GRASS VALLEY GROUP

MASTER ENHANCED DISK RECORDER BOARD

Installation Manual

071-0643-01

NOVEMBER 2000

PROFILE PDR 100

PROFESSIONAL DISK RECORDER

Revision Status

Rev Date	Description
October 1998	Original Issue. Manual part number 071-0463-00.
November 2000	Revised Product Support contact information. Part Number 071-0463-01.

Contents

Figures

Tables

Grass Valley Group Product Support

You can get technical assistance, check on the status of problems, or report new problems by contacting our Product Support Group.

United States and Canada

Monday–Friday 5:30AM–5:00PM Pacific Time
(800) 547-8949

Europe

Monday–Friday 9:00AM–5:30PM

France	01 45 29 73 00	United Kingdom	01628 405830
Germany	49 221 1791 234	Other	+44 1753 218 777
Italy	02 25086606		

Asia and South America

Australia	02-9888 0100	Japan	81-3-3448-3111
- from overseas	61-2-9888 0100	Korea	82-2-528-5299
Beijing	86-10-62351230 ext. 711	Mexico	52-5-666-6333
		Singapore	65-356-3900
Brazil	55-11-3741-8422	Taiwan	886-2-27571571
Hong Kong	852-2585-6579		

World Wide

24-hour Emergency Hotline (530) 478-4148 (Contract and warranty customers)

World Wide Web	http://www.grassvalleygroup.com/support//
FTP Site	ftp.grassvalleygroup.com
E-mail	profile-users@grassvalleygroup.com

General 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.***

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

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

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 while servicing, disconnect the main power by means of the power cord.

Use Care When Servicing With Power On

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

Avoid Exposed Circuitry

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

Do Not Operate Without Product Covers in Place

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

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.

Product Damage Precautions

Use the Proper Voltage Setting

Ensure that the line selector is in the proper position for the power source before applying power.

Provide Proper Ventilation

Prevent product overheating by providing proper ventilation.

Do Not Operate If You Suspect Product 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 you read 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

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 this installation 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 or her own expense. Changes or modifications not expressly approved by Grass Valley Group 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 a 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.

Certification

Category	Standard
Safety	*Designed/tested for compliance with:* **UL1950 –** Safety of Information Technology Equipment, including Electrical Business Equipment (Third Edition, 1995) **IEC 950 –** Safety of Information Technology Equipment, including Electrical Business Equipment (Second edition, 1991) **CAN/CSA C22.2, No. 950-95 –** Safety of Information Technology Equipment, including Electrical Business Equipment **EN60950 –** Safety of Information Technology Equipment, including Electrical Business Equipment (includes Appendix ZB)

PDR100 Master Enhanced Disk Recorder

Introduction

Use these instructions to replace the PDR100 Master Disk Recorder board with the Master Enhanced Disk Recorder (EDR) board. The Master EDR board is the central part of the PDR100 video processing system and includes a high speed real-time processor, two JPEG codecs and two Ultra SCSI channels.

Grass Valley Group recommends removing the PDR100 from the rack to perform this upgrade. Refer to the *PDR100 Installation Manual* for instructions on removing the PDR100 from the rack. Bear in mind that the chassis with a full complement of disk drives weighs approximately 70 pounds. Observe the following warnings:

⚠ ***To prevent injury, two people are required to lift the PDR100. The PDR100 is too heavy for one person to remove from the rack.***

⚠ ***To prevent serious injury, insure that the rack is anchored to the floor so that it cannot tip over when the Profile Video File Server is extended out of the rack.***

System Requirements

The Master EDR board upgrade requires Profile system software version 2.2 or higher. If your Profile system software version is below 2.2, you **must** upgrade your software **before** installing the Master EDR board.

To check Profile system software version:

1. Open the VdrPanel application.
2. Choose **Help | About VdrPanel**.
3. Check the Product Version field in the displayed window for a version of 2.2.X or higher and then perform a software upgrade, if required.

NOTE:

- ***To obtain software and software release notes in order to complete the upgrade, contact your Grass Valley Group representative.***
- ***If you are upgrading system software to version 2.4 or greater, DO NOT attempt to restart the system at the conclusion of the upgrade. Instead, select "No, I will restart my computer later", and then shut down and power Off the system to install the Master EDR board. Attempting to operate version 2.4 software without the Master EDR board will result in system errors.***

Kit Contents

In addition to this manual, the Enhanced Disk Recorder kit includes all the items listed in Table 1.

Table 1. List of kit contents

Qty.	Item
1	Master EDR Board
1	Front panel cable with ferrite bead
1	LED cable assembly with ferrite bead
1	PCI Interconnect Board (Used only when the Slave EDR or Fibre Channel board is installed.)
1	Gasket, EMI Foam
1	Board identification label set
1	Gasket, EMI Foam

Tools Required

Tools required, but not supplied, to install this kit are:

- Torx tool with T8, T10, T15 and T20 tips
- Electrostatic discharge (ESD) grounding straps for handling circuit boards

Electrostatic Precautions

CAUTION: This product contains components that are highly sensitive to electrostatic discharge. To protect these components from damage and to maintain product reliability, take the following precautions when handling the circuit boards:

- ***Handle all circuit boards in a static-protected area capable of controlling static charge on conductive materials, people, and non-conductive materials. Static-protected areas include non-static table tops and non-static floor mats.***
- ***Handle the circuit boards only by the edges. Avoid touching the printed wires on the back of the circuit board as much as possible.***
- ***Leave the board in its static-shielded bag until you are ready to install the board.***
- ***Wear ESD grounding straps when handling boards not protected by static-shielded bags.***

Installation Procedures

This manual includes step-by-step instructions for removing the existing Disk Recorder board from your PDR100 system and replacing it with the Master Enhanced Disk Recorder board. Refer to Table 2 for a summary of installation procedures.

Table 2. Summary of installation procedures

Removing the Chassis Covers

Use the following procedure to remove the chassis covers:

1. Turn off PDR100 power and remove the power cord.
2. Using a Torx tool with a T10 tip, remove the top screws from the front chassis cover (❶ in Figure 1). Remove the front cover. The front chassis cover must be removed first because it overlaps the rear chassis cover.

NOTE: Take care not to lose the chassis screws—they are required to meet EMI specifications for the PDR100 system. If your PDR100 has been upgraded to 9GB disk drives, it will have more disk drive cover screws than shown in Figure 1.

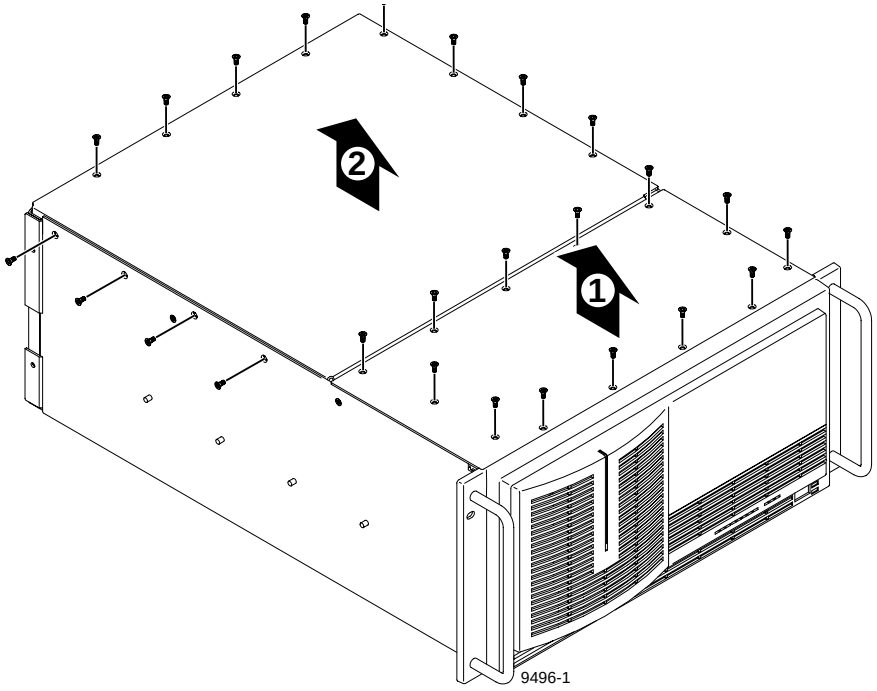

Figure 1. Removing the chassis cover screws

3. Using a Torx tool with a T10 tip, remove the rear chassis screws and then remove the rear cover (❷ in Figure 1).

Removing the Circuit Board Hold-down Brackets

There are two hold-down brackets (shown in Figure 2) you must remove to access the circuit boards. Use the procedure below to remove these brackets.

1. Using a Torx tool with a T10 tip, remove the screw (❶ in Figure 2) which secures the rear board hold-down bracket.

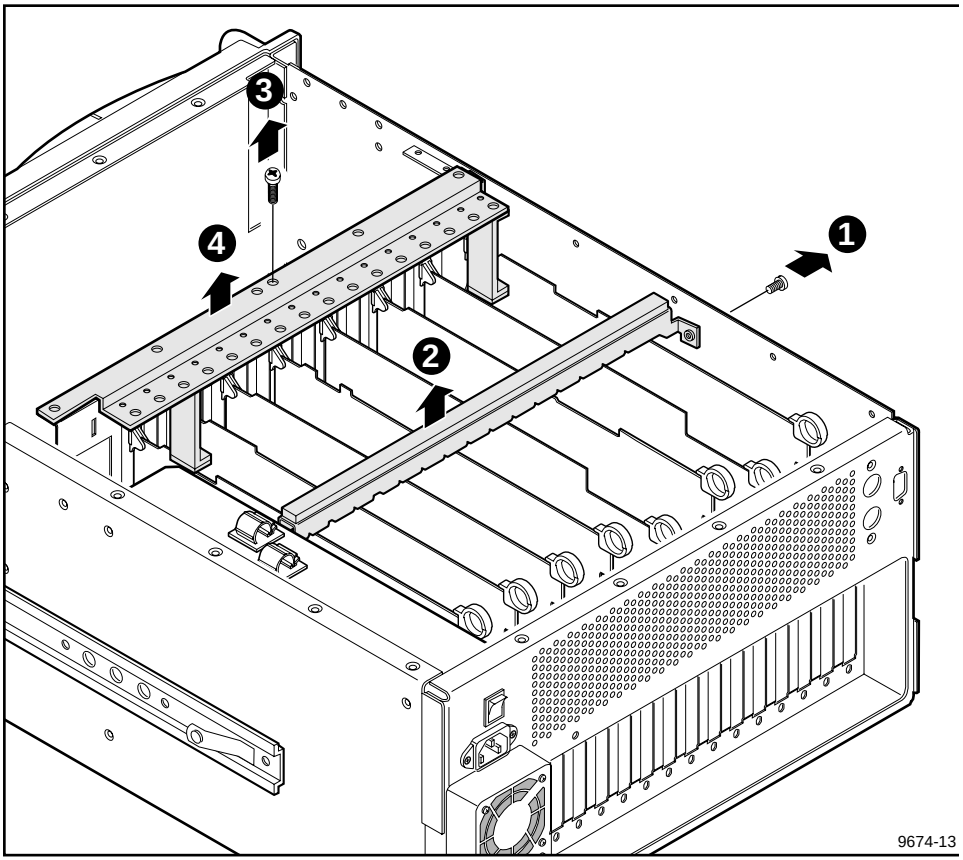

Figure 2. Removing the circuit board hold-down brackets

2. Lift the hold-down bracket (❷ in Figure 2) out of the chassis and set aside.
3. Using a Torx tool with a T10 tip, remove the screw (❸ in Figure 2) which secures the front board hold-down bracket.
4. Lift the hold-down bracket (❹ in Figure 2) out of the chassis and set aside.

Removing the Master Disk Recorder Board

These steps describe how to remove the Master Disk Recorder board from the PDR 100.

To remove the existing Master Disk Recorder board:

1. If you have not done so already, remove any SCSI cable or SCSI terminator from the Master Disk Recorder board rear panel SCSI connector.
2. Remove the SCSI A Cable connector (❶ in Figure 3) from the Master Disk Recorder board.

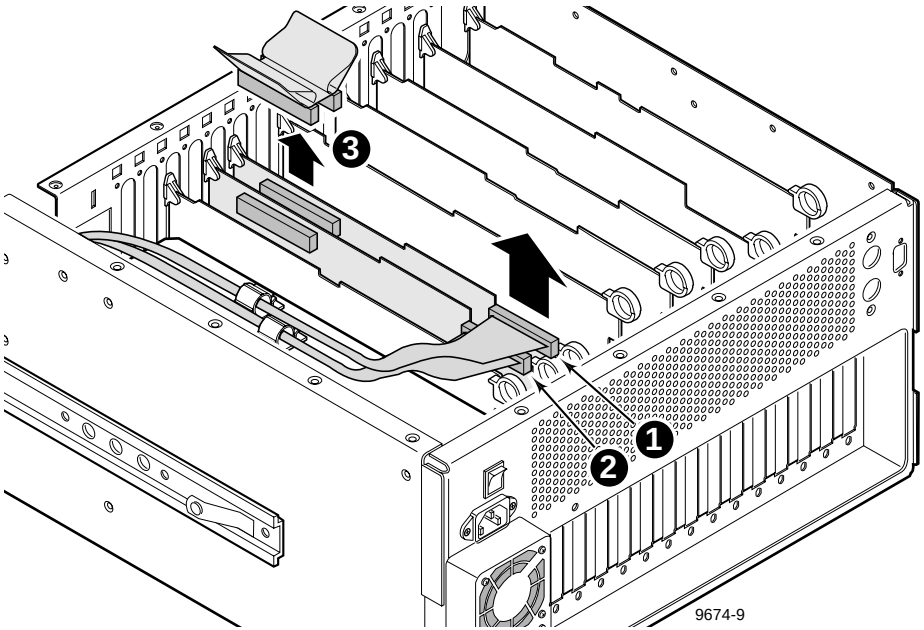

Figure 3. Internal cable removal

3. If you have a Slave Disk Recorder board installed, remove both the SCSI B cable (❷ in Figure 3) and the ribbon cable (❸ in Figure 3).
4. If required, disconnect any other cables which pass over the top of the Master Disk Recorder board. Be sure to make a cable diagram before you remove the cables so that you can reinstall them later.
5. Use the Torx tool with the T15 tip to remove the screws which secure the Master Disk Recorder board to the rear panel (see ❶ and ❷ in Figure 4 as an example).
6. Use the extraction lever on the front of the board and the extraction ring at the back of the board to lift the circuit board free of the connectors on the motherboard.

NOTE: If you have difficulty removing a circuit board, it may be necessary to remove the screw mounting an adjacent circuit board or empty board slot cover.

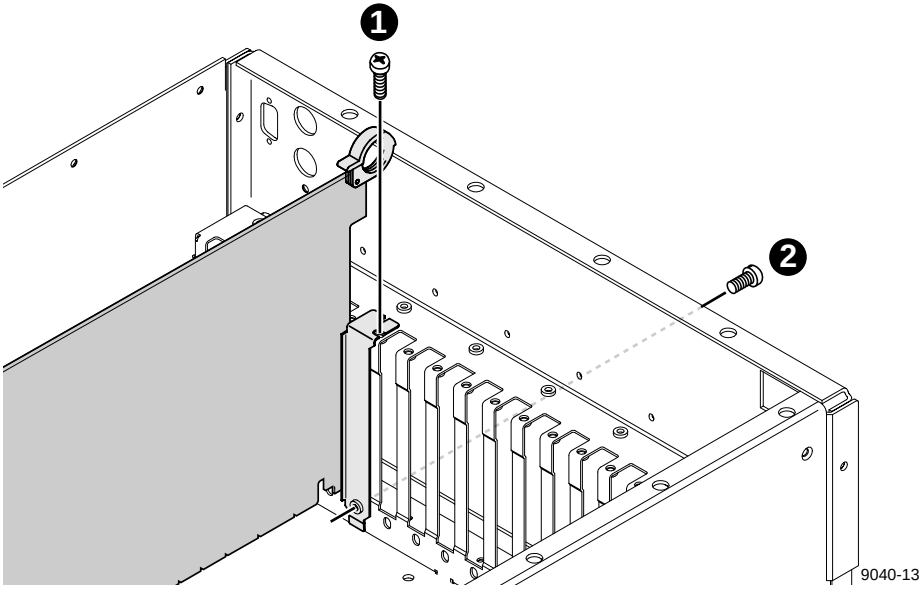

Figure 4. Typical removal of a full size board

Installing the Master EDR Board

These instructions describe installation of the Master EDR board into the old Master Disk Recorder board slot.

To install the Master EDR board:

1. Align the Master EDR board with the connectors on the motherboard slot (as shown in Figure 5), making sure the extractor on the front end of the board is in the up position. Firmly press down on the board until the board seats. The board is properly seated when the top of the rear mounting bracket is resting on the rear chassis wall shelf.

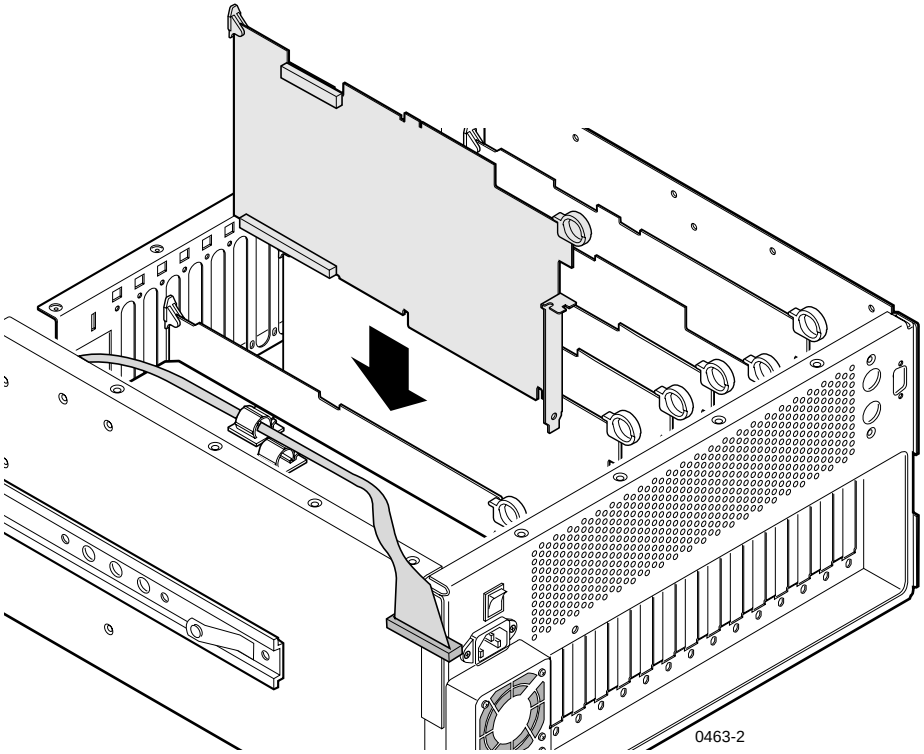

Figure 5. Installing the Master EDR board

NOTE: If you are also performing the Slave EDR board upgrade, you may install it along with the Master EDR now. See Figure 6 to distinguish between the Master EDR board and the Slave EDR board, where the Master EDR board contains the i960 Real-time Processor.

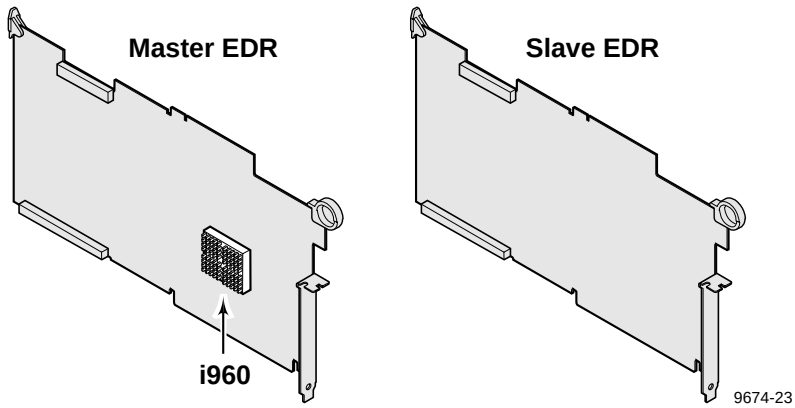

Figure 6. Distinguishing between Master and Slave EDR boards

2. Using a Torx tool with a T15 tip, install the two mounting bracket screws: one that anchors the top of the bracket from inside the chassis (see ❶ in Figure 7) and one that anchors the bottom of the bracket from the outside rear panel of the chassis (see ❷ in Figure 7).

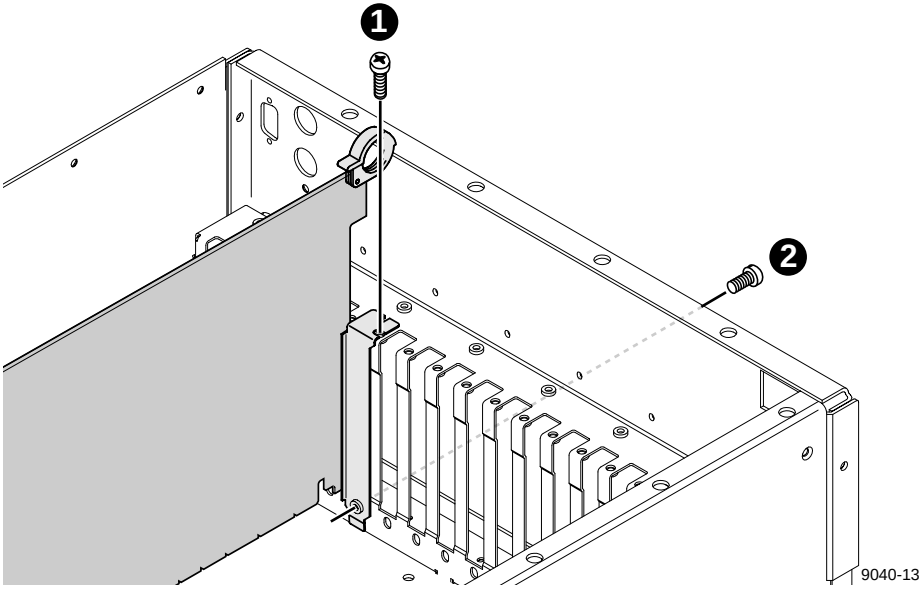

Figure 7. Installing the board mounting bracket screws

3. Connect the cable labelled **SCSI A** (shown in Figure 8) to the connector on the Master EDR board.
4. From your diagram, reconnect all other previously removed internal cables.

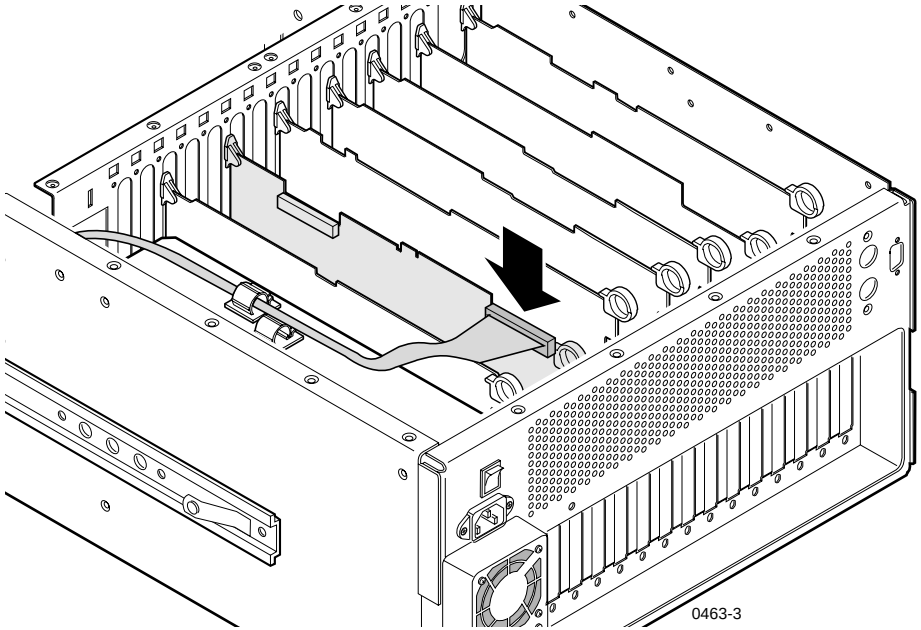

Figure 8. SCSI cable connection

Reinstalling Board Retainer Brackets

Before re-installing the short board retainer bracket, check it against the lay-out of the boards. Ensure that an extender is in every location where a short board is installed and that none are in locations where full sized boards are installed.

NOTE: To prevent damage to the Analog Composite Monitor board, if installed, ensure that an extender is not installed at the Analog Composite Monitor board location.

To move a short board bracket extender:

1. Use the Torx tool with the T15 bit and remove extender retaining screw (❶ in Figure 9) from the bracket.
2. Move the extender to the desired location on the bracket.
3. Ensure that the extender alignment nub is in the hole on the bracket and replace retaining screw (❷ in Figure 9).

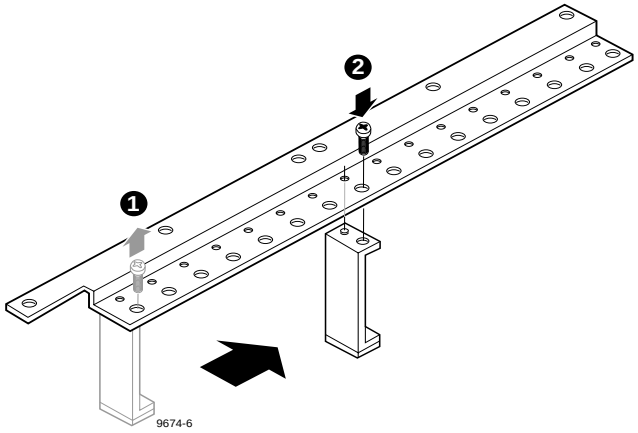

Figure 9. Short board retainer bracket and extender example

To re-install the short board retainer bracket:

1. Insert bracket (❶ in Figure 10) into the board area and ensure that the extenders are on the top edge of all short boards.
2. Use the Torx tool with the T10 bit to replace bracket retaining screw (❷ in Figure 10).

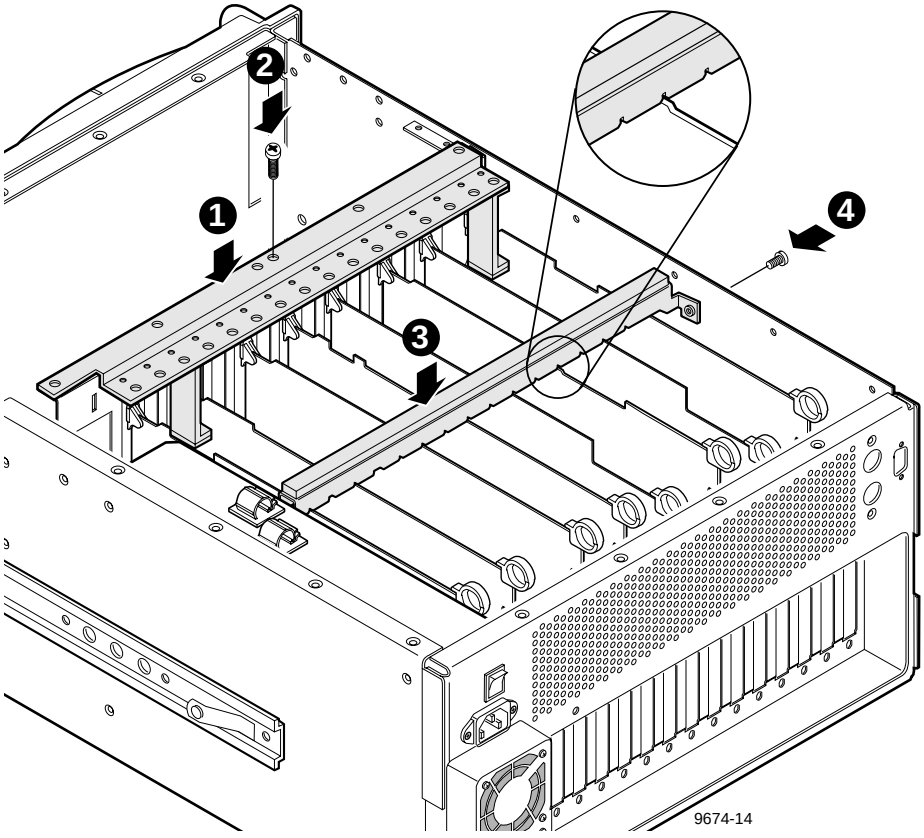

Figure 10. Board retainer bracket installation

To reinstall the full size board retainer bracket:

1. Place bracket (❸ in Figure 10) over the boards.
2. Align the full size boards to the correct bracket slots (see insert in Figure 10) and carefully seat the bracket onto the boards.
3. Use the Torx tool with the T10 bit to replace bracket retaining screw (❹ in Figure 10) at the side of the PDR100.

Installing EMI Compliance Components

NOTE: This procedure is only necessary if your PDR100 serial number is below B041650.

To ensure that your PDR100 remains compliant with EMI standards with the Master EDR board upgrade installed, you must:

1. Remove two cables behind the front panel and replace them with the cables included in this upgrade kit.
2. Install an EMI gasket inside the rear panel behind the power supply.

The following procedures explain how to perform these modifications.

Replacing the Cables

The replacement cable assemblies are shown in Figure 11 and Figure 12. These cables replace the existing cables behind the front panel. You must remove the front panel and its backing plate to replace these cables.

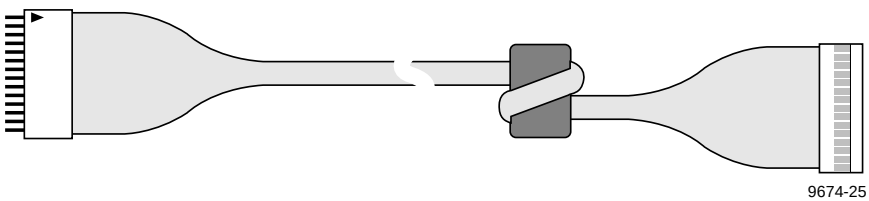

Figure 11. Front panel cable assembly

Figure 12. LED cable assembly

To remove the front panel and replace the cables:

1. Being careful to support the front panel, use the Torx tool with the T20 tip to remove the four screws that mount the handles and front panel to the chassis (see Figure 13).

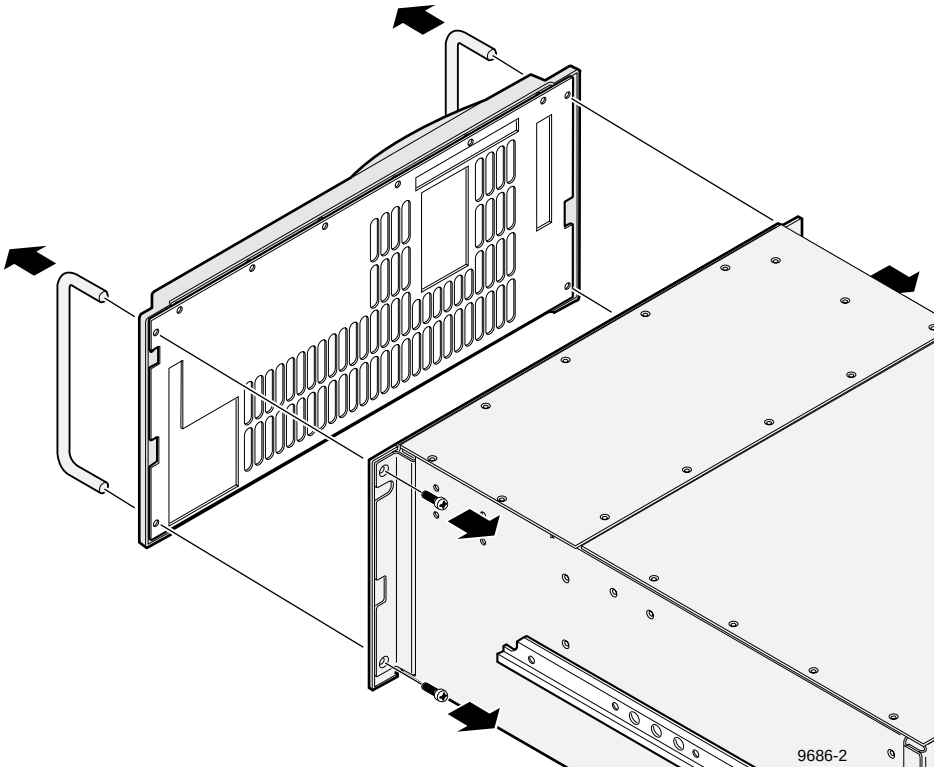

Figure 13. Removing the handles and front panel

2. Disconnect the LED cable from the top left of the chassis, and the On/Standby cable from the bottom right of the front panel as shown in Figure 14.

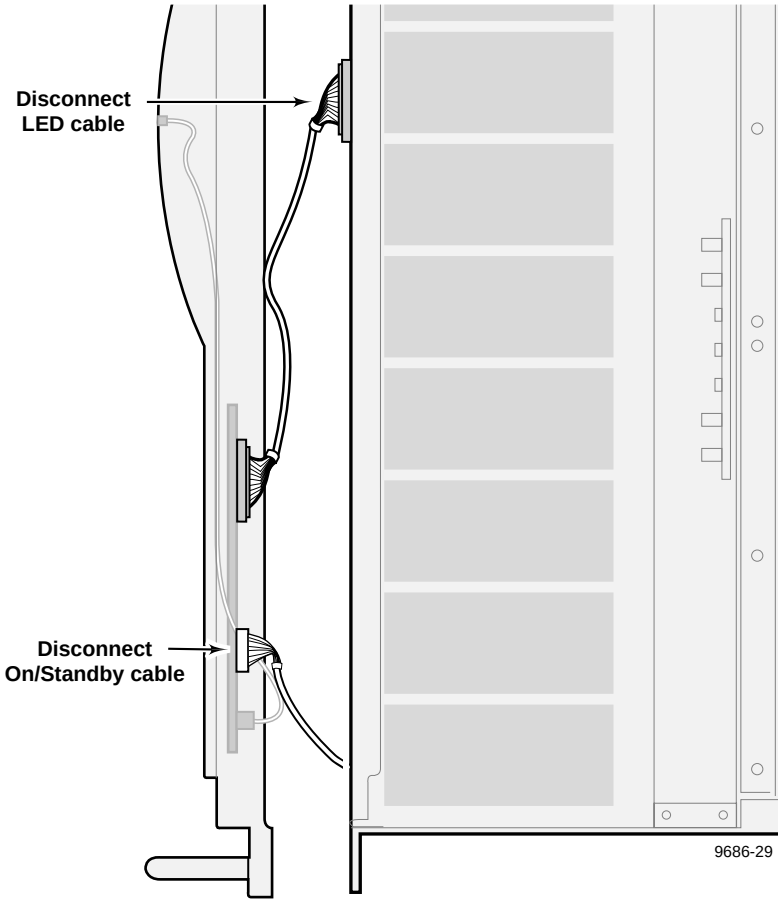

Figure 14. Disconnecting the front panel cables

3. Use the Torx tool with the T8 tip to remove the six screws that attach the backing plate to the rear of the front panel (see Figure 15) and set the backing plate aside.

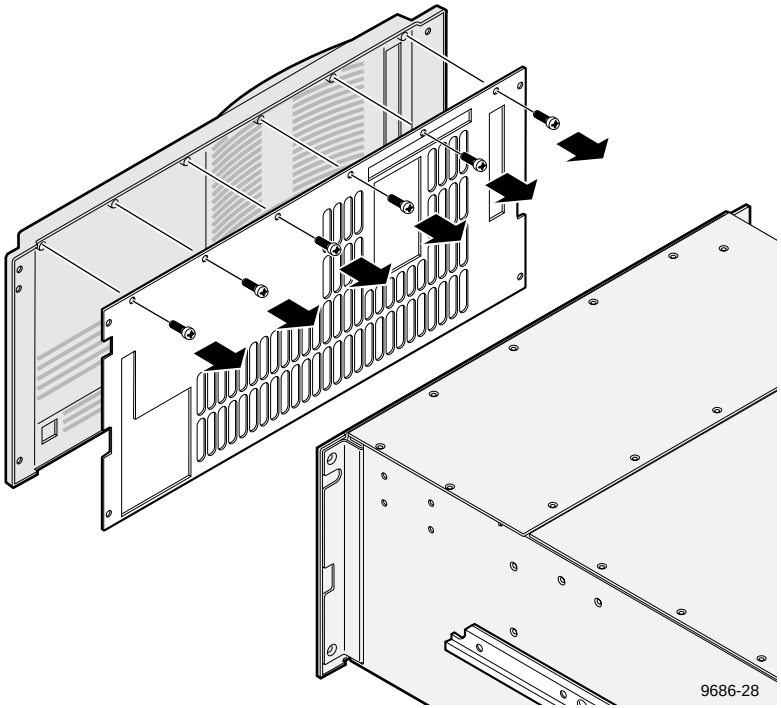

Figure 15. Removing the front panel backing plate

4. Refer to Figure 16 and replace the existing front panel cable and LED cable assemblies with the new ones shipped with this kit.

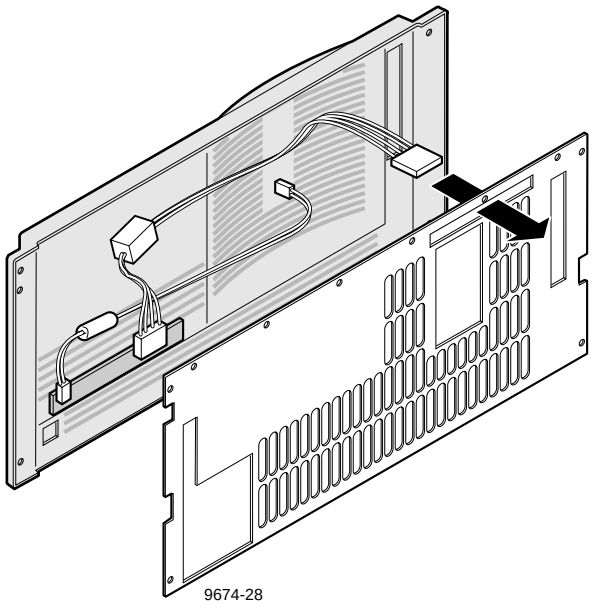

Figure 16. Installing the new front panel cable and LED cable assemblies

5. Reinstall the front panel backing plate (see Figure 15 and 16).
6. Refer to Figure 13 and 14 and reinstall the front panel with its cables and handles.

Installing the EMI Gasket

Installing the EMI gasket involves removing the power supply mounting screws so that the power supply can be slid toward the front of the unit. This gives access to the area where the EMI gasket will be installed.

To install the EMI foam gasket:

1. Use the Torx tool with the T10 tip to remove the four screws, shown as ❶ in Figure 17, which secure the power supply to the right side of the chassis.

2. Refer to ❷ in Figure 17 and slide the power supply toward the front panel of the chassis approximately 1 inch.
3. Remove the protective strip from the adhesive on the EMI gasket.
4. Carefully slip the gasket into the chassis between the power supply and the rear panel and attach it to the chassis just below the power cord connector cut-out as shown at ❸ in Figure 17.
5. Slide the power supply back into its original position and secure it to the chassis with the screws previously removed.

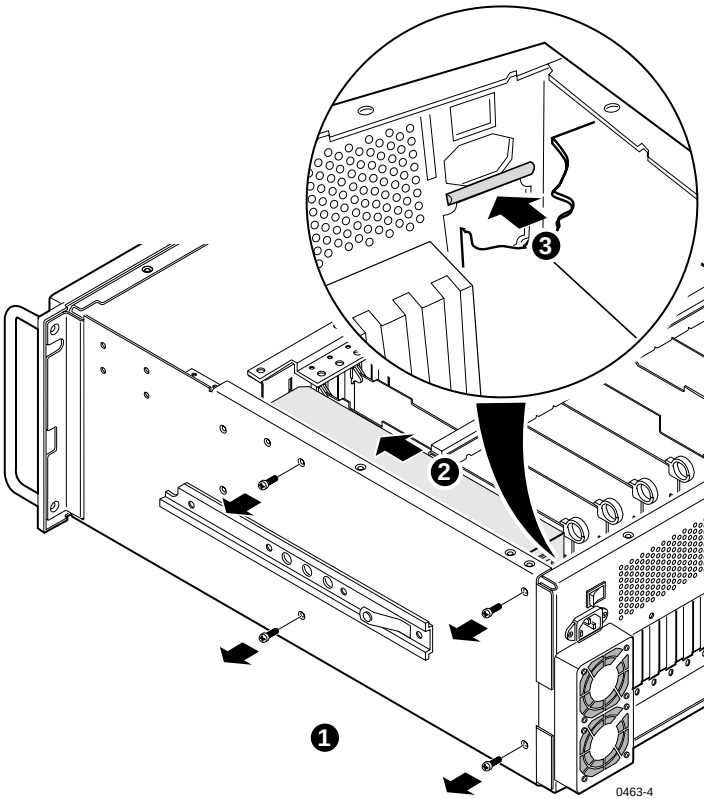

Figure 17. Installing the EMI gasket

Attaching Board Location Labels

A set of self-adhesive labels are included as part this upgrade kit. These labels are used when circuit boards are moved to other slot locations. If you have moved any circuit boards, use these labels to identify the new board locations. Figure 18 shows the location for the circuit board labels. If you need additional or different labels, contact your Grass Valley Group representative.

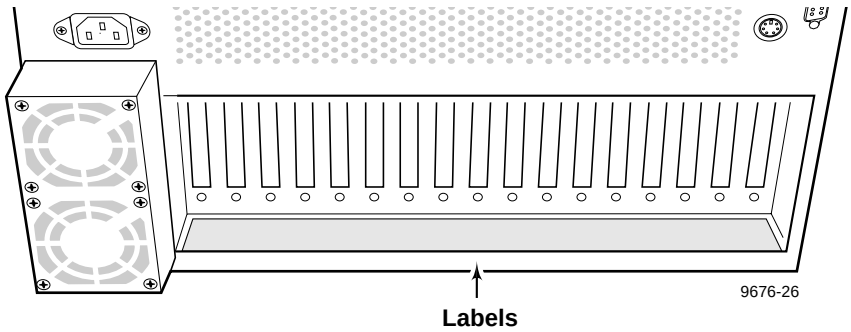

Figure 18. Board location labels

Replacing the PDR100 Covers

To replace the PDR100 covers:

1. Set board area cover in place (❶ in Figure 19) and use the Torx tool with the T10 bit to replace the twelve cover screws; eight on top and four from the side.
2. Set disk drive cover in place (❷ in Figure 19) and use the Torx tool with the T10 tip to replace the cover with the screws previously removed.

NOTE: Your PDR100 may have more disk drive cover screws than shown in Figure 19 if you have 9GB drives installed.

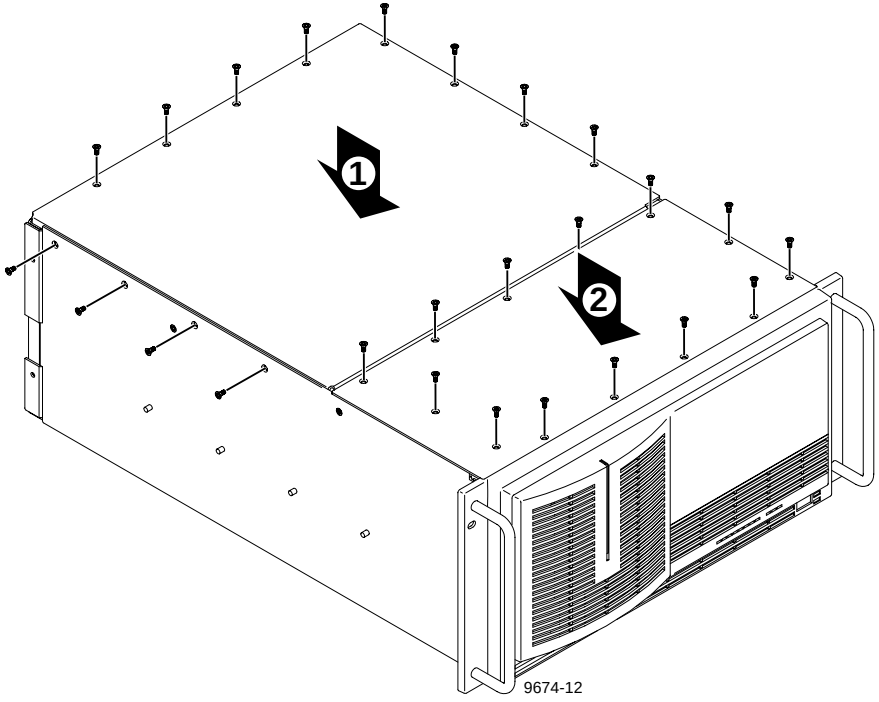

Figure 19. Replacing PDR100 covers

3. Reinstall the PDR100 in the rack. If necessary, refer to the *PDR100 Installation Manual* for rack mounting instructions.
4. Verify the installation. See “Verifying Installation” on page 25 for more information.

Verifying Installation

Verifying installation consists of ensuring that the system recognizes the Master EDR board using the Profile Configuration Manager. The Profile Configuration Manager graphic display shows all installed and recognized boards.

To check for Master EDR board recognition:

1. Power On the PDR100 and logon.
2. Start Profile Configuration Manager using one of the following instructions depending on your operating system:
   - Windows NT 3.51 - Select **PDR100 Applications** program group and then open **Profile Configuration Manager**.
   - Windows NT 4.0 - Select **Start | Programs | PDR Applications | Profile Configuration Manager.**
3. Look at the bottom of the Configuration Manager window to ensure that **Master DiskRec** appears in the slot where you have installed the Master EDR board. Refer to the example in Figure 20 on page 26.

NOTE: If you have a problem, refer to "If A Problem Occurs" on page 27

This completes the Master EDR installation procedure.

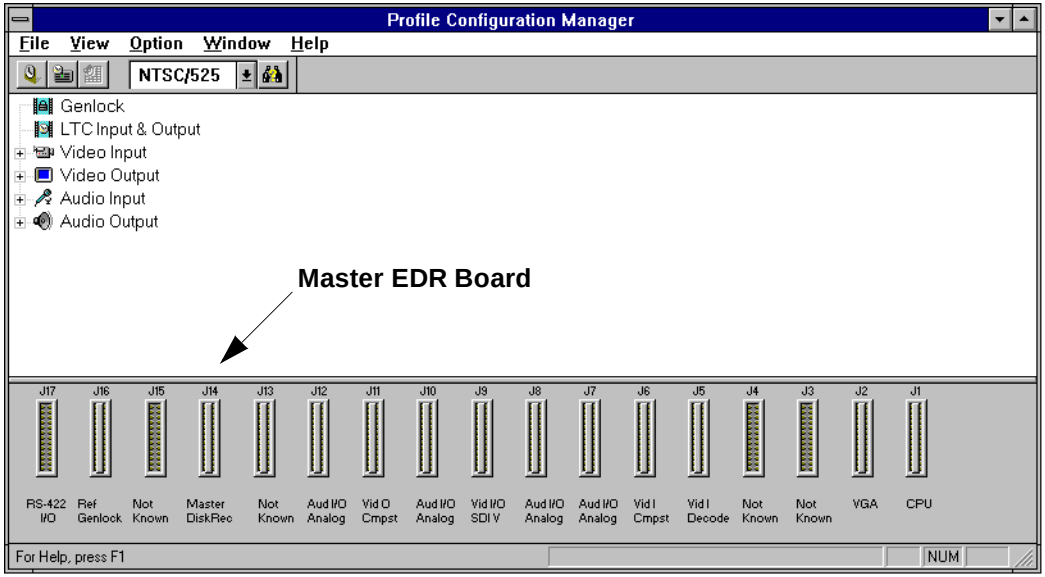

Figure 20. Configuration Manager showing Master EDR board installed

If A Problem Occurs

If you have a problem, first check that all connections are correct and power switches are On. Once you have done this, refer to the following sections for help in troubleshooting problems.

"Initializing Real-time Processor" Message

This message sometimes appears while Profile software is starting up. If the message remains longer that a few minutes and Profile application software fails to run, shutdown the PDR100 and restart the system. If the symptoms remain the same, contact Grass Valley Group Product Support (see "Grass Valley Group Product Support" on page v).

Running System Board Diagnostics

Run system board diagnostics if you still have a problem after rechecking all internal and external cable connections. System board diagnostics can indicate when there is a hardware fault.

To run system board diagnostics:

1. Quit all Profile system software by selecting **Quit** or **Exit** from the File menu.
2. Wait approximately 30 seconds after all applications are shutdown.
3. Start PDR Diagnostics using one of the following instructions depending on your operating system:
   - Windows NT 3.51 - Select **PDR100 Debug Tools** program group and then open **PDR Diagnostics**.
   - Windows NT 4.0 - Select **Start | Programs | PDR Debug Tools | PDR Diagnostics**

   When the diagnostics window is first opened, you may get a message

   Checking availability of VDR Services. Please wait.

   Wait approximately a minute for this message to clear from the screen before proceeding. If the message does not clear, cancel diagnostics and make sure that you have quit all other Profile applications, then restart diagnostics.

4. PDR Diagnostic window description:

   The PDR Diagnostic window is comprised of three panels. The panel on the left contains buttons which identify the boards installed in each of the slots, J1 - J17. (See the example in Figure 21.) Selecting a button brings up the test control buttons for that board's diagnostics in the upper right panel of the window and loads the i960 diagnostics program for that board. Selecting one of the tests executes that test and test results are then shown in the lower right panel of the diagnostics window as well as in the upper right hand panel.

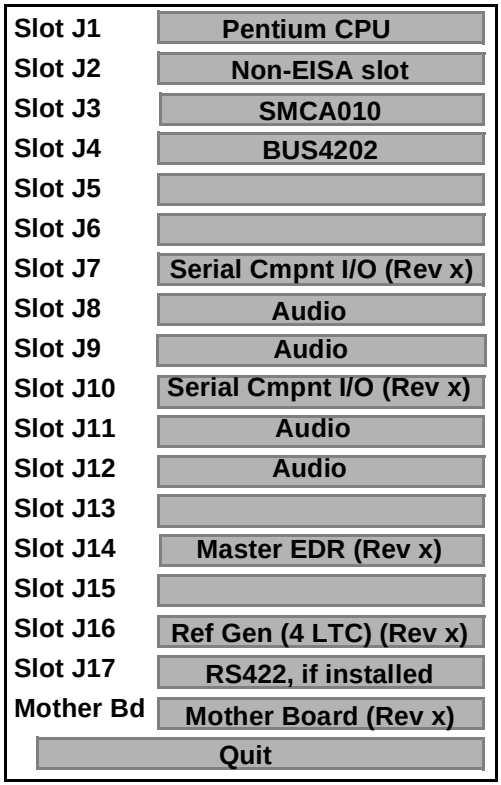

Figure 21. PDR Diagnostics window example

5. Select the **Master EDR** button in the board slot ID region on the **Main Diagnostics** window. Test control buttons for the Master EDR board appear.

   Another window, called **DRSTART** momentarily appears and is then replaced by a **GDB960** window and i960 diagnostics is loaded into EDR memory. Test results will appear in this window which remains open until you exit the Master EDR board menu.

6. When a **READY** prompt appears in the GDB960 window, select the **All Tests** button on the Master EDR board menu.

7. Observe the messages which appear in the GDB960 window. If any ****FAILED**** message appears, the Master EDR board is bad and needs to be replaced.

8. If no failures are noted, at the end of the tests, when **READY** re-appears, select Done in the Master EDR board menu.

9. From the Diagnostics menu bar, select **Tests | All Board Tests**.

10. This executes diagnostics for all installed boards. The All Board Tests diagnostic is dependent on the Master Enhanced Disk Recorder board previously tested. Fully loaded systems take from 10 to 15 minutes to complete the tests. Once initiated, you cannot cancel this diagnostics operation.

11. Select **Quit** to exit the Main Diagnostics window.

    If you have any board failures or any other unresolved installation problems, contact your Grass Valley Group representative; see “Grass Valley Group Product Support” at the front of this manual.

12. Once you have checked all the boards, shutdown and restart Windows NT.

    To shutdown and restart the PDR100:

    a. Press the CTRL+ALT+DEL key sequence.

    b. Select **Shutdown and Restart**.

    c. Select **OK**.

13. This concludes the procedure for running system board diagnostics.