EMULEX Performance™ 6000 Ethernet Terminal Server Hardware Installation Guide

ER2056101–00, Rev A
May 1992

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Effective: October 15, 1990

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REVISION HISTORY

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3–1 thru 3–8	A				
4–1 thru 4–8	A				
A–1 thru A–28	A				
Index-1 thru Index–4	A				
Comment sheet/ Mailer	A				

CONTENTS

FIGURES

TABLES

PREFACE

About This Manual

This guide describes the EMULEX Performance™ 6000 terminal server and provides instructions for installing and configuring the hardware. Installation of the host software and operation of the Performance 6000 with your network are described in separate documents, and are not included in this guide.

This guide consists of the following sections:

- **Section 1, Introduction** – describes the features of the Performance 6000, lists available accessories and gives the specifications of the server.
- **Section 2, Installation** – provides procedures for installing the Performance 6000. Installation includes unpacking and inspection, cabling to the network, and connecting network devices. This section also describes the location and function of controls and indicators.
- **Section 3, Upgrade Installation** – describes the procedures for installing upgrade modules such as additional port modules.
- **Section 4, Troubleshooting** – provides some hints for isolating hardware-related faults.
- **Appendix A, Cabling** – contains cable schematics and instructions for making your own serial port and parallel printer cables.

This guide concludes with an index and Reader's Comment card.

Please take a few minutes to fill out and return the Reader's Comment card at the back of this guide. Your comments will assist us in our continual efforts to improve our documentation.

Audience

This guide is intended for network managers who are responsible for the servers on their network and for installation personnel who are responsible for installing the network hardware.

Product Support

Emulex products are backed by a broad range of educational and technical support services. These customer support services are available to help you make the most effective use of Emulex products and maximize your system performance.

If you experience problems, review the installation procedures to be sure you followed all instructions. If you are unable to resolve the problem, call Emulex Technical Support at (800) 854–7112.

Related Documentation

For information on the Performance Series operational software and its command set, or using the server on the network, refer to the following documentation:

- The *Performance™ Series Product Overview* provides a general description of the servers in the Performance Series, lists each model's capacity, and contains a list of cables and accessories that may be used in connecting your server to the network.
- *Performance™ Series Troubleshooting Guide* provides assistance in identifying the probable cause of common problems associated with network server operations.
- *Performance™ Series Software Installation Guide for UNIX-based Network Load Hosts* provides procedures for installing the operating software on a UNIX-based load host and for configuring the host for operation with the server.
- *Performance™ Series Software Installation Guide for VMS-based Network Load Hosts* provides procedures for installing the operating software on a VMS-based load host, configuring the host for operation with the server, and configuring the server's ports for printers, terminals, and modems.
- *Performance™ Series TCP/IP-LAT Protocol and Command Reference* describes the complete command set and provides application examples for the TCP/IP and LAT protocols.

Section 1
INTRODUCTION

1.1 Overview

This section describes the EMULEX Performance™ 6000 terminal server, and lists the configuration accessories available from Emulex. The section also lists the specifications of the Performance 6000 server.

1.2 Product Description

The Performance 6000 is an Ethernet terminal server designed to connect a maximum of 88 asynchronous terminals or 80 asynchronous terminals and two parallel printers to host computers on a network using the TCP/IP or LAT protocol.

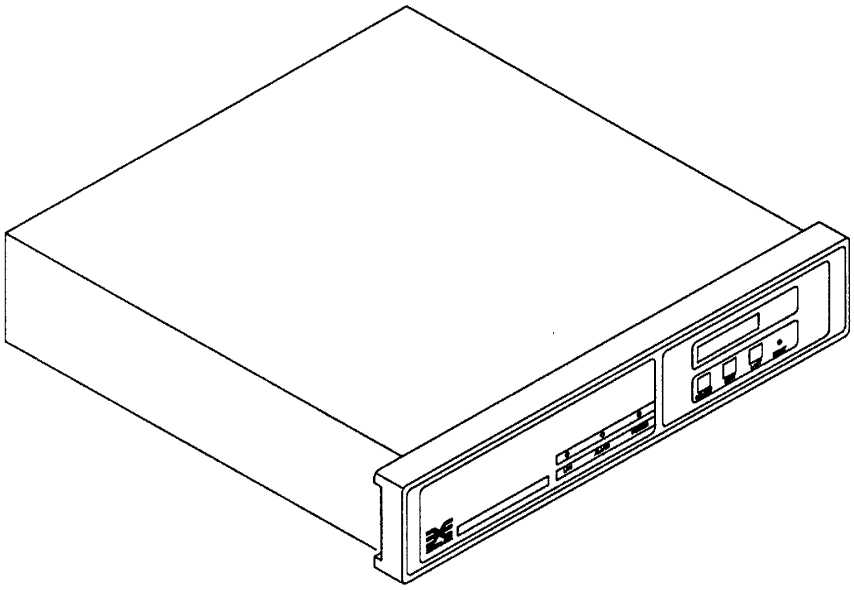
The Performance 6000, shown in Figure 1–1, is designed for mounting in a standard 19-inch RETMA equipment cabinet, or it may be placed on a table top if equipped with optional side panels, top cover, and feet.

The front panel contains three status LEDs, an LCD display, and three menu switches. The server may be configured by issuing commands from a console terminal, or by using the three menu switches and menus displayed on the LCD.

The rear panel contains twelve slots that may be populated with several combinations of plug-in port modules and network interface cards. Each port module provides eight terminal ports using either RJ12, MMJ, or DB44 connectors.

The Performance 6000 uses autosensing to assign port numbers, eliminating the need for user-configured jumpers or switches. Once the server is configured, all parameters are stored in electrically erasable random access memory (EARAM).

The standard Performance 6000 is configured as a network-load server, with operational software down-loaded from the host(s) at boot time. An optional module provides a self-load feature. This module may also be used to increase the server's memory from 2 Mbytes to 4 Mbytes.



P6K-01

Figure 1–1. Performance 6000 with Optional Sides and Top

1.3 Configuration Options and Accessories

The Performance 6000 may be ordered with your choice of Ethernet interface module and port configuration as follows:

- Ethernet Interface option, by server model:
  - Model PE6000B – Ethernet interface card with 15-pin Thickwire and a BNC ThinWire connector
  - Model PE6000T – Ethernet interface card with 15-pin Thickwire and an RJ45 Twisted-pair connector
- Ethernet interface and a maximum of 88 terminal ports; ports are contained in 8-port modules as follows:
  - RS-232 (DB44 connectors) with full-modem control
  - RS-232/RS-423 (RJ12 or MMJ connectors) with partial-modem control
  - Combination of partial-modem (RJ12) and full-modem (DB44) control ports
- Ethernet interface with two parallel printer ports and a maximum of 80 terminal ports, available in 8-port modules as described above
- Ethernet interface, 72 or 80 terminal ports (with or without printer ports), and self-load or memory expansion option

Table 1–1 lists the options available for the Performance 6000. For accessories such as cables, transceivers, and adapters, refer to the *Performance™ Series Product Overview.*

Table 1–1. Performance 6000 Options

Model Number	Description
PE6000SLR	Self-load with memory expansion (1 to 4 Mbytes)
PE6000SL	Self-load module
PE6000R	Memory expansion module (1 to 4 Mbytes)
PE6008	Port module with eight shielded RJ12 ports
PE6008J	Port module with eight unshielded MMJ ports
PE6008M	Port module, full modem, with two DB44 connectors (4 ports per connector)
PE6002P	Printer port module with two DB25 connectors
P6000TT	Table-top conversion kit

Table 1–2 lists the software kits for the TCP/IP-LAT protocol. Software must be loaded on the host unless the Performance 6000 is shipped with the self-load option.

Table 1–2. Performance 6000 Software Kits

Model Number	Description
PS6006MT1600	TCP/IP-LAT software, VMS load, 1600 bpi tape
PS6006TK50	TCP/IP-LAT software, VMS load, TK50 cartridge
PS6007MT1600	TCP/IP-LAT software, TFTP load, 1600 bpi tape
PS6007TK50	TCP/IP-LAT software, TFTP load, TK50 cartridge
PS6007SUN	TCP/IP-LAT software, TFTP load, 1/4-inch cartridge
PS6007HPCART	TCP/IP-LAT software, TFTP load, 1/4-inch cartridge
PS6007HPDAT	TCP/IP-LAT software, TFTP load, 8mm cassette

1.4 Features

The Performance 6000 terminal server contains a variety of features to enhance system performance and simplify configuration. These include:

- **Performance** – Based on an Intel 14-MHz 80386SX processor, aggregate throughput for an 88-port configuration is more than 50,000 characters per second.
- **Configuration versatility** – The Performance 6000 may be configured with 8 to 88 serial ports. Expansion ports are added by inserting 8-port modules.

  Port modules are available with RS-423, two-modem control signals, and with RS-232, full-modem control signals.

  Additional modules provide connection to parallel printers (2 ports), self-load firmware, and memory expansion to 4 Mbytes.
- **Standard connections** – Ethernet connections may be made using IEEE 802.3 15-pin transceiver cable, or BNC ThinWire cable.
- **Front Panel controls** – The front panel contains menu-selection keys and an LCD. The LCD displays server configuration menus as well as port status and system errors.
- **Small size** – The Performance 6000 supports 88 serial ports within a 3.5-inch high, rack-mount chassis.
- **Nonvolatile memory** – Configuration parameters are stored in NOVRAM. Changes to parameters may be temporary or permanent.
- **Power-up diagnostics** – On power–up, the entire server as well as the Ethernet cable are checked. Results are displayed on the front panel LCD.
- **TCP/IP and LAT-compatible protocol support** – The Performance 6000 supports the TCP/IP network protocol as defined by the U.S. Department of Defense (D.O.D.), and the LAT-compatible, Emulex Local Transport (ELT) protocol.
- **Ease of use** – A simple, yet powerful command set provides users and system managers quick access to functions for monitoring server status and configuring the server and ports.

- **Multilevel help system** – Help screens are provided for all server commands.
- **Typeahead Buffer** – The keyboard buffer is active for all ports in local mode.
- **Command line recall** – Previous command lines can be recalled by pressing the up-arrow key, and edited before executing.
- **Remote Console Facility (RCF)** – This feature allows the network manager to manage all terminal servers on the network from any port on the server.
- **Statistics** – The Performance 6000 maintains complete statistics for each port and the entire server. Statistics include traffic and error counts that may be continuously monitored and printed.
- **Verbose Mode** – Ports may be enabled for TELNET Verbose Mode, which displays all TELNET option negotiations with a remote terminal.
- **Raw TCP Mode** – This feature inhibits the TELNET command and option negotiation.

1.5 Functional Block Diagrams

Figure 1–1 is a block diagram of the Performance 6000 system architecture. Figure 1–2 is a block diagram of the Performance 6000 software.

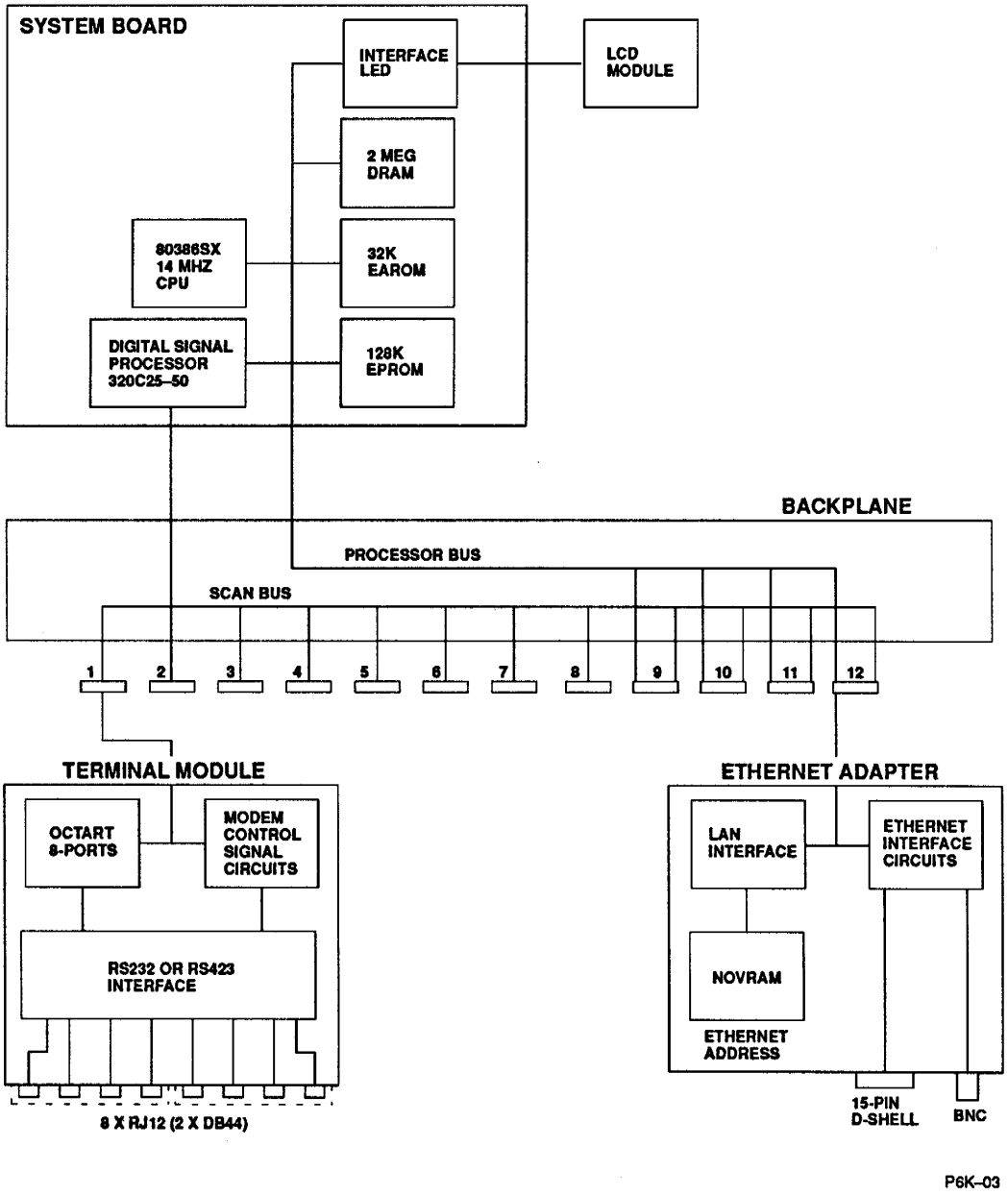


Figure 1–1. Performance 6000 System Architecture

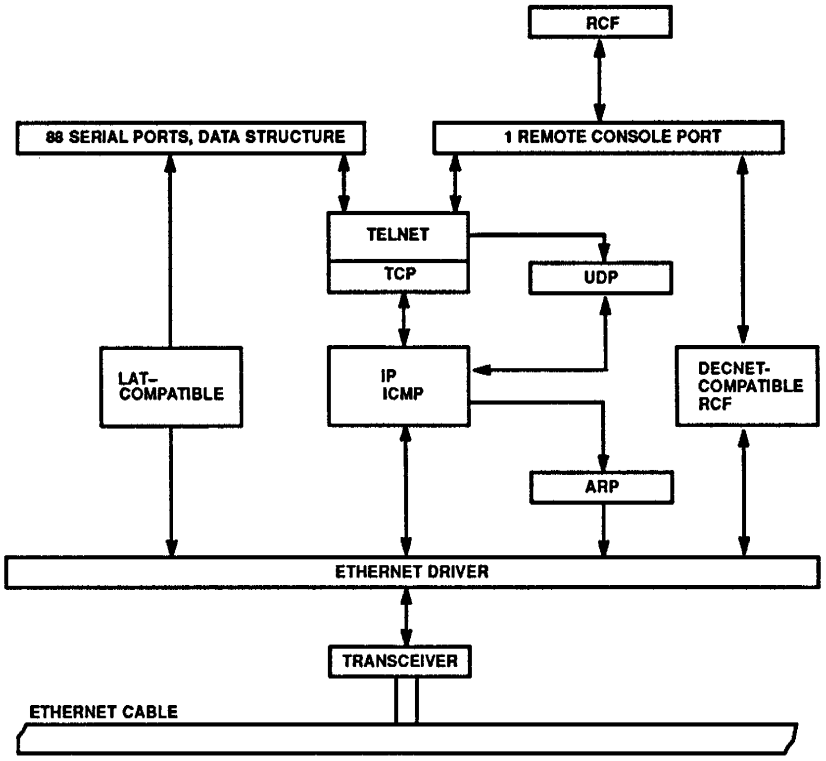


Figure 1–2. Performance 6000 Software Block Diagram

1.6 Specifications

Table 1–3 lists the specifications of the Performance 6000.

Table 1–3. Performance 6000 Specifications

Parameter	Range
Functionality	Allows asynchronous terminals to be connected to an Ethernet network
Compatibility	Ethernet Version 2, IEEE 802.3, 10base5, 10base2, 10baseT
Supported Protocols	TCP/IP, LAT
Operating Systems	AT&T System V UNIX (Release 3 and later) BSD UNIX (Release 4.3 and later) Interactive UNIX (Release 3.2 and later) SCO UNIX (Release 3.2 and later) SunOS (Release 4.0 and later) Ultrix-32 (Release 3.0 and later) VMS (R. 4.5 and later) and DECnet (Phase IV and later) RSX-11M-Plus (Release 3.0 and later) RSTS/E (Release 9.4 and later)
LAN Interface	Ethernet version 2 or IEEE 802.3, 10base2
Connectors	PE6000B – 15-pin D-shell, 10base2 (BNC) PE6000T – 15-pin D-shell, 10baseT (RJ45)
Serial Ports	8 minimum, 88 maximum in increments of 8
Configuration	Asynchronous DTE
Interface	RS-232, RS-423, V.24, V.28, X.26
Modem Signals	RTS, CTS, DSR, DCD, DTR (full modem; RS-232) DSR, DTR (partial-modem; RS-423)
Connectors	44-pin, sub-D-type (full modem) RJ12 (partial modem)
Transmission Speeds	75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19200, 38400 bps
Data Structure	
Character Length	5, 6, 7, or 8 bits
Stop Bits	1, 1.5, or 2
Parity	Odd, Even, Mark, Space, or None
Split Speed	All channels

Continued on next page

Table 1–3. Performance 6000 Specifications (Continued)

Parameter	Range
Parallel Ports	2 (optional)
Interface	Centronics or Dataproducts
Connector	DB25S (25-pin female)
INIT Line	Jumper-selectable (default is active low)
Server Maximums	
Simultaneous Sessions	Default is 96. Maximum of 254, limited by amount of RAM
Known Services	Configurable and limited only by amount of RAM
Known Nodes	Configurable and limited only by amount of RAM
Local Services	16
Virtual Circuits	Default is 96. Maximum of 254, limited by amount of RAM
Queue Entries	Default is 64. Maximum of 128, limited by amount of RAM
General	
Voltage	110 VAC to 220 VAC (autoranging), 50/60 Hz
Current	1.5 Amp maximum; 150 watts
Size	3.5 x 19 x 16 inches (8.9 x 48.3 x 40.6 cm)
Weight	20 pounds (9.1 kg)
Processor	80386SX, 14-MHz Zero wait-states
Co-processor	320C25 DSP, 50 MHz
Memory	2 Mbyte standard; 4.0 Mbytes optional
Agency Approvals	FCC Class A, UL, TUV, VDE, CSA, DOC, FTZ Class A, IEC 950, IEC 389
Environment	
Operating Temperature	41° to 109°F (5° to 43°C)
Storage Temperature	–68° to 151°F (–40° to 66°C)
Relative Humidity	10% to 95%

Section 2
SERVER INSTALLATION

2.1 Overview

This section describes how to install the Performance 6000 server hardware. Figure 2–1 is an example of a completed physical installation.

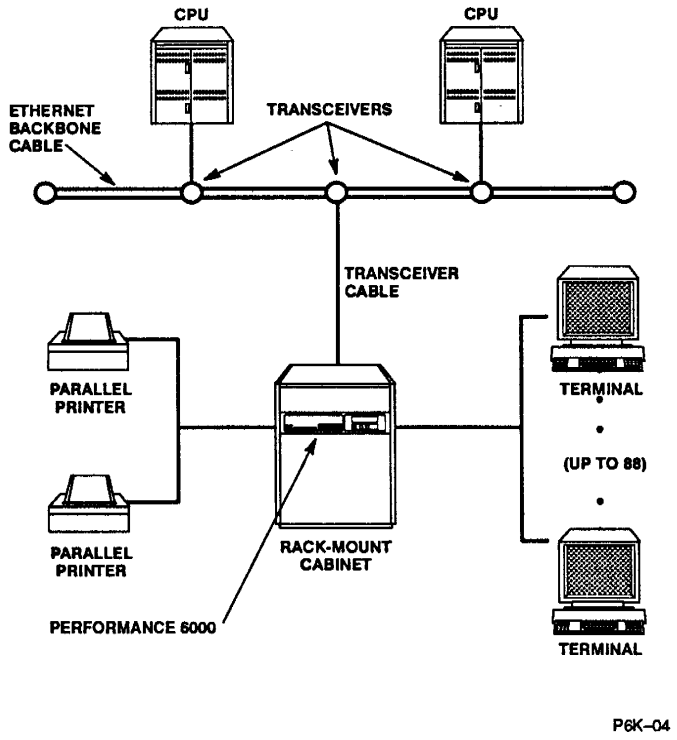


Figure 2–1. Typical Performance 6000 Installation

2.2 Maintaining FCC Compliance

The Performance 6000 is an enclosed subsystem that complies with FCC Class A limits for radiated and conducted radio frequency interference (RFI).

To ensure FCC compliance, do not compromise the integrity of the chassis shielding. Be sure to use shielded cables when connecting serial devices to the port adapter modules.

2.3 Installation Checklist

The following checklist is a summary of the steps required to install the Performance 6000 server hardware. Each step references the subsection that provides the appropriate instructions.

HARDWARE INSTALLATION CHECKLIST

- ☐ 1. **Plan the installation.** This step will ensure that your installation proceeds smoothly, and allows for future expansion (subsection 2.4).
- ☐ 2. **Inspect the Performance 6000 package.** First inspect the carton, server chassis, and any other parts included with the Performance 6000 package (subsection 2.5).
- ☐ 3. **Mount the server in the cabinet.** For rack-mount installations, the server is housed in a 19-inch RETMA cabinet (subsection 2.6).
- ☐ 4. **Install cabling.** The Performance 6000 must be cabled to the Ethernet and serial devices (subsection 2.7). You may wish to install the network software and perform the power-up self-test before installing the cabling.

2.4 Planning the Installation

Careful planning ensures that your installation will proceed smoothly and provide for future expansion.

2.4.1 Site Preparation and Requirements

The Performance 6000 chassis is designed to be installed in a standard 19-inch RETMA cabinet. Use the following guidelines when preparing your installation site:

- **Accessibility** – Allow sufficient space in front of the unit to permit access to the LCD display and function switches.

  Access to the rear of the unit is required for connection and routing of the Ethernet and serial port cables.

- **Ventilation and air conditioning** – To ensure adequate ventilation, the front and rear of the unit must be free of obstructions.

  The unit can operate safely in an environment with an operating temperature from 41° to 109°F (5° to 43°C). Relative humidity may range from 10% to 95%.

- **Power requirements** – The power requirement for a fully configured unit is 150 watts maximum; 100 to 220 VAC; 50 to 60 Hz.

2.4.2 Modem Signal Requirements

The Performance 6000 port modules provide either full-modem RS-232 ports or partial-modem RS-423/232 ports. The modem signals supported for each type of port are:

- **Partial-modem serial ports.** Each serial port supports the modem signals DSR and DTR, as defined in the EIA RS-232C standard. These ports can be used with serial terminals and some modems.
- **Full-modem serial ports.** Each serial port supports the modem signals DSR, DCD, DTR, RTS, and CTS, as defined in the EIA RS-232C standard. These ports can be connected to local terminals, serial printers, full- or half-duplex modems, data switches, and computer ports.

2.4.3 Serial Port Cabling Requirements

Be sure that you have the cabling accessories appropriate for your installation. These accessories include:

- DB44-pin-to-Telco 50-pin adapter cable; see Appendix A for cable pinouts
- Octopus cables that route signals from a 50-pin Telco connector to eight DB25 connectors
- Patch panels
- RJ12 modem cables and terminal cables
- DB25-to-RJ12 adapters
- Punchdown blocks that allow for custom wiring of several different types of connections

The *Performance™ Series Product Overview* lists the accessories and cables that are available from Emulex.

2.4.4 Static Handling Precautions

Static electricity can cause damage to some of the components on the Performance 6000 if precautions are not taken. Be sure to use proper antistatic procedures when handling any of the components that are part of the Performance 6000.

Wear a grounding strap around your wrist when handling the Performance 6000 chassis or components, and attach it to the metal surface of the equipment rack.

2.5 Unpacking and Inspection

Emulex products are shipped in containers designed to provide full protection under normal shipping conditions. When you receive your subsystem, immediately inspect the shipping container for evidence of damage. Report any obvious damage to the carrier in accordance with the instructions in the container.

To avoid damaging the equipment, do not pierce the carton with a sharp object, such as a utility knife. Cut the sealing tapes along the side of the carton and save the carton for possible reshipment. After unpacking the Performance 6000 subsystem, inspect the entire subsystem for damage. Be sure there are no cracks or dents in the outer chassis.

Use the shipping invoice to verify that all equipment is present. Also check that model or part numbers (P/N), revision levels, and serial numbers agree with those on the shipping invoice. These verifications are important to confirm warranty.

If you find evidence of physical damage or an incorrect shipment, notify an Emulex representative immediately.

2.6 Rack-Mount Installation

The Performance 6000 may be placed on a table or installed in a 19-inch, RETMA cabinet. Use the following procedure to install the chassis in the cabinet:

1. Remove the front bezel from the chassis by grasping the bezel at the top and bottom and pulling it forward.
2. Install the Performance 6000 chassis in the cabinet using four screws as shown in Figure 2–2.
3. Replace the front bezel by aligning the square cutout with the LCD display, and pressing the bezel onto the chassis.

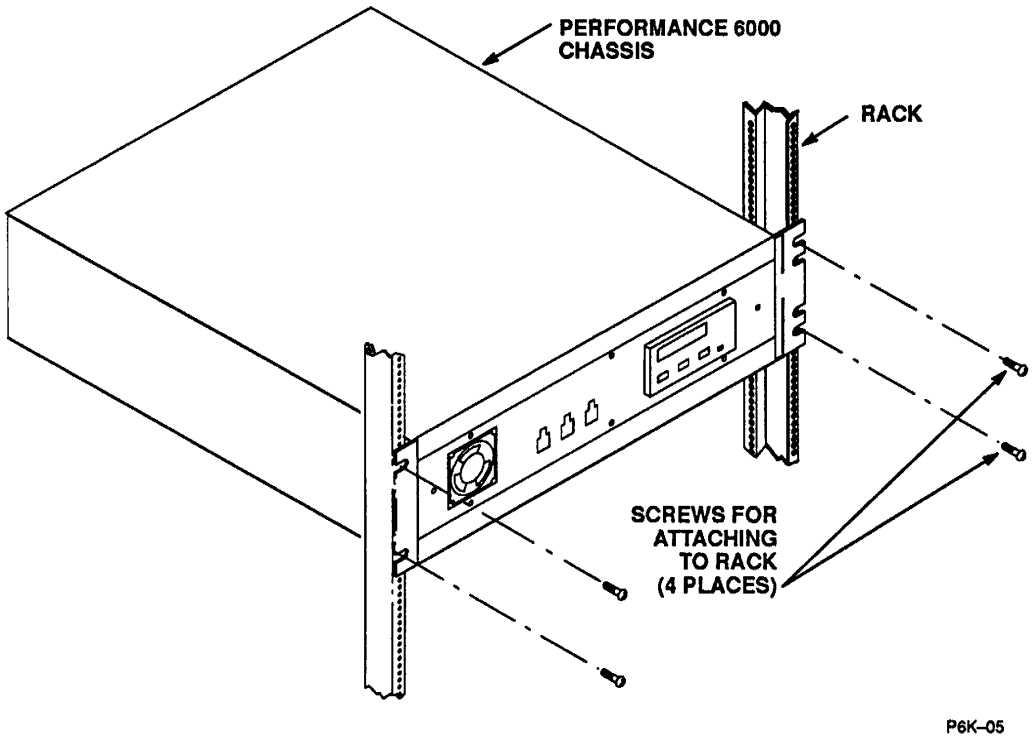


Figure 2–2. Installing the Chassis in a RETMA Cabinet

2.7 Installing Cabling

This subsection discusses how to install the Ethernet cabling and connect the serial devices.

2.7.1 Ethernet Cabling

The Performance 6000 can be physically connected to the network using either Thickwire or ThinWire Ethernet cable. If you ordered the twisted-pair Ethernet interface module, refer to subsection 3.4 for information on configuring the interface card and connecting the Ethernet cable.

CAUTION! Only one of the two connectors on the Performance 6000 rear panel can be used for any particular installation. The unused connector must not have a cable or terminator connected to it.

Use the following steps to connect the server to the network:

1. If you are connecting to your network using ThinWire cable with BNC connectors, skip to step 3.
2. Run a transceiver cable from the 15-pin Ethernet connector on the rear panel to a single or multiport Ethernet transceiver. Transceivers and cables are available from Emulex. Refer to the *Performance™ Series Product Overview* for ordering information.
   - Refer to the transceiver user's manual for detailed instructions on how to install the transceiver and cable it to the Performance 6000.
   - Do not attach anything to the BNC coaxial connector.
   - Proceed to step 4.

3. Attach the BNC coaxial T-adapter provided with your server to the BNC connector on the rear panel of the Performance 6000 as illustrated in Figure 2–3.

   CAUTION! If you are connecting the server to an active ThinWire Ethernet network, the following connection must be performed quickly to avoid interrupting the network for very long.

   - If you are connecting *within* a length of ThinWire Ethernet, connect the two ThinWire segments to the two sides of the BNC T-adapter.
   - If you are connecting *at the end* of a segment of ThinWire Ethernet, connect the Ethernet cable to one side of the BNC T-adapter and connect an Ethernet terminator (not supplied by Emulex) to the other side.
   - Do not attach anything to the 15-pin Ethernet connector.

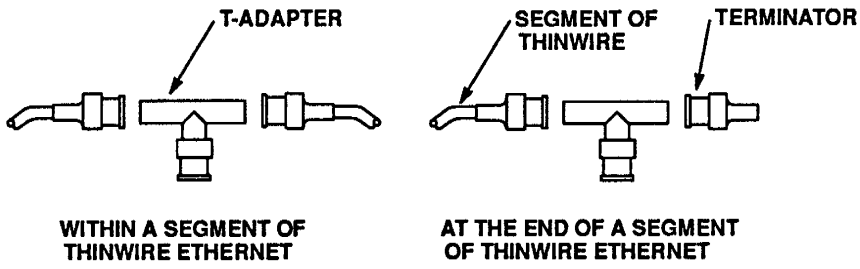


Figure 2–3. Attaching ThinWire Cable

4. Write down the server's Ethernet address, which is located on the rear of the Ethernet interface module as shown in Figure 2–4. You will need this address when you install the operational software and when you communicate with the server through the network.

2.7.2 Serial Port Cabling

The terminal connected to port 1 is automatically designated as the console. The console terminal displays status messages and is required to perform the initial server configuration.

Initially, the console terminal should be set to the default parameters of 9600 baud, 8-bit characters, no parity, and one stop bit. These parameters, as well as the console port number, can be changed after the server is initialized and operating.

Emulex recommends that you wait for the server to complete the power-up self-test and initialization process before you connect serial devices other than the console terminal.

Figure 2–4 shows the port numbering used with partial-modem RS-423 modules. These modules provide direct connection to individual ports using RJ12 connectors. The RS-423 modules support partial-modem RS-423 and RS-232 devices.

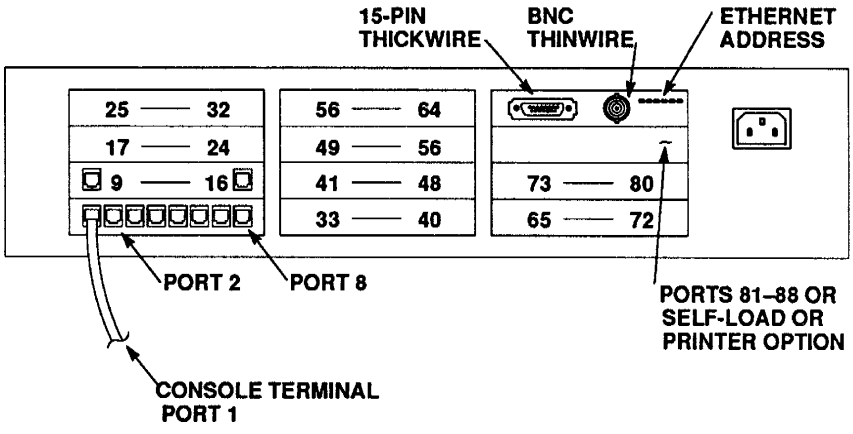


Figure 2–4. Port Locations – RS-423 Ports

Figure 2–5 shows the port numbering used with full-modem RS232 modules. These modules provide two DB44 connectors and require a breakout cable to separate each DB44 connector into 4 ports as shown in the illustration.

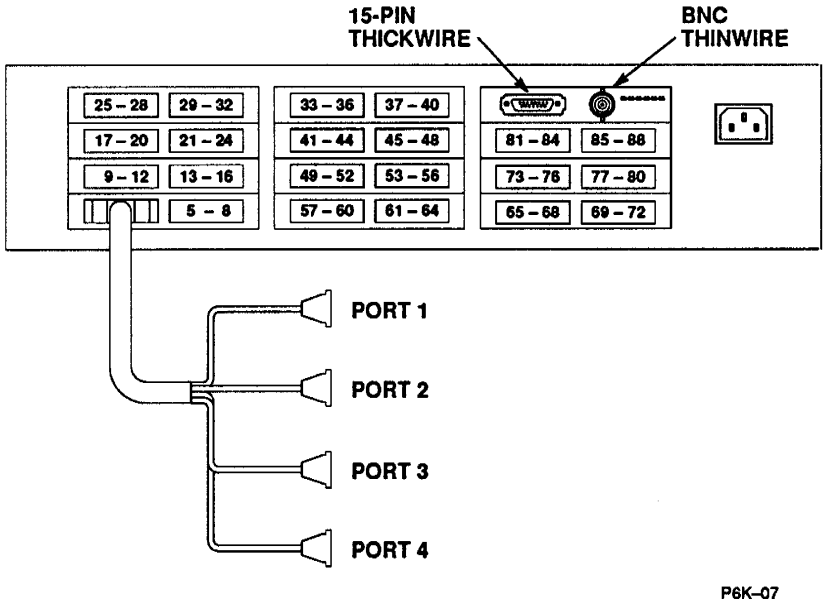


Figure 2–5. Port Location and Cabling – RS-232 Ports

2.8 Initial Power-up and Testing

Initial power-up and testing may be performed only after the Performance 6000 server's operational software is loaded on the host system. Refer to the appropriate *Performance™ Series Software Installation Guide* for the required procedures. If your Performance 6000 is equipped with the optional self-load module, this step is not required.

Figure 2–6 shows the location of the LCD and status LEDs on the front panel. Use the following procedure to perform the initial power up and self-test:

1. Connect the AC power cord to the power socket on the rear panel and the power source.
2. The green power LED illuminates and the LCD displays a series of test names and status.
    a. If a nonfatal error occurs, a messages appears on the console terminal (port 1) at the end of the test.
    b. If a fatal error occurs, the red Alarm LED illuminates, the test name appears on the LCD, and the test sequence stops. When this occurs, refer to Section 4 and the *Performance™ Series Troubleshooting Guide.*
3. If problems are detected in the Ethernet transceiver or cable, the LCD and terminal display the type of failure and an approximate location. Refer to the Error Message section of the *Performance™ Series TCP/IP-LAT Protocol and Command Reference* for information on interpreting these messages.
4. At the completion of the tests, the server loads the operational software and displays the message `Performance 6000` on the LCD. The status LEDs will be as follows:

Alarm LED:	OFF
LAN LED:	Flickering
Power LED:	ON

2.9 Controls and Indicators

Figure 2–6 shows the status LEDs, LCD display and menu switches, and reset button access on the Performance 6000 front panel.

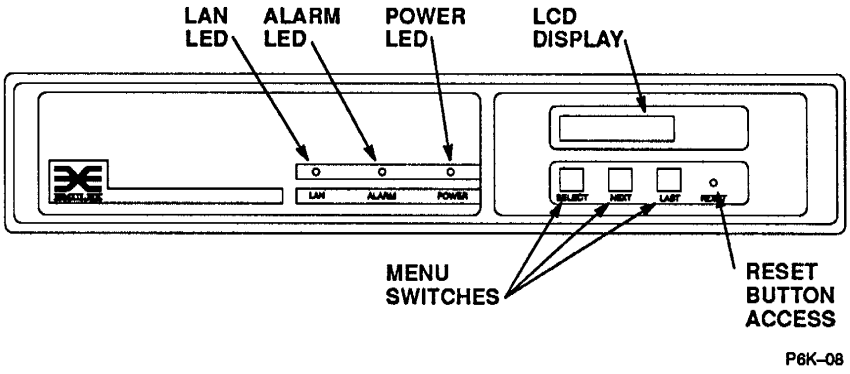


Figure 2–6. Performance 6000 Front Panel

The status LEDs include:

- **LAN** – Indicates Ethernet activity on the network. This LED flashes randomly when the server is operational and the network is active.
- **ALARM** – Indicates a self-test failure. This red LED blinks if a nonfatal error is detected. If a fatal error occurs, the ALARM LED will remain ON until the problem is corrected.
- **POWER** – Indicates the server power supply is functional. This green LED is always ON unless power is removed from the unit.

2.9.1 LCD Control Module

The LCD control module contains an LCD display and menu switches. The LCD display shows the results of all power-up tests and any error messages generated by the server. The menu switches provide access to menus for configuring the server and its ports, and access to status information about the server and attached devices.

The menu switches and their function are:

- **SELECT** – When a menu item is displayed, press the Select switch to execute or select that option or display the next menu level.
- **NEXT** – Press the Next switch to scroll forward through menu levels and items within a menu. When the display shows the default message (`Performance 6000`), press Next to initiate the menu display.
- **LAST** – Press the Last switch to scroll backward through menu levels and items within a menu.

To return to the default message display, press Next and Last simultaneously.

2.9.2 Reset to Factory Default Parameters

To erase the server's internal configuration memory (EAROM) and return it to the factory default parameters:

1. Remove the front bezel, by grasping the top and bottom and pulling the bezel forward, to gain access to the Reset switch. Alternatively, the Reset switch may be pressed by inserting a thin rod into the hole in the bezel.
2. Press the Next and Last switches and hold them while pressing and releasing the recessed Reset switch.
3. Hold the Next and Last switches until the display shows `EAROM RESET`.
4. Release both switches and replace the front bezel.

This procedure completely erases any changes you may have made. All service options, server options, and port options are reset to their original factory settings. After the EAROM is reset, the server will run its power-up self-test and download the operational software.

Section 3
INSTALLING UPGRADES

3.1 Overview

This section describes the procedures for adding port modules to increase the number of serial ports or adding parallel printer ports to the Performance 6000. This section also describes how to install a module to provide self-load capability or to increase system memory.

3.1.1 Backplane Slot Assignments

The Performance 6000 backplane is illustrated in Figure 3–1, showing the identification of each slot. To avoid system conflicts, Emulex recommends the following organization of serial, printer, and option modules:

- Slot 12 is reserved for the Ethernet Interface card.
- Slots 10 and 11 may be used as follows:
  - The option module must be installed immediately below the Ethernet Interface, in slot 11.
  - The printer port module must be installed in the highest numbered slot not occupied by the interface or option module.
- Slots 1 through 11 may be used for port modules as follows:
  - Populate the remainder of the backplane in ascending sequence, starting with slot 1 and working toward slot 11.

NOTE: The Performance 6000 automatically assigns port numbers based on the card slot.

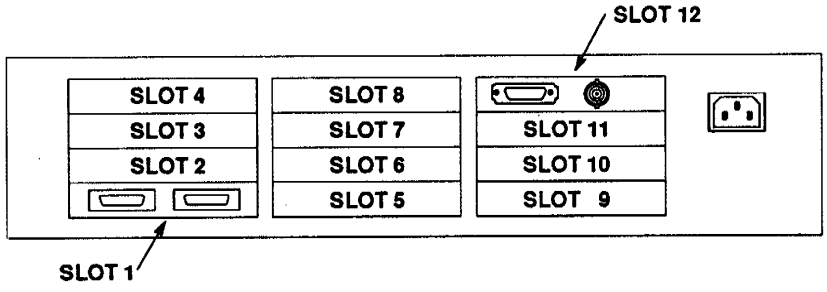


Figure 3–1. Backplane Slot Assignments

3.2 Installing Serial Ports

The installation procedure for serial port modules is identical for the RS-232 and RS-423 versions. When adding port modules, be sure to fill the slots starting with the lowest numbered slot available.

To install a serial port module:

1. Ensure that all users are logged off the server ports, then power down the server.
2. Use a small screwdriver to loosen the captive retaining screws on the cover plate of the desired slot.
3. Insert the port module into the slot and press firmly to seat the card in the backplane.
4. Use a small screwdriver to tighten the two retaining screws. Restore power to the server.
5. Configure the additional ports as required.

3.3 Installing Printer Ports

For best results, the printer port module should be installed in the highest numbered slot available (slot 10 or 11).

If the printer requires the INIT line to be active high (default is active low), jumpers J1 and J2 must be changed before installing the printer port module. Figure 3–2 shows the location of these jumpers and their settings.

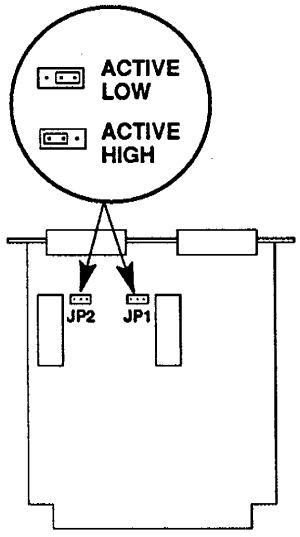


Figure 3–2. Printer Port Module Configuration

To install a printer port module:

1. Ensure that all users are logged off the server ports, then power down the server. Use a small screwdriver to loosen the two captive retaining screws on the cover plate of slot 10 or 11.
2. Insert the port module into the slot and press firmly to seat the card in the backplane.
3. Use a small screwdriver to tighten the two captive retaining screws.
4. Power up the server. The unit will automatically assign and configure the two printer ports as follows:
   a. Slot 10 – Printer ports 73 and 74
   b. Slot 11 – Printer ports 81 and 82

3.4 Installing the 10baseT Ethernet Module

The Performance 6000 may be ordered with the 10baseT (twisted-pair) Ethernet module. This configuration provides direct connection to the Ethernet via standard (15-pin) Thickwire, or twisted-pair cables.

Before using the 10baseT Ethernet module you must configure it for your installation. Figure 3–3 shows the locations of the configuration jumpers; Table 3–1 lists the jumpers and their functions.

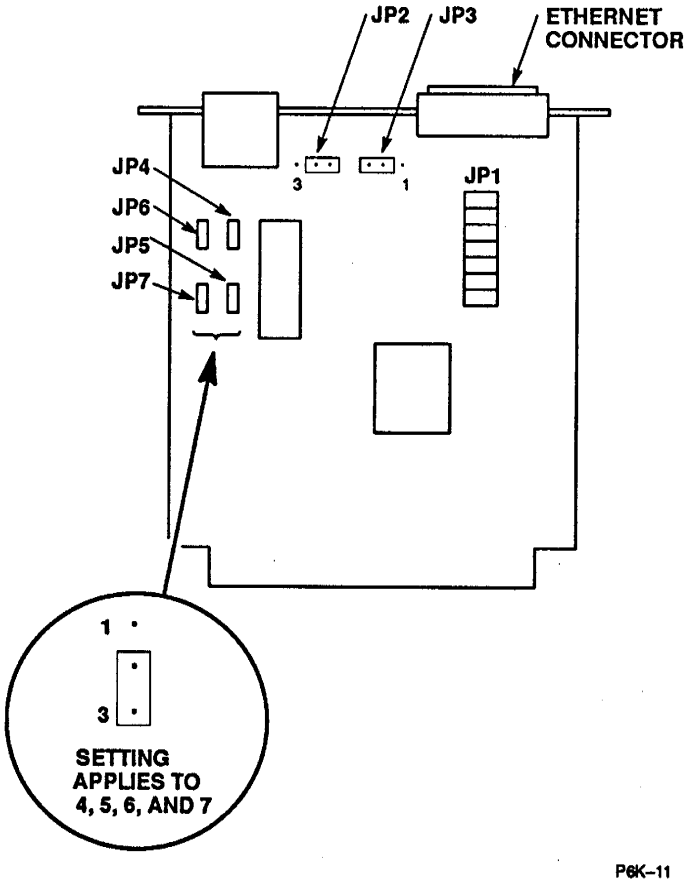


Figure 3–3. 10baseT Module Configuration Jumpers

Table 3–1. Function of 10baseT Jumpers

Jumper	Pins*	Function
JP1	**All IN** All OUT	**Twisted-pair or standard Ethernet** Standard Ethernet only
JP2	**1–2** 2–3	**SQE disabled** SQE enabled
JP3	1–2 **2–3**	Link test disabled **Link test enabled**
JP4 – JP7	1–2 **2–3**	External signal cross-over **Internal signal cross-over**
***Bold type** indicates factory default.		

JP1 is set at the factory for connection to either the standard AUI connector or the RJ45 10baseT connector.

Jumper JP2 should not be changed from the default setting; the Performance 6000 does not support SQE.

If the devices on your network do not support Link Test, you must disable Link testing using JP3. If this is not done, the server detects and reports Link failures.

Jumpers JP4 through JP7 must be set to match the type of modular cable used to connect the server to the Ethernet cable as follows:

NOTE: JP4 through JP7 are used in conjunction with the RJ45 10baseT connector only.

- External cross-over if you are using a cross-over (null-modem) cable
- Internal cross-over if you are using a straight-through (standard) cable

To install the 10baseT Ethernet module in your server:

1. If you are replacing a standard module, first ensure that all users are logged off the server ports, then power down the server. Use a small screwdriver to loosen the two captive retaining screws on the existing module in slot 12 and remove the module.
2. Insert the 10baseT module into slot 12 and press firmly to seat the card in the backplane.
3. Use a small screwdriver to tighten the two captive retaining screws.
4. Connect the server to the Ethernet cable using either a standard (15-pin) AUI cable or the appropriate 10baseT (modular) cable.
5. Power up the server.

The rear panel of the 10baseT Ethernet module has a set of LEDs that indicate network and server status. Figure 3–4 shows these LEDs and Table 3–2 describes their functions.

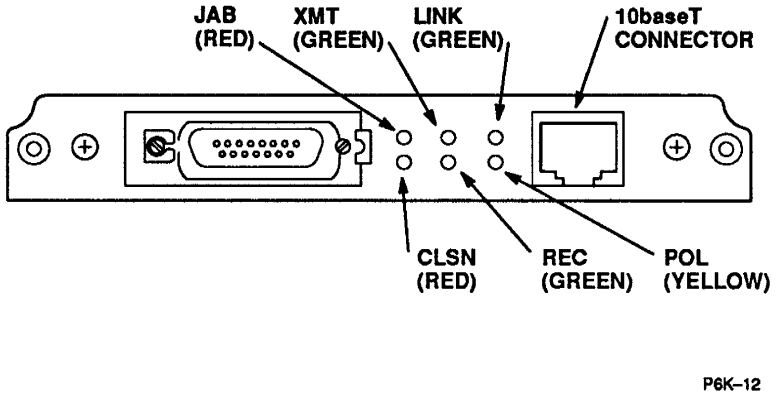


Figure 3–4. LEDs on 10baseT Module

Table 3–2. 10baseT Module LEDs

LED	Function
JAB (red)	ON Transmission exceeded a preset time period OFF Normal
XMT (green)	ON Transmit activity OFF Transmit idle
LINK (green)	ON Connection normal (Link enabled) OFF Connection failure
CLSN (red)	ON Collision occurred OFF Normal
REC (green)	ON Receive activity OFF Receive idle
POL (yellow)	ON Reversed polarity detected and corrected OFF Normal polarity

Section 4
TROUBLESHOOTING

4.1 Overview

This section provides procedures for troubleshooting and correcting most problems related to the Performance 6000 hardware. Refer to the Error Message section in the *Performance™ Series TCP/IP-LAT Protocol and Command Reference* and the *Performance™ Series Troubleshooting Guide* for identifying and correcting problems related to the software or the network.

Subsection 4.2 gives procedures for isolating a defective module and subsection 4.3 provides information for obtaining Emulex service and technical assistance if you have to replace a component or return the unit for repair.

4.1.1 Power-Up Self-Test Error Messages

During the power-up self-test, the Performance 6000 runs a number of tests designed to verify proper operation of the various components of the server.

If one of the tests fails, the self-test halts and the name of the failed test is shown on the LCD display, followed by the word FAIL. The self-test error message indicates which major functional block has a problem. Table 4–1 lists the test name and the server module(s) associated with each test.

To initialize the self-test, either cycle the AC power or press the recessed Reset button on the front panel.

Table 4–1. Power-Up Self-Tests

Major Test (Assoc. Module)	Subtest	Test Description
PROM (System Board, Expanded Memory)	CKSF1 CKSF0 CKSE1 CKSE0	EPROM checksum segment F, MSB EPROM checksum segment F, LSB EPROM checksum segment E, MSB EPROM checksum segment E, LSB
RAM (System Board up to 1 Mbyte)	SEG 0 : SEG F SEG #	DRAM data and address, segment 0 : DRAM data and address, segment F DRAM Intra-segment address
THERM (Fans)	SWTCH	Displays thermal switch status
EAROM (Power Supply)	LOCK	Verify voltage threshold
X_RAM (System Board Expanded Memory)	SIZE	Read/Write to DRAM above 1 Mbyte
INTRP (System Board)	INT NMI	Verify basic program logic Verify NMI interrupts
AIOP (System Board)	RAMD RAMA LOAD SELF MEM ADR BOOT	Verify AIOP RAM data path Read/Write AIOP RAM with address complement Read/Write AIOP RAM with data Boot AIOP and verify Verify data path: AIOP–80386 Verify address path: AIOP–80386 Verify operation of AIOP
ASYNC (Port modules)	BASIC ILP	Basic operation of AIOP and Octarts Internal loopback test on all ports
LAN (Ethernet Interface Module)	BASIC INTRP ILP COLL XADDR XLP	Check data path for LANCE Verify LANCE interrupt to 80386 Verify LANCE internal loopback Verify LANCE collision detect Verify address path for LANCE Verify LANCE chip can transmit and receive in external loopback mode

4.1.2 The Console Port

If a problem occurs, always check the console port for error messages. All fatal error messages and server-wide status messages are directed to the console port. Error and status messages that affect only a single port are normally directed to the affected port.

If you have disabled the console port (via the SET SERVER CONSOLE command), you should reenable it, then try to recreate your problem. (Be sure that Options 5 and 6 are enabled to receive all console information and warning messages.) The error message may lead you to the problem's cause. Refer to the *Performance™ Series TCP/IP-LAT Protocol and Command Reference* for an explanation of how the console port operates and for a description of all Performance Series status and error messages.

4.2 Isolating Server Problems

Server-related problems are discussed in the following subsections:

Subsection	Server Module
4.2.1	Port modules
4.2.2	Ethernet interface
4.2.3	Power supply
4.2.4	Cooling fans
4.2.5	Main system board

4.2.1 Port Module Problems

If one or more individual ports is inoperative, or if the self-test generated an ASYNC ILP or ASYNC BASIC error message, the port adapter module is suspect.

The ports are tested only in *internal* loopback mode during the power-up self-test. To test the ports in *external* loopback mode, you must install loopback plugs and use the Test Port function of the Performance Series operational software.

To isolate a suspect port module, swap the module with one that is functioning.

4.2.2 Ethernet Interface Problems

The following problems may indicate an Ethernet interface module malfunction:

- The server is unable to load its operational software from a network load host.
- All ports are unable to communicate over the Ethernet.
- The self-test generates any of the following errors:

  LAN BASIC FAIL
  LAN INTRP FAIL
  LAN ILP FAIL
  LAN COLL FAIL
  LAN XADDR FAIL
  LAN XLP FAIL

- An inordinate number of Ethernet failures is reported by the SHOW SERVER COUNT and SHOW SERVER COUNT ELT display.

The Ethernet address PROM located on the port adapter module is checked during the LAN Address test. Failure of the PROM results in the message:

LAN BASIC FAIL

The power-up self-test checks most of the Ethernet circuitry with the LANCE (Local Area Network Controller for Ethernet) chip, in internal loopback mode.

4.2.3 Power Supply Module Problems

The following symptoms may indicate power supply problems:

- Intermittent failures – may be caused by noise on the +5V supply.
- The message EAROM LOCK FAIL during self-test – indicates the +5V supply is delivering less than +4.75V.
- Erratic garbled, or inoperative serial ports – may be caused by incorrect voltage from the ±12V supply.

The power supply provides +5V for the digital logic, as well as ±12V for the RS-232 interface.

4.2.4 Cooling Fans

The system board contains a thermal switch that turns ON when the internal temperature exceeds 64°C (147°F). This switch is read by the THERM SWTCH test.

If self-test displays the message, THERM SWITCH FAIL, check your server installation for any restrictions to air flow. If air flow is not restricted, it is likely that the cooling fan(s) have failed and must be replaced.

Under normal conditions, the temperature is below 64°C, and the test displays PASS.

4.2.5 Main System Board

The following self-test error messages indicate failure of components on the main system board:

- RAM SEG*n* FAIL
- PROM CKS*xx* FAIL
- INTRP INT FAIL, or INTRP NMI FAIL
- AIOP xxxx FAIL

The main system board routes data between the network and the serial ports. If the system board is malfunctioning, all serial ports will be inoperative.

The following are examples of malfunctions that could be mistaken for system board problems:

- A few ports are inoperative and failures outside the server subsystem have been ruled out. Check for external problems such as a cabling problem or damage caused by an electrical storm.
- Users can log into the server locally, but cannot connect to any devices (hosts, other servers) on the Ethernet. Check the Ethernet interface module.
- Devices on the Ethernet can "see" the Performance 6000, but users cannot log onto the server. Check for a problem with the asynchronous circuitry on the port module.

4.3 Emulex Service

If you are unable to solve your problem after following the instructions in this section, call Emulex Technical Support at the number below. They can suggest further troubleshooting procedures and can also authorize return of your Performance 6000 to the factory for repair, if that is necessary.

Do not return a component to Emulex without authorization. Before returning a component to Emulex, whether it is under warranty or not, you must contact the factory or the factory's representative for instructions and a Return Materials Authorization (RMA) number. A component returned for service without an authorization will be returned to you at your expense.

In the continental United States, Alaska, and Hawaii contact:

Emulex Technical Support
3545 Harbor Boulevard
Costa Mesa, CA 92626
Outside California: (800) 854-7112
Inside California: (714) 662-5600
FAX: (714) 966-1299

Outside of the United States, contact the distributor from whom the server was initially purchased.

After you have contacted Emulex and received an RMA, package the component (preferably using the original packing material) and send it *postage paid* to the address given to you by the Emulex representative. You must also insure the package.

Appendix A
CABLE SCHEMATICS

A.1 Overview

This appendix provides schematics and pin/signal assignments for cables that may be used with the Performance 6000. Use the list below to help you locate information on specific cable types.

Subsection	Description
A.2	General Cabling Information
A.3	RS-232 Serial Cabling
A.4	RS-423 Serial Cabling
A.5	Parallel Printer Cabling

A.2 General Cabling Information

This subsection provides general information that applies to both the RS-232 and RS-423 serial port modules, including the following:

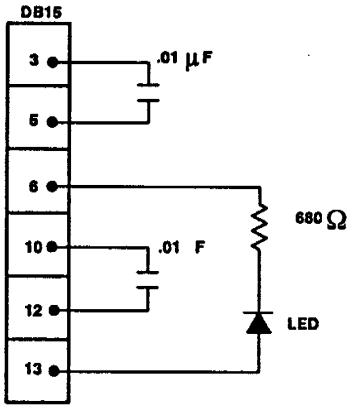
- Ethernet loopback connectors
- Pinouts for the 44-pin adapter cable
- Pinouts for Telco connectors and a punchdown block
- Serial cable considerations
- Serial loopback connector

A.2.1 Ethernet Loopback Connector

The Ethernet loopback connector is used for diagnostic testing. It requires DB15S connectors. Loopback connector pin assignments and schematics are shown in Table A–1 and Figure A–1, respectively.

Table A–1. Ethernet Port Pin/Signal Assignments

Pin No.	Signal Name	Pin No.	Signal Name
1	Ground	8	Ground
2	Collision +	9	Collision –
3	Transmit +	10	Transmit –
4	Ground	11	Ground
5	Receive +	12	Receive –
6	Power –	13	Power +
7	Not Used	14	Ground
		15	Not Used



(NOT AVAILABLE FROM EMULEX)

NOTE: THE CONNECTION BETWEEN PINS 6 AND 13 IS OPTIONAL.

PKC–05

Figure A–1. Thickwire Ethernet Loopback Connector

A.2.2 ThinWire Ethernet Loopback Connector

Function BNC ThinWire loopback connector for ThinWire diagnostic testing

Connectors Two BNC coaxial 50-Ohm terminators; one BNC coaxial T-adapter (not supplied with the Performance 6000)

Cable Type None

Notes For further information, contact Emulex Technical Support.

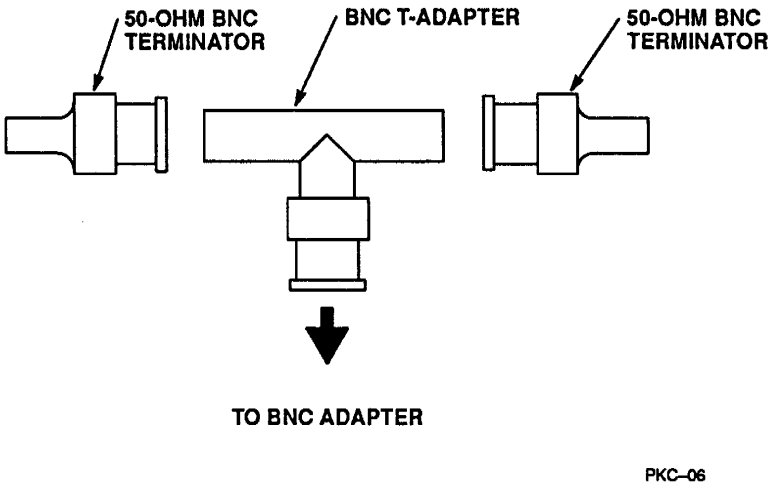


Figure A–2. ThinWire Ethernet Loopback Connector

A.2.3 The 44-Pin-to-Telco Adapter Cable

Table A–2 lists the corresponding pin numbers for the Emulex 44-pin-to-Telco adapter cable.

Table A–2. Pinouts for 44-Pin Adapter Cable

44-pin Connector Pin No.	50-pin Telco Connector Pin No.	44-pin Connector Pin No.	50-pin Telco Connector Pin No.
16	26	8	38
1	2	38	14
31	27	24	39
17	3	9	15
2	28	39	40
32	1	25	13
18	29	10	41
3	5	40	17
33	30	26	42
19	6	11	18
4	31	41	43
32	4	25	16
34	32	27	44
20	8	12	20
5	33	42	45
35	9	28	21
21	34	13	46
6	7	43	19
36	35	29	47
22	11	14	23
7	36	44	48
37	12	30	24
23	37	15	49
6	10	43	22
		NC	25
		NC	50

Note: NC indicates no connection

A.2.4 Punchdown Block Schematics

Table A–3 lists the corresponding pin numbers for the Telco connector on the Emulex adapter cable and a punchdown block.

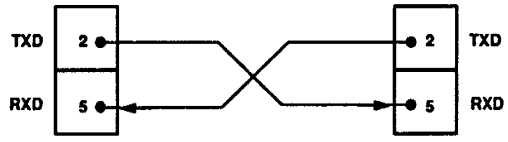
Table A–3. Schematics for a Punchdown Block

50-pin Telco Connector Pin No.	Punchdown Block Pin No.	50-pin Telco Connector Pin No.	Punchdown Block Pin No.
26	1	38	25
2	4	14	28
27	3	39	27
3	6	15	30
28	5	40	29
1	2	13	26
29	7	41	31
5	10	17	34
30	9	42	33
6	12	18	36
31	11	43	35
4	8	16	32
32	13	44	37
8	16	20	40
33	15	45	39
9	18	21	42
34	17	46	41
7	14	19	38
35	19	47	43
11	22	23	46
36	21	48	45
12	24	24	48
37	23	49	47
10	20	22	44

A.2.5 Serial Cable Considerations

The cabling diagrams in this appendix show a variety of serial cabling arrangements that allow you to connect serial devices to RJ12 (MMJ) or DB25 ports. Each cable has a specific purpose, and may require an adapter to make it work. The following addresses cabling considerations:

- **Adapters.** Adapters are required to connect a modular cable to a DB25 connector on a serial port. An adapter is available from Emulex for this purpose.
- **Cable types.** Cables are available in either a standard or modular type. Standard cable is round and has as many conductors as required. Modular cable is usually flat and silver-colored with six conductors. Modular cables require RJ12 or MMJ connectors and a special crimping tool to install the connectors.
- **Connections.** Serial cables may use DB25, RJ12, or MMJ-type connectors on one or both ends.
- **Cross-over vs. straight-through.** Cross-over cables are required to connect terminals (DTE) to a server port (DTE). These cables connect the receive pin of one DTE to the transmit pin of another DTE. The illustration below shows how the signals cross over.



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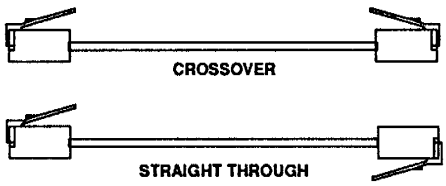
Straight-through cables are used to connect DCE devices, such as modems, to the server ports. These cables are wired pin-for-pin. The following illustration shows how to identify a cross-over and straight-through modular cable.



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The cables shown in this appendix are designed to be compatible with most applications, regardless of what options are used or what devices are connected. In many cases, simpler cables are possible depending on the requirements of your device. The simplest terminals, for example, require only three-wire cables (TXD, RXD, and Signal Ground).

Other types of cables may also serve your needs. If a simpler cable will work for some of your applications, refer to the instruction manuals for your serial devices for information about their requirements.

Figure A–3 illustrates the locations of pins on several types of serial cable connectors.

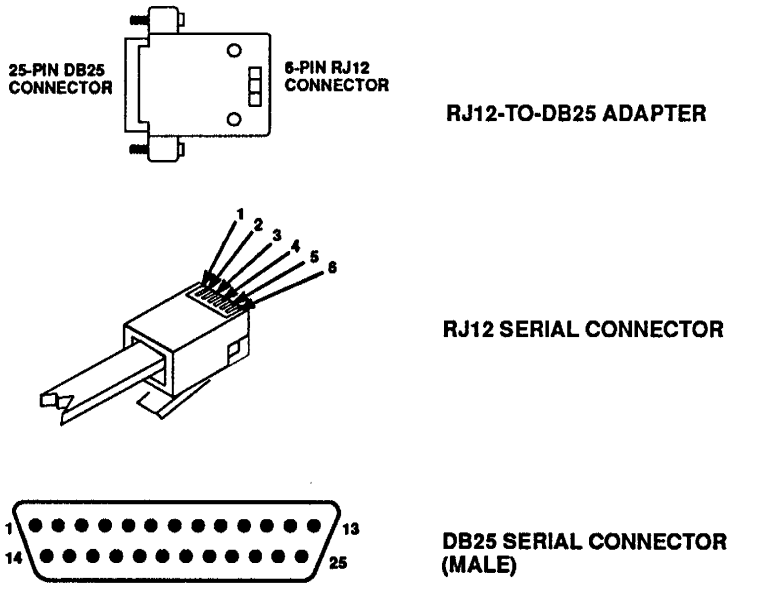

Figure A–3. Pin Locations on Serial Cable Connectors

A.2.6 Serial Loopback Connectors

Function Loopback connector for diagnostic testing

Connectors Full-modem ports (RS-232): DB25S
Partial-modem ports (RS-423): RJ12

Cable Type None

Notes The full-modem port does not provide the DSRS, RI, and SMI signals. Therefore connections to pins 12, 22, and 23 are not required.

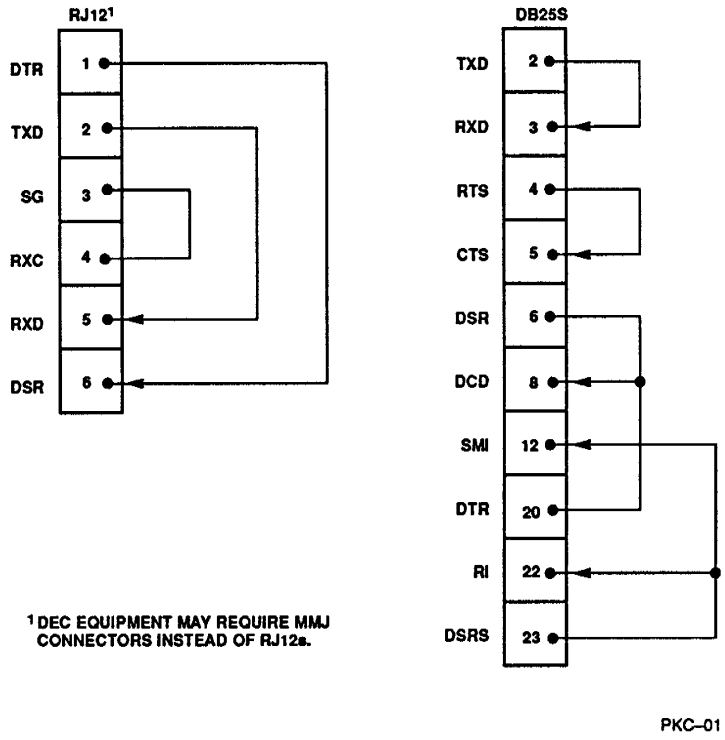

Figure A–4. Serial Port Loopback Connectors

A.3 RS-232 Cabling

For general information about the Ethernet loopback connector, pinouts on the 44-pin-to-Telco adapter cable, punchdown block schematics, and information on serial cables, refer to subsection A.2.

This subsection provides RS-232 pin and signal assignments and schematics for the connectors and cables available from Emulex:

- Modem signals supported by the RS-232
- Pinouts for DB25 serial port connectors
- Schematics for serial terminal, printer, and modem cables

Table A–4 lists the modem signals supported by the RS-232.

Table A–4. Modem Signals Supported by RS-232

Mnemonic	Signal Name
CG	Chassis Ground
SG	Signal Ground
TXD	Transmit Data
RXD	Receive Data
DCD	Data Carrier Detect
RTS	Request to Send
CTS	Clear to Send
DSR	Data Set Ready
DTR	Data Terminal Ready
Note: NC indicates no connection	

NOTE: All signals on the serial ports are electrically compatible with RS-232. Pin and signal assignments on the full-modem ports are standard RS-232.

A.3.1 Schematics for Full-Modem Signal Configuration

Table A–5 lists signal names and pin numbers for the Telco connector on the Emulex 44-pin-to-Telco adapter cable, and the corresponding DB25 port and pin numbers, for a full-modem signal configuration.

Table A–5. RS-232 Telco-to-DB25 Connector Schematics (Full-Modem Signals)

Telco Pin No.	Signal Name & Port No.	DB25 Pin No.	Telco Pin No.	Signal Name & Port No.	DB25 Pin No.
26	DCD 01	8	38	NC	—
2	RXD 01	3	14	NC	—
27	TXD 01	2	39	NC	—
3	DSR 01	6	15	DTS 01	5
28	DTR 01	20	40	RTS 01	4
1	SG 01	7	13	NC	—
29	DCD 02	8	41	NC	—
5	RXD 02	3	17	NC	—
30	TXD 02	2	42	NC	—
6	DSR 02	6	18	DTS 02	5
31	DTR 02	20	43	RTS 02	4
4	SG 02	7	16	NC	—
32	DCD 03	8	44	NC	—
8	RXD 03	3	20	NC	—
33	TXD 03	2	45	NC	—
9	DSR 03	6	21	CTS 03	5
34	DTR 03	20	46	RTS 03	4
7	SG 03	7	19	NC	—
35	DCD 04	8	47	NC	—
11	RXD 04	3	23	NC	—
36	TXD 04	2	48	NC	—
12	DSR 04	6	24	DTS 04	5
37	DTR 04	20	49	RTS 04	4
10	SG 04	7	22	NC	—
			25	NC	—
			50	NC	—

A.3.2 Serial Port Pin/Signal Assignments

Table A–6 lists pin and signal assignments for the Performance 6000 serial ports.

All signals on the serial ports are electrically RS-232 compatible. The data leads are RS-232 compatible. Pin/signal assignments on the full-modem ports are standard RS-232.

For compatibility with DEC equipment, MMJ connectors may be required in place of the RJ12 connectors as noted in the cable schematics.

Table A–6. RS-232 Serial Port Full-Modem DB25 Pin/Signal Assignments

Pin	Signal Name	CCITT No.	Mnemonic
1	Chassis Ground	101	Ground
2	Transmit Data	103	TXD
3	Receive Data	104	RXD
4	Request to Send	105	RTS
5	Clear to Send	106	CTS
6	Data Set Ready	107	DSR
7	Signal Ground	102	SG
8	Data Carrier Detect	109	DCD
20	Data Terminal Ready	108.2	DTR

A.3.3 RS-232 Terminal Cable (full-modem/modular)

Function Connects full-modem server port to terminal or serial printer

Connectors RJ12 to RJ12

Cable Type 6-wire modular, crossover, with Emulex adapters

This diagram shows how to cable a terminal, data switch, or printer to a full-modem port using Emulex adapters on each end to convert the DB25 connectors to RJ12. The cable itself is a modular cable with RJ12 connectors on each end.

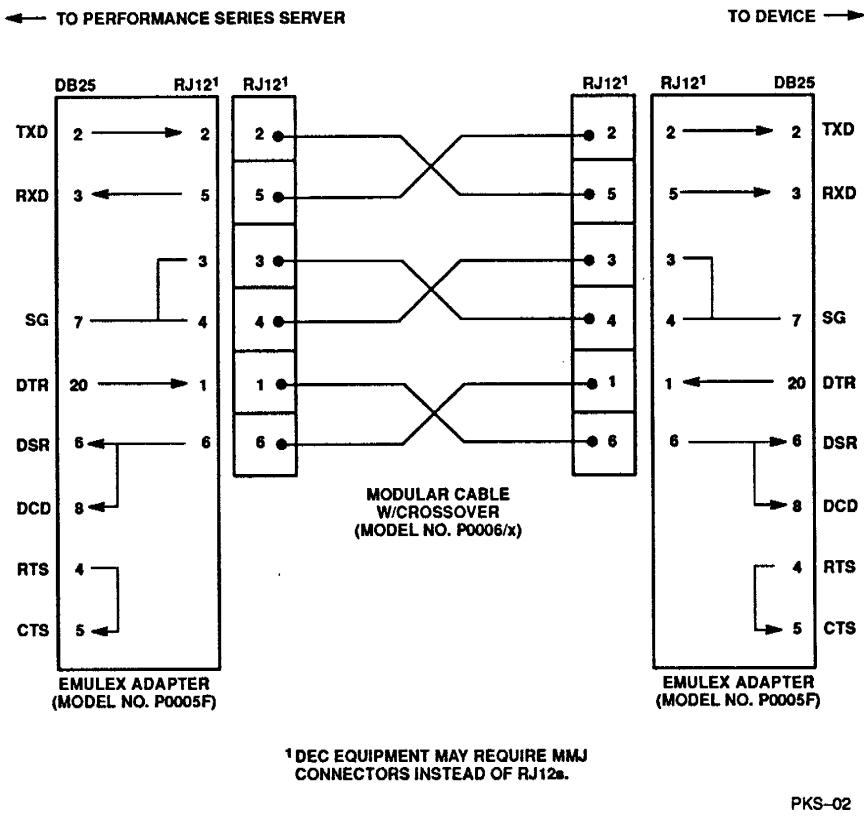

Figure A–5. RS-232 Terminal or Serial Printer Cable (Full-Modem/Modular)

A.3.4 RS-232 Terminal Cable (full-modem/standard)

Function Connects full-modem server port to terminal or serial printer

Connectors DB25S to DB25S

Cable Type 6-wire standard with crossover

This diagram shows how to cable a terminal, data switch, or printer to a full-modem port. No adapters are necessary.

Note that although this cable can be used with most terminals, printers, and data switches, you may be able to get by with a simpler cable. Refer to the instruction manual for your device to see if you can use a cable with fewer connections.

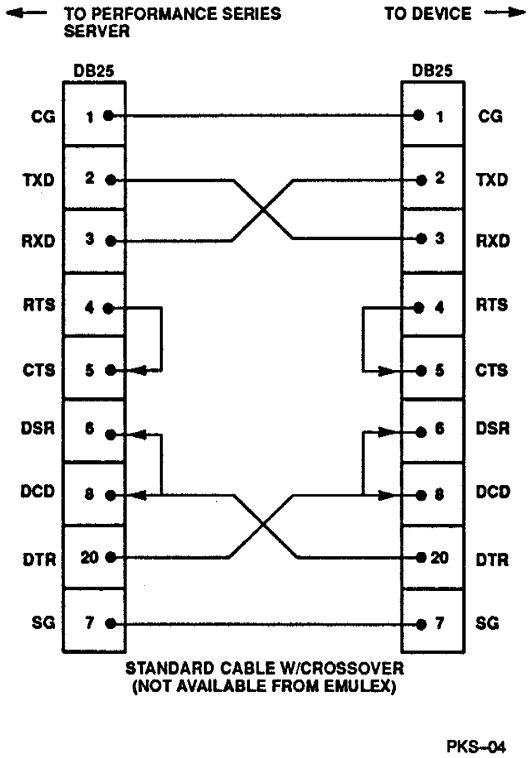

Figure A–6. RS-232 Terminal or Serial Printer Cable (Full-Modem/Standard)

A.3.5 RS-232 Modem Cable (full-modem/standard)

Function Connects full-modem server port to modem

Connectors DB25S to DB25P

Cable Type 9-wire standard cable

Notes For a Hayes Smartmodem, do not connect pin 23.

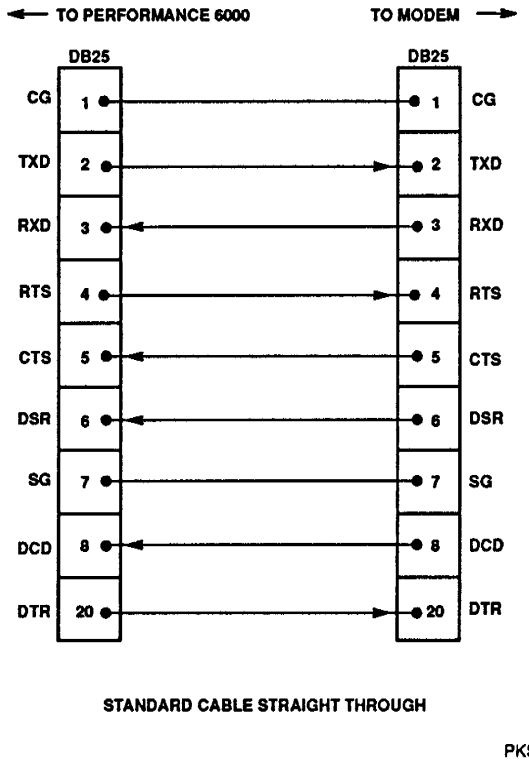

Figure A–7. RS-232 Modem Cable (Full-Modem/Standard)

A.4 RS-423 Cabling

For general information about the Ethernet loopback connector and information on serial cables refer to subsection A.2.

This subsection provides RS-423 pin and signal assignments and schematics for the connectors and cables available from Emulex:

- Modem signals supported by the RS-423
- Pinouts for RJ12 serial port connectors
- Schematics for serial terminal, printer, and modem cables

Table A–7 lists the modem signals supported by the RS-423.

Table A–7. Modem Signals Supported by RS-423

Mnemonic	Signal Name
SG	Signal Ground
TXD	Transmit Data
RXD	Receive Data
DSR	Data Set Ready
DTR	Data Terminal Ready
RXC	Receive Common
Note: NC indicates no connection	

NOTE: All signals on the serial ports are electrically RS-423 compatible.

A.4.1 RXC-to-SG Connections

For proper operation of RS-423, you must connect RXC (from the server) to SG at the device end of the cable. You must also connect SG to earth ground in the device. Figure A–8 illustrates these connections, which allow RS-423 to use RS-232 devices.

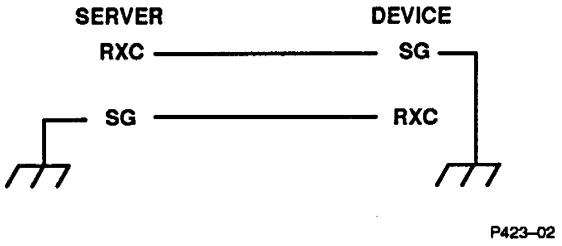

Figure A–8. RS-423 RXC-to-SG Cabling

Subsections A.4.3 through A.4.6 provide cabling schematics for connecting an RS-423 terminal controller module to various RS-232 devices.

A.4.2 RS-423 Serial Port Pin/Signal Assignments

Table A–8 lists pin and signal assignments for the Performance 6000 serial ports. All signals on the serial ports are electrically compatible with RS-423.

Table A–8. RS-423 Serial Port Two Modem (RJ12) Pin/Signal Assignments

Pin	Signal Name	CCITT No.	Mnemonic
1	Data Terminal Ready	108.2	DTR
2	Transmit Data	103	TXD
3	Signal Ground	102	SG
4	Receive Common	—	RXC
5	Receive Data	104	RXD
6	Data Set Ready	107	DSR

A.4.3 RS-423-to-RS-423 Terminal Cable (two modem signals/modular)

Function Connects RS-423 server port with two-modem signals (DSR and DTR) to terminal or serial printer using RS-423

Connectors RJ12 to RJ12

Cable Type 6-wire modular, crossover

This diagram shows how to cable a terminal, data switch, or printer to a partial-modem port with two modem signals (DSR and DTR) using a modular cable with RJ12 connectors on both ends.

Notes For proper operation of RS-423 devices, SG must be connected to earth ground in the device.

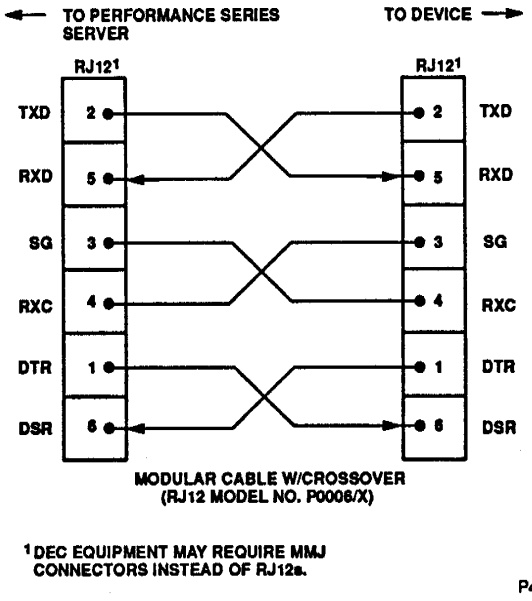

Figure A–9. RS-423-to-RS-423 Terminal or Serial Printer Cable (Two Modem Signals/Modular)

A.4.4 RS-423-to-RS-232 Terminal Cable (two modem signals/modular)

Function Connects an RS-423 partial-modem server port with two signals (DSR and DTR) to a terminal or serial printer using RS-232

Connectors RJ12 to RJ12

Cable Type 6-wire modular, crossover, with Emulex adapter on terminal end

This diagram shows how to cable a terminal, data switch, or printer to a partial-modem port with two modem signals (DSR and DTR) using an Emulex adapter on the terminal end that converts the DB25 connector to RJ12. The cable itself is a modular cable with RJ12 connectors on both ends.

Notes This configuration may be used to connect an RS-232 device to an RS-423 port.

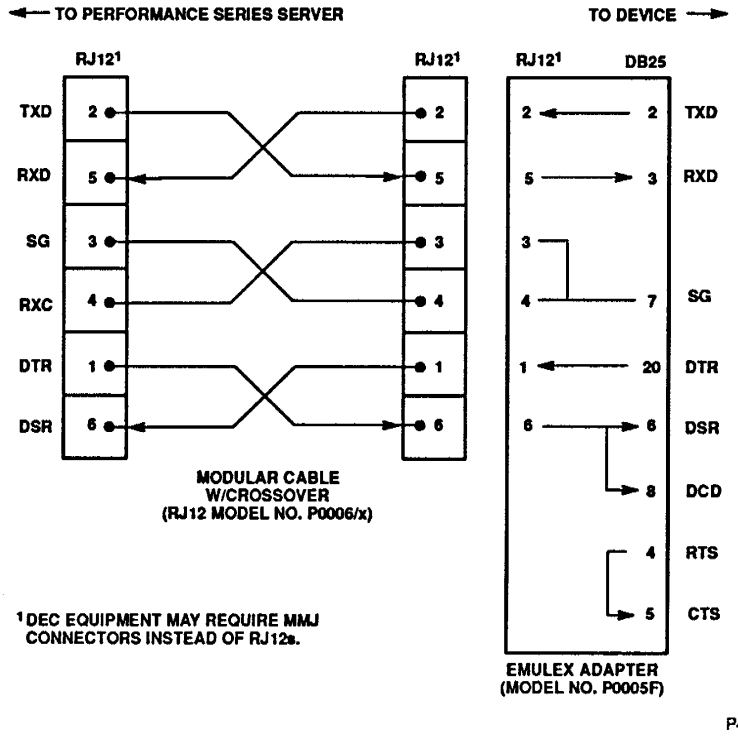

Figure A–10. RS-423-to-RS-232 Terminal or Serial Printer Cable (Two Modem Signals/Modular)

A.4.5 RS-423-to-RS-232 Modem Cable (two modem signals/modular)

Function Connects an RS-423 partial-modem server port with two modem signals (DSR and DTR) to a modem using RS-232

Connectors RJ12 to RJ12

Cable Type 6-wire modular with user-supplied adapter on modem end

Partial-modem ports support full-duplex modems only. Multispeed modem operation is not supported. Refer to the *Performance™ Series TCP/IP-LAT Protocol and Command Reference* for details about how the modem signals work.

Notes This configuration may be used to connect an RS-232 modem to an RS-423 port.

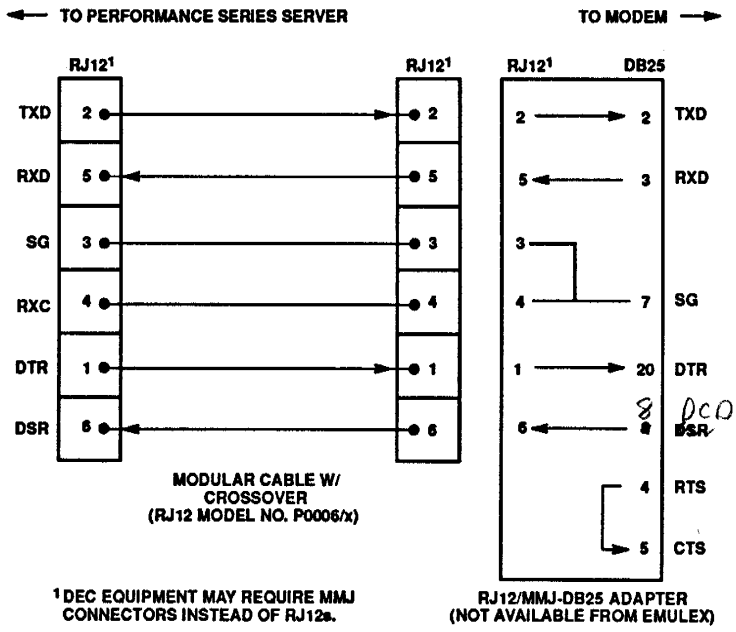

Figure A–11. RS-423-to-RS-232 Modem Cable (Two Modem Signals/Modular)

A.4.6 RS-423-to-RS-232 Serial Printer Cable with CTS/RTS Flow Control (two modem signals/modular)

Function Connects an RS-423 partial-modem server port with two modem signals (DSR and DTR) to serial printer using CTS/RTS flow control and RS-232

Connectors RJ12 to DB25S

Cable Type 6-wire modular crossover, with user-supplied adapter

Printers that use XON/XOFF or DSR/DTR flow control can use the standard terminal cables on the previous pages. Only printers that use CTS/RTS flow control need to use the cable shown below. Note that although partial-modem ports support CTS/RTS printers using this cable, the port itself must be configured for DSR/DTR flow control.

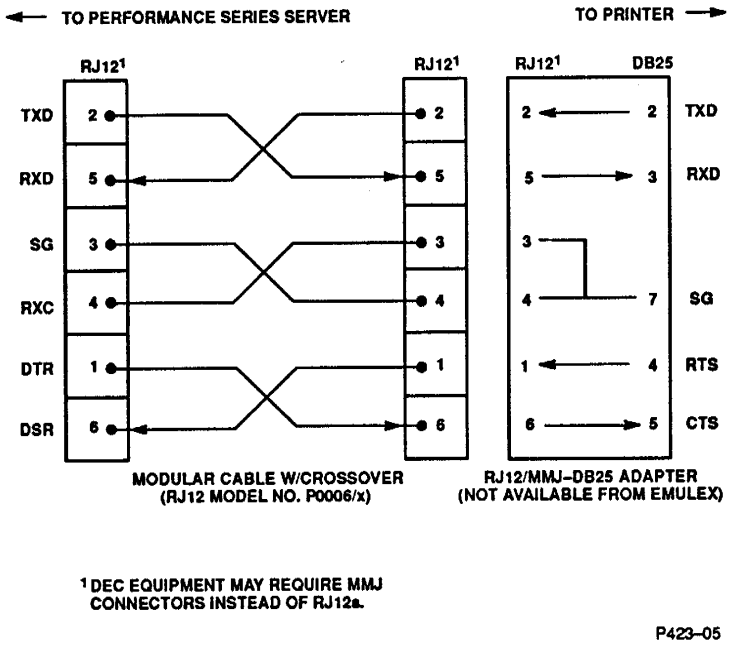

Figure A–12. RS-423-to-RS-232 Serial Printer Cable with CTS/RTS Flow Control (Two Modem Signals/Modular)

A.5 Parallel Printer Port

This section provides pin and signal assignments for the Performance 6000 parallel port. In addition, schematics are provided for some of the cables commonly used with the server's parallel port.

Table A–9 lists pin and signal assignments for the Performance 6000 parallel port, which is compatible with standard PC printer cables. Cabling and connector schematics are provided in the following subsections.

Table A–9. Parallel Port Pin/Signal Assignments

Pin	Signal Name	Mnemonic
1	Data Strobe	Strobe
2	Data 0	D0
3	Data 1	D1
4	Data 2	D2
5	Data 3	D3
6	Data 4	D4
7	Data 5	D5
8	Data 6	D6
9	Data 7	D7
10	Printer Acknowledge	ACK
11	Printer Busy	Busy
12	Paper End	P End
13	Printer Select Status	Select
14	Auto Line Feed	AutoFeed
15	Printer Error	Error
16	Printer Initialization	Init Printer
17	Inhibit Decode of Select/Deselect	Sel Inh
18–25	Ground	Gnd

A.5.1 Parallel Printer Cable – Centronics-style

Function	Connects parallel port to Centronics-type printer
Connectors	DB25P-to-36-pin Centronics
Cable Type	25-wire
Notes	The maximum cable length is typically 30 feet with this interface. Figure A–13 shows the pinouts for the Centronics-style parallel printer cable.

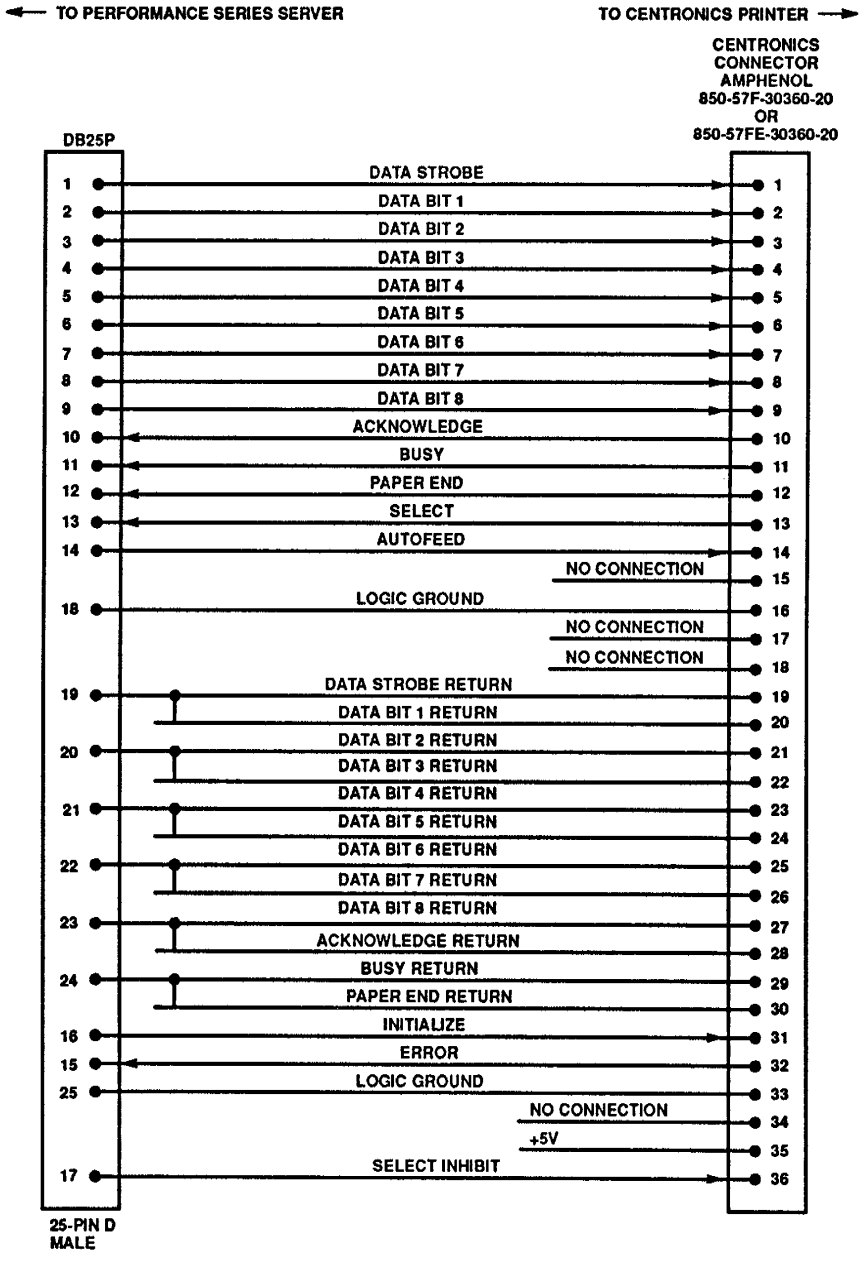

Figure A–13. Parallel Printer Cable – Centronics-style

A.5.2 Parallel Printer Cable – Dataproducts-style, With DAVFU Options

Function Connects parallel port to Dataproducts-style printer

Connectors DB25P-to-50-pin Dataproducts

Cable Type 25-wire

Notes Two different cabling arrangements for Dataproducts-style parallel printers are provided. The first cable has two special features: the ability to detect a disconnected cable, and better control of vertical formatting (DAVFU) options. If you do not need these features, you can use the alternate Dataproducts-style cable described in subsection A.5.3 with no degradation in performance.

The polarity of the BUFFER CLEAR signal is active low, as expected by most printers. You must match the polarity expected by the printer, or not include this line in your cable. (Some printers have jumper options to set the polarity of this signal.) The printer port module may also be set for the correct polarity via a jumper.

In the cable shown, DATA BIT 8 of the Performance 6000 is connected to the PAPER INSTRUCTION signal of the printer. This is normal for most DEC-type installations. Some printers, however, have jumper-selectable options for the DATA BIT 8 and PAPER INSTRUCTION signals. Other printers use bit 8 to enable printing of graphics. Check with your printer supplier or application software supplier for correct jumper settings and cabling requirements.

The maximum cable length is typically 30 feet.

The Performance 6000 does not support the long-line interface. Your printer must have the short-line interface.

Figure A–14 shows the pinouts for the Dataproducts-style parallel printer cable.

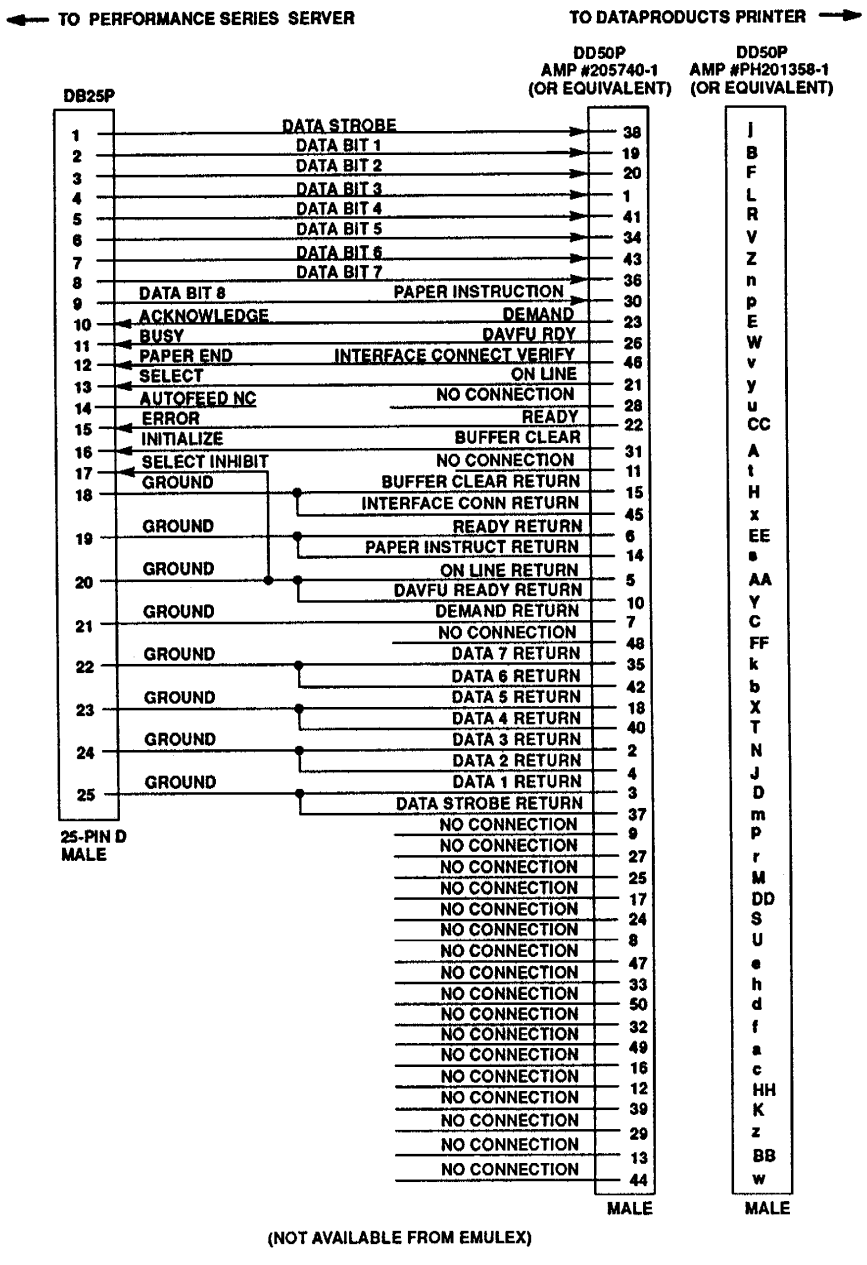

Figure A–14. Parallel Printer Cable – Dataproducts-style, With DAVFU Options

A.5.3 Parallel Printer Cable – Alternate Dataproducts-style

Function Connects parallel port to Dataproducts-style printer

Connectors DB25P-to-50-pin Dataproducts

Cable Type 25-wire

Notes Buffer Clear is active low on the Performance 6000, as expected by most printers. You must match the polarity of this signal to the printer, or not include this line in your cable. This cable does not provide the DAVFU vertical formatting options.

Figure A–15 shows the pinouts for the alternate Dataproducts-style parallel printer cable.

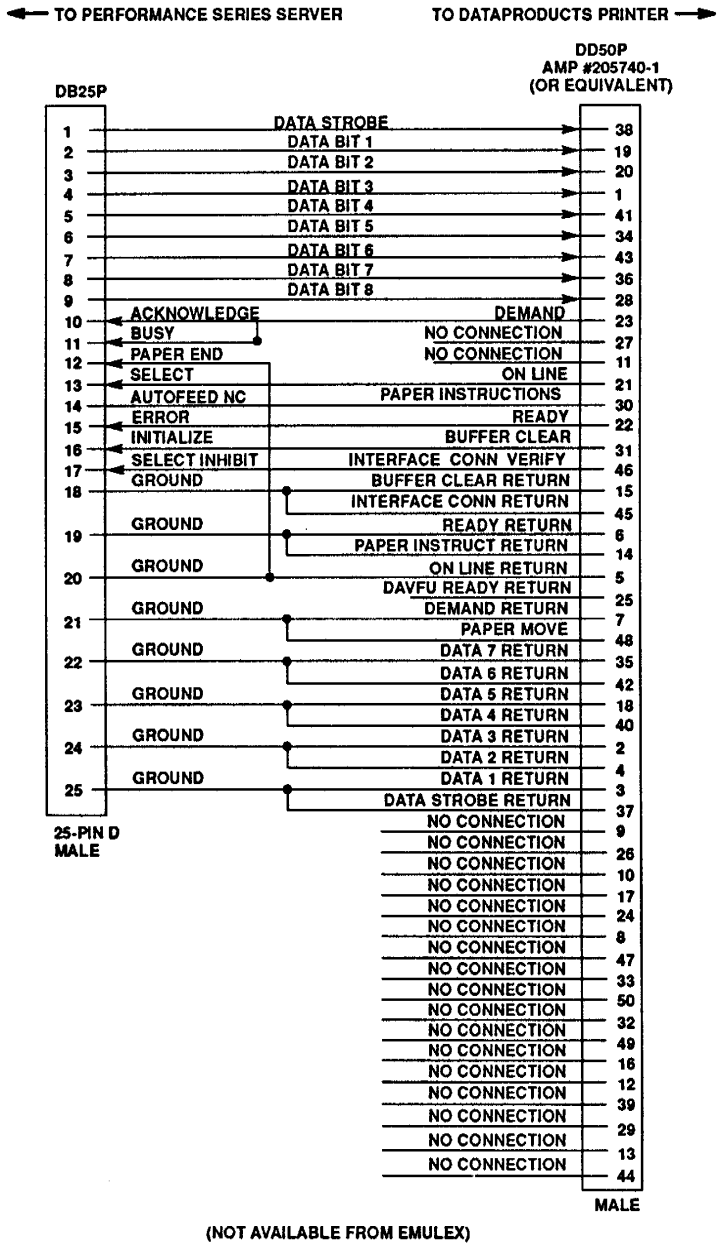

Figure A–15. Parallel Printer Cable – Alternate Dataproducts-style

INDEX

NUMBERS

A

B

C

D

E

F

G

I

L

M

O

P

R

S

T

V