaded listings are the factory settings for the jumpers. A position of “On” or “Off” indicates whether or not the jumper is installed. A position of “1-2” or “2-3” indicates the pins on which the jumper is installed.

Table 3-4. VGA-I/O Board Jumper Settings

Jumper	Position	Function
E1	On	Support 2.88M Floppy
	Off	No 2.88M Floppy
E2	1-2	Selects IRQ4 for Serial Port COM1
	2-3	Selects IRQ3 for Serial Port COM1
E3	1-2	Selects IRQ3 for Serial Port COM2
	2-3	Selects IRQ4 for Serial Port COM2
E4	1-2	Selects IRQ7 for the Parallel Port
	2-3	Selects IRQ5 for the Parallel Port
E5	Off	
E6	1-2	VGA Enable
	2-3	VGA Disable
E7	On	Zero Wait State Operation
	Off	No Zero Wait State Operation
E8	On	IRQ9 Enabled
	Off	IRQ9 Disabled
E9	On	Video Dot Clock Enabled
	Off	Video Dot Clock Disabled
E10	Off	(not used)
E11	Off	(not used)

DIP Switch Settings

The VGA-I/O board has two 6-position DIP switches to define various functions. The switch settings are shown in Figure 3-24. The tables that follow list the settings by function.

Table 3-5. Serial Port COM1 Switch Settings

SW1-5	SW1-6	Functions
On	On	Disable
On	Off	2F8h
Off	On	3E8h
Off	Off	3F8h

Table 3-6. Serial Port COM2 Switch Settings

SW2-1	SW2-2	Functions
On	On	Disable
On	Off	3F8h
Off	On	2E8h
Off	Off	2F8h

Table 3-7. Parallel Port Switch Settings

SW1-1	SW1-2	Functions
On	On	Disable
On	Off	378h
Off	On	3BCh
Off	Off	278h

Table 3-8. Parallel Port Mode

SW1-3	SW1-4	Mode
On	On	Output
On	Off	Invalid
Off	On	Bidirectional
Off	Off	Invalid

Table 3-9. IDE Switch Configuration

SW2-3	SW2-4	Function
On	On	Disable
On	Off	Standard
Off	On	Invalid
Off	Off	Secondary

Table 3-10. Floppy Drive Switch Settings

SW2-5	SW2-6	Function
On	On	Disabled floppy — IDE3F0h
Off	On	Disabled floppy — IDE370h
On	Off	Standard 3F0h
Off	Off	Secondary 370h

RS-422 Circuit Board (Required Slot J17)

DIP Switch Settings

The RS-422 circuit board is a standard circuit card for a commercial PC. Because this board is designed for a number of different operating systems it has some designed in flexibility. See Figure 3-25. All factory settings of the DIP switches are identified.

This circuit card has two sets of DIP switches, an eight-position switch used to select the IRQ, and a four-position switch that selects the I/O address and extended memory enable. The factory default settings for the PDR100 are all off, except for position eight (which selects IRQ 15).

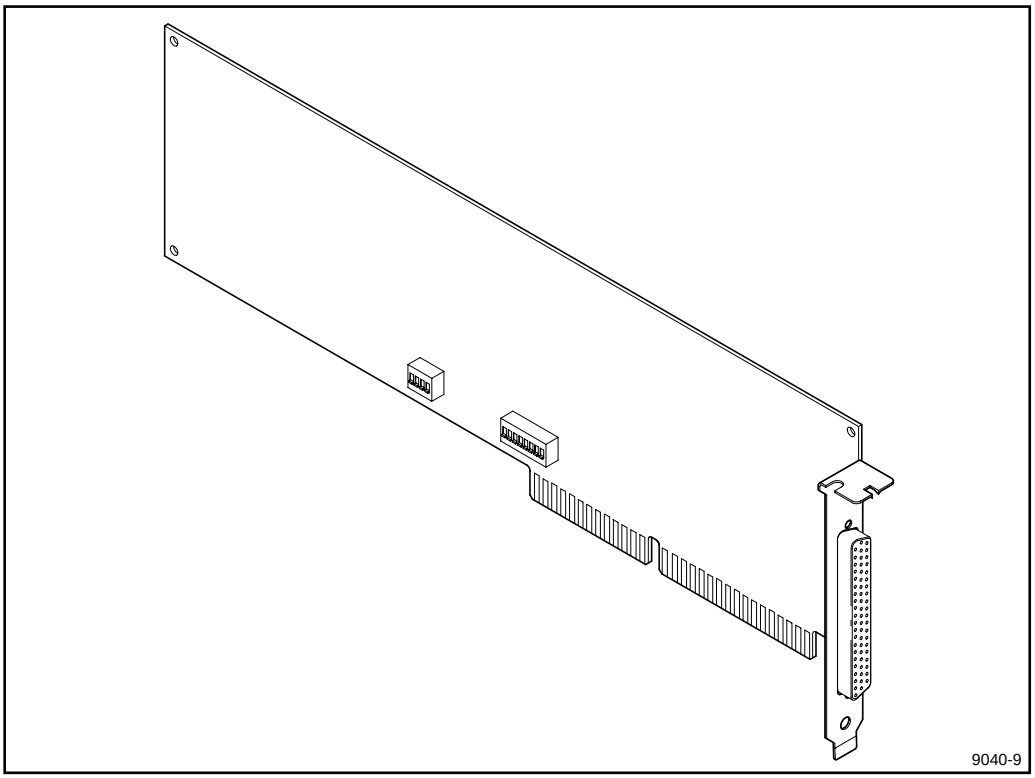


Figure 3-25. RS422 Circuit Board Showing DIP Switches

Eight-Position DIP Switch

This switch is all off except for position eight. See Figure 3-26. The factory selected setting is IRQ 15.

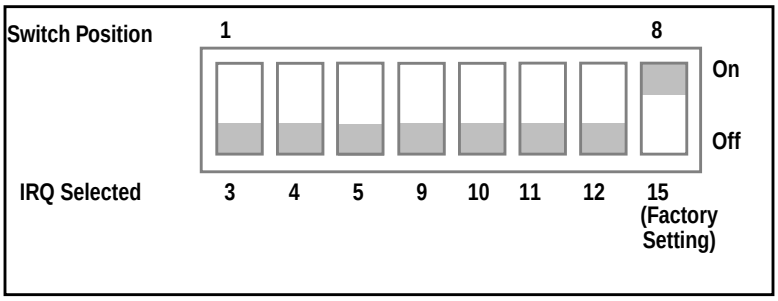


Figure 3-26. RS-422 Eight-position DIP Switch Settings

Four-Position DIP Switch

This switch is all off (see Figure 3-27). Positions one and two set the I/O address, position three enables extended memory, and position four is not used. The factory selected settings are:

- 1 and 2 off (I/O address in hexadecimal, 200, 204)
- 3 off to enable extended memory
- 4 off (does not matter)

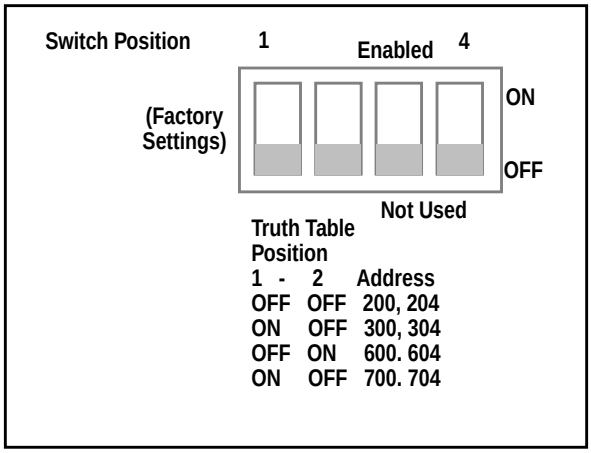


Figure 3-27. RS-422 Four-Position DIP Switch Settings

Reference Genlock Circuit Board (Required Slot J16)

The Reference Genlock circuit board has three plug jumpers. One, J4, disables the burst-lock loop for test purposes. J7 and J8 were used to develop a programmed part, and should always remain in the factory-installed positions. See Table 3-11. Factory-installed positions are marked with a] symbol, on the circuit board. J1, J3, J5, and J6 are connectors for the system clock (27 MHz) that can be used as additional audio play clocks.

The Reference Genlock board also has a four-position dip switch (see the insert in Figure 3-28) used to enable 600 Ω termination for each of the LTC inputs (input impedance in the "open" position is 20 kΩ. The four rockers on the switch are shipped from the factory in the "open" position as marked on the switch. To enable the 600 Ω termination for any LTC channel, shift the rocker for that channel to the enable position. The channel number for each rocker is screened on the board (NOT on the switch--the numbers on the switch are reversed).

Table 3-11. Reference Genlock Plug Jumper Settings

Plug Jumper	Position	Operation
J4	1 - 2	Test Burst Phase Lock Loop Disabled
	2 - 3	Normal Operation (Factory-Installed Position)
J7	1 - 2	Normal Operation (Factory-Installed Position)
	2 - 3	Program Part Development
J8	1 - 2	Down Loads Over EISA Bus
	2 - 3	Normal Operation (Factory-Installed Position)

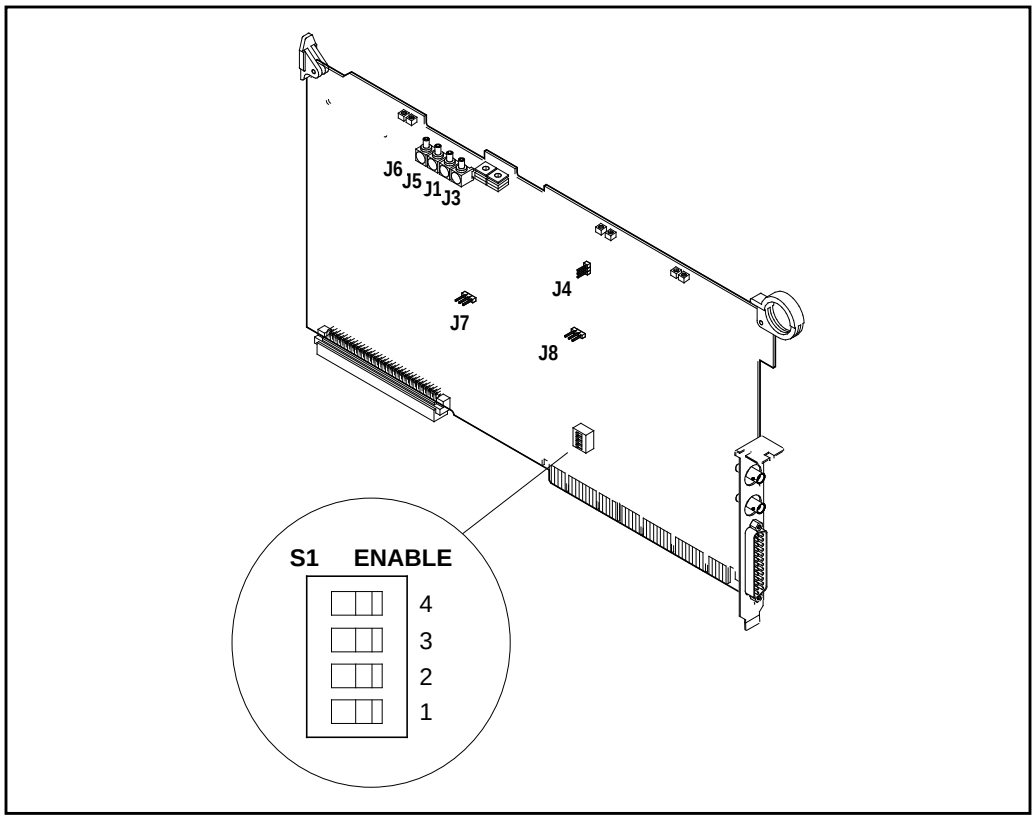


Figure 3-28. Reference Genlock Circuit Board with Termination Switch and Jumper Locations

Master Disk Recorder Circuit Board (Required Slot J14)

The Master Disk Recorder circuit board has a number of square-pin connectors that are used for test purposes. None of these plugs should have jumpers on them. See Figure 3-29.

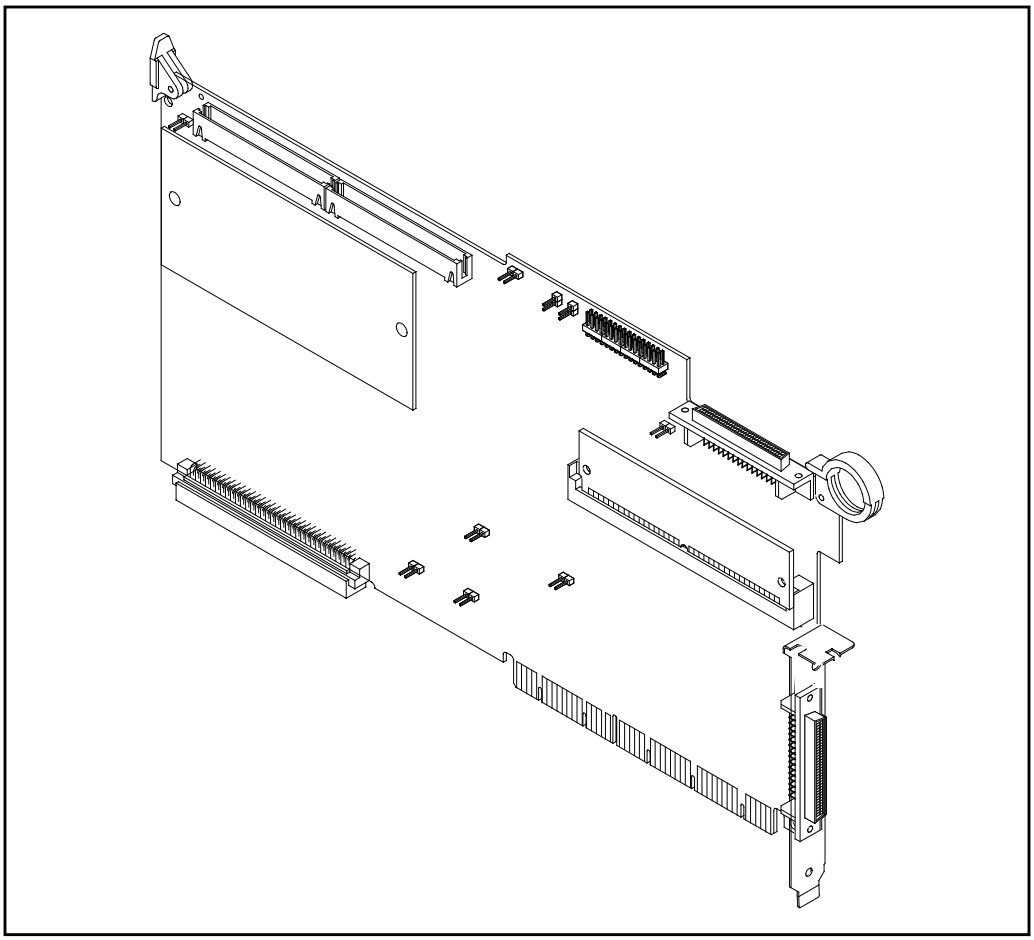


Figure 3-29. Master Disk Recorder Circuit Board Showing Square-Pin Test Points

Slave Disk Recorder Circuit Board (Optional J15)

The Slave Disk Recorder circuit board has two sets of square-pin connectors that are used for test purposes. None of these plugs should have jumpers on them. See Figure 3-30.

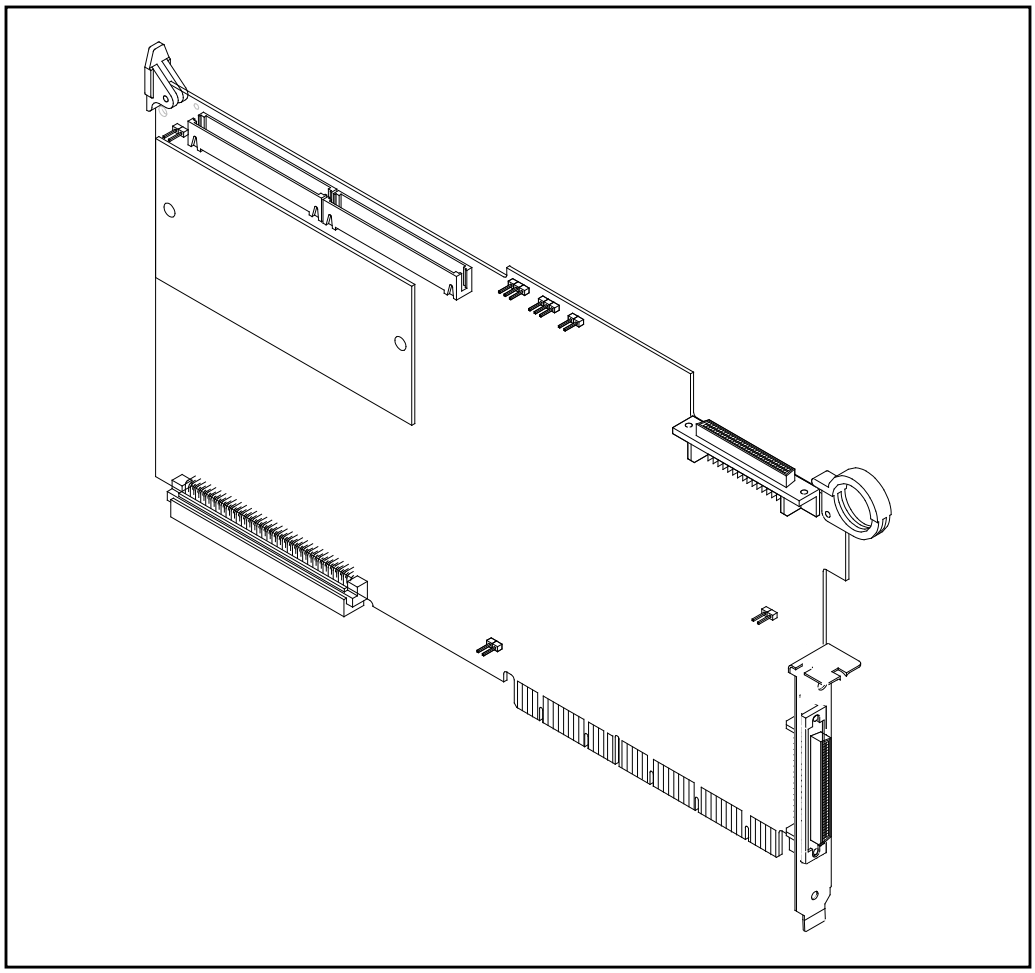


Figure 3-30. Slave Disk Recorder Circuit Board Showing Square Pin Test Points

Serial Digital I/O Circuit Board

The Serial Digital I/O board is optional, and can occupy various slots from J6-J13.

The Serial Digital I/O circuit board has a number of plug jumpers in order to accommodate a number of operating circumstances. In addition it has six connectors that are used to route clock signals to the Audio I/O circuit boards. See Figure 3-31.

The Serial Digital I/O board with embedded audio capability does not have all the jumpers shown in Figure 3-31. The connectors for clock signals are present on the board, but there are no clock connections to make since there can be no Audio boards in use at the same time as the embedded audio Serial Digital I/O board.

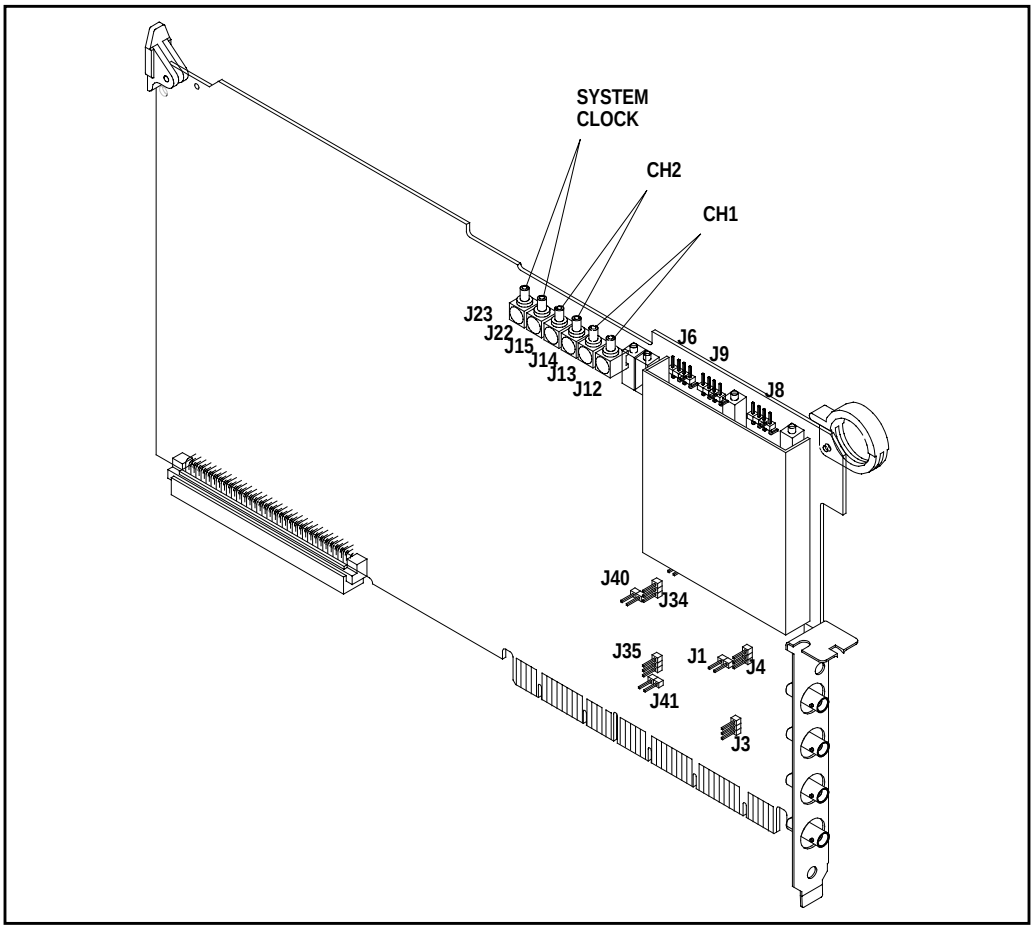


Figure 3-31. Serial Digital I/O Circuit Board Showing Plug Jumpers

Table 3-12. Serial Digital I/O Plug Jumpers

Jumper	Name	Position	Factory-Installed	Operation
J1	Monitor Point	Pin 1		Internal Clock 2
		Pin 2		Ground
J2	Monitor Point	Pin 1		Internal Clock 1
		Pin 2		Ground
J3	Serial Video Input 1 VCO Frequency	1-2		Test Position to set VCO free run frequency.
		2-3	2-3	Operate
J4	Serial Video Input 2 VCO Frequency	1-2		Test Position to set VCO free run frequency.
		2-3	2-3	Operate
J6	Audio Clock Test Points	1-2	Open	Audio Clock 2 Test Point Pin 1 (Clock) Pin 2 Ground
		3-4	Open	Audio Clock 1 Test Point Pin 3 (Clock) Pin 4 Ground
J8	Serial Channel 1 Video Present	1-2	1-2	Normal Operation
		2-3		Video 1 Present pulled low to adjust VCO free run frequency
		3-4		Video 1 Present pulled high forces video clock output
J9	Serial Channel 2 Video Present	1-2	1-2	Normal Operation
		2-3		Video 2 Present pulled low to adjust VCO free run frequency
		3-4		Video 2 Present pulled high forces video clock output
J34	Serial Video Output 1 VCO Frequency	1-2		Test Position to set VCO free run frequency.
		2-3	2-3	Operate
J35	Serial Video Output 2 VCO Frequency	1-2		Test Position to set VCO free run frequency.
		2-3	2-3	Operate
J40	Monitor Point	Pin 1		VCO Frequency for Serial Output 2
		Pin 2		Ground
J41	Monitor Point	Pin 1		VCO Frequency for Serial Output 1
		Pin 2		Ground

Audio Clock Outputs

The Serial I/O outputs both record and play clocks to the Audio I/O circuit boards. Plugs for J12, 13,14, and 15 are record clocks J22 and J23 are system clocks that are used as the play clocks. See Figure 3-32. Note that in this configuration J13 and J14 are the record clocks, while J22 and J23 are connected as the play clocks.

Note that the clock signals are plugged in with the play clock connected to the front connector, on the Audio I/O circuit board, and that the record clock plugged into the back connector.

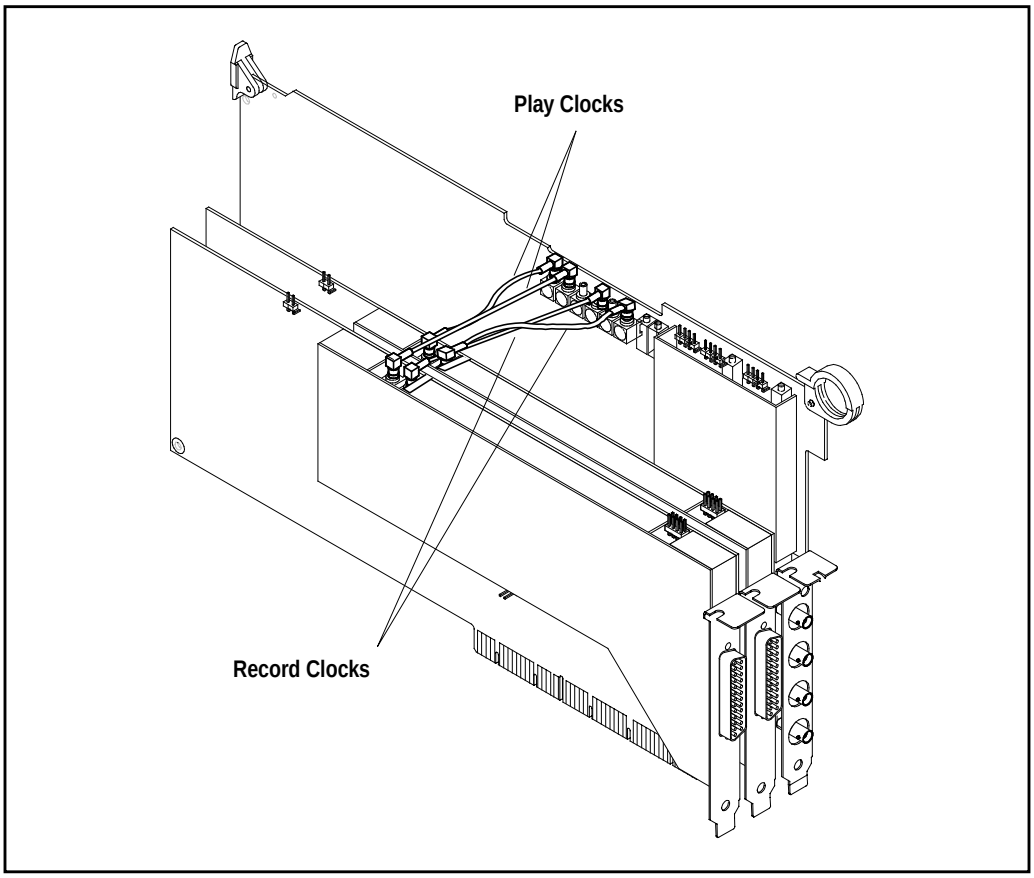


Figure 3-32. Clock Connections from Serial Digital I/O to Audio Interface Boards

Analog Composite Input Circuit Board

The Analog Composite circuit board is optional, and can occupy various slots from J3 to J13.

The Analog Composite circuit board, which is paired with the Decoder circuit board, has seven plug jumpers and a four-position DIP switch for test and development purposes. See Figure 3-33. In addition, J14 and J15 output clock signals related to the incoming video signal (audio record clocks). This circuit board does not output the 27 MHz system clock that is required for audio playback.

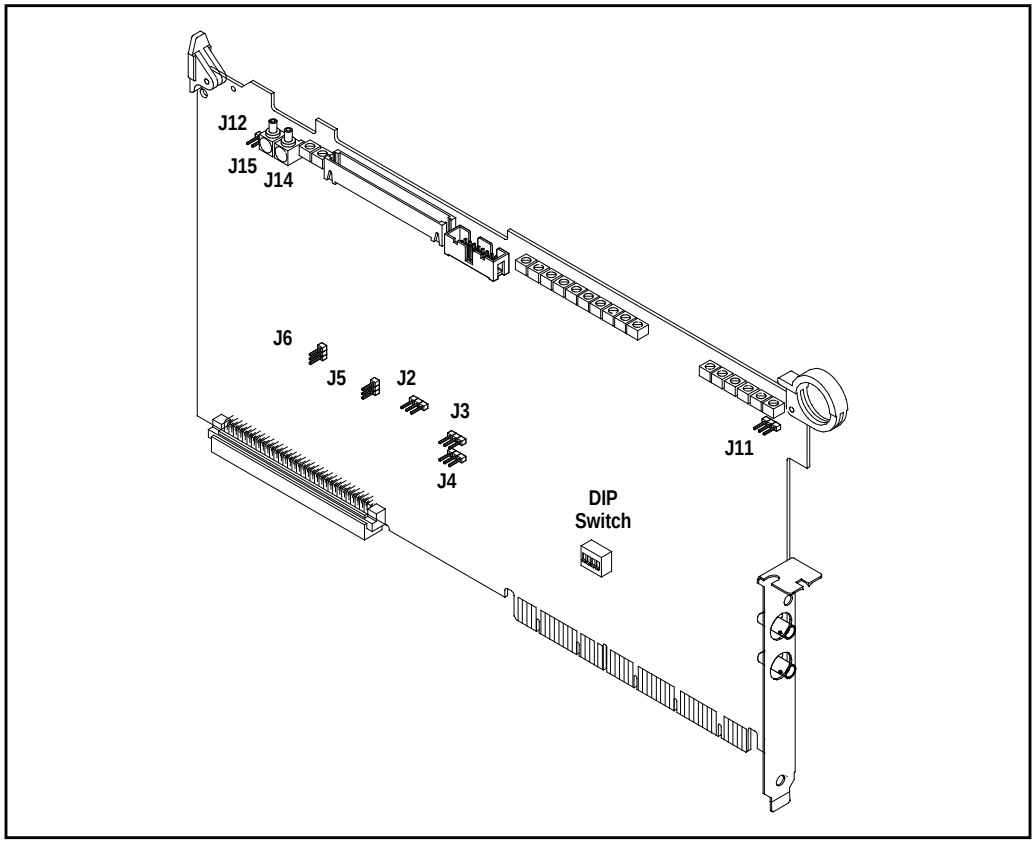


Figure 3-33. Analog Composite Input Circuit Board Showing Plug Jumpers

DIP Switch Settings

The four-position DIP switch is used only for development purposes. All switches are set to the open position for normal operation.

Audio Clock Signals

The two clock outputs are from the incoming video signal and, therefore, can only be used as record clocks. In most applications there will only be one Audio circuit board per Analog Composite Input circuit board (single video channel per board). Audio output clock is the System Clock (27 MHz) and is provided by the Analog Composite Output circuit board; audio output is usually from a separate Audio circuit board adjacent to the Analog Composite Output circuit board. Figure 3-34 shows the cable connection for a single Audio I/O circuit board.

Table 3-13. Analog Composite Input Plug Jumpers

Jumper	Name	Position	Factory- Installed	Operation
J12	Code Development	All Open	No Jumper	Operating Position
J6	Code Development	All Open	No Jumper	Operating Position
J5	Test Jumper	1-2		Developmental Position
		2-3	Jumpered	Operating
J2	Test Jumper	1-2		Developmental Position
		2-3	Jumpered	Operating
J3	Test Jumper	1-2		Developmental Position
		2-3	Jumpered	Operating
J4	Test Jumper	1-2	Jumpered	Operating
		2-3		Developmental Position

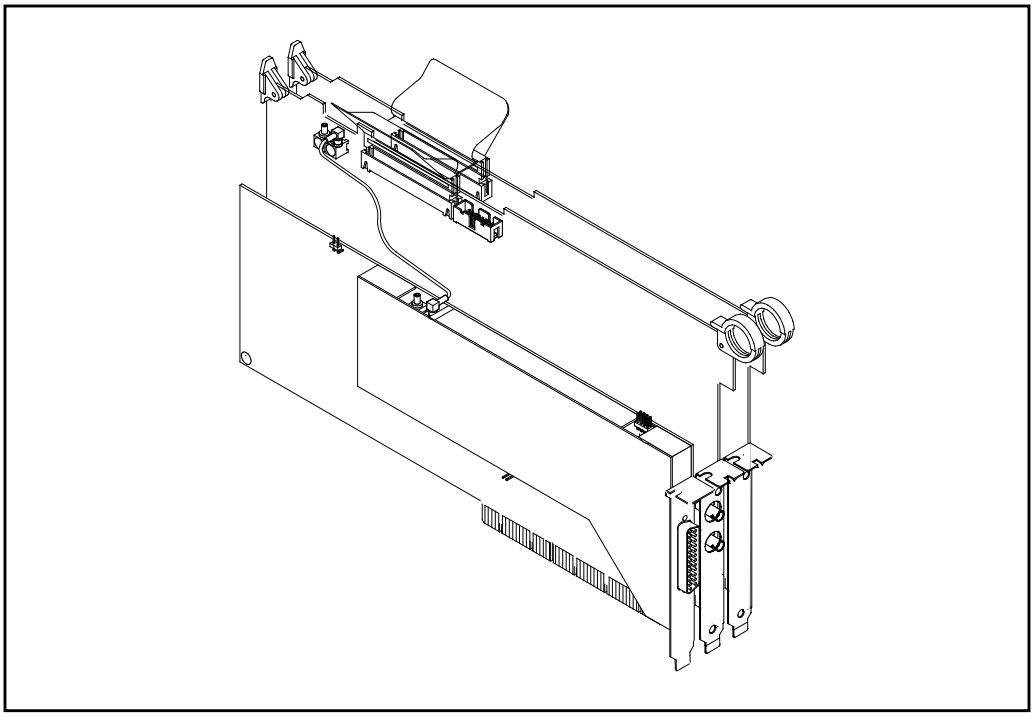


Figure 3-34. Audio Clock Cabling for Analog Composite Input

Decoder Circuit Board

The Decoder circuit board, which is paired with the Analog Composite Input circuit board, is optional and can occupy various slots from J3 to J13.

The Decoder circuit board has three plug jumpers for test purposes. See Figure 3-35.

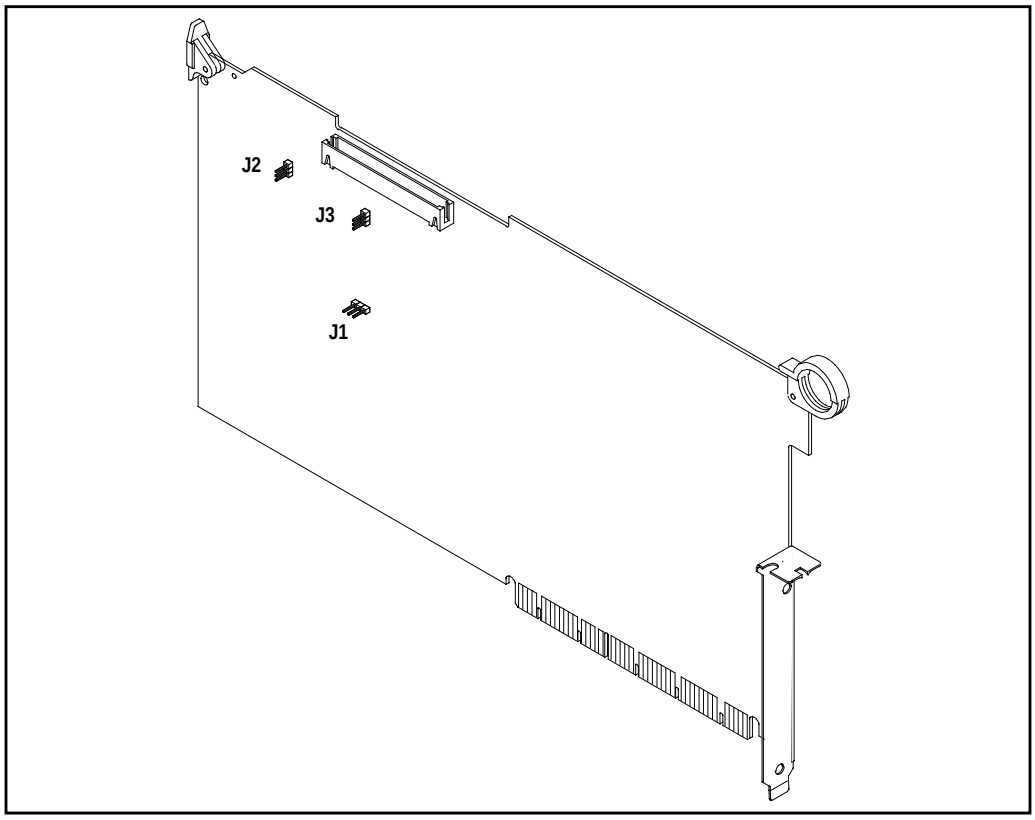


Figure 3-35. Decoder Circuit Board Showing Plug Jumpers

Table 3-14. Decoder Plug Jumpers

Jumper	Name	Position	Factory-Installed	Operation
J1	Test Jumper	1-2	Jumpered	Operating
		2-3		Developmental Position
J2	Test Jumper	1-2	Jumpered	Operating
		2-3		Developmental Position
J3	Test Jumper		No Jumper	Operating position for board 671-3083-00
		1-2	Jumpered	Operating position for board 671-3083-01[a]
		2-3		Developmental Position

a. Decoder board with the -01 or higher suffix level are compatible only with Analog Composite Input boards 671-3081-02 or higher, and require software Version 1.3 or higher.

Analog Composite Output Circuit Board

The Analog Composite Output board is optional, and can occupy slot J11 or J12.

The Analog Composite Output circuit board has eight plug jumpers for test purposes only. See Figure 3-36. In addition, this circuit board can output four system clocks (27 MHz) that are used as audio play-back clocks by the Audio I/O circuit board. System Clock signals are output from J4, J5, J2, and J7.

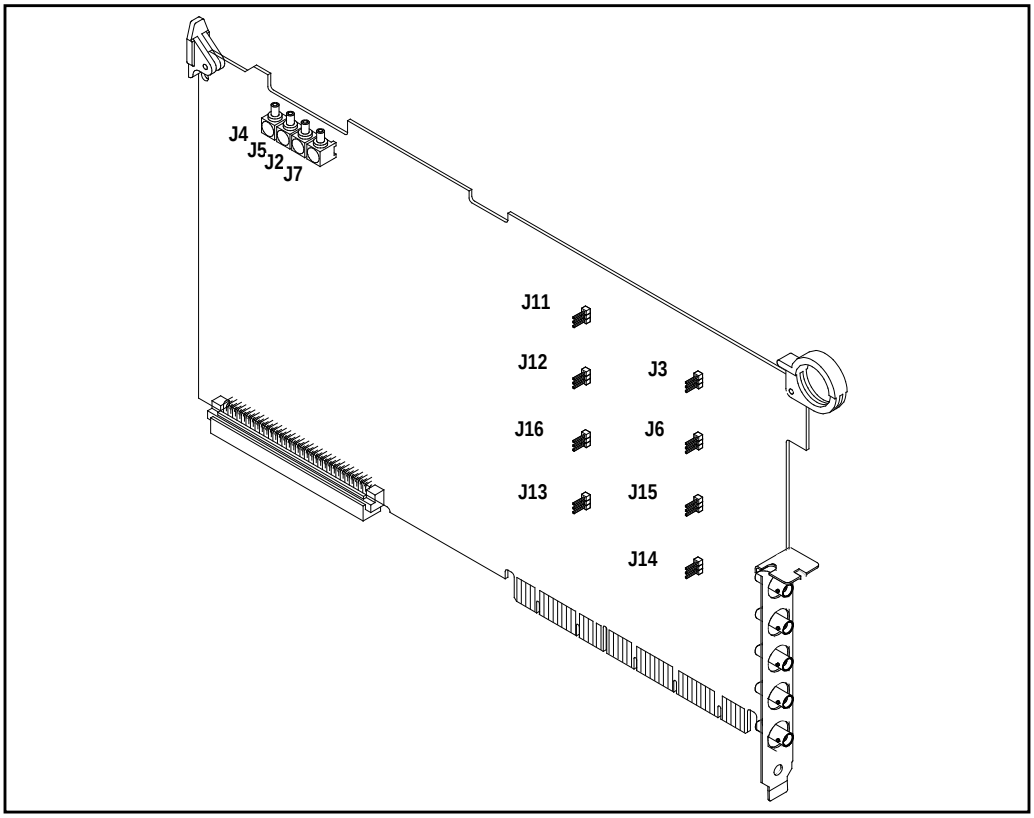


Figure 3-36. Analog Composite Output Circuit Board Showing Plug Jumper Locations

Table 3-15. Analog Composite Output Plug Jumpers

Jumper	Name	Position	Factory- Installed	Operation
J11	Channel 1 Filter Input	Jumpered	Jumpered	DAC Output to Filter
		Open		Open
J12	Channel 2 Filter Input	Jumpered	Jumpered	DAC Output to Filter
		Open		Open
J16	Channel 3 Filter Input	Jumpered	Jumpered	DAC Output to Filter
		Open		Open
J13	Channel 4 Filter Input	Jumpered	Jumpered	DAC Output to Filter
		Open		Open

Table 3-15. Analog Composite Output Plug Jumpers (Continued)

Jumper	Name	Position	Factory- Installed	Operation
J3	Channel 1 Filter Output	Jumpered	Jumpered	Corrected
		Open		Open
J6	Channel 2 Filter Output	Jumpered	Jumpered	Corrected
		Open		Open
J15	Channel 3 Filter Output	Jumpered	Jumpered	Corrected
		Open		Open
J14	Channel 2 Filter Output	Jumpered	Jumpered	Corrected
		Open		Open

Audio Clock Signals

The only clock signals available on the Analog Composite Output circuit board are system clocks (27 MHz). There are four identical buffered clock signals available, enough to have one clock signal for each of the output channels. In most cases not all will be used. The example shown in Figure 3-37 has only one Audio I/O circuit board, which is located adjacent to the Composite Analog Output circuit board. With longer cables, the clock signals can be routed to other Audio I/O circuit boards located some distance from the Analog Composite Output circuit board.

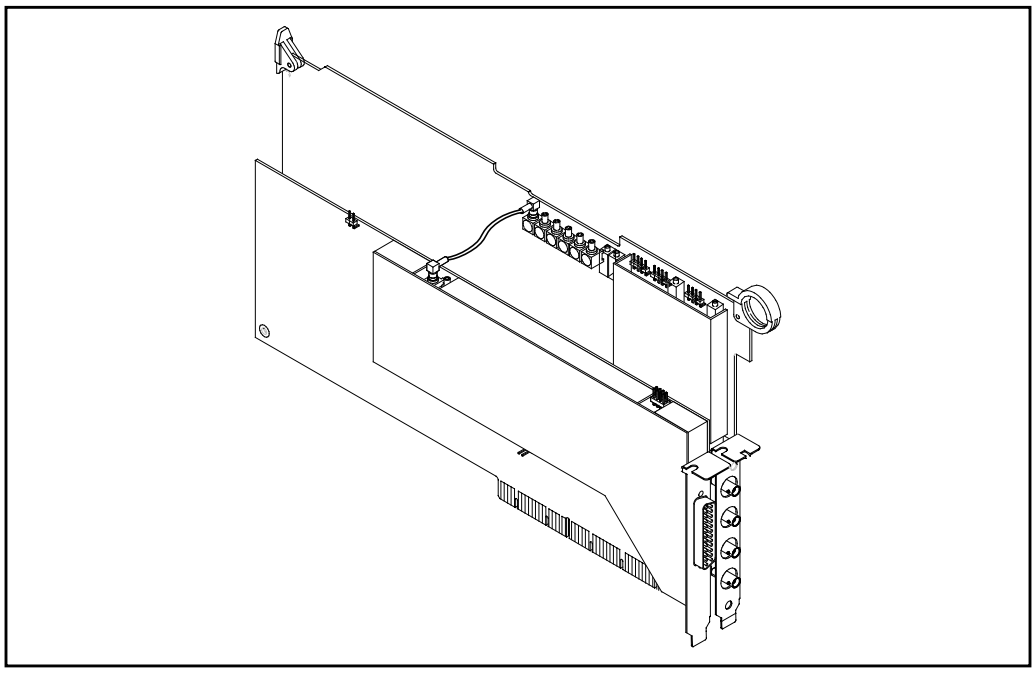


Figure 3-37. Audio Clock from Analog Composite Output Circuit Board

Component Analog Video Input Board

The Component Analog Video (CAV) Input board is optional and can be installed in any unused board slot that includes connection to the Video Bus (slots that include the video bus are slots J5-J16). The CAV Input board must be installed close enough to the audio card so that the audio clock cables will make connection. If your VDR has an Analog Composite Output card, that card must be installed in slot 11 or 12.

The Component Analog Video (CAV) Input board accepts a single source of component analog video input, which it converts to digital component video conforming to SMPTE 125M (525-line) or EBU 3267 (625-line). The board then transfers the digital video to the VDR's video router bus.

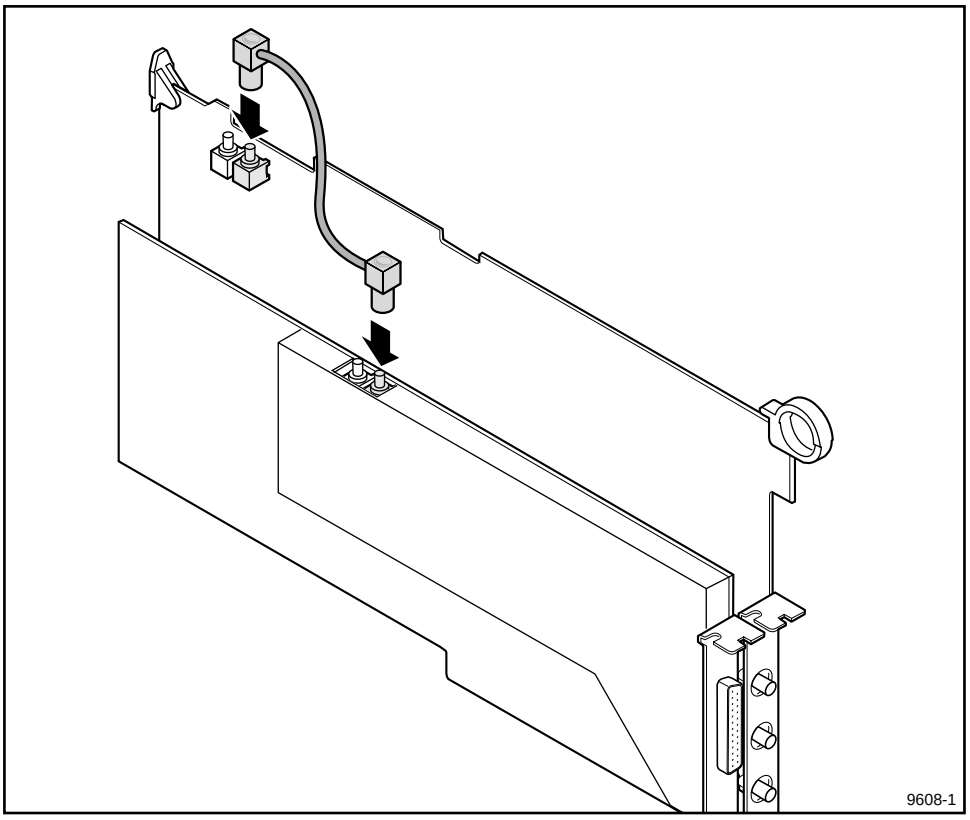


Figure 3-38. Audio Clock Cabling from the CAV Input Board

Audio I/O Circuit Board (Optional, Various Slots from J3-J13)

The Audio I/O circuit board is a purchased circuit card designed with an EISA- bus interface for use in PC applications. In order to prevent the Processor reconfiguring the board, a disable jumper, J4, is provided so that the processor will not recognize the board and attempt to reconfigure it at boot-up. See Figure 3-39.

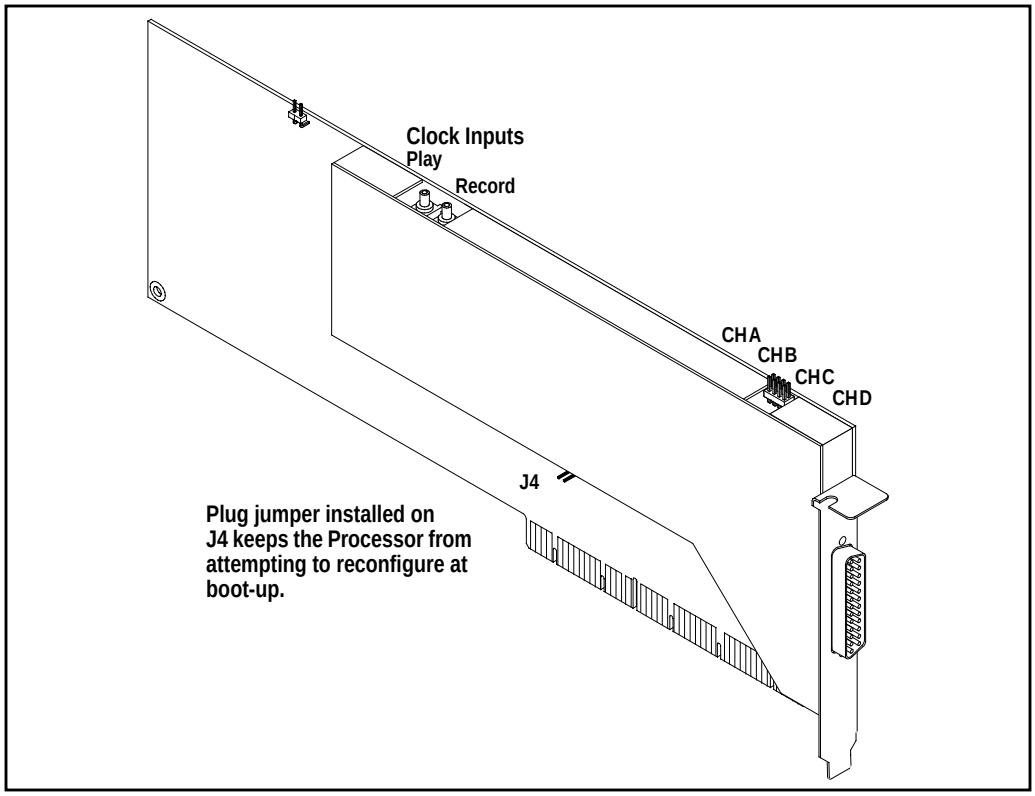


Figure 3-39. Audio I/O Circuit Board Showing Square-Pin Locations

The audio lines can be terminated for 600Ω impedance or high impedance (20 kΩ). The impedance is determined by whether there are jumpers installed on the four sets of pins (one for each channel) on the top of circuit board. When the pins are shorted together by jumpers, the lines are terminated in 600Ω. The PDR100 is normally shipped with jumpers installed for 600Ω termination.

Timing the PDR100 to the System

In a number of applications it will be necessary to time the PDR100 to the system. The internal reference for the PDR100 is the Reference Genlock. The PDR100 is shipped with 0 delay in the reference and the output timed to the reference. The reference delay and the output timing can be set separately; however, if the reference is moved, the output will be moved a corresponding amount and should only be adjusted if the range of the Output Delay is insufficient.

Setting the Reference Genlock Delay

The Reference Genlock advance is set from the PDR100 Configuration Tool, which will only run if the VDR panel is already running. See the “User Manual” for more information on the VDR panel. The actual setting is in software and is set from the Configure System menu, by selecting Configure Reference Genlock. When Reference Genlock is selected, a panel containing three settings is shown on the screen of the monitor:

Fields, which is initially set to 0.

Lines, which is initially set to 0.

Vernier, which is initially set to 0 advance.

Each of these can be set with the mouse in the select and drag mode.

Setting the Output Delay

The output of the PDR100 can be advanced up to $2^{1}/_{2}$ lines, or delayed up to 148 lines from the Reference Genlock. The output delay is set from the PDR100 Configuration Tool. The settings are in software and are reached from the Configure System menu, by selecting Configure Video Output and then selecting the appropriate output. There are two settings that can be made using the mouse in the select and drag mode:

Line, which is initially set to 0, but can be advanced two lines or delayed 148 lines.

Fine, which is initially set to 0, but can be set to advance or delay at 74 ns per click.

If the Reference Delay has been changed, the Output Delay will also be affected, and will need to be reset.

Reference—Timing a PDR100

The PDR100 has a few special considerations that should be taken into account when determining how to time your system.

- The PDR 100 is designed so that a prerecorded output is perfectly timed to the Genlock Input, when no delay is set on the Video Output.
- Each type of input board has its own internal delay. (This should be compensated for externally.)
- The PDR100's Auto-Timing feature only has a pull-in range of ±1 line.

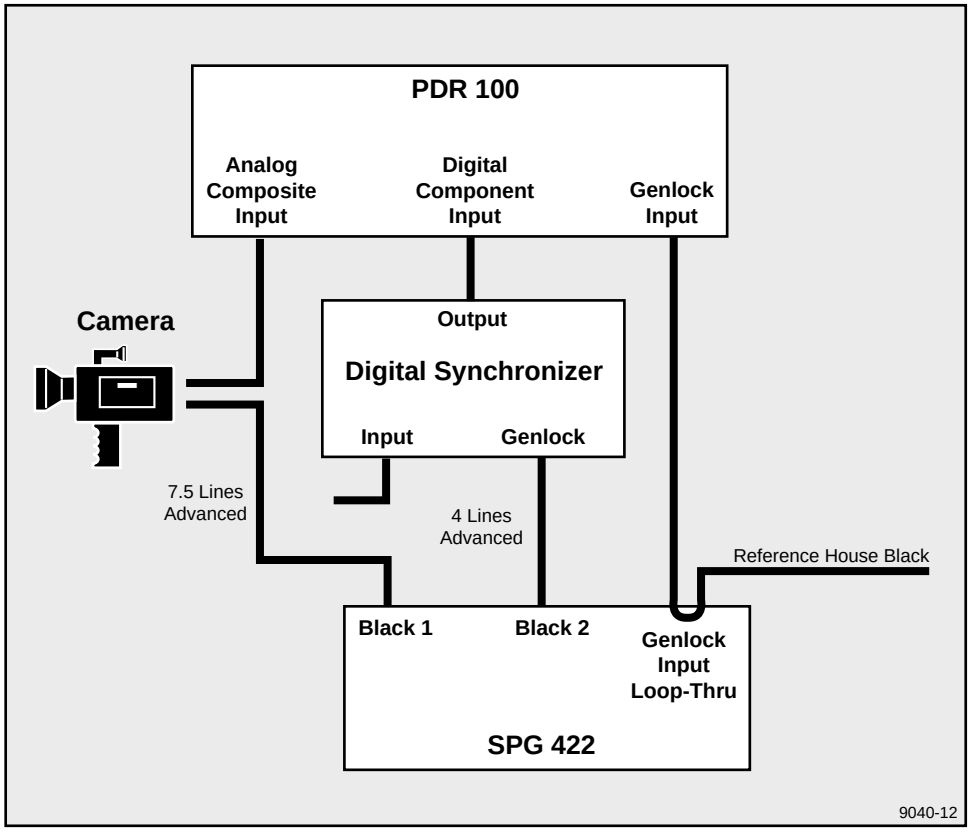


Figure 3-40. Illustration of the Setup Required to Properly Time Inputs

Figure 3-40 shows how these points effect PDR100 timing and installation.

In the example, the PDR100 has two input sources: an analog composite camera feed and a digital component synchronizer feed. Notice that the Reference House Black is the Genlock signal for both the PDR100 and the SPG 422 (a sync pulse generator). Also notice that the Reference House Black signal is not be used directly as the genlock signal for PDR100 input sources.

Each input source has its own Genlock source (from the SPG422) that is advanced from the Reference House Black. The analog composite is advanced 7.5 lines and the digital component is advanced 4 lines.

NOTE: The input timing requirements for each board are different:
Analog Compositeadvance 7.5 lines
Digital Componentadvance 4 lines

This is the amount of advance required to get the input into the Auto-Timing window. Once the input is within the Auto-Timing window, then the PDR100 can automatically lock to the input signal. This allows all signals through the box to be correctly timed into the system. (Even inputs operating in E-to-E mode.)

What if the Inputs Cannot be Timed

Operate with Auto-Timing Disabled

If you do not have access to Reference House Black with varying amount of advance, you have a few options, depending on what operations you need to perform.

If you just want to record material and play it back at a later time, this option works fine. But if this input is also being fed directly through the PDR100 (operating in E-to-E mode, feeding this signal to another channel, etc.), the resulting output will not be correctly timed.

Adjust the Genlock Timing

This will only work if you only have one type of input. You can adjust the Genlock Input Timing (delay 4 or 7.5 lines) to move the genlock timing until is within range to lock onto the input. **This is not recommended**. Remember, that the PDR100 is designed so that output is timed with zero delay to the genlock. If you use this option, then the output is delayed either 4 or 7.5 lines from the reference. You would then need additional equipment to advance the output signal (PDR100 only offers a two-line advance for its outputs) so that it will remain properly timed into the system.

Chapter 4

Software Upgrades

There may be occasional upgrades to the PDR100 software. This chapter outlines how to update your software and it also lists the traps that you may fall into and how to get yourself back out again.

Updating the Software

Use the disks that came with your PDR100 or with your Field Upgrade kit. If you have more than one set of disks, use the one with the higher version number. Follow the procedures in the Release Notes that accompany the diskettes.

Creating an Emergency Repair Disk

Whenever you upgrade the software, it is strongly recommended that you either create a new emergency repair disk or upgrade the existing emergency repair disk. This will minimize the chances that you will need to completely re-load the software for minor problem.

Making a New Emergency Repair Disk

To make a new emergency repair disk, you need one 3.5" disk. Mark it clearly as the emergency repair disk for PDR100 serial number xxxxxxx. (It is not necessary that this disk is already formatted.)

NOTE: The emergency repair disk is PDR100 specific. Make sure that the emergency repair disk is clearly marked with its PDR100's serial number.

1. From the File menu in the Program Manager, choose the Run command.
2. Enter *rdisk* in the Run dialog box.
3. Choose the Create Repair Disk command button.
4. Insert the floppy disk in the A drive and choose OK. The utility then formats the disk and loads all of the information from the registry.
5. When the operation is complete, choose the Exit command button to leave the Repair Disk Utility.

Windows NT Operating System is Corrupt

Use the Emergency Repair Disk. (See the Windows NT manual.)

>>> ***WARNING. The Emergency Repair Disk is PDR100 specific. (The disk shipped with the PDR100 is the* ONLY *one that will work with that PDR100.) Keep track of this disk.***

>>> ***WARNING. Repairing the Window NT operating system requires a copy of Windows NT 3.51. This is NOT included with the PDR100. You must purchase a copy of this software from your local retailer or call Tektronix Service for help.***

1. Verify that you have a source of setup information available (in floppy format). See the above warning.
2. Insert the Windows NT Setup disk.
3. Restart the PDR100.
4. When the Windows NT Setup Screen appears, press R (repair).
5. When prompted, insert the Emergency Repair disk.
6. The Emergency Repair disk performs the following:
   a. Runs CHKDSK.EXE on the WINNT and SYSTEM partitions.
   b. Verifies each file in the installation and replaces any that are missing or corrupt.
   c. Replaces the System, Security, and Security Accounts Manager hives in the registry.
   d. Reinstalls the Boot Loader (the boot sector, BOOT.INI, etc.).

Appendix **A**

Specifications

Electrical Characteristics

The Performance Requirements listed in the Electrical Characteristics apply over an ambient temperature range of +20°C to +30°C. The Performance Requirement tolerances listed in the Electrical Characteristics are doubled over the temperature range of 0°C to +40°C, unless there is a specific exception.

Definition of Terms Used in Specification Tables

The tables that follow contain headings, including Requirements and Supplemental information, which make it easier to relay the specifications, in numerical values. The following terms apply to the PDR 100 Characteristics and Descriptions as printed in the following tables.

Specification - A document or a section of a document that lists and describes characteristics and performance requirements of equipment and certain program material**.**

REQUIREMENT: **(Performance Requirement) –** A statement that defines a characteristic usually in limit form.

SUPPLEMENTAL DATA: - Statements that explain performance requirements or provide performance information. These are not considered to be statements of guaranteed performance and are not ordinarily supported by a performance check procedure.

Table A-1. Serial Digital Video Input/Output

Characteristics	Description
Number of Inputs	*Supplemental Data:* Two component serial digital
Input Type	*Supplemental Data:* 75Ω terminated
Number of Outputs	*Supplemental Data:* Two component serial digital
Output Timing Range	*Requirement:* -21/2 H to +148 H *Supplemental Data:* Independent for each output *Supplemental Data:* Resolution; 74 ns
Digital Format	*Supplemental Data:* CCIR 601 Component 525/625 8 bit data, Scrambled NRZI; complies with SMPTE 259M and CCIR 656
Bit Rate	*Supplemental Data:* 270 Mb/s
Source Impedance	*Supplemental Data:* 75Ω
Return Loss	*Supplemental Data:* ≥15 dB from 5 MHz to 270 MHz
DC Offset	*Requirement:* 0 ±0.5V
Rise and Fall Times	*Requirement:* 400 - 1000ps; 20% to 80% amplitude slew rate
Jitter	*Requirement:* ≤±360 ps
Input Level	*Supplemental Data:* 800 mV p-to-p ±10% *Supplemental Data:* Input voltages outside this range may cause reduced receiver performance
Serial Receiver Equalization Range	*Requirement:* Proper operation with up to 17 dB loss at 135 MHz using coaxial cable having $1/\sqrt{F}$ loss characteristics. 800 mV launch amplitude
Output Level	*Requirement:* 800 mV peak-to-peak ±10% *Supplemental Data:* Can be adjusted for 740 mV p-to-p ±10%

Table A-2. Analog Composite Video E-to-E (Direct)
(Valid only for Factory Installed Analog Composite Input/Output)

Characteristics	Description
Program Gain	*Requirement:* 1 ±1% Direct 1 ±2% AGC Path
Program Input Gain Range	*Requirement:* 70% to 140% or Better Direct Path *Supplemental Data:* Approximately ±3 dB
Frequency Response	*Requirement:* 500 kHz to 5.8 MHz ±2% Direct or AGC Path *Supplemental Data:* -3 dB Nominally 6.25 MHz
Signal-to-Noise Ratio	*Requirement:* > 50 dB Direct > 45 dB AGC Path
Chrominance-to-Luminance Delay Error	*Requirement:* ≤10 ns NTSC Direct or AGC Path ≤15 ns PAL Direct or AGC Path
Differential Gain	*Requirement:* ≤1.5% NTSC Direct or AGC Path ≤1.5% PAL Direct or AGC Path
Differential Phase	*Requirement:* ≤1.5° Direct or AGC Path

Table A-2. Analog Composite Video E-to-E (Direct) (Continued)
(Valid only for Factory Installed Analog Composite Input/Output)

Characteristics	Description
K-Factor	*Requirement:* ≤1% Direct or AGC Path
2T Pulse-to-Bar Ratio	*Requirement:* ≤1% Direct or AGC Path
Output Timing Range	*Requirement:* -21/2H to +148H *Supplemental Data:* Independent for each output *Supplemental Data:* Resolution; ≈0.3° of 3.58 MHz *Supplemental Data:* Timing Stability: 1°
Sync and Burst Insertion Timing Accuracy	*Requirement:* Meets RS-170A, and CCIR RPT 624-3; always on
Insertion Phase Error	*Requirement:* ≤1° Direct or AGC Path
Chrominance Phase Error with Reference Burst Frequency Change	*Requirement:* ≤1° with an input burst. This is a frequency change of ±10 Hz Direct or AGC Path
Chrominance Phase Error with Reference Signal Amplitude Change	*Requirement:* ≤1° with a ±3 dB amplitude change Direct or AGC Path
DC Offset	*Requirement:* ≤±50 mV Direct or AGC Path
Inserted Sync and Burst Amplitude Accuracy	*Requirement:* Sync Direct or AGC Path NTSC 40 IRE ±1 IRE PAL 300 mV ±7 mV Burst Direct or AGC Path NTSC 40 IRE ±1 IRE PAL 300 mV ±7 mV
Inserted Sync and Burst SCH Phase Accuracy	*Requirement:* 0° ±5° Direct or AGC Path
Black Level Error	*Requirement:* ±3.5 mV Direct ±5 mV AGC Path

Table A-3. Analog Composite Video Output
(Valid for Customer-Installed Composite Output or Digital Component Input/Analog Composite Output)

Characteristics	Description
Program Gain	*Requirement:* 1 ±1%
Frequency Response	*Requirement:* 500 kHz to 5.8 MHz ±2% *Supplemental Data:* -3 dB Nominally 6.25 MHz
Signal-to-Noise Ratio	*Requirement:* > 50 dB
Chrominance-to-Luminance Delay Error	*Requirement:* ≤10 ns NTSC ≤15 ns PAL
Differential Gain	*Requirement:* ≤1% NTSC ≤1.5% PAL
Differential Phase	*Requirement:* ≤1°
K-Factor	*Requirement:* ≤1%
2T Pulse-to-Bar Ratio	*Requirement:* ≤1%

Table A-3. Analog Composite Video Output (Continued)
(Valid for Customer-Installed Composite Output or Digital Component Input/Analog Composite Output)

Characteristics	Description
Output Timing Range	*Requirement:* -21/2H to +148H *Supplemental Data:* Independent for each output *Supplemental Data:* Resolution; ≈0.3° of 3.58 MHz *Supplemental Data:* Timing Stability: 1°
Sync and Burst Insertion	*Requirement:* Meets RS-170A, and CCIR RPT 624-3; always on
Insertion Phase Error	*Requirement:* ≤1°
Chrominance Phase Error with Reference Burst Frequency Change	*Requirement:* ≤1° with an input burst frequency change of ±10 Hz
Chrominance Phase Error with Reference Signal Amplitude Change	*Requirement:* ≤1° with a ±3 dB amplitude change
DC Offset	*Requirement:* ≤±50 mV
Inserted Sync and Burst Amplitude Accuracy	*Requirement:* Sync NTSC 40 IRE ±1 IRE PAL 300 mV ±7 mV Burst NTSC 40 IRE ±1 IRE PAL 300 mV ±7 mV
Inserted Sync and Burst SCH Phase Accuracy	*Requirement:* 0° ±5°
Black Level Error	*Requirement:* ±3.5 mV

Table A-4. Analog Composite Video E-to-E (Direct)
(Valid for Customer-installed Composite Output or Digital Component Input/Analog Composite Output)

Characteristics	Description
Program Gain	*Requirement:* 1 ±3% Direct or AGC Path *Supplemental Data:* Typically 1 ±1%
Program Input Gain Range	*Requirement:* 70% to 140% or Better Direct or AGC Path *Supplemental Data:* Approximately ±3 dB
Frequency Response	*Requirement:* 500 kHz to 5.8 MHz ±6% Direct or AGC Path *Supplemental Data:* -3 dB Nominally 6.25 MHz
Signal-to-Noise Ratio	*Requirement:* > 50 dB Direct > 45 dB AGC Path
Chrominance-to-Luminance Delay Error	*Requirement:* ≤30 ns Direct or AGC Path *Supplemental Data:* Typically ≤10 ns
Differential Gain	*Requirement:* ≤3% Direct or AGC Path *Supplemental Data:* Typically ≤1%
Differential Phase	*Requirement:* ≤3° Direct or AGC Path *Supplemental Data:* Typically ≤1°

Table A-4. Analog Composite Video E-to-E (Direct) (Continued)
(Valid for Customer-installed Composite Output or Digital Component Input/Analog Composite Output)

Characteristics	Description
K-Factor	*Requirement:* ≤3% Direct or AGC Path *Supplemental Data:* Typically ≤1%
2T Pulse-to-Bar Ratio	*Requirement:* ≤3% Direct or AGC Path *Supplemental Data:* Typically ≤1%
Output Timing Range	*Requirement:* -21/2H to +148H *Supplemental Data:* Independent for each output *Supplemental Data:* Resolution; ≈0.3° of 3.58 MHz *Supplemental Data:* Timing Stability: 1°
Sync and Burst Insertion	*Requirement:* Meets RS-170A, and CCIR RPT 624-3; always on
Insertion Phase Error	*Requirement:* ≤3° Direct or AGC Path
Chrominance Phase Error with Reference Burst Frequency Change	*Requirement:* ≤3° with an input burst frequency change of ±10 Hz Direct or AGC Path *Supplemental Data:* Typically ≤1°
Chrominance Phase Error with Reference Signal Amplitude Change	*Requirement:* ≤3° with a ±3 dB amplitude change Direct or AGC Path *Supplemental Data:* Typically ≤1°
DC Offset	*Requirement:* ≤±50 mV Direct or AGC Path
Inserted Sync and Burst Amplitude Accuracy	*Requirement:* Sync Direct or AGC Path NTSC 40 IRE ±3 IRE PAL 300 mV ±21 mV Burst Direct or AGC Path NTSC 40 IRE ±3 IRE PAL 300 mV ±21 mV *Supplemental Data:* Typically Sync NTSC 40 IRE ±1 IRE PAL 300 mV ±7 mV Burst NTSC 40 IRE ±1 IRE PAL 300 mV ±7 mV
Inserted Sync and Burst SCH Phase Accuracy	*Requirement:* 0° ±15° Direct or AGC Path *Supplemental Data:* Typically 0° ±5°
Black Level Error	*Requirement:* ±0.5 mV Direct ±15 mV AGC Path

Table A-5. Program Input Genlock

Characteristics	Description
Burst Frequency Lock Range	*Requirement:* ±50 Hz at subcarrier *Supplemental Data:* Remains locked or initial lock
Signal Amplitude Lock Range	*Requirement:* Stays locked to +6 dB and -3 dB
Phase Jitter (Analog Input and Analog Output)	*Requirement:* ≤1°
Phase Jitter (Analog Output Only)	*Requirement:* ≤0.5°
Hum Rejection	*Requirement:* ≥32 dB
Recovery Time	*Requirement:* Fast - Within 35.7 mV in 2 to 3 lines Medium - Within 35.7 mV in 10 to 30 lines Slow - Within 35.7 mV in > 30 lines
Switch Points	*Requirement:* Fast - Medium 30 to 40 dB signal-to-noise *Supplemental Data:* Medium - Slow 20 to 30 dB signal-to-noise

Table A-6. Analog Input/Output

Characteristics	Description
Program Input Return Loss	*Requirement:* ≥40 dB to 5 MHz
Program Output Return Loss	*Requirement:* ≥40 dB to 5 MHz

Table A-7. Component Analog Video Input

Characteristic	Specification
Input connectors:	BNCx (3) terminating
Impedance:	75 ohms
Return loss:	≥ -40dB to 5.0MHz
Input formats supported (525/60):	Betacam Betacam without setup Betacam (non-EBU) MII MII without setup (SMPTE/EBU-N10) GBR (700mv no setup)
Input formats supported (625/50):	SMPTE/EBU-N 10 Betacam (non-EBU) GBR (700mv no setup)
Reference:	Sync on Y/G video input

Table A-8. Component Analog Video Performance

Characteristic	Specification
A to D conversion:	*Supplemental Data:* 10 bits at 27 MSPS on all 3 inputs
Output video data:	*Supplemental Data:* Dynamically rounded (dithered) to 8 bits
Input gain controls:	*Requirement:* Each CAV input is software adjustable ±3dB except MII, which is software adjustable +2.5/-3dB.
Input Setup Controls	*Requirement:* ±20 mV *Supplemental Data:* Software adjustable
Frequency response:	*Requirement:* (Y) ±0.25 dB 0-5.8MHz (Cb/Cr) ±0.25 dB 0-2.75 MHz
Signal-to-Noise Ratio	*Requirement:* > +50dB
Relative timing error:	*Engineering Note:* Y to Cb/Cr, <5ns by design Cb to Cr, <5ns by design Measurement accuracy ±5ns
Internal Sync (Y/G input) timing:	*Requirement:* Digital video output H position error <25ns w.r.t. input sync *Engineering Note:* CAV auto-timing ON. Input signal timed to Genlock Black Burst.
Standards selection:	Software selectable 525/625
Gain Accuracy	*Requirement:* All supported input formats translated to ±1% of SMPTE/EBU-N10 levels given in Tables A-9 and A-10 *Supplemental Data:* 75% bars with 100% flag
K Factor K-2T (Y) K-4T (B-Y) K-4T (R-Y)	*Requirement:* ≤1% *Supplemental Data:* Component K factor measurement @ VM700
K Pulse-to-Bar	*Requirement:* ±1% K factor *Supplemental Data:* Component K factor measurement @ VM700

Table A-9. Format Voltage Level Definitions for CAVmtrxN Colorbar Matrix Test Clip

Format	White	Yellow	Cyan	Green	Magenta	Red	Blue	Black
SMPTE/EBU-N10 (MII w/o setup)								
Y	700	465.2	368	308.2	216.8	157.0	59.9	0
B-Y	0	-262.5	88.6	-173.9	173.9	-88.6	262.5	0
R-Y	0	42.7	-262.5	-219.8	219.8	262.5	-42.7	0
MII								
Y	700	482.8	392.9	337.6	253.1	197.7	107.9	52.5
B-Y	0	-242.8	81.9	-160.9	160.9	-81.9	242.8	0
R-Y	0	39.5	-242.8	-203.3	203.3	242.8	-39.5	0

Table A-9. Format Voltage Level Definitions for CAVmtrxN Colorbar Matrix Test Clip (Continued)

Format	White	Yellow	Cyan	Green	Magenta	Red	Blue	Black
Betacam								
Y	714.3	492.6	400.9	344.4	258.2	201.7	110.1	53.6
B-Y	0	-350	118.1	-231.9	231.9	-118.1	350	0
R-Y	0	56.9	-350	-293.1	293.1	350	-56.9	0
Betacam w/o setup								
Y	714.3	474.6	375.5	314.5	221.2	160.2	61.1	0
B-Y	0	-378.4	127.7	-250.7	250.7	-127.7	378.4	0
R-Y	0	61.5	-378.4	-316.8	316.8	378.4	-61.5	0
Betacam w/o setup (non-EBU)								
Y	700	465.2	368	308.2	216.8	157.0	59.9	0
B-Y	0	-350	118.1	-231. 9	231. 9	-118.1	350	0
R-Y	0	56.9	-350	-293.1	293.1	350	-56.9	0
GBR								
G	700	525	525	525	0	0	0	0
B	700	0	525	0	525	0	525	0
R	700	525	0	0	525	525	0	0

Table A-10. Format Voltage Level Definitions for CAVmtrxP Colorbar Matrix Test Clip

Format	White	Yellow	Cyan	Green	Magenta	Red	Blue	Black
SMPTE/EBU-N10 (MII w/o setup)								
Y	700	465.2	368	308.2	216.8	157.0	59.9	0
B-Y	0	-262.5	88.6	-173.9	173.9	-88.6	262.5	0
R-Y	0	42.7	-262.5	-219.8	219.8	262.5	-42.7	0
Betacam w/o setup (non-EBU)								
Y	700	465.2	368	308.2	216.8	157.0	59.9	0
B-Y	0	-350	118.1	-231. 9	231. 9	-118.1	350	0
R-Y	0	56.9	-350	-293.1	293.1	350	-56.9	0
GBR								
G	700	525	525	525	0	0	0	0
B	700	0	525	0	525	0	525	0
R	700	525	0	0	525	525	0	0

Table A-11. Reference Genlock

Characteristics	Description
Color Field Detection, Based on SCH Phase	*Requirement:* Correct color framing for signals having an average SCH phase ±40°; Lockup ±10° *Supplemental Data:* Once locked to color field, it will stay locked over a range of 0° to ±90°
Burst Frequency Lock Range	*Requirement:* PAL,±10 Hz at subcarrier: NTSC, ±20 Hz at subcarrier
Signal Amplitude Lock Range	*Requirement:* Stays locked to +6 dB and -3 dB
Reference Genlock Input Return Loss	*Requirement:* ≥40 dB to 5 MHz

Table A-12. Time Code

Characteristics	Description
Input	*Supplemental Data:* Longitudinal Time Code. AC coupled, differential input
Input Impedance	*Supplemental Data:* 20 kΩ. Switch selectable 600 Ω input.
Input Amplitude	*Supplemental Data:* 0.1 V p-to-p, differential, minimum
Maximum Input Voltage	*Supplemental Data:* 2.5 V p-to-p, differential, maximum

Table A-13. Analog Audio Mode

Characteristics	Description
Through Gain	*Requirement:* 1 ±1 dB *Supplemental Data:* Non-mix mode each of four channels
Frequency Response	*Requirement:* 20 Hz to 20 kHz, with between +0.5 dB, -2 dB maximum deviation from flatness at 48 kHz sample rate
Input Impedance	*Supplemental Data:* 600 Ω or 20 kΩ each channel through independent jumper selection
Input/Output Signal Levels	*Supplemental Data:* Nominal Line Level: 0 dBu Nominal Peak Line Level: +9 dBu Digital Clipping: +18 dBu (16-bit quantization)
THD+N at 1020 Hz and 60 Hz	*Requirement:* -70 dBm (0.031%) at +9dBu input

Table A-14. Power Source

Characteristics	Description
Electrical Rating	*Requirement:* 100 -240V, 50/60 Hz, 12A maximum
Supply Type	*Supplemental Data:* Single Phase
Supply Connection	*Supplemental Data:* Detachable cord set
Power Consumption	*Supplemental Data:* <1000 VA

Environmental Characteristics

Table A-15. Environmental Characteristics

Characteristics	Description	
Operating Temperature	*Requirement:*	5° to 40°C (+41° to 122°F)
Storage Temperature	*Requirement:*	-40° to 65°C (-40° to 149°F)
Operating Altitude	*Requirement:* *Supplemental Data:*	To 15,000 feet (4572 meters) IEC 950 compliant to 2000 meters
Storage Altitude	*Requirement:*	To 50,000 feet (15,240 meters)
Vibration	*Requirement:*	Military Specification: Mil-T-28800D, Class 6 (Non-Operating Only)
Mechanical Shock	Military Specification: Mil-T-28800D, Class 6 (Non-Operating Only)	
Transportation	*Requirement:*	Qualified under NSTA Test Procedure 1A, Category II (24 inch drop)
Equipment Type	*Supplemental Data:*	Information Technology
Equipment Class	*Supplemental Data:*	Class I
Installation Category	*Requirement:*	Category 2 Indoor use only
Pollution Degree	*Requirement:*	Level 2 operating environment
Humidity	*Requirement:* *Supplemental Data:*	Operating 20% - 80% Non-Operating 8% - 90% Transportation 5% - 95% Maximum Wet Bulb Temperature 26° Do not operate with visible moisture on the circuit boards

Mechanical Characteristics

Table A-16. Mechanical Characteristics

Characteristic	Description		
Dimensions	*Requirement:*	Height: Width: Depth:	8.750 inches (22.225 centimeters) 19.000 inches (48.260 centimeters) 23.500 inches (59.690 centimeters)
Weight	*Requirement:*	Net: Shipping:	70 pounds (31.751 kilograms) 85 pounds (38.555 kilograms)

Certification

Table A-17. Certification

Category	Standard
Safety	*Designed/tested for compliance with:* **UL1950 -** Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition, 1993) **IEC 950 -** Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition, 1991) **CAN/CSA C22.2, No. 950-93 -** Safety of Information Technology Equipment, including Electrical Business Equipment **EN60950 -** Safety of Information Technology Equipment, including Electrical Business Equipment