

Rec 1/10/90

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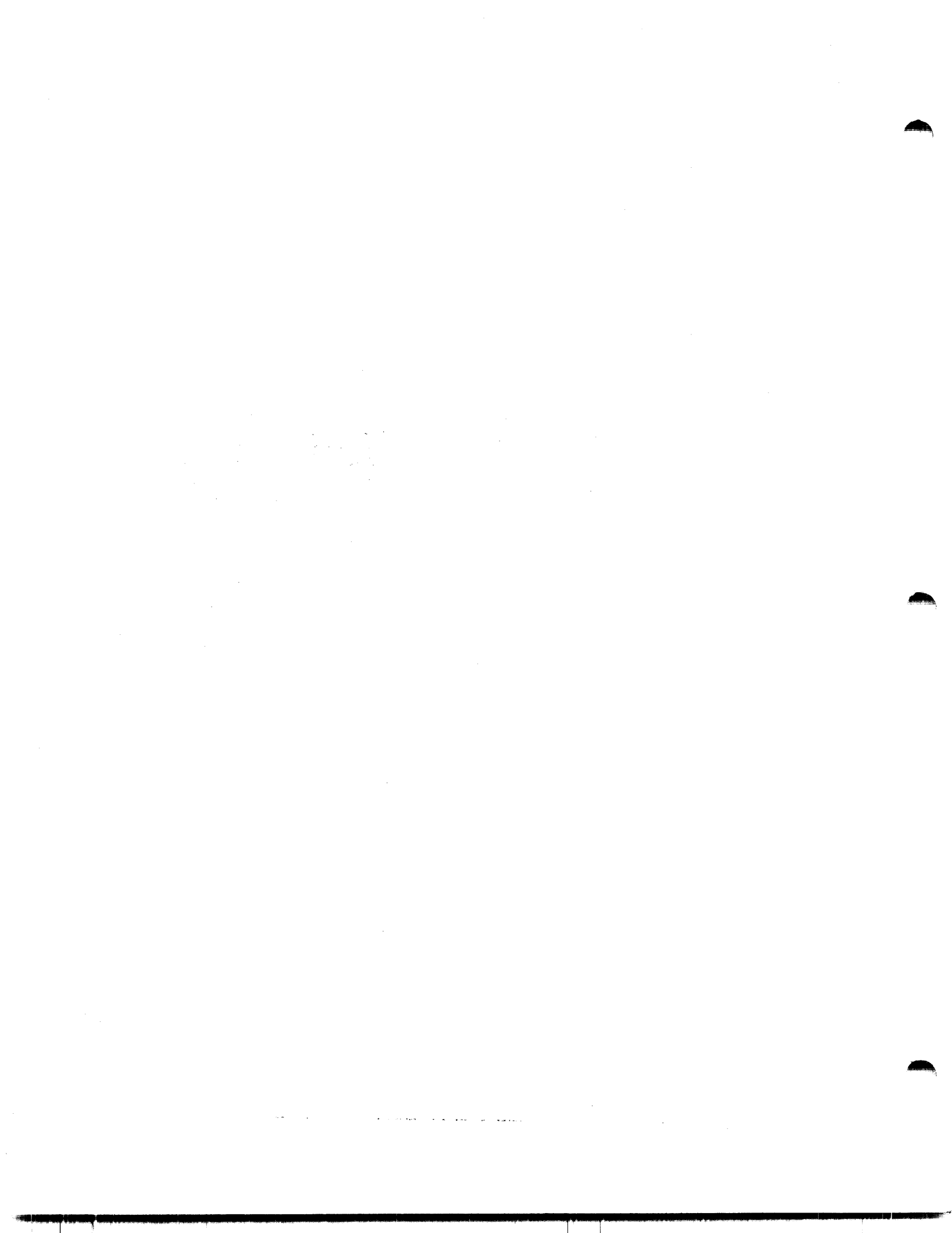
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ER2051008-00	-	A	Sys Mgr Manual P3000	3	4	4	4	4	4
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**PERFORMANCE 3000
ETHERNET PRINTER SERVER
SYSTEM MANAGER'S MANUAL**



WARNING

This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the technical manual, might cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of Federal Communications Commission (FCC) Rules, which are designed to provide reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures might be required to correct the interference.

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EMULEX PRODUCT WARRANTY

SERVER WARRANTY: Emulex warrants for a period of twelve (12) months from the date of shipment that each Emulex Performance 3000 main unit or PortPak supplied shall be free from defects in material and workmanship.

CABLE WARRANTY: All Emulex provided cables are warranted for ninety (90) days from the time of shipment.

The above warranties shall not apply to expendable components such as fuses, incandescent lamps, and the like, nor to connectors, adaptors, and other items not a part of the basic product. Emulex shall have no obligation to make repairs or to cause replacement required through normal wear and tear or necessitated in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized use of the product, or use of the product in such a manner for which it was not designed, or by causes external to the product, such as but not limited to, power failure or air conditioning. Emulex's sole obligation hereunder shall be to repair or replace any defective product, and, unless otherwise stated, pay return transportation cost for such replacement. Purchaser shall provide labor for removal of the defective product, shipping charges for return to Emulex and installation of its replacement.

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1.1 Overview

This manual describes how to install and configure the Emulex Performance 3000 Ethernet Printer Server.

If you want to get the Performance 3000 installed as quickly as possible without enabling any special features, you need to read only the first three sections of this manual:

- **Section 1 (Introduction)** is the section you are reading now.
- **Section 2 (Installation)** describes physical installation, cabling, and host software loading.
- **Section 3 (Configuration)** describes how to set server options and individual port options.

Subsequent sections and appendices contain detailed command and configuration information, troubleshooting suggestions, and cabling diagrams. Although these sections can be skipped if you just want to get the server up and running, they are required reading if you want to become familiar with some of the more sophisticated features of the Performance 3000.

If, during your reading, you come across any terms that you are not familiar with, check the glossary in the back of the manual. Most technical terms are defined there.

1.1.1 Related Documents

Emulex sells several Ethernet accessories for the Performance 3000, such as transceivers and repeaters, which come with their own instruction manuals.

Thus, although this manual completely describes how to install and configure the Performance 3000 itself, you might also need to refer to these manuals during the installation of the Performance 3000.

1.2 General Description

The Performance 3000 is an Ethernet printer server designed to connect up to four parallel or serial printers to host computers manufactured by Digital Equipment Corporation and others. It is supported on all DEC Ethernet networks and can generally take the place of a DECserver 250. The configurable nature of the Performance 3000 also makes it usable as a modem server, a six-port terminal server, or some combination thereof.

The Performance 3000 contains two asynchronous serial ports and up to four configurable expansion ports.

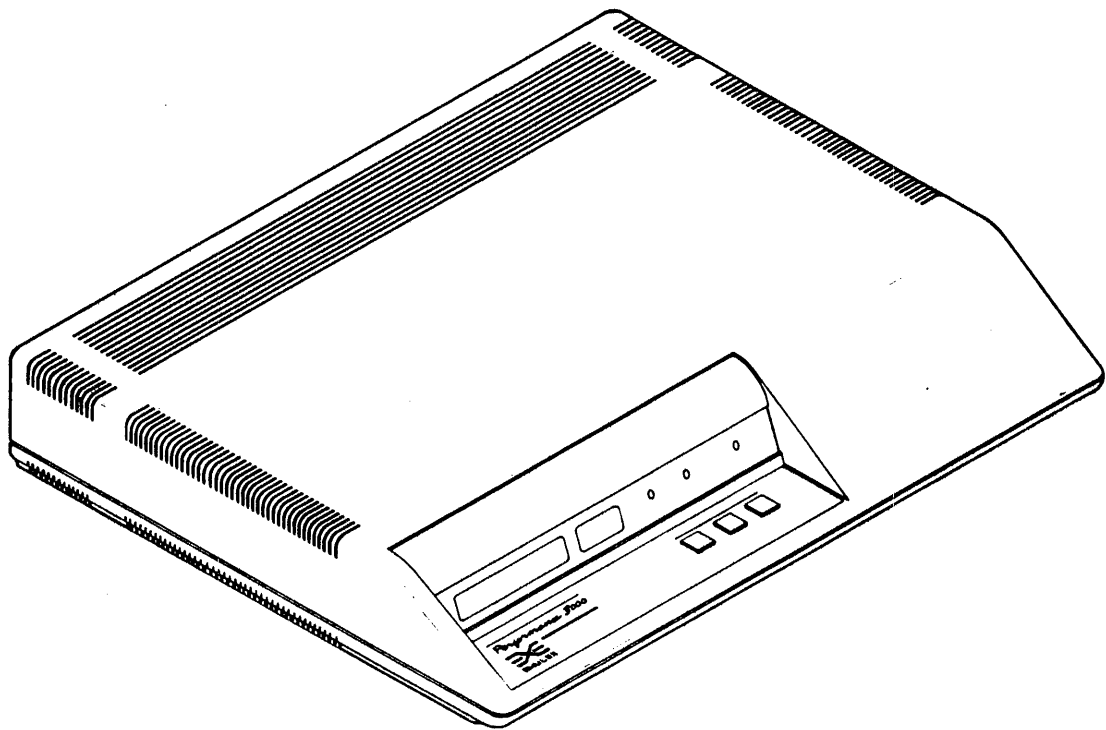
The two serial ports support partial modem controls. Both ports are available for general usage. In addition, either port can be used as a console terminal port for Performance 3000 configuration and control.

The four expansion ports are typically used as printer ports. Each of the four expansion ports can be ordered as any one of the following:

- Blank,
- An asynchronous RS-232 serial port with full modem controls,
- A PC-compatible parallel port,
- A Centronics parallel port, or
- A DEC/Dataproducts parallel port (short-line interface).

The Performance 3000 supports the LAT protocol over the Ethernet. The Ethernet interface itself can be physically connected to the Performance 3000 in one of two ways. The first way is via a 15-pin connector on the rear panel of the Performance 3000 to an Ethernet transceiver. The second way is via a BNC coaxial connector on the rear panel of the Performance 3000 directly to a thinwire Ethernet (Cheapernet) network. The software in the Performance 3000 will automatically detect which interface is being used and will activate the proper one.

Figure 1-1 shows the Performance 3000.



P3000-01

Figure 1-1. The Performance 3000 Ethernet Printer Server

1.2.1 How the Printer Server Works

The Performance 3000 connects to any DEC Ethernet network and supports up to 6 ports. Terminal users who are connected to the server can connect to any device on the network, including host CPUs, printers, other terminal or printer servers, and anything else you wish to make accessible.

Unlike ordinary communications controllers, which limit all of their ports to connections with a single CPU, servers allow connections to multiple CPUs. Servers also allow each port to have multiple active sessions with different CPUs at the same time. This allows ordinary users to make full use of the benefits of the Ethernet network.

Multiple sessions are possible because terminal users connected to the server can break out of CPU sessions and enter *local mode*, a mode in which commands can be given to the server itself. Typical server commands allow users to change port parameters, connect to other CPUs, view active sessions, and so forth.

Devices on the network are usually referred to as hosts, nodes, and services. Be sure you know what these terms mean:

- **Host.** A host is a CPU on the network. A host is often referred to as a CPU, a host CPU, a VAX, a remote host, or simply a computer. They all mean the same thing.
- **Node.** A node is any device on the network. A host is a node, for example, and so is a terminal server, a printer server, and so forth.
- **Service.** A service is anything you can connect to on your network. For example, a host VAX is typically configured as a named service so that users can connect to it by name. A printer server port can also be configured as a service (although this is optional) if other nodes will be connecting to it. Frequently, for example, a printer server port connected to a printer is defined as a service so that host CPUs can queue print jobs to it.

If you run into other terms that are unfamiliar to you, check the glossary in the back of the manual.

1.3 Ordering Information

The basic Performance 3000 requires each of the items listed in Table 1-1. Optional items and accessories are listed in Table 1-2. Consult Emulex for details about new models and options not listed.

Table 1-1. Performance 3000 Required Components

Qty	Model Number	Description
1	P3000	Printer Server Main Unit
1 to 4	P3KDP P3KCEN P3KPC P3KSER	Dataproducts Parallel PortPak Centronics Parallel PortPak IBM PC Compatible (DB25) Parallel PortPak RS-232 Serial PortPak
1	PS3001MT1600-C PS3001TK50-C PS3001MT1600 PS3001TK50 PS3003MT1600-C PS3003TK50-C PS3003MT1600 PS3003TK50	VMS host LAT software (1600 bpi 9-track tape) with one-year software update service VMS host LAT software (TK50 cartridge tape) with one-year software update service VMS host LAT software (1600 bpi 9-track tape) VMS host LAT software (TK50 cartridge tape) Ultrix-32 host LAT software (1600 bpi 9-track tape) with one-year software update service Ultrix-32 host LAT software (TK50 cartridge tape) with one-year software update service Ultrix-32 host LAT software (1600 bpi 9-track tape) Ultrix-32 host LAT software (TK50 cartridge tape)
		Note: The host software and the PortPaks are ordered separately.
1	--	Power Cord
1	ER2051008-00	Performance 3000 System Manager's Manual

Table 1-2. Performance 3000 Options and Accessories

Model Number	Description
P0007RMS	Rack-mount shelf
P4901TNI P4901TNS	Ethernet transceiver (nonintrusive cable piercing) Ethernet transceiver (N-series tap)
P4902	Multiport transceiver. Connects up to eight devices to a single Ethernet tap.
P4903/05	Transceiver cable, 5 meters
P4904	Ethernet repeater. Connects multiple Ethernet segments.
P4905	Multiport Ethernet repeater. Connects up to six thinwire segments and two thickwire segments.
P0002/10	Serial port modem cable, 10 feet (25-pin male to female)
P0005M P0005F	RJ12-to-25-pin adapter (male) RJ12-to-25-pin adapter (female)
P0006/1 P0006/25 P0006/100	RJ12 crossover (terminal) cable, 1 foot RJ12 crossover (terminal) cable, 25 feet RJ12 crossover (terminal) cable, 100 feet
P0008/1 P0008/25 P0008/100	RJ12 straight (modem) cable, 1 foot RJ12 straight (modem) cable, 25 feet RJ12 straight (modem) cable, 100 feet

1.4 Hardware and Software Requirements

1.4.1 Hardware Requirements

The Performance 3000 is compatible with both Ethernet Version 2 and IEEE 802.3. It connects to most Ethernet or 802.3 transceivers (thickwire, thinwire, or fiber optic).

1.4.2 Software Requirements

The Performance 3000 is directly supported under DEC operating systems VMS (V4.5 and later), RSX-11M-Plus (V3.0 and later), and Ultrix-32 (V2.0 and later). Call Emulex for information about other versions of these operating systems and for information about other DEC operating systems.

You must install an Emulex host software kit on at least one host on your network. This host either must be running VMS and DECnet Phase IV (or later), or else the host must be running Ultrix-32 version 3.0 (or later).

1.4.3 Serial and Parallel Ports

Different models of the Performance 3000 contain different numbers and types of I/O ports. The following types of ports are supported:

- **Partial-modem serial ports.** These ports use modular RJ12 jacks and support two modem signals. These ports are available for general usage and can be connected to a local terminal, a serial printer, a full-duplex modem, a data switch, or to a computer port. Either of these ports can be used as a console terminal port for Performance 3000 configuration and control.
- **Full-modem serial ports.** These ports use 25-pin D male connectors and support eight modem signals. They can be connected to local terminals, serial printers, full-duplex modems, data switches, and computer ports.

- **PC-compatible parallel ports.** These ports use 25-pin D female connectors and are designed to be connected to either Centronics-compatible or Dataproducts-compatible printers that require an IBM PC type printer connector. The type of interface (Centronics or Dataproducts) is software selectable.
- **Centronics-compatible parallel ports.** These ports use 36-pin female microribbon Centronics-style connectors and are designed to be connected to Centronics-compatible printers.
- **DEC/Dataproducts-compatible parallel ports.** These ports use 37-pin D female connectors and are designed to be connected to DEC/Dataproducts-compatible printers, with short-line interfaces.

Appendix A contains pin and signal assignments for the Performance 3000 serial and parallel ports.

1.5 Features

The Performance 3000 contains a variety of features designed to enhance system performance and make configuration and maintenance simple. These include:

- **Performance.** Each parallel port of the Performance 3000 is capable of continuously and simultaneously outputting in excess of 3000 lines per minute of 132 column print.
- **DECserver 250 compatible.** The Performance 3000 supports ELT, a LAT-compatible protocol that makes it directly compatible with the DECserver 250 and all popular DEC operating systems.
- **Small size.** The Performance 3000 supports 6 ports in a package with a height of only 2.5 inches. A rack-mount shelf is available that allows the Performance 3000 to be mounted in any standard 19-inch equipment rack.
- **Standard connections.** The Performance 3000 connects to a thickwire Ethernet cable via any standard IEEE 802.3 transceiver, or directly to a thinwire cable via a standard BNC "T" adapter (supplied with the unit). The Performance 3000 will automatically select between the two connectors. The Performance 3000 is compatible with most thinwire and thickwire Ethernet cables and with fiber-optic and broadband devices.
- **Multiple sessions.** Users connected to the Performance 3000 can connect to any service on the network and can switch between services without using any host CPU processing power. Users can keep multiple sessions active on different hosts (or the same host) and switch between sessions with the touch of a key.

Alternatively, user ports can be configured so that they are dedicated to a single CPU. This simplifies login for users who need access to only one CPU.

- **Load balancing.** If more than one node is able to respond to a connect request, the server connects to the least-busy node. In a cluster environment, the Performance 3000 automatically connects its ports to the least-busy host in the cluster. This balances the number of ports connected to each host and optimizes processing power.

- **Automatic failover.** The Performance 3000 can be configured to automatically reconnect a port to a different host (or "service") in case of a host failure.
- **Nonvolatile memory.** All parameters on the Performance 3000 are saved in nonvolatile memory, if desired. Changes to server parameters can be temporary or permanent.
- **Multilevel help system.** The Performance 3000 contains help screens for all server commands.
- **Easy configuration.** The Performance 3000 uses a simple, yet powerful, command structure that gives both users and system managers quick access to all server features. There are no jumpers to set within the main unit, and the Performance 3000 does not have to be opened to install various options. LED status indicators and LCD display allow easy setup and troubleshooting. The console terminal port also allows for easy setup. Easily available off-the-shelf cables are used for all supported printers.
- **Configuration versatility.** The Performance 3000 can be configured with from one to four printer ports. In addition, these ports can be any combination of RS-232 serial, Centronics parallel, DEC/Dataproducts parallel, or IBM PC parallel. All configurations can be accomplished without removing the cover of the Performance 3000.
- **PC file transfers.** The Performance 3000 supports file transfers between PCs connected to different ports on the server and between PCs and host CPUs.
- **Host-initiated connections.** Host CPUs on the network can request connections to ports on the server. This allows CPUs to contend for a printer connected to the server and for these requests to be queued within the server.
- **Typeahead.** The Performance 3000 contains a typeahead buffer that is active in all modes for all ports.
- **Command line recall.** Like VMS, the Performance 3000 remembers previous command lines and can recall them with a touch of the up-arrow key. Recalled command lines can be edited before they are reentered.

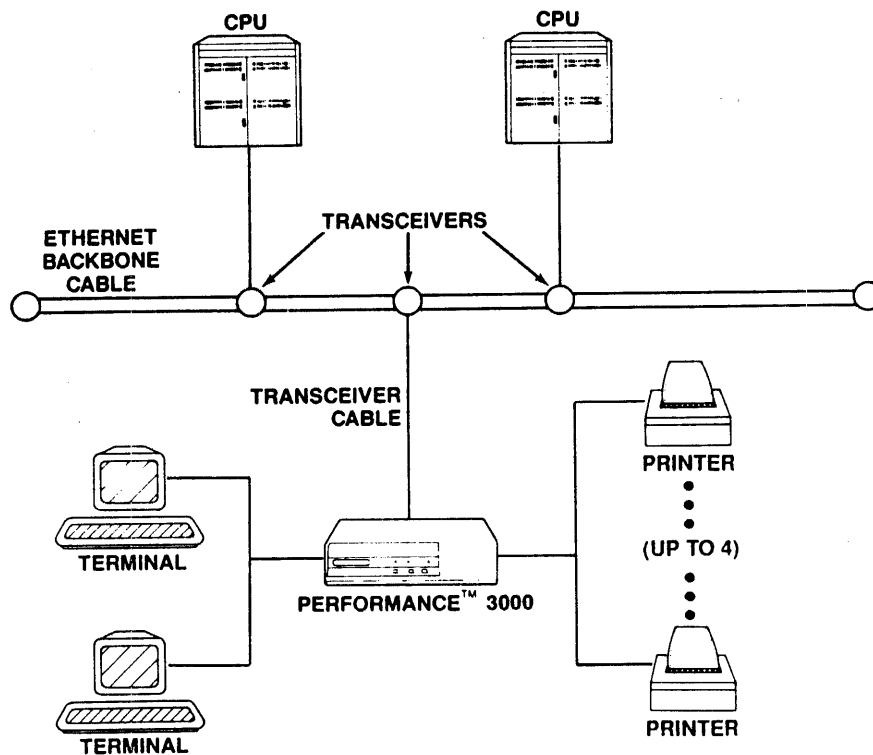
- **Remote console support.** The Performance 3000 can be reconfigured from either a host CPU or from another Performance 3000. This feature is compatible with both DECnet NCP and DEC TSM (Terminal Server Manager).
- **Group codes.** Ports on the Performance 3000 can be individually configured so they have access only to services with certain group codes.
- **Power-up diagnostics.** A complete set of internal diagnostics and Ethernet cable diagnostics are run when the Performance 3000 is powered up. The result of the diagnostics is displayed on the server's front panel and console port.
- **Complete statistics.** The Performance 3000 maintains complete statistics for every port. This includes traffic and error counts that can be continuously monitored or printed.
- **Wide range power input.** The Performance 3000 will operate properly from any power line input voltage within the range of 100 VAC to 240 VAC, without the need to change any switches, jumpers, etc.

BLANK

2.1 Overview

This section describes how to install and cable the Performance 3000. This is a short process and is summarized in the installation checklist on the next page. Use this checklist to make sure you don't skip any steps.

Figure 2-1, below, shows what the completed physical installation should look like.



P3000-02

Figure 2-1. Typical Performance 3000 Installation

PERFORMANCE 3000 INSTALLATION CHECKLIST

- 1. Install the PortPak(s) for your server configuration in the Performance 3000 main unit.
- 2. Pick a location for the Performance 3000 and connect it to your network. Either connect the BNC Ethernet connector on the rear of the server directly to your thinwire Ethernet network, or else run a cable from the 15-pin Ethernet connector on the rear of the server to either an Ethernet transceiver or a port on an Ethernet multiport transceiver. If you are using an Ethernet transceiver and you need instructions on installing it, refer to its manual.
- 3. If you have not already done so, add the LAT activation command to the system startup files on each VMS network host.
- 4. Install the Emulex host software kit on a host and run the server configuration utility (ESVCONFIG.COM for VMS or **esvconfig** for Ultrix-32).
- 5. Cable terminals and printers to the serial and parallel ports on the Performance 3000. This step can be performed later, if you wish, but at least one terminal should be attached now so it can be used as a console port.
- 6. Power up the Performance 3000 and make sure it passes its self-test. If it does not, refer to Section 6, Troubleshooting.

The following steps require you to set options on the Performance 3000. If you are familiar with option setup on the DECserver 250, you can set up options on the Performance 3000 in the same way. Otherwise, steps 7 through 9 are covered in detail in Section 3.

- 7. Set options for individual ports.
- 8. If necessary, set internal server options.
- 9. Create services and set service options.
- 10. Log in to a host and make sure everything is working properly. If you encounter any problems, refer to Section 6, Troubleshooting, or call Emulex Technical Support.

2.2 Installing the PortPaks

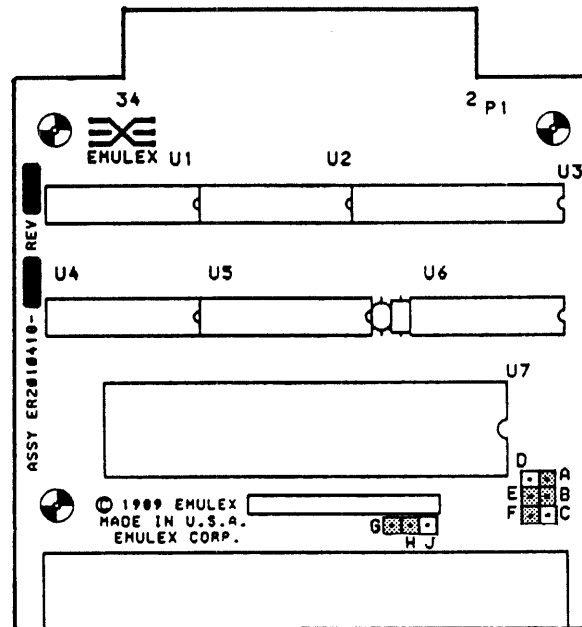
The Performance 3000 uses small interface modules, called PortPaks, which are shipped separately from the server and must be installed before the server can be used. Before installing the PortPaks, you should first verify that the factory jumper settings on each PortPak match the requirements of the printer to be used with the PortPak, and change the jumper settings if necessary. Then, you must physically install the PortPaks in the Performance 3000 main unit. The next two subsections describe how to do this.

2.2.1 Setting the Jumpers on the PortPaks

The full-modem serial PortPaks have no jumpers; these boards are ready to be installed as supplied.

Each of the different types of parallel PortPaks has a jumper block labeled **ABC**, which can have a jumper installed either from A to B or from B to C. Figure 2-2 shows the location of the jumper block on the PortPaks. The function of this jumper block is the same on each type of PortPak: to invert or not invert one of the signals on the PortPak's printer connector.

Table 2-1 shows the jumper settings for Jumper Block **ABC**. For each type of parallel PortPak, this table lists the possible jumper settings for Jumper Block **ABC**, the name of the affected signal on the printer connector, and the pin number of this signal on the printer connector. The table also shows the factory setting for Jumper Block **ABC**.



P3000-03

Figure 2-2. Parallel PortPak Jumper Locations

NOTE

The DEC/Dataproducts parallel PortPak contains additional jumper blocks labeled **DEF** and **GHJ**. These jumper blocks normally are unused and should be left in their factory setting. The factory setting for jumper block **DEF** is with a jumper from E to F; the factory setting for jumper block **GHJ** is with a jumper from G to H.

Table 2-1. Jumper Block ABC Settings

Type of Parallel PortPak	Jumper Settings	Signal	Connector Pin Number (P3000 Rear Panel)
DEC/Dataproducts	A-B IN B-C OUT (Factory)	$\overline{\text{BUFFER CLEAR}}$	10
	A-B OUT B-C IN	BUFFER CLEAR	
Centronics	A-B IN B-C OUT (Factory)	$\overline{\text{INITIALIZE}}$	31
	A-B OUT B-C IN	INITIALIZE	
IBM PC with Centronics Interface Selected	A-B IN B-C OUT (Factory)	$\overline{\text{INITIALIZE}}$	16
	A-B OUT B-C IN	INITIALIZE	
IBM PC with Dataproducts Interface Selected	A-B IN B-C OUT (Factory)	$\overline{\text{BUFFER CLEAR}}$	16
	A-B OUT B-C IN	BUFFER CLEAR	

For each parallel printer PortPak that you will be installing in your Performance 3000, determine whether the listed signal for the printer to be attached to the PortPak needs to be inverted or not. Then, consult Table 2-1 and set the jumper on Jumper Block ABC accordingly.

NOTE

Most printers are configured with a low-true signal, which corresponds to the factory setting of the jumper on Jumper Block ABC. Some printers allow polarity selection of this signal through jumpers or switches at the printer. Whichever polarity setting you choose, be certain that the setting of the PortPak matches the setting of the printer.

2.2.2 Installing the PortPaks In the Performance 3000 Main Unit

To install the PortPaks in your Performance 3000, refer to Figure 2-3 and perform the following steps:

1. Choose the locations for the PortPaks. Emulex recommends that you assign parallel PortPaks starting with connector J6 and working downward toward J3, and that you assign serial PortPaks (including PortPaks used with serial printers) starting with J3 and working upward toward J6. If you have fewer than four PortPaks to install and you decide to add PortPaks to your server at some future time, this assignment scheme should make it easier to reconfigure the operating system for the added PortPaks.

CAUTION

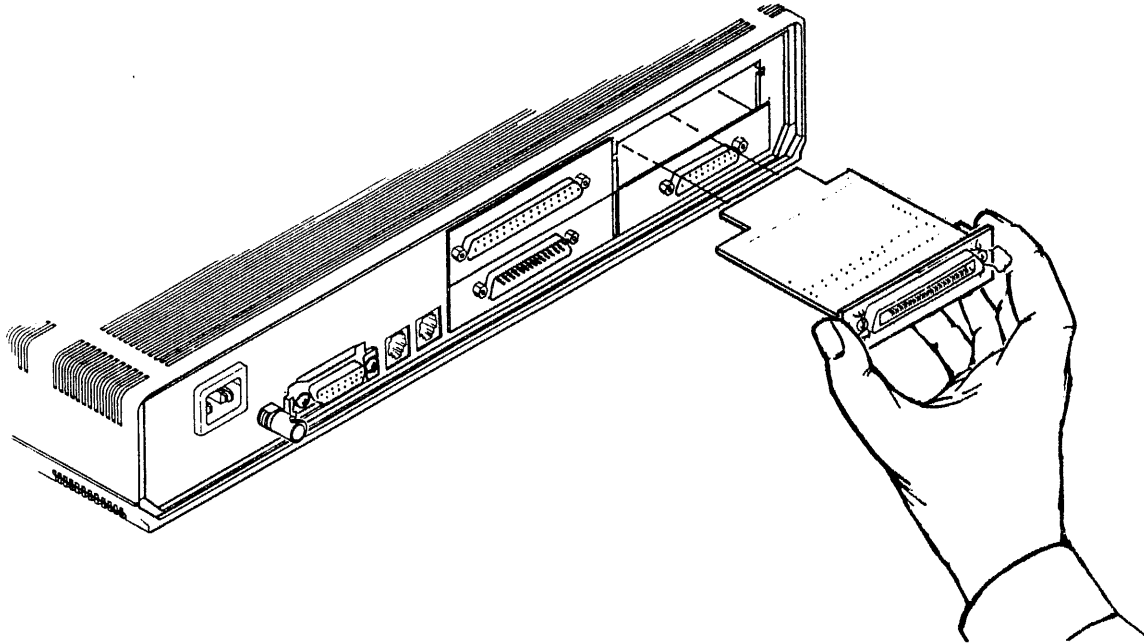
For proper operation of the Performance 3000, all serial PortPaks must be installed in lower-numbered slots than all parallel PortPaks, although blank spaces between PortPaks are permitted.

2. Unplug the Performance 3000's power cord.

CAUTION

Be sure the Performance 3000 is unplugged before you install (or remove) any of the PortPaks.

3. At the rear of the server, remove the two screws securing one of the blank panels in a location where you plan to install a PortPak and remove the blank panel. Save the screws.
4. Now, carefully plug a PortPak into the vacated slot. Orient the PortPak with its component side down.
5. Using the two screws that you removed in a previous step, secure the PortPak to the rear panel of the server.
6. For each additional PortPak to be installed, repeat steps 3 through 5 above.



P3000-04

Figure 2-3. Installing the PortPaks

2.3 Installing the Main Unit

The main unit is now ready to be installed and connected to the network. The Performance 3000 can be physically connected to the network in either of two ways. The first way is via a 15-pin connector on the rear panel of the Performance 3000, to an Ethernet transceiver (or to a port on an Ethernet multiport transceiver). The second way is via a BNC coaxial connector on the rear panel of the Performance 3000, directly to a thinwire Ethernet (Cheapernet) network. The software in the Performance 3000 will automatically detect which interface is being used and will activate the proper one.

CAUTION

Only one of the two connectors marked "Ethernet" on the Performance 3000 rear panel can be used for any particular Performance 3000 installation. The unused Ethernet connector must have no cable or terminator connected to it.

Use the following steps to install the main unit:

1. Select a location for the server that has adequate cooling and power. Note that the Performance 3000 will operate correctly from any power line input voltage within the range of 100 VAC to 240 VAC. There are no jumpers or switches, etc. to set for voltage selection.
2. If the site will not be readily accessible after installation, copy down the unit's Ethernet address, located on the rear panel just above the Ethernet port. You will need this address later during the configuration process. Figure 2-4 shows the location of the Ethernet address on the rear panel.

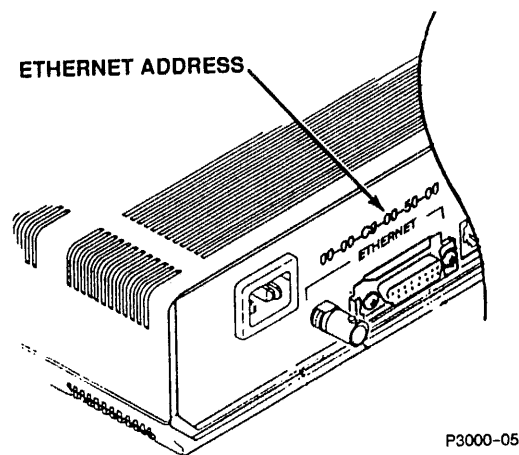
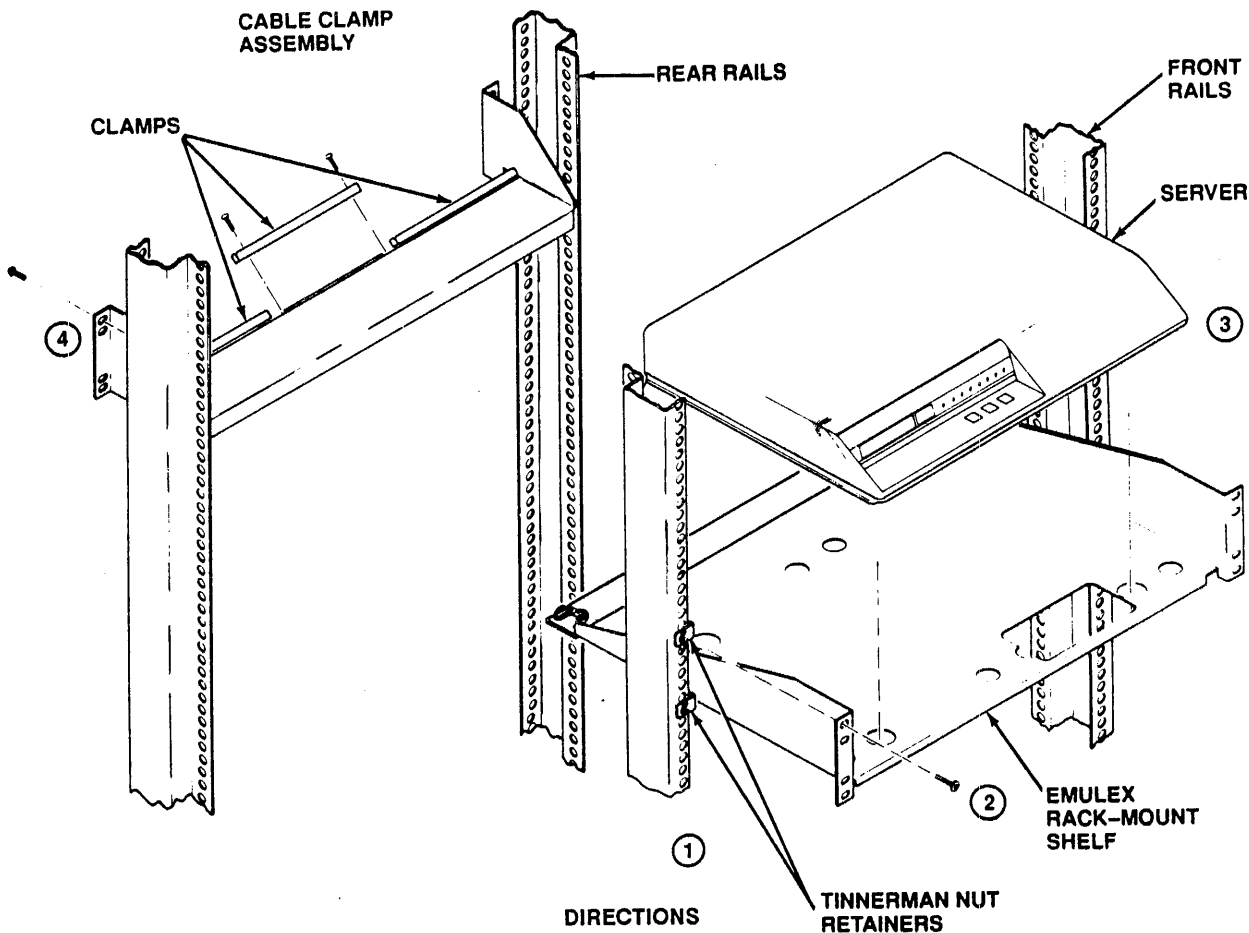


Figure 2-4. Location of Ethernet Address

3. If you are installing the Performance 3000 in an Emulex rack-mount shelf, install the shelf now, as shown in Figure 2-5. Do not stack Performance 3000 units directly on top of each other. You must allow a few inches of space between units to insure adequate cooling.



- 1 INSERT TWO TINNERMAN NUT RETAINERS ON EACH SIDE OF THE FRONT RAILS OF YOUR EQUIPMENT RACK.
- 2 HOLD THE RACK-MOUNT SHELF IN PLACE AND INSERT THE SCREWS THROUGH THE SHELF AND THE NUT RETAINERS.
- 3 PLACE THE SERVER ON THE SHELF SO THAT THE RUBBER FEET FIT IN THE HOLES IN THE SHELF.
- 4 ATTACH THE CABLE CLAMP ASSEMBLY TO THE REAR RAIL OF YOUR EQUIPMENT RACK, LEVEL WITH THE SHELF. LATER ON, WHEN YOU CABLE DEVICES TO THE SERVER, YOU CAN USE THE CLAMPS TO HOLD THE CABLES SECURELY IN PLACE.

P3000-08

Figure 2-5. Installing the Performance 3000 in the Rack-Mount Shelf

If you are connecting your Performance 3000 to your network via the 15-pin Ethernet connector on the rear panel, continue the installation with step 4a below. However, if you are connecting your Performance 3000 to your network using the BNC coaxial connector on the rear panel, skip step 4a and proceed with step 4b below.

(15-pin
connector)

- 4a. Run a transceiver cable from the 15-pin Ethernet connector on the rear panel of the Performance 3000 to either (1) an Ethernet transceiver, or (2) a port on an Ethernet multiport transceiver. Transceivers and cables are available from Emulex (see Section 1 for model numbers and ordering information).

Refer to the user's manual that came with your transceiver for detailed instructions on how to install the transceiver and cable it to the Performance 3000.

Do not attach anything to the BNC coaxial connector.

Skip step 4b below and continue the installation with the next subsection of this manual.

(BNC coaxial
connector)

- 4b. Attach the BNC coaxial "T" adapter provided with your server to the BNC connector on the rear panel of the Performance 3000.

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 segment of thinwire Ethernet, connect each side of the segment to each side of the BNC "T" adapter. If you are connecting *at the end* of a segment of thinwire Ethernet, connect the Ethernet cable to either 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.

2.4 Activating the LAT Driver

DEC operating systems communicate with Ethernet printer servers via a protocol called LAT (Local Area Transport). The Performance 3000 uses a LAT-compatible protocol called ELT (Ethernet Local Transport).

To enable LAT support on a VMS node, make sure that the following command is executed in the system-specific startup file:

```
@SYS$MANAGER:LTLOAD.COM
```

NOTE

The above command applies only to VMS nodes, not to Ultrix nodes.

A default version of the LTLOAD.COM command file is supplied with all DEC operating systems that support LAT. If you wish to modify this file to enable special features, refer to the LAT documentation supplied with your operating system (for example, the *LAT/VMS Management Guide*).

2.5 Installing the Performance 3000 Software

The host software kit enables a VMS or Ultrix node to become a load host for the Performance 3000. This software must be installed on at least one host running either DECnet or Ultrix-32 version 3.0 (or higher).

The most important part of the Emulex host software kit is a file named P3KL00E.SYS, the operational software for the server, which is automatically downloaded into the server whenever the server powers up. Since the server will not work unless this file is present, you might wish to install the host software kit on more than one host so that servers can still power up even if the primary load host is down.

The host software runs under either Ultrix-32 version 3.0 (or higher), or under VMS V4.5 (or higher). (Consult Emulex for information about other revisions.) The VMS version of the host software requires that Phase IV or higher DECnet be up and running on the host. After the software is installed, it needs to be reinstalled only after major operating system upgrades (5.0, 6.0, etc.).

NOTE

If you are *updating* your software kit (that is, this is not the first time it has been installed on your network), be sure to update all copies on all load hosts. Otherwise, servers might load unpredictable software revisions.

Subsections 2.5.1 and 2.5.2, following, explain how to install the Emulex-supplied Performance 3000 software on a VMS host; subsections 2.5.3 and 2.5.4 explain how to install the software on an Ultrix-32 host. Be sure to use the correct set of instructions for each VMS or Ultrix-32 host upon which you plan to install the software.

2.5.1 Installing the Emulex Software on a VMS Node

The following steps explain how to install the Emulex software on a VMS host:

1. Make sure you have at least 1000 blocks free on your system disk.
2. Mount the distribution media and enter the following command:

```
$ @SYS$UPDATE:VMSINSTAL
```

The VMSINSTAL utility asks some introductory questions. Answer them appropriately.

3. VMSINSTAL asks which products should be installed. Answer with an asterisk.
4. Several paragraphs of instructions are printed out as the software is being installed. VMSINSTAL then asks if you wish to install anything more. Type EXIT.
5. If it does not already exist, VMSINSTAL creates the directory SYS\$COMMON:[DECSEVER]. When VMSINSTAL is finished, the following files have been copied into this directory:

P3KL00E.SYS. This file is the operational software that is downloaded into the server when it powers up.

ESVCONFIG.COM. This is the server configuration utility. It should be run whenever a printer server is removed or installed on the network.

ESVCONFIG.DAT. This data file is created when you run the server configuration utility. It contains all server parameters.

P3K * DEFAULTS.COM.** This command file can be used with the DEC Terminal Server Manager program to change all server options back to their factory defaults. It can be edited to set the server to different defaults if you wish.

P3K_***.RELEASE_NOTES. This file contains release notes for the software. You may delete it after printing, if you wish.

6. The instructions printed out by VMSINSTAL tell you to do two things:

First, if it has not already been done, insert in your system startup file¹ the following logical definition, which equates the logical name MOM\$LOAD to a search string equal to SYS\$SYSROOT:[DECSERVER] as well as its current definition² (this is not necessary if you already have DECservers on your network):

```
DEFINE/SYSTEM/EXEC/NAME ATTRIBUTE=NO ALIAS/NOLOG -  
MOM$LOAD (current_defin),SYS$SYSROOT:[DECSERVER]
```

Second, add the newly-installed Performance 3000 to the DECnet NCP database by using the Emulex server configuration utility, ESVCONFIG.COM. This is described in the next subsection.

NOTE

As of VMS 5.0, the logical name MOM\$LOAD must be defined as a two-element search list (see DEFINE Statement). If this is not done, the DECNET Startup procedure will redefine MOM\$LOAD as SYS\$SYSROOT:[MOM\$SYSTEM].

¹For VMS 5.0 and above, the name of the system startup file is SYS\$MANAGER:STARTUP_V5.COM. For previous versions of VMS, the name of the system startup file is SYS\$MANAGER:SYSTARTUP.COM.

²To find the current definition of MOM\$LOAD, use the following command: SHOW LOGICAL MOM\$LOAD

2.5.2 The ESVCONFIG.COM Server Configuration Utility for VMS

The ESVCONFIG.COM procedure was designed to allow the user an easy method to configure a server for downloading. Functionally, it is compatible with the DECserver configuration procedure "DSVCONFIG.COM". The program can be broken into three main parts:

1. Routines that output prompts and parse all information needed to issue NCP commands to add, modify, or delete a server in the NCP data base.
2. Routines that define a local server database (ESVCONFIG.DAT) used by the software utilities to manage the server network. TSM (Terminal Server Manager) uses this database.
3. Routines to convert or merge the DECserver database into the Emulex database, and vice versa.

This procedure will define the Performance 3000 and all known DECservers. There are three allowable parameters to be passed as 'P1':

- RESTORE {circuit_id}
- SET_CIRCUIT circuit_id
- HELP

The RESTORE parameter allows nodes to centrally configure their local databases, and has an optional parameter (P2) that takes the place of the SET_CIRCUIT function by passing circuit_id.

The SET_CIRCUIT parameter allows a node to set its circuit_id, after using the RESTORE parameter. This step is needed only if the remote configured node has a different circuit name (for example, QNA-0 or UNA-0) than the central database.

You can use either of the following two methods to load the central database:

1. DSVCONFIG.COM compatible method

```
"$ @SYS$COMMON:[DECSERVER]:ESVCONFIG RESTORE"  
"$ @SYS$COMMON:[DECSERVER]:ESVCONFIG SET_CIRCUIT  
circuit_id"
```

2. Enhanced method provided

```
"$ @SYS$COMMON:[DECSERVER]:ESVCONFIG RESTORE  
circuit_id"
```

To run the configuration utility, type the following:

```
@ESVCONFIG
```

The main menu appears, as shown in Figure 2-6. At any time, press "?" for help or <ctrl-Y> to return to the main menu. The following paragraphs explain each menu option.

1 - Show known servers

This option lists all Emulex printer servers that the program has configured so far. The parameters listed are the same ones entered using option 2, explained below.

```
Emulex Server Configuration Utility

1 - Show known servers
2 - Add a server
3 - Modify an existing server
4 - Delete a server
5 - Restore known servers
6 - Import servers from DECserver database
7 - Export servers to DECserver database
^Z - Exit command procedure

Enter desired function, 1 - 7:
For Help with a menu option, enter ? followed by the option number.
```

P3000-07

Figure 2-6. The Server Configuration Utility Main Menu

2 - Add a server

This option asks the following questions about the server you are adding:

```
Enter server type for new server:
Enter DECnet name for new server:
Enter DECnet ID for new server:
Enter Ethernet address for new server:
Enter service circuit for new server:
```

The *Server type* is normally P3000 for the Performance 3000. You can also configure a Performance 4000 (P4000), or a DECserver 100 or 200 (DS100 and DS200). The designation UNKNW (Unknown) is reserved for future use.

The *DECnet name* can be one to six characters long. The first character must be alphabetic. Be sure to choose different names for every server on your network.

The *DECnet ID* is the address DECnet uses for the server. You must specify an area number (2-63) and a node number (1-1023). For example, the ID 2.31 designates area 2, node 31. If you enter only one number, the configuration utility will use the area number of the DECnet executor as the area number, and the number that you entered as the node number.

The *Ethernet address* for the Performance 3000 is stamped directly above the Ethernet port on the server's rear panel.

The *service circuit* refers to the type of Ethernet adapter on the load host. Your choices are BNA-0 for BI Bus adapters, QNA-0 for Q-Bus adapters, UNA-0 for UNIBUS adapters, and SVA-0 for MicroVAX 2000 adapters. Use the number 1 instead of 0 if you are using the second Ethernet controller on a system.

3 - Modify existing server

This option allows you to change any of the parameters you entered when you added a server. The questions asked are exactly the same as the questions for option 2.

4 - Delete a server

This option allows you to delete a Performance 3000 server from the DECnet database. It asks only for the DECnet name of the server you wish to delete. Respond with the name you assigned to the server when you added it to the DECnet database.

5 - Restore known server

This option adds each server defined in the ESVCONFIG database to the DECnet database.

6 - Import servers from DECserver database

This option allows you to include all DEC servers in the Emulex database. This is useful for two reasons: (1) the conversion utility checks to make sure that no two servers have the same name, and (2) it is sometimes convenient to have all servers in a single database. This allows you to manipulate all of your servers from within the conversion utility.

7 - Export servers to DECserver database

This option is the opposite of option 6: it adds Performance 3000 servers to the DECnet database, DSVCONFIG.DAT (the Performance 3000 is exported as server type DECserver 250). This is useful because certain DEC utilities (for example, the Terminal Server Manager) obtain configuration information from the DECnet database. If the Performance 3000 servers are not included, the DEC utilities do not know they exist.

2.5.3 Installing the Emulex Software on an Ultrix-32 Node

The following steps explain how to install the Emulex software on an Ultrix-32 host:

1. Edit the Configuration File

Add the following entries to the configuration file if they are not already present:

```
options DLI
pseudo-device dli
```

The configuration file can be found in the directory `/sys/conf` and has the name of your system. For example, if your system name is **ROYAL**, then your configuration file will be in `/sys/conf/ROYAL`. You must rebuild your kernel to make sure that the changes take effect. You can use the `/etc/doconfig` utility to assist you in this.

The new kernel generally should be copied into the `vmunix` directory. When you reboot your system, the system will look for the kernel in the `vmunix` directory by default, unless you configure your system to redirect to a different directory when it reboots.

2. Edit the rc.local File

Editing the `/etc/rc.local` file allows you to start the network interface and the `mop_mom` daemon on system bootup.

To start the network interface for Unibus DEUNA or DELUA, add the following command to the `rc.local` file:

```
/etc/ifconfig de0 `/bin/hostname`
```

To start the network interface for Q-Bus DEQNA or DELQA, add the following command to the `rc.local` file:

```
/etc/ifconfig qe0 `/bin/hostname`
```

To start the network interface for MicroVAX 2000 DESVA, add the following command to the `rc.local` file:

```
/etc/ifconfig se0 `/bin/hostname`
```

To start the network interface for BI DEBNT or DEBNA, add the following command to the `rc.local` file:

```
/etc/ifconfig ni0 '/bin/hostname'
```

To start the `mop_mom` daemon, add the following commands to the `rc.local` file (these commands must come after the command to start the network interface with other local daemons):

```
if [ -f /usr/etc/mop_mom ]; then
    echo 'Starting mop_mom' >/dev/console
    /usr/etc/mop_mom &
fi
```

The commands above will cause your host to load all servers for which it has the requested software, and to accept dumps from all servers requesting to do so. If you do not desire this for your node, alternatively you may add the commands below to the `rc.local` file to cause the `mop_mom` daemon to search the nodes database and support only servers that it finds there. Use the Emulex utility `/usr/lib/dnet/esvconfig` (described later) to manage this database.

```
if [ -f /usr/etc/mop_mom ]; then
    echo 'Starting mop_mom' >/dev/console
    LOADDUMP_SECURE=on /usr/etc/mop_mom &
fi
```

3. Install the Terminal Server Software

You now must install the terminal server software image on your host. To do this, mount your media on your host and make sure it is write protected. From a terminal, type the following command, replacing the "?" symbol with the device number:

```
setld -l /dev/rmt?h
```

From here, the `setld` utility will prompt you to complete the installation.

4. Make Your Changes Effective

To make your changes effective, you now must reboot your system. Type the following command to shut down the system and reboot:

```
/etc/shutdown -r now "Rebooting For  
Terminal Server Support"
```

Note that the "-r" parameter reboots your system from whatever operating system is running on disk drive 0. This example assumes that you have Ultrix-32 version 3.0 on disk 0. If Ultrix resides on a different disk unit, you may wish to substitute "-h" instead of "-r". Entering "**shutdown -h**" halts your system and prompts you to select a boot disk unit.

5. Add the Server to the DECnet Database

Add the newly-installed Performance 3000 to the DECnet NCP database by using the Emulex server configuration utility, **esvconfig**. This is described in the next subsection.

2.5.4 The esvconfig Server Configuration Utility for Ultrix-32

The **esvconfig** utility is a program that is supplied with the Ultrix-32 host software kit. The **esvconfig** utility program file is in the directory `/usr/lib/dnet/esvconfig`. The **esvconfig** utility eliminates the need for memorizing many cumbersome commands and their associated syntax by providing a menu-driven and prompted interface to host management of terminal servers. In addition, whenever the user gives an incorrect response to a prompt, **esvconfig** provides detailed help to assist the user in his task. Following is a summary of the capabilities of **esvconfig**:

1 - Show known servers

Selecting this option displays all the nodes and servers that you have defined using the **esvconfig** utility. This display is generated from **esvconfig**'s private database.

2 - Add a server

This option allows you to add nodes and servers in a prompted fashion. Be prepared to provide the server name, type, service circuit, and Ethernet address.

3 - Swap or modify a server

This option allows you to modify a portion of an entry, in case the entry was made in error or a new hardware item is being swapped in a particular node's location.

4 - Delete a server

This option allows you to delete nodes from both **esvconfig**'s database and the host's nodes database simultaneously.

5 - Restore existing servers

This option provides great convenience if the host's nodes database is deleted inadvertently. This option restores all the nodes and servers defined in the **esvconfig** private database to the nodes database.

6 - Show nodes database

This option displays the host's nodes database. This allows you to confirm that the nodes entered with **esvconfig** are indeed in the host's nodes database. Note: nodes that were not entered with **esvconfig** will be displayed also, if other sources have defined any.

2.6 Cabling

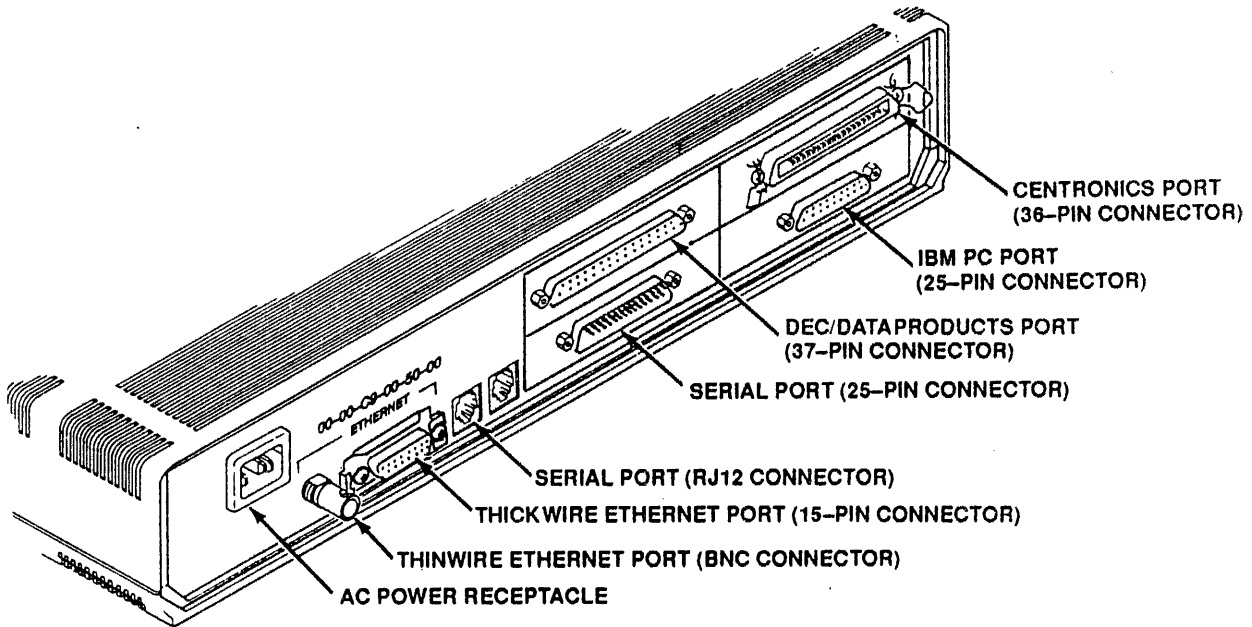
Different models of the Performance 3000 contain different numbers and types of I/O ports. The following types of ports are supported:

- **Partial-modem serial ports (RJ12).** These ports support data signals plus two modem signals and can be connected to local terminals, local serial printers, and most full-duplex modems.
- **Full-modem serial ports (25-pin male).** These ports have eight modem controls and support full-duplex modems, terminals, serial printers, and a wide range of devices that require modem controls. Note that half-duplex modems are not supported on either type of serial port.
- **DEC/Dataproducts parallel ports (37-pin female).** These ports use a 37-pin D female connector and support standard Dataproducts parallel printers, using a DEC-type cable having a 37-pin connector on the server end, such as a DEC type BC27A or BC27B cable, or equivalent.
- **Centronics parallel ports (36-pin female).** These ports use a 36-pin female ribbon connector and support standard Centronics parallel printers.
- **IBM PC printer parallel ports (25-pin female).** These ports use a 25-pin D female connector and can be software-selected as either a Centronics or Dataproducts port. These ports support either Centronics or Dataproducts printers that have cabling that is compatible with a 25-pin IBM PC parallel printer port.

Although it is not necessary to cable all of your printers and terminals at this time, you should connect a terminal to connector J1 on the Performance 3000 rear panel. This port is set at the factory to be the console port, and displays all status messages during initialization. Set the terminal for 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 installed and operating, if you wish).

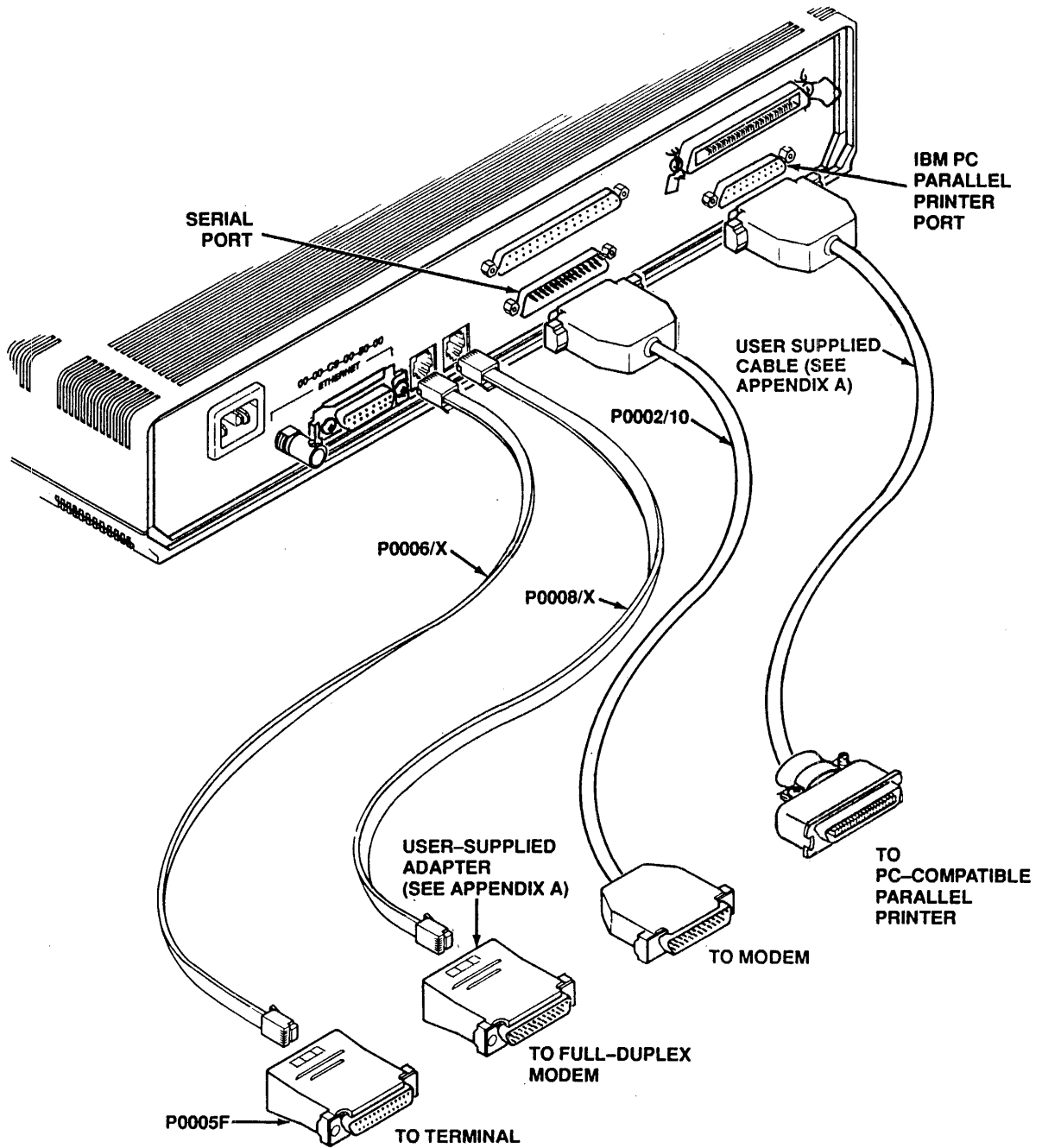
Figure 2-7 depicts the Performance 3000 rear panel, and shows the location of all of the ports. Figure 2-8 shows typical cabling arrangements.

Refer to Appendix A for pin and signal assignments for these ports, and for sample cabling diagrams for common applications.



P3000-08

Figure 2-7. Location of Ports on Rear of Performance 3000



P3000-09

Figure 2-8. Cabling the Performance 3000

2.6.1 Device Configuration

Be sure to correctly configure each device that you connect to the Performance 3000. Refer to the manufacturer's manual for each type of device that you plan to connect to the Performance 3000, and verify that the device's parameter settings are correct.

For example, serial printers and terminals must have their serial parameters (baud rate, number of data bits per character, etc.) set to match the corresponding parameters of the server port to which they are attached.

Also, some printers have parameters that control their response when they receive a carriage return or line feed code. Wrong settings for these parameters could cause overprinting, double spacing, or other symptoms. If your printer has a parameter called "Autofeed" or "AutoLF," it usually should be disabled in the printer for proper operation with the Performance 3000.

In addition, some parallel printers have parameters that control their response to DATA BIT 8. If you are using such a printer, refer to the parallel printer cable schematics in Appendix A and ensure that both the cable wiring and printer parameters are correct for your printer.

CAUTION

Failure to properly configure a device that is connected to a Performance 3000 port could cause the device to not operate, or to operate improperly or erratically.

2.7 Power-Up and Verification

Once your Performance 3000 system is completely installed and cabled, power it up by plugging it into an AC outlet. If the server has been installed previously, you might wish to restore all options to their factory settings by holding down the Next and Last buttons on the front panel as you plug in the server.

Upon power-up, the server runs an internal self-test. Self-test results are shown on the server's front panel, which contains three LEDs and an LCD display (see Figure 2-9). The power-up sequence goes like this:

1. The Power LED lights up and test names flash through the LCD display. The server downloads its software from the load host and displays messages while it is doing this.
2. If a fatal error occurs during the self-test, the Alarm LED lights and the name of the failed test appears in the LCD display. If a nonfatal error occurs, a message is displayed on a terminal connected to the console port and the server continues initializing. If either a fatal or nonfatal error occurs, refer to Section 6, Troubleshooting, for further help, or call Emulex Technical Support.
3. If all tests pass and the network load completes, the front panel should be in the following state:

Alarm: Off
LAN: Flickering (shows LAN activity)
Power: On
LCD Display: "Performance 3000"

Installation of the Performance 3000 is now complete and you are ready to finish up by configuring server and port options.

If you are downloading from a VMS host, you should see a message on the operator's console if the download was successful.

If you are downloading from an Ultrix-32 host, type the following command at the host to see if the download was successful:

```
more /usr/spool/mqueue/syslog
```

If the Ultrix download was successful, you should see system log entries similar to the following:

```
Jun 13 12:22:17 localhost: 2459 mop_dumpload:  
sending volunteer assistance for system load,  
(target node Ethernet address = 00-00-C9-00-50-00)  
Jun 13 12:22:18 localhost: 2459 mop_dumpload:  
sending system image, (target node Ethernet  
address = 00-00-C9-00-50-00)
```

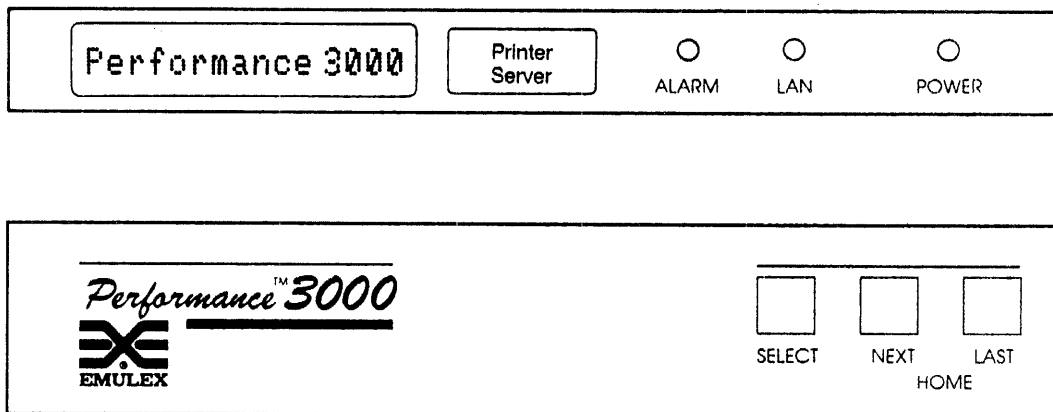


Figure 2-9. Performance 3000 Front Panel LEDs and LCD Display

3.1 Overview

This section explains how to set options on the Performance 3000 and how to perform basic functions such as logging in to the server and connecting to host CPUs.

There is much more information available about configuring the server than is contained in this section, of course. After you have performed basic server configuration and your system is up and running, you might wish to consult the following sections:

- **Section 4 (Application Examples).** This section explains how to use some of the more advanced features of the Performance 3000.
- **Section 5 (Commands).** This section describes in detail all commands available for system tuning and configuration.

3.2 Logging In to the Server

3.2.1 Local Mode

The first step in configuring the Performance 3000 is to plug a terminal into connector J1 on the rear panel of the server. The terminal must be set to 9600 baud, 8-bit characters, and no parity (this can be changed later, if you wish).

Use the following steps to complete the login process:

1. Press the <return> key several times until the server responds.
2. If this is the first time the server has been powered up, no password is required. Go to step 3.

If password protection has been enabled previously, the server displays a pound sign (#). Type in the login password (the default password is ACCESS). The password is not echoed on the screen.

3. Unless a permanent username has been configured for the port, you are asked for a username:

```
Enter username, or HELP>
```

You can enter a username of 1 to 16 characters that identifies you or `<ctrl-z>`, which assigns the port name "PORT_n" as the username. Later on, you might wish to use the `CHANGE PORT USERNAME` command to assign a permanent name to the port so that you no longer get the username prompt when you log in.

4. The server displays the server prompt:

```
Server>
```

You are now in local mode and ready to begin configuring the server. Complete configuration instructions are given later in this section, but you might want to enter the following commands immediately:

- **SET PORT TYPE VT100.** Enter this command if you are using a VT series terminal or compatible.
- **SET PORT PAUSE ENABLED.** This command affects the way screens are displayed. Several of the `SHOW` commands, which are used to view current server settings, display several screens of information and require you to specify which screen you want. These screens are described fully in Section 5. In the meantime, however, you might wish to enter the `SET PORT PAUSE ENABLED` command. This command forces the server to pause after each screen it displays and then display the next screen when a particular key is pressed. (The required key is listed at the bottom of the screen.) This is a convenience until you are more familiar with the various `SHOW` commands, but remember that if it is enabled, you must press the `<return>` key to stop displaying screens and return to local mode.

NOTE

In the examples that appear throughout the rest of this manual, all user input is shown in red.

3.2.2 Gaining Access to Privileged Commands

Server configuration commands can be issued only by privileged users. To gain access to privileged commands, type the following command and enter the privileged password. Note the prompt change when you are in privileged mode:

```
Server> SET PRIVILEGED
Password> (enter the password here)
Server>>
```

The privileged password is set at the factory to SYSTEM. After entering this, you should change it immediately by typing:

```
Server>> CHANGE SERVER PRIVILEGED PASSWORD
Privileged password>
```

If you have forgotten the privileged password, you can restore the password to SYSTEM by resetting the server to its factory defaults (see subsection 3.2.5). Be sure to return the port you are using to nonprivileged access as soon as you are finished configuring the server. This is done by typing:

```
Server>> SET NOPRIVILEGED
Server>
```

3.2.3 Command Line Editing

Command line entry and editing is similar to the method used by VMS:

- The <delete> key (labeled <rubout> on some keyboards) erases the character to the left of the cursor. The <backspace> key moves the cursor to the beginning of the line.
- The left and right arrow keys move the cursor without erasing any characters.
- The up-arrow key recalls the last command line entered. The down-arrow key reverses this after successive up-arrows until you are back to a blank command line. Recalled command lines can be edited in the usual manner.

Table 3-1 lists the functions of all special command line editing keys.

Table 3-1. Command Line Editing Keys

Key	Usage
Return	Causes the current command line to be executed. Note that the entire command line will be executed, including characters to the right of the current cursor position, if any.
Rubout or Delete	Erases the character immediately to the left of the cursor (this is usually the last character entered).
Backspace	Moves the cursor to the beginning of the line without deleting any characters on the line.
Ctrl-E	Moves the cursor to the end of the line without deleting any characters on the line.
Break	Aborts the command line or any display that might be in progress. (This key can be disabled later via the SET PORT BREAK command.)
Ctrl-B	Recalls the previous command line.
Ctrl-R	Redisplays the current command line, with any line editing changes incorporated. This is useful to verify the effects of command line editing.
Ctrl-U	Erases all characters to the left of the cursor. If the cursor is at the end of the command line, this action effectively aborts the entering of the command without causing it to be executed.
Ctrl-Z	Aborts the entering of passwords.
<p>The following features are available on ANSI and VT100 terminals only if the server port has been configured as type VT100 or ANSI. Note: Some keys have different functions during server displays (see the SHOW command for details).</p>	
Ctrl-A	Toggle Insert Mode. Insert mode causes characters to be "inserted" into the command line at the cursor position. Pressing <return> or <ctrl-A> returns you to overstrike mode.
Up Arrow	Same as Ctrl-B. Recalls the previous command line.
Down Arrow	Recalls the subsequent command line (after one or more up-arrows).
Left Arrow or Ctrl-D	Moves the cursor left without erasing any characters.
Right Arrow or Ctrl-F	Moves the cursor right without erasing any characters.
Linefeed or Ctrl-J	Deletes the previous word.
Ctrl-H	Same as <backspace>. Moves the cursor to the beginning of the line without deleting any characters on the line.

3.2.4 The HELP Command

You can get online information about server commands at any time by using the help command. To activate it, type HELP:

```
Server> HELP
```

The server displays a list of commands. To get information about a particular command, type HELP followed by the command name:

```
Server> HELP SET
```

The server displays a screen of information about the command. You can also go directly to a particular command option by typing the option name:

```
Server> HELP SET PORT BROADCAST
```

Note that information about privileged commands is available only to privileged users. A hints screen is available to help new users. Simply type HELP HINTS to display a screen of introductory information about the Performance 3000.

3.2.5 Returning to the Factory Settings

If you make some mistakes while you are configuring options (or at any other time) and want to start over, you can erase the server's internal memory and get back the original factory settings as follows:

1. Remove power from the Performance 3000.
2. While holding down the Next and Last keys on the server's front panel, restore power to the server. Continue to hold the keys down until the message "EAROM RESET" appears. (This takes about two seconds.)

When you do this, you completely erase any option changes that you might have made. All service options, server options, and port options are reset to their original factory settings.

3.3 Configuring the Server

Although the server generally can be used without any special configuration, it is a good idea to go through the server options and see if there are any that you would like to change. Three sets of options can be changed:

- **PORT Options.** These options affect individual ports on the server. For example, you might wish to set such things as speed, parity, and type of flow control individually on each port.
- **SERVER Options.** These are options that affect the entire server.
- **SERVICE Options.** These are options used to create local services on the server. For example, if you have a printer connected to a port on the server, you might wish to define that port as a service named PRINTER.

All of these options are modified by either the SET, DEFINE, or CHANGE command. Each of these three commands works slightly differently:

- **CHANGE** - Options are modified immediately and permanently (unless the server is reset to its factory settings). This is the most common command.
- **SET** - Options are modified temporarily. The old values return the next time the server is reinitialized. Port options modified by a SET command return to their old values when the port is logged in or out.
- **DEFINE** - Options are not modified until the server is reinitialized, but are then changed permanently (unless the server is reset to its factory settings). Port options modified by a DEFINE command become permanent when the port is logged in or out.

Thus, there are a total of nine commands that can be used to modify various options:

CHANGE PORT	CHANGE SERVER	CHANGE SERVICE
SET PORT	SET SERVER	SET SERVICE
DEFINE PORT	DEFINE SERVER	DEFINE SERVICE

These commands are described on the following pages.

3.3.1 Setting Port Options

The CHANGE PORT command and all the options it affects are described fully in subsection 5.29. Note that nonprivileged users are allowed to change some options on their own ports (see subsection 5.29 for details) but only a privileged user can change another port's options. Examples of port setup for different devices (printers, modems, etc.) are given in subsection 3.4.

Note that some parameters (for example, SPEED) apply only to serial ports, some parameters (for example, LOGGING) apply only to parallel ports, and some parameters (for example, ACCESS) apply to both serial and parallel ports. As an example, assuming that port 6 is a serial port, the following command sets the baud rate of port 6 to 9600 bps:

```
Server>> CHANGE PORT 6 SPEED 9600
```

You can specify several ports or all serial ports with one command. The following line sets port 1 and ports 4 through 6 to 9600 baud:

```
Server>> CHANGE PORT 1,4-6 SPEED 9600
```

You can specify all serial ports with PORT ALL. The following line prevents all serial ports from receiving broadcast messages from other ports:

```
Server>> CHANGE PORT ALL BROADCAST DISABLED
```

If no port number is specified, your own port is changed. You can also specify multiple parameters on a single line as long as the line does not exceed 132 characters. For example, if you want to configure your own port for a VT100 type terminal with the pause option enabled, enter the following (note that you are not required to be in privileged mode because you are changing your own port):

```
Server> CHANGE PORT TYPE VT100 PAUSE ENABLED
```

The word PORT is optional. The following line is identical to the one above:

```
Server> CHANGE TYPE VT100 PAUSE ENABLED
```

3.3.2 Setting Server Options

The CHANGE SERVER command and all the options that it affects are described fully in subsection 5.29. Note that server options can be modified only by a privileged user.

The options affected by the CHANGE SERVER command affect internal server operation and are set to standard values at the factory. Most of them can be safely left in their factory settings but a few are system dependent. At a minimum, you should consider changing the following options:

- CONSOLE PORT
- HEARTBEAT
- NAME
- PRIVILEGED PASSWORD

Some server options can not be changed while sessions are active (they are noted individually in subsection 5.29). For these options, it is often convenient to use the DEFINE command and then issue a delayed INITIALIZE command to reinitialize the server at a later time when no sessions are active. The new options take effect when the reinitialization is complete.

3.3.3 Setting Service Options

The CHANGE SERVICE command and all the options that it affects are described fully in subsection 5.30. Note that service options can be modified only by a privileged user.

The CHANGE SERVICE command defines a server port(s) as a local service. This allows hosts or users to connect to the ports by simply specifying the service name. For example, if a dialout modem is connected to, say, port 1 on the server, you might want to define that port as a service named MODEM so that users can connect to the modem by entering the command CONNECT MODEM.

Configuring a port as a service is required only for ports connected to devices to which other users (or hosts) might want to connect. This includes printers, modems, data switches, and so forth. If your server is used only for interactive terminals, there is no need to define any local services.

Existing services can be eliminated by the CLEAR/PURGE SERVICE command (see subsection 5.5 for details).

3.3.4 Setting Port Options for Local Services

If you have defined any local services, you must set port options for each of the service's ports. For example, if you connect a serial printer to port 1 and define it as the service PRINTER, you must set the port options on port 1 so that the port is compatible with your printer.

The following port options must always be set for all local services:

- ACCESS must be remote or dynamic
- If the port is a serial port, AUTOBAUD must be disabled
- If the port is a serial port, SPEED and PARITY must be set via the CHANGE PORT command

In addition, there are a number of port options that might need to be changed from their factory defaults depending on the type of service offered (printer, modem, etc.). Subsection 3.4 contains several examples of how to configure ports for specific devices. Be sure to read this subsection if you are unsure of how to set port options for local services. Even if a local service is defined properly, it will not work if its port options are set incorrectly.

3.4 Examples

Figure 3-1 gives a sample Performance 3000 configuration sequence. It steps you through the login procedure and shows how to configure local services, server options, and port options.

This is an example only. Your local services (if any) will probably be named and defined differently, and you might wish to set your server and port options differently. The general sequence, however, will be the same.

Press Enter until the following prompt appears:

```
Enter username, or HELP> John Smith
# ACCESS (this does not appear on the screen when you type it)
```

```
Server> SET PRIVILEGED
Password> SYSTEM (this does not appear on the screen when you type it)
```

```
Server>> CHANGE SERVICE MODEM PORTS 1-3 PASSWORD "AARDVARK"
Server>> CHANGE PORT 1-3 ACCESS REMOTE SPEED 300 CHARACTER SIZE 7
Server>> CHANGE PORT 1-3 PARITY NONE
```

```
Server>> CHANGE SERVICE PRINTER PORT 6
Server>> CHANGE PORT 6 TYPE DATAPRODUCTS
Server>> CHANGE PORT 6 ACCESS REMOTE
```

```
Server>> SET PORT 1-6 AUTHORIZED GROUPS 0,2-5
Server>> SET PORT 1-6 GROUPS 0,2-5
Server>> CHANGE PORT ALL BROADCAST DISABLED
Server>> CHANGE PORT ALL DSRLOGOUT ENABLED
Server>> CHANGE PORT ALL TYPE VT100
```

```
Server>> CHANGE SERVER CONSOLE PORT 2
Server>> CHANGE SERVER HEARTBEAT DISABLED
Server>> CHANGE SERVER LOGIN PASSWORD "MISSOURI"
Server>> CHANGE SERVER NAME SERVER 1
Server>> CHANGE SERVER PRIVILEGED PASSWORD "THERMIDOR"
Server>> CHANGE SERVER SERVICE GROUPS 0,2-5
Server>> CHANGE SERVER WELCOME "Welcome to Server 1"
```

```
Server>> SET NOPRIVILEGED
Server>
```

Figure 3-1. Sample Server Configuration Sequence

Note that ALL refers to all of the serial ports. When parallel ports are included, they must be specifically cited (as above).

3.4.1 Sample Port Setups

The following subsections contain examples of how to set port options for a variety of devices. The following port setups are covered:

- Standard Terminals
- Dedicated Terminals
- PCs as Terminals
- Standard Serial Printers
- Serial Printers Using CTS/RTS or DSR/DTR Flow Control
- Parallel Printers
- Modems
- Non-ELT Hosts
- Data Switches

Port options are set via the SET/DEFINE/CHANGE PORT command. Note that for most devices nearly all of the port options can be left in their factory default settings. In the examples that follow, options that are a matter of personal preference are not discussed. Only the options that *must* be changed in order to support a particular device are listed.

3.4.2 Standard Terminals

A standard terminal is any dumb, ANSI, or DEC-compatible terminal that users use interactively. These terminals use the standard ASCII character set.

Standard terminals require no changes from the factory default port settings. You might wish to make the following changes, however:

- The default terminal type for all serial ports is SOFTCOPY. If, for example, your server has DEC VT series terminals or compatibles on ports 1 through 3, issue the command `CHANGE PORT 1-3 TYPE VT100`. If you are unsure what terminal type you have, type `HELP HINTS TERMINAL`.
- You might wish to assign permanent usernames to terminal ports via the `CHANGE PORT x USERNAME` command. If this is not done, users are prompted for a username every time they log in. Note that this command can also be issued by individual users for their own ports.
- Be sure each user is authorized for the right services. Each node that offers a service has a group code, and users must be authorized to access this group code if they are to use the service. This is done by the `CHANGE PORT AUTHORIZED GROUPS` command.
- The default flow control type for all serial ports is XON/XOFF, the most common type. If, for example, you have terminals on serial ports 1 through 3 using EIA flow control, you must issue the command `CHANGE PORT 1-3 FLOW CONTROL DSR`.
- All serial ports are set for autobaud operation. This allows the attached terminals to be set for any speed, but characters must be either 7-bit even parity or 8-bit no parity. If they are not, you can not use autobaud and must set all port parameters individually using the `CHANGE PORT SPEED, PARITY, and CHARACTER` options.

3.4.3 Dedicated Terminals

A dedicated terminal is one that connects directly to a service, skipping the connect command and username prompt. For example, if you have a VAX node with a service name of ACTG, a user normally is required to enter a username, a password, and a CONNECT command before logging in to the VAX.

If you wish, the username prompt can be disabled by assigning the port a permanent username via the CHANGE PORT USERNAME command, and the password requirement can be deleted by the CHANGE PORT PASSWORD command.

You can also eliminate the CONNECT command. There are two ways this can be done:

- CHANGE PORT *x* AUTOCONNECT ENABLED PREFERRED *service*

When autoconnect is enabled, the port automatically connects the user to the specified service after the server login. If you then require a connection to a different service, press the "break" key to enter local mode and return to the Server > prompt, then issue the new connect command.

- CHANGE PORT *x* DEDICATED *service*

This command is similar to the one above with one difference: the user does not receive the server login prompt and is not allowed to enter local mode. This means that the user can not switch to another service; he is connected permanently to the specified service just as if he had a hardwired connection.

In summary, use the PREFERRED option when the autoconnect is simply a convenience for the user. Use the DEDICATED option when you want to prevent a user from accessing any other services (this makes the server transparent to the user). Note, however, that in both cases the user must still enter the login password if it is enabled for his port.

3.4.4 PCs as Terminals

A PC running terminal emulation software can be set up just like any other terminal. No special options are required.

If you plan to use a PC for file transfers, you might need to set a few options differently:

- **ACCESS** should be set to **DYNAMIC** so that the PC can accept a connection from another device that wants to transfer a file. (Note that this port must be included on a service offered by the server.)
- **AUTOBAUD** does not work with remote connections. If the PC is defined as a local service and will be accepting connections from other devices, you must disable **AUTOBAUD** and set speed, parity, and character size via the **CHANGE PORT** command.

Refer to subsection 4.6.2 for a complete discussion of using PCs for file transfers.

3.4.5 Standard Serial Printers

A standard serial printer, like a standard terminal, is one that uses XON/XOFF flow control. Standard serial printers require the following port settings:

- **ACCESS REMOTE**. In most cases, a printer does not need to initiate connections; it only needs to accept them.

Some printers, however, such as hardcopy keyboard devices, can act as terminals as well as printers. For these devices, set **ACCESS DYNAMIC** so that connections can be originated as well as received. You might also wish to set **INTERRUPTS ENABLED** so that you can interrupt a print job by pressing a key on the keyboard.

- **AUTOBAUD DISABLED**. Autobaud does not work with remote connections. You must set the speed, parity, and character size via the **CHANGE PORT** command.

3.4.6 Serial Printers Using CTS/RTS or DSR/DTR Flow Control

Some serial printers use modem signals for flow control rather than XON/XOFF characters. These printers should be set up like standard printers with two differences:

- FLOW CONTROL should be set to either CTS (for printers that use CTS/RTS flow control) or DSR (for DSR/DTR flow control). Partial-modem ports can only be set to DSR and require a special cable if CTS flow control is used (see Appendix A for cable schematics).
- MODEM CONTROL must be disabled.

Note that printers that use modem signals for flow control must be connected with cables that carry the modem signals. See Appendix A for a diagram of the appropriate cables.

3.4.7 Parallel Printers

The only configuration necessary for printers connected to any of the parallel ports is to set TYPE to either CENTRONICS or DATAPRODUCTS (the default is TYPE CENTRONICS for PC or Centronics PortPaks, and TYPE DATAPRODUCTS for Dataproducts PortPaks).

3.4.8 Modems

The following options should be set on ports connected to modems:

- MODEM CONTROL must be enabled.
- AUTOBAUD must be disabled if the modem is a dialout modem. Set the speed, parity, and character size via the CHANGE PORT command.
- If your modem has a fallback speed and supports alternate speed modem protocol signals DSRS and SMI, set the ALTERNATE SPEED option to reflect the fallback speed. If a port is attached to an alternate speed or multiple speed modem and the modem is a dialin modem, the alternate speed option can be disabled and the autobaud option enabled to support the fallback speed(s).
- PASSWORD should be enabled as a security feature.

- On partial-modem ports (RJ12 connectors), DTRWAIT must be disabled for dialin modems and enabled for dialout modems. ALTERNATE SPEED must be disabled.
- ACCESS should be set to LOCAL for dialin modems, REMOTE for dialout modems, and DYNAMIC for dialin/dialout modems.

Be sure to use the correct cables for connecting modems. Cabling diagrams are shown in Appendix A. Refer to Appendix C if you require more detailed information on Performance 3000 modem signals.

3.4.9 Non-ELT Hosts

The Performance 3000 can be used to connect non-ELT hosts to your Ethernet network (ELT is compatible with LAT, the protocol DEC printer servers use to communicate with remote hosts). Figure 3-2 illustrates how a non-ELT host can be connected to your Ethernet network by connecting serial ports on the host to serial ports on the Performance 3000.

Set port options (server "B" in Figure 3-2) as follows:

- ACCESS must be set to REMOTE.
- AUTOBAUD should be disabled. Set the speed, parity, and character size via the CHANGE PORT command.
- MODEM CONTROL should be enabled.
- Be sure to define the ports to which the host is connected as a service. Users can then connect to the non-ELT host by connecting to the service.

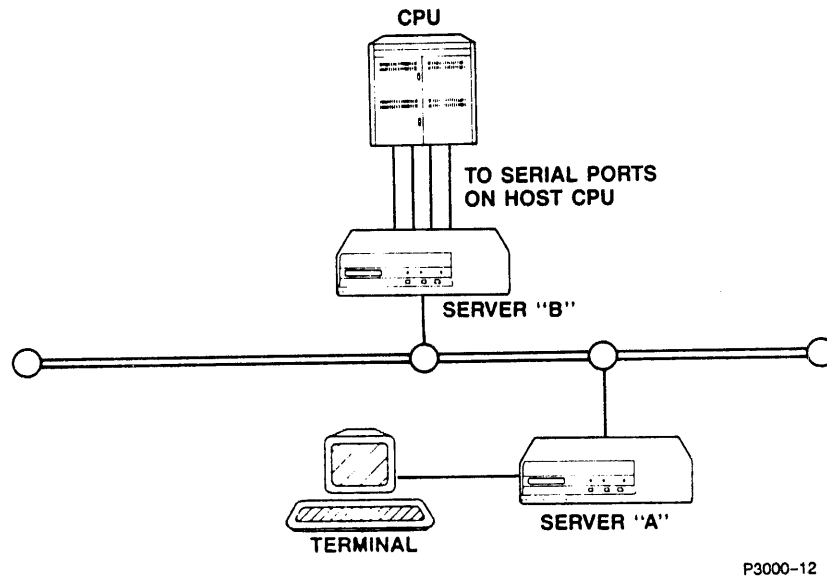


Figure 3-2. Connecting a Non-ELT Host to the Performance 3000

3.4.10 Data Switches

You can attach a data switch to a port (or ports) on the Performance 3000 in order to allow server users access to hosts or other devices connected to the data switch. Ports must be set up as follows:

- ACCESS should be DYNAMIC. If connections will be made in one direction only (for example, server users connecting to remote hosts on the switch, but not vice versa), access can be either LOCAL or REMOTE, as appropriate.
- MODEM CONTROL should be enabled.
- DSRLOGOUT must be disabled.
- AUTOBAUD should be disabled if access is REMOTE or DYNAMIC. Set speed, parity, and character size via the CHANGE PORT command.

- BREAK might need to be set to REMOTE or DISABLED. This depends on the requirements of the data switch.
- Be sure to define the ports to which the data switch is connected as a service. Users can then connect to the switch by connecting to the service.

It is possible that you might need to set other port options in addition to the ones above. Different data switches have different requirements, and the only way to make sure that your port options are set correctly is to refer to the technical documentation for your data switch.

3.5 Connecting to Services

After all server and port options have been configured, the server is ready for use. Once you have logged in to the server and gotten the `Server>` prompt, you are in *local mode* and can use the `CONNECT` command to connect to host CPUs and other services on the network.

The `CONNECT` command can be abbreviated `C`, so to connect to a VAX named `SALES`, for example, you would enter the following and then log in to your account on the VAX normally:

```
Server> C SALES
local-010-Session 1 to SALES on node VAX1 established

Welcome to VAX/VMS Sales

Username: (enter your account name here)
```

After you have logged in to your account, you are in *service mode*. You can exit service mode in three ways:

- By logging off the VAX. This disconnects your session.
- By pressing the `<break>` key (unless you have disabled the break key via the `SET PORT BREAK` command). This puts you back in local mode but keeps your session active. You can get back into your session by entering the `RESUME` command.
- By pressing the local switch character. This character works in a manner similar to the `<break>` key. Pressing the local switch character puts you back in local mode but keeps your session active. You can get back into your session by entering the `RESUME` command.

By using the <break> key or the local switch character to exit sessions, you can keep multiple sessions active and switch between them easily. To get a list of all your active sessions, get into local mode and issue the `SHOW SESSIONS` command.

To disconnect all your active sessions, get into local mode and either enter the command `DISCONNECT ALL` or simply log off the server by entering `LO`.

For a complete description of all server commands, refer to Section 5, `Commands`.

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4.1 Overview

This section describes some of the advanced features of the Performance 3000. It includes subsections on initializing the server, managing print queues, using the front panel display, and other topics.

4.2 Initialization

The Performance 3000 can be initialized in the following ways:

- By removing then restoring the server's power.
- By issuing a CRASH 300 command.
- By issuing an INITIALIZE command. The INITIALIZE command has several options that can be used for such things as delaying initialization. Refer to Section 5, Commands, for further details.
- By issuing an NCP TRIGGER command from a DECnet host. For example, the following command initializes and downloads a server that has the name ACTG and a maintenance password of AA10:

```
NCP> TRIGGER NODE ACTG SERVICE PASSWORD AA10
```

Refer to your DEC documentation for further information about NCP commands.

When the server is initialized, all sessions are disconnected and the server runs through its self-test. The server then downloads its software from a load host. When downloading is complete, the server is ready for use.

If you would like further details on how the server download process works, refer to Appendix C, Technical Notes.

4.3 Remote Console Operation

Your terminal does not have to be physically connected to the Performance 3000 in order for you to issue server commands. The Remote Console Facility (RCF) allows you to log in to the Performance 3000 from any host on your network that has DECnet up and running. This feature lets you control all the servers on your network from a single central terminal.

RCF allows you to connect to port 7 of the server, a port that does not physically exist (ports on the server are numbered 1 through 6). This port is called the remote console port.

The exact procedure for connecting to the remote port varies from device to device. From a VMS host, use the following procedure:

1. Enter the Network Control Program with the following command:

```
$ MCR NCP
```

2. Enter a CONNECT command. The type of CONNECT command depends on whether or not you are connecting from a load host:

If the node is defined in the DECNET database, enter the following command:

```
CONNECT NODE server id SERVICE PASSWORD maintenance password
```

Server id can be either the DECnet node name of the server or the DECnet node address. Both of these were assigned when you added the server to the permanent DECnet database. *Maintenance password* is required only if you enabled it when you configured server options (note, however, that the maintenance password is not supported under some versions of NCP--check this before you enable maintenance passwords).

If the node is not defined in the DECNET database, enter the following command:

```
CONNECT VIA UNA-0 PHYSICAL ADDRESS ethernet address  
SERVICE PASSWORD maintenance password
```

UNA-0 stands for the first UNIBUS Ethernet adapter and specifies the host's physical Ethernet adapter. Use QNA-0 for Q-Bus adapters, BNA-0 for BI Bus adapters, and SVA-0 for MicroVAX 2000 adapters. *Ethernet address* is the physical Ethernet address of the server (stamped on the rear of the server just above the Ethernet port). *Maintenance password* is required only if you enabled it when you configured server options.

3. If the server is not operational, or if it requires a maintenance password and you did not supply it, NCP displays this message:

```
Target does not respond
```

If the connection is successful, NCP displays this message:

```
Console connected (press CTRL/D when finished)
(press a key here)
```

```
#
```

4. Enter your server login password and a username (both of these are required for remote connections, even if you have disabled them for nonprivileged connections). The default password is ACCESS.
5. You are now logged in to the server. Note that the server prompt is forced to "Local >" even if you have changed this via the CHANGE SERVER LOCAL PROMPT command. Press <ctrl-D> when you are finished to return to NCP.

4.3.1 Managing the Remote Console Port

Keep the following things in mind when you use the remote port:

- The only way to reenter local mode when you are connected to port 7 is to log out of the session. You can have only one active session at a time when you are connected to the server via the remote port.
- You can not permanently configure port options on the remote port (that is, you can not issue a CHANGE PORT or DEFINE PORT command for port 7). Also, you can not include the remote port in a range of ports (for example, SET PORT 1-7).

- The remote port is permanently configured as follows: AUTOBAUD disabled, BREAK disabled, BROADCAST disabled, INACTIVITY LOGOUT disabled, SESSION LIMIT = 1, and NAME = "Remote Console." The remote port has access to all group codes to which any of the physical ports have access. All other options are the same as the defaults for the physical ports.

4.4 The Console Port

The Performance 3000 has been designed so that all status and error messages that relate to the server as a whole are directed to one port, called the console (or diagnostic) port. This is the only port on the server that receives 900-series messages that concern fatal errors and downloading.

The console port is always port 1 when the server is delivered from the factory, but you can define any other physical port as the console port by using the following command:

```
Server>> CHANGE SERVER CONSOLE x
```

The value *x* specifies the number of the port. To disable the console port, specify NONE.

If you want to place a modem or a user terminal on console port 1, either configure another port as the console or specify CONSOLE NONE.

NOTES

The server transmits 900-series messages to the console port no matter what kind of access is specified for that port. Be sure that the device connected to that port can display messages.

If the device is a general access printer, these maintenance messages might appear within any data printing out on the printer.

Refer to Appendix D for a complete list of 900-series messages.

4.5 Host-Initiated Connections and the Server Queue

The Performance 3000 contains a single queue that it uses to store service requests from operating systems that support queuing (such as VMS).

Queuing allows remote devices to contend for a service and be placed in a queue if the service is unavailable. A printer connected to a printer server, for example, might be busy printing a job from one host when it gets a connect request from another. If queuing is enabled, the server places the request in its queue. Then, when the printer has finished the first job, the server notifies the waiting host that the printer is ready.

For detailed instructions on setting up queues directed to devices on the server, refer to your operating system documentation. Under VMS, the procedure is fully described in the *LAT/VMS Management Guide*.

If you require further functional details about how the server handles host-initiated connections, refer to Appendix C, Technical Notes.

4.5.1 Setting Up Ports and Services for Host Connections

Queuing is supported on all local services. The only requirements are that (1) queuing must be enabled on the service, and (2) the service must not be password protected.

Queuing is also supported for host requests made to port names, rather than services. Using service names is generally more convenient than port names and gives you greater control over access to the service (for example, by setting password protection), but direct connections are sometimes necessary. For example, if a service is password protected, the only way for a host to bypass the password protection is to connect directly to the port that offers the service.

Any port on the server that is defined as a service must be set up to accept remote connections. The default access setting for the server's serial ports is ACCESS LOCAL, which means the port can originate connections but not accept them. To allow a port to accept connections from remote hosts, you must configure the port for remote access:

```
Server>> CHANGE PORT x ACCESS REMOTE
```

This allows a port to accept connections but not originate them. If you want a port to both originate and accept connections (an example might be a hardcopy keyboard device that can act as both a terminal and a printer), configure the port for ACCESS DYNAMIC. Ports configured for remote or dynamic access should have AUTOBAUD disabled; baud rate, parity, and character size must be set via the SET PORT command.

If a service is made up of several ports (for example, a modem pool), you must change the access option for all ports in the service. Note that other port options might also need to be changed depending on the type of device connected to the port; refer to subsection 3.4 for further details.

4.5.2 Monitoring and Configuring the Server Queue

You can get a list of current queue requests by issuing the SHOW QUEUE command. You can list all queue requests, requests made to a specific port, requests made to a specific service, or requests made *from* a specific node. Refer to the SHOW QUEUE command in Section 5 for further details.

Entries can be individually removed from the server queue via the REMOVE QUEUE ENTRY command. Alternatively, the entire queue for a specific service can be disabled by the following command:

```
Server>> CHANGE SERVICE name QUEUE DISABLED
```

Note, however, that if a specific service queue is disabled, connection requests that are made to a port name instead of the service name are still queued.

4.5.3 The Printer Ports

Each printer port can be configured as a service and will accept host-initiated connections just like the other ports. The only difference is that there is no need to set port options on the parallel ports. The default access is remote.

4.6 Using PCs

The following two subsections describe how PCs connected to the server can connect to (1) printers and (2) other PCs that are defined as local services.

4.6.1 Connecting PCs to Printers

PCs can connect directly to printers as follows:

1. Using a VT220 terminal emulation program, log in to the server normally.
2. From local mode, connect to the printer service. If the service is named PRINT, you would use the following command:

```
Server> CONNECT PRINT  
Password>
```

(The server prompts for a password only if one was enabled when the service was created.)

Note that the printer service might contain several printers. In this case, the server connects the PC to the first available printer. This is probably all right if all of the printers are identical, but if they are different, it is a good idea to define each printer as a separate printer service.

3. Exit the VT220 terminal emulation program and return to DOS.
4. Redirect printer output from your PC's parallel port to the serial port that connects it to the server (COM1, COM2, etc.). For DOS print functions, the following command is all you need:

```
A> MODE LPT1:=COM1:
```

If you are using an application program, refer to its documentation for instructions on how to redirect printer output.

5. The printer is now connected to the PC just as if a regular printer cable were run between the two. When you are finished printing, be sure to reenter local mode and disconnect from the printer. No one else can use the printer until this is done.

4.6.2 PC File Transfers

The following procedure shows how to set up file transfers between PCs attached to the Performance 3000:

1. Using a VT220 terminal emulation program, log in to the server normally.
1. From local mode, connect to the remote PC. If the receiving PC is defined as the service PC3, for example, enter the following command:

```
Server> CONNECT PC3
```

2. Break out to local mode and configure your port to pass through the control characters that it normally intercepts:

```
Server> SET SESSION PASSALL  
Server> RESUME
```

NOTE: `PASSALL` disables XON/XOFF Flow Control to allow binary data to pass unaltered. If the file to be transferred has no embedded XON or XOFF characters, (11₁₆, 13₁₆) then set `SESSION` to `PASTHRU`. This allows XON/XOFF to be honored.

3. Exit the VT220 terminal emulation program and return to DOS.
4. Run your file transfer program. It will work just as though there is a cable connected between your PC and the target computer.
5. When the file transfer is finished, return to local mode and disconnect from the target PC.

4.7 The Front Panel Display

The Performance 3000 contains a 16-character LCD display on its front panel. This display is used to display selected status information.

Status information is arranged in menus. The three buttons on the front panel select menus, as well as options within menus. The Next button moves the display forward through menu choices, the Last button moves the display backward through menu choices, and the Select button executes a menu choice.

On the next two pages you will find two tables: Table 4-1 lists all the menu options available through the front panel display and Table 4-2 is an example of how to use the buttons to step through the menus.

Note the following things about the Performance 3000 front panel display:

- All front panel options can also be executed on a normal terminal by a privileged user. The front panel is a convenience only; it is never required.
- You can advance through a single menu selection by pressing the appropriate button, or you can hold the button down and the menus will advance automatically.
- Most displays are shown for one minute, after which the default display ("Performance 3000") reappears.
- Pressing the Next and Last buttons together after a status display returns the display to the last menu option selected.

Most of the menu options are self-explanatory. If you require further details about any of the options, however, the next three subsections, following the two tables, describe each front panel menu option in detail.

Table 4-1. Front Panel Menu Options

Level One	Level Two
SERVER STATUS	NAME NUMBER ETHERNET ADDRESS #SESSIONS / CPU% TIME AND DATE EXIT
PORT STATUS	SELECT PORT* PORT STATE MODEM CONTROLS-1** MODEM CONTROLS-2** SPEED/PARITY** PRINTER STATE*** PRINTER STATUS*** NUMBER SESSIONS EXIT
EXIT	<p>*The PORT STATUS option requires you to choose a port. When the SELECT PORT option appears, press Select and a port number appears. Then press Next until you get the port number you are interested in, and press Select.</p> <p>**The MODEM CONTROLS-1, MODEM CONTROLS-2, and SPEED/PARITY options will be displayed only if the selected port is a serial port.</p> <p>***The PRINTER STATE and PRINTER STATUS options will be displayed only if the selected port is a parallel port.</p>

Table 4-2. Example of Front Panel Menu Selection

Button	Display	Comment
	Performance 3000	Default display.
Next	Server Status	Pressing any button brings up the first menu option.
Next	Port Status	Pressing Next takes the display to the next menu option.
Last	Server Status	Pressing Last takes the display backward through menu options.
Select	Name	Pressing Select chooses a menu option. The display is now in the level 2 menu.
Next	Number	Moving through level 2 options...
Next	Ethernet Address	
Select	<i>(The server's Ethernet address is displayed)</i>	
Next-Last	Performance 3000	Pressing Next and Last together returns the display to level 1.

4.7.1 Front Panel Displays: Server Status

The Server Status menu allows you to display server parameters. It has the following suboptions:

Name. The server name, as defined by the SET SERVER NAME command.

Number. The server ID number, as defined by the SET SERVER NUMBER command.

Ethernet Address. The server's physical Ethernet address (the address stamped on the rear panel of the server, just above the Ethernet port).

#Session/CPU%. The number of active sessions on the server and the percentage of internal microprocessor usage.

Time and Date. Displays the time and date.

Exit. Exits the current menu level (Level Two), and returns the display to the previous menu level (Level One).

4.7.2 Front Panel Displays: Port Status

The Port Status menu allows you to display information about each port on the server. It has the following suboptions:

Select Port. This option allows you to choose the number of the port for which you want status information. If you make no choice, port 1 is chosen.

To select a port, press the Select button when the server displays "Select Port". Then press Next (forward) or Last (backward) until the server displays the desired port number. Press Select again to select the displayed port. This port number stays in memory until it is changed or the server is reinitialized.

Port State. Indicates the state of the port you have selected. The server will display one of the following states:

- IDLE - The port exists but is not active.
- WAKING UP - The port is responding to modem handshaking.
- LOGGING IN - A user is logging in to the port.
- LOGGING OFF - A user is logging off the port.
- LOCAL - The port is logged in but has no active sessions.
- CONNECTING - The port is in the process of connecting to a service.
- CONNECTED - The port is connected to a service.
- LOCKED - A LOCK command has been entered at the port.
- RESUME PENDING - The port is trying to resume a session.
- DIAGNOSTIC - A TEST PORT command has been executed for the port.
- AUTOBAUD - The port is in the process of autobauding (automatically setting the baud rate of the port to match the baud rate of incoming characters).
- MONITORING - A MONITOR command has been executed at the port.
- SEALED - The user has incorrectly entered a password.
- TRANSITION - The port is changing from one state to another.

Modem Controls-1. Displays the incoming modem signals that are currently asserted on the port. The server displays each of the following modem signals, if asserted:

DSR, CTS, RI, CD, SMI (Full Modem)

DSR (Partial Modem)

Modem Controls-2. Displays the outgoing modem signals that are currently asserted on the port. The server displays each of the following modem signals, if asserted:

DTR, RTS, DSRS (Full Modem)

DTR (Partial Modem)

Speed/Parity. Displays the speed and parity settings of the selected port. If the port has different input and output speeds, the output speed is displayed.

Printer State. The Performance 3000 will display this option only if the selected port has been configured for a serial or parallel printer device. This option indicates the current state of the selected port, as follows:

- IDLE - The port exists but is not active.
- CONNECTED - The port is connected to a service.

Printer Status. The Performance 3000 will display this option only if the selected port has been configured for a serial or parallel printer device. This option indicates the current status of the printer device attached to the selected port, as follows:

- PRINTER RUNNING - This is the normal condition.
- PAPER EMPTY - The printer is out of paper.
- PRINTER OFFLINE - The printer is offline.
- POWER OFF - The printer is not on.
- PAPER ERROR - Indicates a paper jam or something similar.

Number Sessions. Displays the number of current sessions in use by the port. This includes both local and remote sessions and active and inactive sessions.

Exit. Exits the current menu level (Level Two), and returns the display to the previous menu level (Level One).

4.7.3 Front Panel Displays: Exit

This option exits the current menu level (Level One), and returns the display to the default display ("Performance 3000").

5.1 Overview

This section contains detailed descriptions of all Performance 3000 local mode commands. They are listed in alphabetical order.

Nearly all server commands and options can be abbreviated, usually with just the first two or three letters of the keyword. Table 5-1 lists all Performance 3000 keywords, with the minimum acceptable abbreviations shown in capital letters at the beginning of each keyword.

Table 5-1. Performance 3000 Keyword Abbreviations

ACcess	CRASH 300	Full	Monitor	Ring
ADdress	CTs	Groups	MULTicast	SECurity
ALArms	DAtaproducts	HARdcopy	NAME	SERVER
ALL	DATE	Hardware	Network	SERvice
ALTErnate	DCDlogout	Heartbeat	NODE	SESSion
ANnouncements	DEDicated	Help (or "?")	NODEs	SEt
ANsi	DEFine	HInts	NONE	Show
ASsistant	DElay	Host	NOPrivileged	Size
AUTHorized	DestInation	IdentIfication	NOTIfication	SOftcopy
AUTOBaud	DIALup	INActivity	NUMber	SOFTWARE
AUTOConnect	DISable	INItialize	ODd	SPAcE
AUTOPrompt	DISabled	INPut	OUtput	SPEEd
AUTOREinit	DISconnect	InterActive	OverrIde	STatus
Backward	DISPlay	INternal	PARity	SUMmary
BREAK	DSr	INTerrupts	PASSall	SWItch
BROadcast	DSrlogout	Keepalive	PASSword	Test
CANCEL	DTRwait	LIMit	PASThru	TIme
CEntronics	DUmp	LISt	PAUse	TImer
CHange	DYnamic	LOCAL	PORT	TRAnsmIt
CHARacter	ELt	LOCK	PREferred	TRIGGER
CHARacteristics	EMULEX	LOGGing	PRIVileged	TYpe
CIrcuit	ENabled	LOGIn	PROMpt	Username
CLear	ENtry	LOGout	Purge	Users
CLS	ERrorlogoff	LOOP	Queue	VerIfication
CODes	ETHERnet	LOOPback	RCF	VT100
Connect	EVEN	LOSS	REceive	WELcome
Connections	EXternal	MAIntenance	REMOte	Width
CONsole	FLow	MARK	REMOve	XOFFany
CONtrol	FORward	MESsage	REsume	XON
COUnT	FRontpanel	MODem	RETrAnsmIt	Zero
COunters				

5.1.1 Format of Command Descriptions

The command descriptions that follow all have the same format. The format is the same as the one used on this page.

Syntax This line shows the command and its keywords. All keywords enclosed in [square brackets] are optional. Where keywords are stacked above one another and enclosed in square brackets, you may choose any one, or none, of the keywords. Where keywords are stacked above one another without square brackets, you must choose exactly one of the keywords.

Privilege This line describes whether nonprivileged users can execute the command (privileged users can always execute all commands without restrictions). It also describes additional restrictions, if any, on secure users (refer to the SET PORT SECURITY command for a description of secure users).

Example This line gives one or more examples of the command. All user input is shown in red.

Comments This line offers hints and explains any restrictions on using the command.

Table 5-2 explains the various options and modifiers that can be used with the command. Options are listed in the order they appear in the syntax line (left to right). Two of the options appear in many commands and have the same meanings for all. They are *SERVICE name* or *NODE name*, and *PORT number*.

Table 5-2. COMMAND Options (Example)

Option	Definition
<i>SERVICE name</i> or <i>NODE name</i>	The name of a service or node on the network. All names are 1 to 16 characters long and can contain the following characters: A-Z, 0-9, \$, - (dash), _ (underscore), . (period)
<i>PORT number</i>	The number of the server port to which the command applies. It can be one port, several ports, or all ports. For example: SET PORT 2 (port 2 only) SET PORT 2,4-6 (port 2 plus ports 4 through 6) SET PORT ALL (all serial ports in the range 1 through 6)

5.2 BACKWARD

The BACKWARD command places you back in the session that preceded your most recent one. If you have only a single active session, BACKWARD places you in that session.

Syntax BACKWARD

Privilege Available to all users.

Comments The BACKWARD command works in a circular fashion. Issuing the BACKWARD command repeatedly will roll you through all your active sessions.

There are two other commands that place you back in your sessions: the FORWARD command is similar to BACKWARD but rolls you through your sessions in the opposite direction; the RESUME command can be used to switch into a specific session.

Note that you can also switch backward and forward between sessions from within the sessions themselves by using the FORWARD and BACKWARD keys. Refer to the SET PORT BACKWARD SWITCH command for details.

5.3 BROADCAST

The BROADCAST command transmits a message to another port or ports on the server.

Syntax BROADCAST PORT *number* "*message*"

Privilege Nonprivileged users can broadcast messages only to a single port. Secure users can not use this command.

Examples BROADCAST PORTS 1,3-5 "The laser printer is back up"
BROADCAST ALL "Server ready"

Comments The BROADCAST command works only if it has been enabled by the SET SERVER BROADCAST command. In addition, each target port must have broadcast individually enabled by the SET PORT BROADCAST command in order to receive broadcasts.

The broadcast message will not reach the target port if (1) the port is logged out, (2) the port's BROADCAST option is disabled, (3) the port is flow controlled and its output buffer is full, or (4) the port's current session is in PASSALL or PASTHRU mode (see SET SESSION). The sender is notified of all logged-in ports that do not receive a broadcast message.

Table 5-3. BROADCAST Options

Option	Definition
PORT <i>number</i>	The ports to which the message is transmitted. It can be a single port, several ports, or ALL.
" <i>message</i> "	The message to be transmitted. The message can be any length as long as the entire command does not exceed a single command line (132 characters). If the message is not enclosed in quotation marks it is sent out in all capitals. All eight-bit non-ASCII characters are sent exactly as entered.

5.4 CHANGE --

All CHANGE commands are described under the equivalent SET command.

5.5 CLEAR/PURGE SERVICE

The CLEAR SERVICE and PURGE SERVICE commands delete a local service that was created by the SET, DEFINE, or CHANGE SERVICE commands.

CLEAR SERVICE deletes a service temporarily; the service will return the next time the server is reinitialized. PURGE SERVICE deletes a service permanently but does not take effect until the server is reinitialized. To delete a service immediately and permanently, issue a CLEAR SERVICE command followed by a PURGE SERVICE command.

Syntax CLEAR/PURGE SERVICE *name*
LOCAL

Privilege Available to privileged users only.

Examples CLEAR SERVICE MODEM

PURGE SERVICE LOCAL

Comments The CLEAR SERVICE command can not be issued if (1) there are sessions connected to the service or (2) the server queue contains connect requests to the service. Sessions can be forcibly disconnected by the DISCONNECT PORT command; queue entries can be deleted by the REMOVE QUEUE command.

Table 5-4. CLEAR/PURGE SERVICE Options

Option	Definition
<i>name</i>	Specifies the name of a single service to be deleted.
LOCAL	Specifies that all local services are to be deleted.

5.6 CLS

The CLS command clears the screen.

Syntax CLS

Privilege Available to all users.

5.7 CONNECT

The CONNECT command connects your port to (1) ELT services on other Ethernet nodes, and (2) local services. Use the CONNECT PORT command to connect *another* port to a service.

- Syntax** CONNECT [*service_name* [*NODE name*] [*DESTINATION port*]]
- Privilege** Available to all users. If the service is protected by a password, the user must know the password.
- Examples** CONNECT
- CONNECT ACTG
- CONNECT ACTG NODE VAX DESTINATION PORT_3

Table 5-5. CONNECT Options

Option	Definition
<i>service_name</i>	The name of the service to which you wish to connect. If no service name is specified, you are connected to your preferred service (as defined by the SET PORT PREFERRED command).
<i>NODE name</i>	The name of the Ethernet node on which the ELT service is located. Use this option when the service is offered on more than one node and you wish to connect to the service on a specific node. If no node is specified, the server connects you to the highest rated node that offers the service.
<i>DESTINATION port</i>	The name of the port to which you wish to connect. Use this option when the service is offered on more than one port and you wish to connect to the service on a specific port. If no port is specified, the server connects you to the first available port that offers the service.

5.8 CONNECT PORT

The CONNECT PORT command connects *another* port to a service. Use the CONNECT command to connect your own port to a service.

Syntax CONNECT PORT *number* [*service_name* [NODE *name*] [DESTINATION *port*]]

Privilege Available to privileged users only.

Examples CONNECT PORT 3 PRINT

CONNECT PORT 3 PRINT NODE SALES DESTINATION PORT_6

Comments This command can not be used if (1) you don't specify a service name and the target port's preferred service is protected by a password, (2) the target port's ACCESS is set to REMOTE, or (3) the target port has a session in progress (you can use the LOGOUT PORT command to terminate the session).

This command can be used only if the target port has been configured for a dedicated service.

Table 5-6. CONNECT PORT Options

Option	Definition
<i>number</i>	The target port number. You can specify only a single port.
<i>service_name</i>	The name of the service to which you wish to connect the port. If no service name is given, the port is connected to the dedicated service for that port. If it does not have a dedicated service, no connection is made.
NODE <i>name</i>	The name of the Ethernet node that offers the service. Use this option when more than one node offers the service and you wish to connect to the service on a particular node. If no node is specified, the port is connected to the highest rated node that offers the service.
DESTINATION <i>port</i>	The port name on the remote node to which you wish to connect. Use this option when more than one port offers the service and you wish to connect to a particular port. If no port is specified, the connection is made to the first available port on the remote service. If a port is specified but no node, the server connects to the local service, if any, and then defaults to the highest rated service.

5.9 CONNECT RCF

The CONNECT RCF command connects your port to the remote console port of another server. The server uses its DECnet-compatible Remote Console Facility (RCF) to establish the connections.

Syntax `CONNECT RCF NODE name [PASSWORD maintenance][TRIGGER [load node]]`
 `ADDRESS number`

Privilege Available to privileged users only.

Examples `CONNECT RCF NODE ACTG`

 `CONNECT RCF ADDRESS 00-00-C9-02-56-78 PASSWORD 1234 TRIGGER`

Comments When you make a successful RCF connection, the following message is displayed:

`Console connected (press CTRL/D when finished)`

Typing <ctrl-D> terminates the remote connection and returns you to local mode.

You can not use the CONNECT RCF command to connect to the remote console port of another server if:

- The remote console port of the local server is already in use, or if
- The remote console port of the target server is already in use.

Table 5-7. CONNECT RCF Options

Option	Definition
NODE <i>name</i>	The name of the Ethernet node to which you want to connect. If the server does not know the node name, use the node's Ethernet address instead.
ADDRESS <i>number</i>	The Ethernet address of the node to which you wish to connect. It is in the form of six hexadecimal pairs separated by dashes (for example, 00-00-C9-45-56-00). Use the Ethernet address only if you do not specify a node name.
PASSWORD <i>maintenance</i>	The password, if any, of the node. The maintenance password is a 1 to 16 digit hexadecimal number.
TRIGGER [<i>load node</i>]	Initializes and downloads a server. TRIGGER will cause the <i>target node</i> to reboot and reload its software from the <i>load node</i> (if specified) if the maintenance password is correct.

5.10 CRASH 300

The CRASH 300 command immediately halts the server and causes it to reinitialize. All users are logged off and all sessions are disconnected.

In addition, if crash dump is enabled, the Performance 3000 will upload an image of the Performance 3000 memory contents to a file created on a designated host.

Use the INITIALIZE command if you wish to execute a delayed initialization.

Syntax CRASH 300

Privilege Available to privileged users only.

5.11 CRASH MESSAGE

The CRASH MESSAGE command allows a privileged user to specify the message number of a server message that will cause a crash dump if the message having this number occurs.

If a SERVER MESSAGE *number* occurs, with a message number that matches the number specified by a CRASH MESSAGE command, the server will crash. In addition, if crash dump is enabled, the Performance 3000 will upload an image of the Performance 3000 memory contents to a file created on a designated host.

Syntax CRASH MESSAGE *number*

Privilege Available to privileged users only.

Comments You should issue the CRASH MESSAGE command only under the explicit direction of Emulex Technical Support, for troubleshooting a particular problem. Random execution of this command **will cause your Performance 3000 to crash inexplicably**. Do not send unsolicited crash dump information to Emulex. Please contact Emulex Technical Support if you are experiencing a problem; they will determine whether you should obtain and send in a crash dump, and what information should accompany the crash dump.

See the description of the SET SERVER DUMP command for information on enabling and disabling crash dump.

Table 5-8. CRASH MESSAGE Options

Option	Definition
<i>number</i>	The message number of the server message, a four-digit decimal number.

5.12 CRASH ADDRESS

The CRASH ADDRESS command allows a privileged user to set a breakpoint in the server's internal program code so that a crash dump will occur if the server encounters this breakpoint.

If the Performance 3000's internal program encounters a breakpoint that was set by a CRASH ADDRESS command, the server will crash. In addition, if crash dump is enabled, the Performance 3000 will upload an image of the Performance 3000 memory contents to a file created on a designated host.

Syntax CRASH ADDRESS *segment:offset*

Privilege Available to privileged users only.

Comments You should issue the CRASH ADDRESS command only under the explicit direction of Emulex Technical Support, for troubleshooting a particular problem. Random execution of this command **will cause your Performance 3000 to crash inexplicably**. Do not send unsolicited crash dump information to Emulex. Please contact Emulex Technical Support if you are experiencing a problem; they will determine whether you should obtain and send in a crash dump, and what information should accompany the crash dump.

See the description of the SET SERVER DUMP command for information on enabling and disabling crash dump.

Table 5-9. CRASH ADDRESS Options

Option	Definition
<i>segment:offset</i>	The segment address and offset into the segment, each a four-digit hexadecimal number.

5.13 DEFINE --

All DEFINE commands are described under the equivalent SET command.

5.14 DISCONNECT

The DISCONNECT command disconnects your port from one or more of your active sessions. Use the DISCONNECT PORT command to disconnect *another* port from its sessions.

Syntax DISCONNECT [SESSION] [*number*
range
ALL]

Privilege Available to all users.

Examples DISCONNECT

DISCONNECT SESSION 2

DISCONNECT 1, 3-5

DISCONNECT ALL

Comments Use the SHOW SESSIONS command to get a numbered list of all your active sessions. If any entry in Range is invalid, none of the sessions disconnect and an error message is issued.

Table 5-10. DISCONNECT Options

Option	Definition
SESSION <i>number</i>	Specifies the number of a single session you wish to disconnect. If no number is specified, your most recent session is disconnected. The word SESSION is optional.
<i>range</i>	Specifies a range of sessions you wish to disconnect.
ALL	Specifies that you want to disconnect all your active sessions.

5.15 DISCONNECT PORT

The DISCONNECT PORT command terminates the currently active session on *another* port. Use the DISCONNECT command to end a session on your own port.

Syntax DISCONNECT PORT *number*

Privilege Available to privileged users only.

Example DISCONNECT PORT 5

Comments This command terminates the port's currently active session. If the port is configured for ACCESS LOCAL or DYNAMIC, it is placed in local mode; if it is configured for ACCESS REMOTE, it is logged out. Use the LOGOUT PORT command to terminate all active sessions on a port and log out the port.

This command can be used only if the target port has been configured for a dedicated service.

Table 5-11. DISCONNECT PORT Options

Option	Definition
<i>number</i>	The port you wish to disconnect. It must be a single port.

5.16 FORWARD

The FORWARD command places you in the session that comes "after" your most recent one. If you have only a single active session, FORWARD places you in that session.

Syntax FORWARD

Privilege Available to all users.

Comments The FORWARD command works in a circular fashion. Issuing the FORWARD command repeatedly will roll you through all your active sessions.

There are two other commands that place you back in your sessions: the BACKWARD command is similar to FORWARD but rolls you through your sessions in the opposite direction; the RESUME command can be used to switch into a specific session.

Note that you can also switch forward and backward between sessions from within the sessions themselves by using the FORWARD and BACKWARD keys. Refer to the SET PORT BACKWARD SWITCH command for details.

5.17 HELP

The HELP command displays information about particular commands. You can substitute a question mark for the word HELP (see examples below).

Syntax `HELP [command name and options]`

Privilege Privileged users can display information about all commands. Nonprivileged and secure users can display information only about the commands they are allowed to execute.

Examples `HELP`

`HELP SET`

`HELP SET PORT SPEED`

`? SET PORT SPEED`

Comments Each HELP screen contains an explanation of the command and a list of command options. For example, the HELP screen displays all server commands, the HELP SET screen displays the SET options (PORT, SERVER, etc.), and the HELP SET PORT screen displays all the options that can be changed by the SET PORT command.

You can use the line editing keys to speed your use of the HELP command. For example, if you type `HELP SET PORT`, and decide you want more information about the SPEED option, press the up-arrow (on a VT type terminal) and the phrase `HELP SET PORT` appears. Simply add `SPEED` to the end of the line and press `<return>`.

The command `HELP HINTS` displays a screen of introductory information about the Performance 3000 for new users.

Table 5-12. HELP Options

Option	Definition
<i>command name and options</i>	The name of the command about which you need information. It can be a single command, a command plus an option, or a command plus an option and a modifier. All keyword abbreviations are acceptable.

5.18 INITIALIZE SERVER

The INITIALIZE SERVER command reinitializes the Performance 3000. The initialization is exactly the same as when the server is powered up.

Syntax INITIALIZE [SERVER] [DELAY *minutes*] [DISABLE]
CANCEL

Privilege Available to privileged users only.

Examples

```
INITIALIZE
INITIALIZE DELAY 30
INITIALIZE DELAY 30 DISABLE
INITIALIZE CANCEL
```

Comments When the INITIALIZE command is issued, a warning message is sent every 30 minutes to all logged in ports. Five minutes before the initialization, the warning is broadcast every minute. The warning is broadcast regardless of the SERVER BROADCAST setting; however, ports with the PORT BROADCAST setting disabled do not receive the warning.

When the server is reinitialized, all options changed by the SET command are reset to their permanent values and all options changed by the CHANGE or DEFINE command take effect.

Table 5-13. INITIALIZE Options

Option	Definition
DELAY <i>minutes</i>	The number of minutes before the server is initialized. Use this option if you wish to delay initialization until no sessions are active (midnight, for example). The default is 1 minute; the range is 0 to 32767 minutes.
DISABLE	Disables the CONNECT command. If you use this option, no connections can be made after the server finishes initialization. To re-enable connections, issue the INITIALIZE command again without the DISABLE option.
CANCEL	Cancels a previously-entered INITIALIZE command.

5.19 LIST --

All LIST commands are described under the equivalent SHOW command.

5.20 LOCK

The LOCK command locks a terminal without disconnecting your current sessions. When you enter the LOCK command, you are prompted for a password (it is not displayed on the screen) and the terminal is then disabled. To re-enable the terminal, you must enter the password.

Syntax LOCK

Privilege Available to all users.

Example Server> LOCK
 Lock Password> *(enter a password here)*
 Verification> *(enter the same password again)*
 Port X is locked
 Unlock Password> *(enter your password here to unlock the terminal)*

Comments If a user forgets his password, a privileged user must log out the port (thus disconnecting all current sessions) before the port can be used again.

The LOCK command can be used only if the SERVER LOCK option is enabled.

5.21 LOGOUT

The LOGOUT command logs out a port.

Syntax LOGOUT [PORT *number*]

Privilege Any user can log out his own port. Only a privileged user can log out another person's port.

Examples LOGOUT

LOGOUT PORTS 1,3-5

LOGOUT PORT ALL

Table 5-14. LOGOUT Options

Option	Definition
PORT <i>number</i>	The port you wish to log out. It can be a single port, several ports, or PORT ALL. If no port is specified, your own port is logged out.

5.22 MONITOR --

All MONITOR commands are described under the equivalent SHOW command.

5.23 PURGE SERVICE

See CLEAR SERVICE.

5.24 REMOVE QUEUE

The REMOVE QUEUE command deletes requests for local services from the server queue.

Syntax REMOVE QUEUE ENTRY *number*
 NODE *name*
 SERVICE *name*
 ALL

Privilege Available to privileged users only.

Examples REMOVE QUEUE ENTRY 3-6

REMOVE QUEUE SERVICE LASERPRINTER

Comments When a queue entry is deleted, the server notifies the requesting device.

Table 5-15. REMOVE QUEUE Options

Option	Definition
ENTRY <i>number</i>	The number of the queue entry you wish to delete. It can be one entry or several. Use the SHOW QUEUE command to display a list of queue entries.
NODE <i>name</i>	Deletes all requests <i>from</i> the specified node.
SERVICE <i>name</i>	Deletes all requests <i>to</i> the specified local service.
ALL	Deletes all requests in the server queue.

5.25 RESUME

The RESUME command places you back in one of your active sessions.

Syntax RESUME [SESSION *number*]

Privilege Available to all users.

Examples

```
RESUME
RESUME 2
RESUME ?
```

Comments If you enter the RESUME command without a session number, you are placed back in your *current* session. Your current session is normally the one you were most recently in.

Use the SHOW SESSIONS command to get a numbered list of your active sessions. An asterisk is placed next to your current session.

Table 5-16. RESUME Options

Option	Definition
SESSION <i>number</i>	<p>The number of the session you wish to resume. The word SESSION is optional.</p> <p>If you enter RESUME ? the server displays a list of your current sessions and prompts you for a session number.</p>

5.26 SET HOST

The SET HOST command connects you to network services. It is identical to the CONNECT command. You can issue the SET HOST command using exactly the same syntax and options as the CONNECT command.

5.27 SET PRIVILEGED/NOPRIVILEGED

The SET PRIVILEGED command places a port in privileged mode. The SET NOPRIVILEGED command returns a port that is in privileged mode to nonprivileged mode.

Syntax SET PRIVILEGED/NOPRIVILEGED [OVERRIDE]

Privilege Available to all users.

Examples

```
Server> SET PRIVILEGED
Password> (enter the privileged password)
Server>>
```

```
SET PRIVILEGED OVERRIDE
```

```
SET NOPRIVILEGED
```

Comments You must enter the privileged password in order to enter privileged mode. The factory default password is SYSTEM. The password is changed by the SET SERVER PRIVILEGED PASSWORD command.

If you forget the privileged password, you must reinitialize the server so that all the factory default settings return (as described in subsection 3.2.5). This procedure also resets all port, service, and server options, so it should be considered a last resort.

In privileged mode, the server prompt changes from `Server>` to `Server>>`. If the CHANGE SERVER SECURITY option is enabled, the time of the last entry to privileged mode is displayed. All server commands can be executed in privileged mode, so be sure to return your port to normal mode as soon as you are finished executing privileged commands.

Table 5-17. SET PRIVILEGED/NOPRIVILEGED Options

Option	Definition
OVERRIDE	Only one port at a time is allowed to have privileged status. If another port is already in privileged mode, use the OVERRIDE option to transfer privileged status to your port.

5.28 SET/DEFINE/CHANGE PORT

The SET PORT, DEFINE PORT, and CHANGE PORT commands change the options of individual ports on the server. If no port number is specified, your own port is changed.

The three commands work as follows:

- SET - Port options are changed temporarily. The old values return the next time the port is logged in or out.
- DEFINE - Port options are not changed until the port is logged in or out, but are then changed permanently.
- CHANGE - Port options are changed immediately and permanently.

When port options are changed permanently they are stored internally in EAROM. When they are changed temporarily they are stored in ordinary RAM and thus are lost when the port is logged out or the server is reinitialized.

Syntax SET/DEFINE/CHANGE [PORT *number*] [*options and modifiers*]

Privilege Nonprivileged and secure users can change most options on their own ports, but never any other port. If privileged status is required to change an option, it is noted in the Options Table. Privileged users can change all options on all ports.

Examples CHANGE USERNAME "John Smith"

CHANGE PORTS 2-4 AUTOBAUD DISABLED SPEED 1200

Comments You can specify as many options as you like in a single line, up to a maximum of 132 characters. You do not need to specify options you do not want to change.

To see the current settings of a port, use the SHOW PORT command.

Table 5-18. SET/DEFINE/CHANGE PORT Options

Option	Definition
<p><i>PORT number</i></p> <p><i>options and modifiers</i></p> <p>ACCESS <i>(Privileged users only)</i></p>	<p>The port you wish to change. It can be a single port, several ports, or PORT ALL (which, except for the GROUPS and AUTHORIZED GROUPS options, affects all serial ports but none of the parallel ports). If no port number is specified, your own port is changed (and the word PORT is optional).</p> <p>All port options and modifiers are listed below in alphabetical order.</p> <p>Default: LOCAL. Specifies the type of connections the port can make. Four types of access are supported:</p> <p>LOCAL - allows a port to originate connections to other devices. This is the standard setting for user terminals.</p> <p>REMOTE - allows a port to accept connections but not originate them. This type of port is typically defined as a service (for example, a printer or a dialout modem). Ports with ACCESS REMOTE must have autobaud disabled.</p> <p>DYNAMIC - a combination of local and remote access. It is sometimes used for hardcopy terminals that are used as both printers and input devices and for dialin/dialout modems.</p> <p>NONE - disables all access to the port.</p> <p>If a port is currently active, ACCESS can be changed only by the DEFINE command, not SET or CHANGE. Example:</p> <pre>CHANGE PORT x ACCESS REMOTE</pre>
<p>ALTERNATE [SPEED] <i>(Privileged users only)</i></p>	<p>Default: NONE. Specifies the fallback speed for a dual-speed modem. In order for this option to work, the modem must support signals DSRS and SMI. If the modem supports an alternate speed and does not support DSRS and SMI, or if it is a multiple speed dialin modem, the alternate speed option can be disabled and the autobaud option enabled to support the fallback speed(s). For example:</p> <pre>CHANGE PORT x SPEED 2400 ALTERNATE SPEED 1200</pre> <p>See Appendix C for more information.</p>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
<p>AUTHORIZED [GROUPS] <i>(Privileged users only)</i></p>	<p>Default: 0. Specifies which group codes are accessible to the port. For example, if you have some Ethernet nodes with group codes of 0 and others with group codes of 1, you can restrict a port's access to only the nodes with a group code of 0 by entering:</p> <pre>CHANGE PORT x AUTHORIZED GROUPS 0</pre> <p>To give a port access to multiple group codes, use the standard list format. For example:</p> <pre>CHANGE PORT x AUTHORIZED GROUPS 0,5-9</pre> <p>You can add a group to a port by using the ENABLED modifier. For example, to add group 1 access to a port, enter CHANGE PORT x GROUP 1 ENABLED. You can subtract a group by using the DISABLED modifier.</p> <p>Note that users can further restrict their port's view of available services via the GROUPS option. Refer to the GROUPS option for further details.</p> <p>The group code for the Performance 3000 itself is set by the CHANGE SERVER SERVICE GROUP command. Group codes for other Ethernet nodes are set as described in their documentation.</p> <p>If you want users to be able to connect directly to local services (for example, if you want to allow a PC connected to one server port to connect to a printer on another port), be sure at least one of the server's group codes matches one of the user's authorized group codes.</p> <p>Refer to Appendix C, Technical Notes, for a detailed discussion of group codes and how to set them to make the most efficient use of the server's internal memory.</p>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
AUTOBAUD <i>(Privileged users only)</i>	<p>Default: ENABLED. Allows a port to automatically sense the speed of incoming characters. Example:</p> <p>CHANGE PORT x AUTOBAUD DISABLED</p> <p>Autobaud works with any standard speed (see SPEED) but the terminal must be set for either 8 bit characters with no parity or 7 bit characters with even parity.</p> <p>If your port is set for autobaud operation, you must press the <return> key twice when logging in to allow the port to sense the characters. Autobaud must be disabled for ports set for remote or dynamic access (see ACCESS).</p>
AUTOCONNECT	<p>Default: DISABLED. When enabled, the server connects you directly to a particular service upon login, just as if you had a hardwired connection to the service. The PREFERRED option specifies the service to which to connect. For example:</p> <p>CHANGE PORT AUTOCONNECT ENABLED PREFERRED ENGR</p> <p>Note that although the AUTOCONNECT option automatically connects you to a service, it does not prevent you from returning to local mode (usually by pressing the <break> key) and connecting to another service if you desire.</p> <p>You can also specify a specific NODE and PORT with the PREFERRED option in addition to a service. For example:</p> <p>CHANGE PORT AUTOCONNECT ENABLED PREFERRED ENGR NODE VAX1 DESTINATION 5</p>
AUTOPROMPT	<p>Default: ENABLED. If this is disabled, you must press the <return> key to get a prompt when you connect to a service. Example:</p> <p>CHANGE PORT x AUTOPROMPT DISABLED</p>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
BACKWARD [SWITCH]	<p>Default: NONE. The backward switch is a key that allows you to immediately switch backward to a previous session at any time. Only uppercase letters are allowed (when switch characters are defined, lowercase letters are converted to uppercase). To specify a control character (such as <ctrl-L>), hold down the control key while pressing the second key. For example:</p> <pre>CHANGE PORT x BACKWARD SWITCH ^L</pre> <p>As an alternate method, type a caret (^) followed by the character. (On most keyboards, the caret is entered by typing <shift-6>.) Be careful not to specify a backward switch character that is also used by VMS (for example, <ctrl-C> or <ctrl-Y>).</p> <p>See also FORWARD SWITCH, which allows you to switch to more recent sessions (that is, the forward and backward switches allow you to go back and forth between sessions).</p>
BREAK	<p>Default: LOCAL. This option defines the way the <break> key works. For example:</p> <pre>CHANGE PORT x BREAK REMOTE</pre> <p>The following break options are available:</p> <p>LOCAL - The <break> key returns you to local mode if you are in the middle of a session.</p> <p>REMOTE - Breaks are passed through to the service.</p> <p>DISABLED - Break characters are ignored when you are in a session.</p>
BROADCAST	<p>Default: ENABLED. This option allows a port to receive broadcast messages from other ports. Example:</p> <pre>CHANGE PORT x BROADCAST ENABLED</pre>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
CHARACTER [SIZE]	<p>Default: 8. This option defines the number of bits per character. The allowed settings are 5, 6, 7, and 8. Example:</p> <pre>CHANGE PORT x CHARACTER SIZE 7</pre>
DCDLOGOUT <i>(Privileged users only)</i>	<p>Default: ENABLED. When disabled, the server logs out a port immediately if DCD (full-modem port) or DSR (partial-modem port) is lost. (Disable this option if the device is a null modem device such as a data switch or a computer port.) If enabled, the server waits two seconds for DCD then logs out the port if DCD is still not present. Example:</p> <pre>CHANGE PORT x DCDLOGOUT DISABLED</pre>
DEDICATED <i>(Privileged users only)</i>	<p>Default: NONE. If a service name is specified with the DEDICATED option, you are automatically connected to the service upon login. Once connected, you can not enter local mode or connect to any other service (this makes the server transparent to the user). If the port is currently active, it is valid only with the DEFINE command, not SET or CHANGE. Example:</p> <pre>CHANGE PORT x DEDICATED ACTG</pre>
DIALUP <i>(Privileged users only)</i>	<p>If you wish, you can also specify a particular NODE and PORT in addition to a service. For example:</p> <pre>CHANGE PORT x DEDICATED ACTG NODE VAX1 DESTINATION 5</pre> <p>Default: DISABLED. When enabled, the server passes the dialup modem characteristic to the host when a connection is made. Some operating systems (for example, VMS) use this for security purposes. Example:</p> <pre>CHANGE PORT x DIALUP ENABLED</pre>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
DSRLOGOUT <i>(Privileged users only)</i>	<p>Default: DISABLED. When this option is enabled, the server logs out a port if the device attached to the port deasserts a modem signal (usually DTR) that is connected to the DSR pin on the server (this typically happens when the device is powered off). If DSRLOGOUT is enabled, the MODEM CONTROL option must be disabled. Example:</p> <p>CHANGE PORT x DSRLOGOUT ENABLED MODEM DISABLED</p> <p>The DSRLOGOUT option is intended for use on ports that have terminals attached. Note that the port does not deassert DTR to the device as required by data switch and computer ports. Therefore, always enable MODEM CONTROLS on a port if the attached device is a data switch or computer port. The MODEM CONTROL option will deassert DTR to the device if server DSR is lost.</p>
DTRWAIT <i>(Privileged users only)</i>	<p>Default: DISABLED. When disabled, the modem signals DTR and RTS are asserted as soon as the server initializes. They remain asserted except for a five second period when the port is being logged out (at which time they are deasserted). When enabled, DTR and RTS (DTR partial-modem port) remain deasserted until either of the following occur:</p> <ol style="list-style-type: none"> 1. A LAT connection is made to the port. 2. A RING (full-modem port) or DSR (partial-modem port) is detected. <p>If DTRWAIT is enabled, the MODEM CONTROL option must also be enabled. Example:</p> <p>CHANGE PORT x DTRWAIT ENABLED MODEM ENABLED</p>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
DTRWAIT (continued)	<p>If DTRWAIT is enabled and port access is remote or dynamic and a connection is made to the port, the port asserts DTR and RTS (full modem) or DTR (partial modem). Enable DTRWAIT when a dialout modem is on a full-modem port and the port access is set to remote. Enable DTRWAIT when a dialout modem is on a partial-modem port and the port access is set to remote. Enable DTRWAIT when a dialin/dialout modem is on a full-modem port and port access is set to local or dynamic.</p> <p>If DTRWAIT is enabled and port access is local or dynamic and the RING signal (full modem) or DSR signal (partial modem) is detected, the port will assert DTR and RTS (full modem) or DTR (partial modem). Disable DTRWAIT when a dialin or dialin/dialout modem is on a partial-modem port.</p> <p>Disable DTRWAIT on a partial-modem port that has access DYNAMIC or LOCAL and is attached to a modem. In this configuration it is necessary to connect modem DCD to server port DSR. The modem RING signal (and its function) is not supported on partial-modem ports.</p>
ERRORLOGOFF	<p>Default: DISABLED. This option is valid only for ports configured for parallel printers. When enabled, printer status changes cause sessions to the port to terminate.</p> <p>Example:</p> <pre>CHANGE PORT 6 ERRORLOGOFF ENABLED</pre>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
FLOW [CONTROL]	<p>Default: XON. This option defines the type of flow control used by the port. Example:</p> <pre>CHANGE PORT x FLOW CONTROL CTS</pre> <p>Four types of flow control are supported:</p> <p>XON - specifies XON/XOFF flow control. This is standard for all DEC VT series terminals and compatibles.</p> <p>XOFFANY - Similar to XON/XOFF except that any character will restart transmission, not just an XON. It is commonly used on PCs.</p> <p>CTS - specifies CTS/RTS flow control (full-modem ports only).</p> <p>DSR - Specifies DSR/DTR flow control.</p> <p>Specify DISABLED if you want no flow control on a port. You can specify flow control in only one direction by enabling flow control and then disabling either INPUT FLOW CONTROL or OUTPUT FLOW CONTROL. See Appendix A to ensure your cable is correct.</p>
FORWARD [SWITCH]	<p>Default: NONE. Selects a key that allows you to switch forward to other active sessions. It is usually a control key, such as <ctrl-F>. See BACKWARD SWITCH for further details.</p>
GROUPS	<p>Default: All authorized groups. This option can be SET only (when you log out, it is returned to its default). It can be the same groups specified by the AUTHORIZED GROUPS option or a subset of those groups. For example:</p> <pre>SET PORT x GROUPS 0-3,7</pre>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
GROUPS (continued)	<p>The GROUPS option is a user convenience to simplify displays. For example, if the SHOW NODES command is issued, the server displays a list of all nodes you are authorized to access, which could be quite long. If you use the GROUPS option to restrict the display to the groups you use most, the list is much shorter and easier to read. Note that this does not restrict the groups you can connect to; that is affected only by the AUTHORIZED GROUPS option.</p>
INACTIVITY [LOGOUT] <i>(Privileged users only)</i>	<p>Default: DISABLED. When enabled, the server logs out the port if it is inactive for a certain period. The length of the period is chosen by the SERVER INACTIVITY TIMER option. Example:</p> <p>CHANGE PORT x INACTIVITY LOGOUT ENABLED</p>
INPUT FLOW [CONTROL]	<p>Default: ENABLED. This option enables or disables input flow control. The actual type of flow control is specified by the FLOW CONTROL option. Example:</p> <p>CHANGE PORT x INPUT FLOW CONTROL DISABLED</p>
INTERRUPTS <i>(Privileged users only)</i>	<p>Default: DISABLED. When enabled, this option allows you to interrupt a remote connection and return to local mode (note, however, that the port must be set to ACCESS DYNAMIC for this to work). If a host is printing on a hardcopy terminal, and INTERRUPTS is enabled, you can stop the printing and regain control of the terminal by pressing <break> on the terminal. Example:</p> <p>CHANGE PORT x INTERRUPTS ENABLED</p> <p>Note: Type RESUME to restart an interrupted print job.</p>

continued on next page

Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
LOCAL [SWITCH]	<p>Default: NONE. Specifies a key that allows you to enter local mode when you are in a session. Use the RESUME command to return to the session. See BACKWARD SWITCH for a description of which keys you can use. Example:</p> <pre>CHANGE PORT x LOCAL SWITCH ^L</pre> <p>Note that unless you have specified otherwise with the BREAK option, the <break> key is normally used as the local switch key for all ports.</p>
LOGGING	<p>Default: DISABLED. This option is valid only for ports configured for parallel printers. When enabled, printer status changes are logged to the console port. Example:</p> <pre>CHANGE PORT 6 LOGGING ENABLED</pre>
LOSS [NOTIFICATION]	<p>Default: ENABLED. When enabled, the server beeps when a typed character is lost because of an entry error or overrun. Example:</p> <pre>CHANGE PORT x LOSS NOTIFICATION DISABLED</pre>
MESSAGE [CODES]	<p>Default: ENABLED. When enabled, message codes accompany all status and error messages. Example:</p> <pre>CHANGE PORT x MESSAGE CODES DISABLED</pre>
MODEM [CONTROL] (Privileged users only)	<p>Default: DISABLED. Specifies whether modem controls are active on a port. Example:</p> <pre>CHANGE PORT x MODEM CONTROL ENABLED</pre> <p>If MODEM CONTROL is enabled, the attached device must assert DSR, CTS, and DCD for the port to function (only DSR is required on partial-modem ports).</p>

continued on next page

Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
NAME <i>(Privileged users only)</i>	<p>Default: PORT_n. Defines the logical name of the port. It can be up to 16 characters and must be unique for each port. Remote devices can use either the port name or service name to connect to a port. Example:</p> <pre>CHANGE PORT x NAME J_SMITH</pre>
OUTPUT FLOW [CONTROL]	<p>Default: ENABLED. This option enables or disables output flow control. The actual type of flow control is specified by the FLOW CONTROL option. Example:</p> <pre>CHANGE PORT x OUTPUT FLOW CONTROL DISABLED</pre>
PARITY	<p>Default: NONE. Specifies the parity used by the port. The options are ODD, EVEN, MARK, SPACE, or NONE. This parameter must match the setting of the terminal, serial printer, or other device connected to the port. Example:</p> <pre>CHANGE PORT x PARITY EVEN</pre>
PASSWORD <i>(Privileged users only)</i>	<p>Default: DISABLED. If this option is enabled, you are prompted for a password when you log in to the server. If it is disabled, no password is required. This does not affect passwords you might have set up for access to specific services. The value of the password is specified by the CHANGE SERVER LOGIN PASSWORD command. Example:</p> <pre>CHANGE PORT x PASSWORD ENABLED</pre>
PAUSE	<p>Default: DISABLED. When enabled, the server accepts commands to display several screens of similar information (for example, the status of several ports) with a pause between each screen.</p>

continued on next page

Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
PAUSE (continued)	<p>For example, if you enter the command SHOW PORT 1-6, the server displays information about port 1 and then waits until you press a key before displaying information about port 2. If PAUSE is disabled, information about each port is displayed in a continuous stream. Example:</p> <pre>SET PORT x PAUSE ENABLED</pre> <p>Refer to the SHOW/MONITOR/LIST command for further details.</p>
PREFERRED	<p>Default: NONE. Defines a service to which you are connected if you enter a CONNECT command with no destination. If AUTOCONNECT is enabled, it also specifies the service to which you are automatically connected upon login. Example:</p> <pre>CHANGE PORT x PREFERRED ACTG</pre> <p>If you wish, you can also specify a particular NODE and PORT in addition to a service. Example:</p> <pre>CHANGE PORT x PREFERRED ACTG NODE VAX1 DESTINATION 5</pre>
RING <i>(Privileged users only)</i>	<p>Default: DISABLED. When enabled on a service port, this option allows a port to ring an external DTE device such as a computer or data switch. DSRS is connected to the device's RING input. DSRS asserts and deasserts (rings) until DSR is received from the external device at which time DSRS remains deasserted. The RING option is available only on full-modem ports and requires that the MODEM CONTROL and DTRWAIT options be enabled and port access be set to REMOTE or DYNAMIC. Example:</p> <pre>CHANGE PORT x RING ENABLED</pre>

continued on next page

Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
SECURITY <i>(Privileged users only)</i>	<p>Default: DISABLED. When enabled, provides the port with secure status. This is one step below nonprivileged status and prevents you from using the SHOW command to look at the status of other users' ports or sessions. It also restricts your access to some configuration commands.</p> <p>Example:</p> <pre>CHANGE PORT x SECURITY ENABLED</pre>
SESSION LIMIT <i>(Privileged users only)</i>	<p>Default: 4. Defines the number of simultaneous sessions you can have. The range is 0 (no sessions allowed) to 8. Entering NONE permits up to 8 sessions. Example:</p> <pre>CHANGE PORT x SESSION LIMIT NONE</pre>
SPEED	<p>Default: 9600. Selects the port speed in bits per second.</p> <p>Example:</p> <pre>CHANGE PORT x SPEED 9600</pre> <p>Permissible values are 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19200, and 38400 bps. You can specify split input and output speeds as follows:</p> <pre>CHANGE PORT x INPUT SPEED 2400 OUTPUT SPEED 9600</pre> <p>The number of stop bits per character is set automatically to 1.5 for 75 bps; 2 for 110, 134.5, and 150; and 1 for all other speeds.</p>
TYPE	<p>Default: SOFTCOPY (serial ports), CENTRONICS (PC and Centronics PortPaks), or DATAPRODUCTS (Dataproducts PortPaks). Specifies the type of device connected to the port. For example:</p> <pre>CHANGE PORT x TYPE VT100</pre> <p>The following types are supported on the serial ports:</p>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
<p>TYPE (continued)</p> <p>USERNAME</p>	<p>VT100 - Specifies a DEC VT series terminal or compatible.</p> <p>ANSI - Same as VT100 but does not support line drawing.</p> <p>SOFTCOPY - Same as VT100 but does not support line drawing, the clear screen function, or special cursor controls.</p> <p>HARDCOPY - A hardcopy serial terminal. Deleted characters are echoed between backslashes.</p> <p>For a parallel port, the TYPE option specifies a printer type:</p> <p>CENTRONICS - Configures a parallel port for a Centronics type printer.</p> <p>DATAPRODUCTS - Configures a parallel port for a Dataproducts type printer.</p> <p>Default: No username. Defines a username for a port. The name can be 1 to 16 characters long. If the name is not enclosed in quotes, it is converted to all uppercase. Example:</p> <pre>CHANGE PORT x USERNAME "J_Smith"</pre> <p>This is primarily a convenience feature. If a username is specified with this command, the server does not prompt for a username when you log in. To eliminate a previously set username, enter the command CHANGE PORT USERNAME "".</p>

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Table 5-18. SET/DEFINE/CHANGE PORT Options (continued)

Option	Definition
VERIFICATION	Default: ENABLED. When enabled, the server displays a short message whenever a session connection or disconnection is made or a session switch is made. Error messages are always displayed, regardless of the VERIFICATION option. Example: CHANGE PORT x VERIFICATION DISABLED

5.29 SET/DEFINE/CHANGE SERVER

The SET SERVER, DEFINE SERVER, and CHANGE SERVER commands change options that affect the entire server. The three commands work as follows:

- SET - Server options are changed temporarily. The old values return when the server is reinitialized.
- DEFINE - Server options are not changed until the server is reinitialized, but are then changed permanently.

Some server options can not be changed while sessions are active. It is convenient to set these options with the DEFINE command and then use a delayed INITIALIZE command to reinitialize the server at a later time when no sessions are active.

- CHANGE - Server options are changed immediately and permanently.

When server options are changed permanently they are stored internally in EARAM. When they are changed temporarily they are stored in ordinary RAM and thus are lost when the server is reinitialized.

Syntax SET/DEFINE/CHANGE SERVER [*options and modifiers*]

Privilege Available to privileged users only.

Examples CHANGE SERVER BROADCAST DISABLED

DEFINE SERVER RETRANSMIT LIMIT 12

Table 5-19. SET/DEFINE/CHANGE SERVER Options

Option	Definition
<i>options and modifiers</i>	There are a large number of server options. They are listed in alphabetical order starting on the next page.

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
ANNOUNCEMENTS	<p>Default: ENABLED. This option allows the server to send multicast messages to other Ethernet nodes announcing that it has services available. If no local services are defined, no announcements are sent.</p> <p>If this option is disabled, other nodes will be unaware of the Performance 3000 and therefore unable to initiate connections with it. To disable announcements, enter:</p> <p>CHANGE SERVER ANNOUNCEMENTS DISABLED</p>
AUTOREINIT	<p>Default: ENABLED. When enabled, the server automatically reinitializes (including software download) if it detects an unresolvable internal software problem.</p> <p>Example:</p> <p>CHANGE SERVER AUTOREINIT DISABLED</p>
BROADCAST	<p>Default: ENABLED. Allows users to send messages to other ports on the server. Note that target ports must have the PORT BROADCAST option enabled in order to <i>receive</i> broadcast messages. Example:</p> <p>CHANGE SERVER BROADCAST DISABLED</p>
CIRCUIT [TIMER]	<p>Default: 80 milliseconds. The interval between Ethernet packets sent from the server to other nodes on the network. A higher value makes more efficient use of the Ethernet but delays character echoing; a low value improves character echoing but increases the number of Ethernet packets sent. The range is 30 to 200 milliseconds. For example:</p> <p>DEFINE SERVER CIRCUIT TIMER 120</p> <p>If any sessions are active, the CIRCUIT TIMER option is valid only with the DEFINE command, not SET or CHANGE.</p>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
CONSOLE [PORT]	<p>Default: Lowest numbered port. Designates a port as the console port. The console port receives all error and status messages. To designate port 3 as the console port, for example, enter the following:</p> <pre>CHANGE SERVER CONSOLE PORT 3</pre> <p>To disable the console port, specify CONSOLE NONE. Since maintenance messages are always sent to the console port, be sure not to mistakenly configure a nonprivileged user as the console port.</p>
DATE	<p>Default: Downloaded date. This option specifies the date displayed by the server on its front panel and in status displays. The date is normally downloaded from the load host when the server is initialized, but you can change it with this option if you wish. Use the following format (the example specifies December 31, 1989):</p> <pre>SET SERVER DATE 31-DEC-1989</pre>
DUMP <i>(Privileged users only)</i>	<p>Default: ENABLED. This option enables or disables the crash dump facility. Example:</p> <pre>CHANGE SERVER DUMP DISABLED</pre>
EMULEX OPTIONS	<p>Default: Enabled/Disabled. Use Enabled or Disabled to add or remove option(s) from the existing options list. If neither keyword is specified, the existing options list is replaced by the new options list. Options include:</p> <ul style="list-style-type: none"> 0 = Enable unknown frames (bypass protocol frame filter) 1,2 = Reserved 3 = Pack group codes into the smallest number of bytes 4 = Host-initiated requests announce supported services 5 = Print information-only messages to the console port 6 = Print nonfatal error messages to the console port

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
EMULEX OPTIONS (continued)	<p>As an example, the following command would enable options 0, 3, and 4, leaving the other options unchanged:</p> <pre>CHANGE SERVER EMULEX 0,3-4 ENABLED</pre> <p>The options are defined as follows:</p> <p>Option 0</p> <p>The frame checker is a protocol filter that tests the validity of each frame before it is acted upon. Under certain circumstances, the frame checker might prevent a previously-undefined LAT frame from being processed. Having an option to bypass this check allows for better support of newer (even unannounced) LAT products.</p> <p>While frame validation is a useful safeguard against potentially harmful packets, it does have a performance impact. By providing the option to bypass this check, the user might experience a significant performance improvement. Only the network manager can make the decision as to whether or not this is a fair tradeoff on the network in question.</p> <p>Options 1 and 2</p> <p>These options are reserved.</p> <p>Option 3</p> <p>The DECserver 200 packs group codes into the least number of bytes possible. All other DEC LAT devices send group codes in a bit mask made up of 32 bytes. By enabling this option, the Performance 3000 will pack group codes exactly like the DECserver 200, thereby, in some cases, sending smaller packets (31 bytes fewer, in the best case).</p>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
EMULEX OPTIONS (continued)	<p>Option 4</p> <p>When this option is disabled (the default setting), the Performance 3000 announces supported services during a HIC (host-initiated connect) request like the DECserver 500. (The DECserver 500 does not build a list of local services; it merely sends its node information.) This results in significantly faster HIC response time when there are many local services defined.</p> <p>When this option is enabled, the Performance 3000 behaves like the DECserver 200. (The DECserver 200 sends not only node information but also a full list of all local services.) With all supported operating systems, there is no known advantage in enabling this feature; it is offered so that the Performance 3000 can emulate either the DECserver 200 or DECserver 500.</p> <p>Option 5</p> <p>Informational messages are used primarily as a network management or debugging aid. These messages include "Server has zero idle time" and "3503 - heavy network activity". Emulex recommends that under normal circumstances Option 5 be disabled. This option should be enabled only to troubleshoot network problems or at the request of Emulex Technical Support.</p>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
<p>EMULEX OPTIONS (continued)</p> <p>FRONTPANEL</p>	<p>Option 6</p> <p>Nonfatal warning messages also are used primarily as a network management or debugging aid. Emulex recommends that under normal circumstances Option 6 be disabled. This option should be enabled only to troubleshoot network problems or at the request of Emulex Technical Support.</p> <p>Default: ENABLED "Performance 3000". This option specifies two things: the operation of the front panel buttons and the default message that appears in the Performance 3000's LCD display.</p> <p>The front panel buttons are enabled and disabled via the ENABLED and DISABLED options. For example:</p> <p>CHANGE FRONTPANEL DISABLED</p> <p>The DISPLAY option selects the contents of the LCD display:</p> <p>DISPLAY NAME - Selects the server's name (as set by the SET SERVER NAME command).</p> <p>DISPLAY NUMBER - Selects the server's ID number (as set by the SET SERVER NUMBER command).</p> <p>DISPLAY TIME - Selects the date and time of day.</p> <p>DISPLAY "message" - Selects a user-defined message up to 16 characters long. Both the front panel buttons and the LCD display can be set with one command. For example:</p> <p>CHANGE FRONTPANEL DISABLED DISPLAY "Server1"</p>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
<p>HEARTBEAT</p>	<p>Default: DISABLED. When enabled, the server monitors the Ethernet collision detect circuitry. This option must be compatible with the type of transceiver you are using. Example:</p> <pre>CHANGE SERVER HEARTBEAT ENABLED</pre> <p>Note that some devices, such as repeaters and multiport transceivers, require that heartbeat be disabled. These include the Emulex P4902, P4904, and P4905. The P4901 transceiver can be used with or without heartbeat.</p>
<p>IDENTIFICATION</p>	<p>Default: None. Specifies a phrase that describes the server. The phrase can be up to 40 characters long and must be enclosed in quotation marks. If any sessions are active, this option is valid only with the DEFINE command, not SET or CHANGE. Example:</p> <pre>DEFINE SERVER IDENTIFICATION "P3000 No. 6"</pre>
<p>INACTIVITY [TIMER]</p>	<p>Default: 30 minutes. The length of time before an inactive port is logged out. Affects only ports with the port option INACTIVITY LOGOUT enabled. Range is 1 to 120 minutes. Example:</p> <pre>CHANGE SERVER INACTIVITY TIMER 45</pre>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
KEEPALIVE [TIMER]	<p>Default: 20 seconds. This option specifies how often the server will transmit an ID on a virtual circuit in the absence of any other activity (the purpose is to keep other nodes aware that the server is still active). It also specifies how often the server will retry a connection if AUTOCONNECT is enabled for a port. The range is 10 to 180 seconds. If any sessions are active, this option is valid only with the DEFINE command, not SET or CHANGE. Example:</p> <pre>DEFINE SERVER KEEPALIVE TIMER 10</pre>
[LOCAL] PROMPT	<p>Default: "Server". The prompt normally displayed by the server. It must be 1-8 characters and enclosed in quotes. The server always adds a ">" character after the prompt (">>" if you are in privileged mode). Example:</p> <pre>CHANGE SERVER LOCAL PROMPT "Local"</pre>
LOCK	<p>Default: ENABLED. Allows users to use the LOCK command. The LOCK command allows users to lock their terminals without logging out. See the description of the port LOCK command for further details. Example:</p> <pre>CHANGE SERVER LOCK DISABLED</pre>
LOGIN PASSWORD	<p>Default: ACCESS. This option sets the password that users must enter to log in to the server. It must be 1 to 16 characters starting with an alphabetic character and must be enclosed in quotation marks. Example:</p> <pre>CHANGE SERVER LOGIN PASSWORD "ORANGE"</pre>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
LOGIN PASSWORD (continued)	<p>You can also type the command without a password and the server will prompt you for one:</p> <pre>Server>> CHANGE SERVER LOGIN PASSWORD Login password> (enter the password here--it is not echoed) Verification> (enter the password again)</pre> <p>Note that this option specifies only the <i>value</i> of the login password. If you want to require the use of login passwords, you must enable passwords on a port-by-port basis via the CHANGE PORT <i>x</i> PASSWORD command.</p>
LOGIN PROMPT	<p>Default: #. The prompt displayed by the server when it is waiting for a user to enter the login password. The prompt must be 1-8 characters and must be enclosed in quotation marks. Example:</p> <pre>CHANGE SERVER LOGIN PROMPT "Password"</pre> <p>The login prompt is always preceded by a beep when the user logs in.</p>
MAINTENANCE PASSWORD	<p>Default: No password. The password that must be entered by remote console operators and by persons using the DECnet NCP TRIGGER command. The password must be 1 to 16 <i>hexadecimal</i> characters. A value of zero disables the password. Example:</p> <pre>CHANGE SERVER MAINTENANCE PASSWORD "AB1234"</pre>
MULTICAST [TIMER]	<p>Default: 30 seconds. The interval between multicast announcements. The range is 10 to 180 seconds. See ANNOUNCEMENTS for further details. Example:</p> <pre>CHANGE SERVER MULTICAST TIMER 20</pre>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
NAME	<p>Default: P3K_ether_net-address. A name for the server used in CONNECT commands and by host-initiated connections. It can be up to 16 characters long and should be different from all other nodes on a single network. It <i>must</i> be different from all other server names if the server accepts host-initiated connections or offers services. Example:</p> <pre>DEFINE SERVER NAME OZMA</pre> <p>Emulex recommends that this name match the DECnet name for the server (as specified by the server configuration utility--see subsection 2.5). In any case, note that this name is the one used to connect to the server; the DECnet name is rarely used except by DECnet NCP commands.</p> <p>If any sessions are active, this option is valid only with the DEFINE command, not SET or CHANGE.</p>
NODE [LIMIT]	<p>Default: 125. The maximum number of nodes about which the server stores information internally. The range is 1-125. NONE sets the limit to its maximum. If your network has more nodes than the maximum supported, segment the network with group codes (see Appendix C for further details). Example:</p> <pre>CHANGE SERVER NODE LIMIT NONE</pre> <p>Note that there is no advantage to reducing the NODE LIMIT; it is included as an option only for compatibility with DECserver products.</p>
NUMBER	<p>Default: 0. An ID number for the server. The range is 0 to 32767. If any sessions are active, this option is valid only with the DEFINE command, not SET or CHANGE. Example:</p> <pre>DEFINE SERVER NUMBER 97</pre>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
PASSWORD LIMIT	<p>Default: 3. The number of times you can enter an incorrect password when the server prompts you for one. If you exceed the limit, your port is disconnected and you must wait one minute before trying again. (If the SERVER SECURITY option is enabled, the port is disconnected until a privileged user logs it out). The range is 0 to 250. If you specify NONE, you are logged out after 250 unsuccessful attempts. Example:</p> <pre>CHANGE SERVER PASSWORD LIMIT 4</pre>
PRIVILEGED PASSWORD	<p>Default: SYSTEM. The password that must be entered when you enter the SET PRIVILEGED command. It must be 1 to 16 characters and must be enclosed in quotation marks. For example:</p> <pre>CHANGE SERVER PRIVILEGED PASSWORD "LEXINGTON"</pre> <p>You can also type the command without a password and the server will prompt you for one:</p> <pre>Server>> CHANGE SERVER PRIVILEGED PASSWORD Login password> (enter the password here--it is not echoed) Verification> (enter the password again)</pre> <p>The privileged password can be changed only by a privileged user. If you forget the password, you can reset it to SYSTEM by resetting the server to its factory defaults (see subsection 3.2.5).</p>
QUEUE [LIMIT]	<p>Default: 64. The maximum number of host requests the server can store in its internal queue. The range is 1 to 64. NONE sets the limit to 64. Example:</p> <pre>CHANGE SERVER QUEUE LIMIT 20</pre>

continued on next page

Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
RETRANSMIT [LIMIT]	<p>Default: 32. The number of times a message is retransmitted to a remote node when no acknowledgement is received. The range is 4 to 120. If any sessions are active, this option is valid only with the DEFINE command, not SET or CHANGE. Example:</p> <pre>DEFINE SERVER RETRANSMIT LIMIT 12</pre>
SECURITY	<p>Default: DISABLED. When enabled, this option has the following effects:</p> <p>First, users who exceed the password limit when logging in are disconnected permanently (rather than for one minute). The port is said to be in "sealed" state and this state is logged to the console port. To re-enable the port, a privileged user must issue a LOGOUT PORT command for the port.</p> <p>Second, whenever you enter privileged mode the server prints a message telling you the identity (port number) and date and time of the last user to enter privileged mode.</p> <p>Example:</p> <pre>CHANGE SERVER SECURITY ENABLED</pre>
[SERVICE] GROUPS	<p>Default: Group 0. This option defines the group code for the Performance 3000. This group code applies only to local services and ports on the Performance 3000 and thus does not need to be specially set if no local services are defined and remote connections to server ports are not required. The server can be assigned a single group or multiple groups in the range 0 to 255.</p>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
<p>[SERVICE] GROUPS (continued)</p>	<p>Typically, group codes are assigned to Ethernet devices based on categories. For example, all engineering nodes on a network might be assigned a group code of 0, and all accounting nodes a group code of 1. Then, if you wanted to restrict a user to the use of only engineering nodes, you would set his port so it has access only to group 0 (see the CHANGE PORT AUTHORIZED GROUPS command).</p> <p>If you use a scheme like this, you should assign a group code to the Performance 3000 based on its category. If you wanted to assign it to several categories (for example, if you wanted its printers available to both engineering and accounting users), you would assign it multiple group codes using the standard list format:</p> <pre>CHANGE SERVER SERVICE GROUP 1,4-8</pre> <p>You can add a group by using the ENABLED modifier. For example, to add group 2 to the existing list, enter CHANGE SERVER SERVICE GROUP 2 ENABLED. You can subtract a group by using the DISABLED modifier.</p> <p>It is common on smaller systems to assign all nodes a group code of 0. This gives everyone access to all services.</p>
<p>SESSION [LIMIT]</p>	<p>Default: 48. This option allows you to reduce the total number of sessions the server can support at one time. It is rarely used. Example:</p> <pre>CHANGE SERVER SESSION LIMIT 40</pre> <p>Note that there is no advantage to reducing the SESSION LIMIT; it is included as an option only for compatibility with DECserver products.</p>

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Table 5-19. SET/DEFINE/CHANGE SERVER Options (continued)

Option	Definition
SOFTWARE	<p>Default: P3KL00E. A 1 to 9 character name for the software that the server will load from its load host the next time it is initialized. This option is valid with the DEFINE command only. Example:</p> <pre>DEFINE SERVER SOFTWARE P3KL00E</pre>
TIME	<p>Default: Downloaded time. This option specifies the time displayed by the server on its front panel and in status displays. The time is normally downloaded from the load host when the server is initialized, but you can change it with this option if you wish. Use the following format:</p> <pre>SET SERVER TIME 18:30:00</pre>
WELCOME	<p>Default: "Welcome to Performance 3000". This option defines a message that the server displays when a user logs in. It can be up to 80 character long and must be enclosed in quotes. It can include any ASCII characters (including special control characters). For example:</p> <pre>CHANGE SERVER WELCOME "Call x3333 for help"</pre>

5.30 SET/DEFINE/CHANGE SERVICE

The SET SERVICE, DEFINE SERVICE, and CHANGE SERVICE commands create and change local services. Any single port or group of ports on the server can be defined as a service.

The three commands work as follows:

- SET - Services are created (or modified) temporarily. The old values return the next time the server is reinitialized. If a service is created with the SET command, it is deleted when the server is reinitialized.
- DEFINE - Services are not created or changed until the server is reinitialized, but are then changed permanently.
- CHANGE - Services are created or changed immediately and permanently.

When services are changed permanently, the service options are stored internally in EARAM. When they are changed temporarily the options are stored in RAM and thus are lost when the server is reinitialized.

Syntax SET/DEFINE/CHANGE SERVICE *name* [*options and modifiers*]

Privilege Available to privileged users only.

Examples CHANGE SERVICE MODEM_POOL PORTS 1-4

CHANGE SERVICE MODEM_POOL PORTS 1-4 PASSWORD "KLINGON"

Comments A maximum of 16 local services can be defined on the server. Note also that port parameters must be set correctly for all local services; see subsection 3.3.4 for further details.

Table 5-20. SET/DEFINE/CHANGE SERVICE Options

Option	Definition
<i>name</i>	The name of the local service you wish to create or modify. Users use this name to connect to the service.

continued on next page

Table 5-20. SET/DEFINE/CHANGE SERVICE Options (continued)

Option	Definition
<p><i>options and modifiers</i></p> <p>PORTS</p> <p>CONNECTIONS</p> <p>IDENTIFICATION</p> <p>PASSWORD</p> <p>QUEUE</p>	<p>All service options are listed below.</p> <p>Default: None. Specifies which ports make up the service. If you have dialout modems connected to the first three serial ports, for example, you might use the following command to create the service MODEM on ports 1-3:</p> <pre>CHANGE SERVICE MODEM PORTS 1-3</pre> <p>You can add ports to an existing service via the ENABLED modifier. For example, the following command adds port 4 to the existing port list for the service MODEM:</p> <pre>CHANGE SERVICE MODEM PORT 4 ENABLED</pre> <p>You can subtract ports from an existing service by using the DISABLED modifier.</p> <p>Default: ENABLED. Allows new connections to be made to the service.</p> <p>Default: None. A phrase that describes the service. It can be up to 40 characters long and must be enclosed in quotation marks.</p> <p>Default: None. Defines a password that is required to connect to the service. The password must be 1 to 16 characters long starting with an alphabetic character. For example:</p> <pre>CHANGE SERVICE MODEM PORTS 1-3 PASSWORD "JACK"</pre> <p>To remove password protection from a service that already has it, enter PASSWORD "".</p> <p>Default: ENABLED. When enabled, the server places requests for the service into an internal queue when the service is busy.</p>

5.31 SET SESSION

The SET SESSION command varies the transparency of your current session (that is, the session you were most recently in). In PASSALL mode, the port does not check for control characters; all characters are passed through as data. Additionally, all server messages to the port are disabled.

PASSALL mode is used primarily for file transfers. It allows data files that contain control characters to be transferred without interference from the server.

Syntax SET SESSION INTERACTIVE
 PASSALL
 PASTHRU

Privilege Available to all users.

Example SET SESSION PASSALL

Comment The SET SESSION command affects only your most recent session. You can not specify a session number.

Table 5-21. SET SESSION Options

Option	Definition
INTERACTIVE	Nonprivileged mode.
PASSALL	Disables all switch characters, server messages, and XON/XOFF flow control. Use this mode for binary file transfers (for example, transferring programs).
PASTHRU	Disables all switch characters and server messages but leaves XON/XOFF flow control enabled. Use this mode for ASCII file transfers (for example, transferring text files).

5.32 SHOW/MONITOR NODE

The SHOW NODE and MONITOR NODE commands display information about the Ethernet nodes that are accessible to users from the Performance 3000. The two commands work as follows:

- SHOW - Displays current information about available nodes on the network.
- MONITOR - Similar to SHOW, but the display is updated every second for privileged users and every 10 seconds for nonprivileged users. MONITOR displays are terminated by pressing any key.

Syntax SHOW/MONITOR NODE [*name*] [STATUS
 [ALL] [SUMMARY
 COUNTERS]

Privilege Available to all users. Privileged status is required to display information about nodes you are not currently authorized to use (see SET PORT AUTHORIZED GROUPS).

Examples SHOW NODE

 SHOW NODE ACTG COUNTERS

 SHOW NODE ALL

Comments If the SET PORT PAUSE option is enabled, the server stops after each screen and displays a prompt until you press the specified key (shown at the bottom of the screen). Press any other key to terminate the displays.

Three different displays about each node are available:

- STATUS display (default if one node is specified)
- SUMMARY display (default if multiple nodes are specified)
- COUNTERS display

Each of these displays is described briefly in the Options Table and then in full detail in the subsections following the table.

Table 5-22. SHOW/MONITOR NODE Options

Option	Definition
<i>name</i>	The name of the node about which you want information. If no node name is specified, a summary line is displayed for each node that has a group code that matches the setting of your PORT GROUP option. If you are a privileged user, a summary line is displayed for all nodes of which the server is aware.
ALL	Specifies that you want a summary line displayed for all nodes that match the setting of your PORT AUTHORIZED GROUPS option.
STATUS	One screen per node. Displays the STATUS screen for each node you specify. This screen contains the node's Ethernet address, group codes, services offered, etc. This is the default if one node is specified. See subsection 5.32.1 for further details.
SUMMARY	One screen. Displays a single line summary for each node you specify. This is the default if multiple nodes are specified. See subsection 5.32.2 for further details.
COUNTERS	One screen per node. Displays the COUNTERS screen for each node you specify. This screen contains information about the number of connections the server has made to the node, the number of messages sent, number of errors detected, etc. See subsection 5.32.3 for further details.
<p>Note: If the SET PORT PAUSE option is enabled, use the specified keys (displayed at the bottom of the screen) to move forward and backward from node to node.</p>	

```
Current Status for Node ACTG
-----
Identification:
ID: VAX-11/780 - main building
Protocol Rev: 5.0           Ethernet Address: AA-00-04-00-0A-04
Frame Size: 1500           Mode: Master
Address Errors: 0           Status: reachable
                               Multicast Rate:                20

Enabled Groups: 0,7

Service Name  ‡ Sess Rating Identification
ACTG         6      219 VAX-11/780 - main building

07-JUN-1989 15:00:00
```

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Figure 5-1. The SHOW NODE STATUS Display

5.32.1 The SHOW NODE STATUS Display

The STATUS display is the default when one node is specified by the SHOW NODE command (for example, SHOW NODE ACTG). It contains the following groups of information:

Identification:

- *ID* is the identification string that identifies the node.
- *Protocol Rev* is the revision level of the LAT or ELT protocol that the node is using. Note that only revision levels 5.1 or higher support host-initiated connections.
- *Frame Size* is the maximum size of the Ethernet packets that the node transmits over the network.
- *Address Errors* is the number of times a node's address has changed. The server increments this number if it receives a multicast announcement from a particular node name and discovers that its address is different from the last time it received an announcement. This usually indicates that two nodes have the same name or that a node name has been changed.
- *Ethernet Address* is the node's physical Ethernet address.

- *Mode* can be either master or slave. Master indicates that the node itself initiated the connection to the server; slave indicates that the server originated the connection. If the node has both master and slave connections active, two separate status screens are displayed for the node.
- *Status* can be either reachable or unknown. Unknown indicates that the server is aware of the node (i.e, it has received multicast announcements from it in the past) but the node has not transmitted a multicast announcement advertising its services in the last several minutes.
- *Multicast Rate* is the interval in seconds between multicast announcements from the node (packets that announce the availability of services to other Ethernet nodes).

Enabled Groups:

The group code (or codes) of the node. A port must be authorized for at least one of the node's group codes in order to connect to the node (see SET PORT AUTHORIZED GROUPS).

Service Name:

A list of the services offered by the node. Each line includes the following:

- *Service Name* identifies the service.
- *# Sess* is the number of sessions currently connected to the service from the server.
- *Rating* indicates the current ability of the service to accept new connections. The range is 0 to 255. The higher the number the greater the capacity of the node to accept new connections. A rating of zero indicates the service can not accept any new connections.

Service ratings change dynamically as connections are made to the service. If you try to connect to a service that is offered on several nodes, the server normally connects you to the service with the highest rating.

- *Identification* is the identification phrase that identifies the service.

```
Current Node Summary
Node Name      Sessions  Identification
ACTG           4  VAX-11/780 - main building
ENGR           2  VAX 8600 - engineering building
- SALES        0  MicroVAX II - main building
* SERV1        0  Performance 3000 #1
*=local node  --status unknown  07-JUN-1989 15:00:00
```

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Figure 5-2. The SHOW NODE SUMMARY Display

5.32.2 The SHOW NODE SUMMARY Display

The SUMMARY display is the default when multiple nodes are specified by the SHOW NODE command (for example, SHOW NODE ALL).

Each line has the following information:

- *Node Name* is the name assigned to the node.
- *Sessions* is the number of sessions connected to the node from the server. If the node is the server itself, connections between two server ports (that is, local connections) count as two sessions.
- *Identification* is the node's identification phrase (if any).

An asterisk next to a node name indicates that it is the server itself. A dash next to a node name indicates that its status is unknown; issue a SHOW NODE STATUS command to find out the exact status of the node.

```

Current Counters for Node ACTG
Seconds since zeroed: 7055 (0 01:57:35)

ELT Statistics
Bytes Received:          54321
Bytes Transmitted:      34567
Messages Received:      100
Messages Transmitted:   48
Slots Received:         12345
Slots Transmitted:      4321

ELT Errors
Duplicates Rec'd:       0
Illegal Messages:      0
Illegal Slots:          0
Retransmissions:       0
Dup Address:            0

Solicitations:
Accepted:                0
Rejected:                0
    
```

07-JUN-1989 15:00:00

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Figure 5-3. The SHOW NODE COUNTERS Display

5.32.3 The SHOW NODE COUNTERS Display

The COUNTERS display contains a variety of statistics about data exchanges between the Performance 3000 and the node you specify. It can be useful for estimating how heavily certain nodes are being used. Use the SHOW SERVER COUNTERS command if you wish to view statistics for the server as a whole.

The COUNTERS display contains the following groups of information:

Seconds since zeroed:

The number of seconds since either (1) the server was reinitialized or (2) the ZERO COUNTERS command was issued for the node. The value in parentheses indicates the same period in a different format (days, hours, minutes, and seconds).

ELT Statistics:

- *Bytes Received* and *Bytes Transmitted* are the number of bytes exchanged by the server and the node.
- *Messages Received* and *Messages Transmitted* are the number of ELT packets exchanged by the server and the node. It includes user data packets and system multicast messages. (ELT is the protocol the Performance 3000 uses to communicate with DEC hosts; it is compatible with the LAT protocol used by DEC servers.)

- *Slots Received* and *Slots Transmitted* are the number of slots exchanged by the server and the node. A slot is a part of an ELT packet that contains information about specific sessions.

ELT Errors:

- *Duplicates Rec'd* is the number of ELT packets the server has received from the node twice. If this number is higher than 1/1000 of the total messages received, it might indicate either (1) the node is not processing incoming packets properly (possibly due to insufficient internal buffers), or (2) the server is not accepting messages properly, causing the node to retransmit them.
- *Illegal Messages* is the number of badly-formatted ELT packets the server has received from the node. This number should be zero. Any other number indicates a possible problem with LAN nodes or an Ethernet adapter.
- *Illegal Slots* is the number of badly formatted slots the server has received from the node.
- *Retransmissions* is the number of messages the server has had to retransmit to the node. Retransmissions are usually caused by a busy node or by a fault with the node's host software.
- *Dup Address* is the count of the number of times the server has received a multicast message having the same name as a known node, but with a different address. This number should be zero. Any other value indicates an invalid network configuration.

Solicitations:

- *Accepted* is the number of host-initiated requests from the node that the server has accepted (that is, either the connection was made immediately or was placed in the server queue).
- *Rejected* is the number of host-initiated requests from the node that the server has rejected.

5.33 SHOW/MONITOR/LIST PORT

The SHOW PORT, MONITOR PORT, and LIST PORT commands display information about server ports. The three commands work as follows:

- **SHOW** - Displays current information about server ports, including port options that have been changed temporarily by the SET command.
- **MONITOR** - Similar to SHOW, but the display is updated every second for privileged users and every 10 seconds for nonprivileged users. MONITOR displays are terminated by pressing any key.
- **LIST** - Displays permanent information about server ports. These are the parameters that will take effect (if they haven't already) the next time the port is logged in or out.

Syntax SHOW/MONITOR/LIST PORT [*number*] [CHARACTERISTICS *type*]
 [ACCESS *type*] [SUMMARY
 STATUS
 SESSIONS
 COUNTERS]

Privilege Available to all users. Nonprivileged users can MONITOR more than one port with the SUMMARY option only. Secure users can display information about their own port only.

Examples SHOW PORT

 SHOW PORT 1-4 CHARACTERISTICS HARDWARE

 SHOW PORT ACCESS REMOTE SUMMARY

Comments Only the CHARACTERISTICS option is valid with the LIST PORT command.

If the PORT PAUSE option is enabled, the server pauses after displaying the requested screen. Press the specified keys to view the same screen for another port or the next screen for the same port (the keys are shown at the bottom of the screen). Press any other key to immediately terminate a display.

Five different displays about each port are available:

- CHARACTERISTICS display (default if one port is specified)
- SUMMARY display (default if multiple ports are specified)
- STATUS display
- SESSIONS display
- COUNTERS display

Each of these displays is described briefly in the Options Table and then in full detail in the subsections following the table.

Table 5-23. SHOW/MONITOR/LIST PORT Options

Option	Definition
<i>number</i>	The number of the port about which you want information. It can be one port, several ports, or PORT ALL. If no port number is given, information is displayed about your own port.
ACCESS <i>type</i>	Specifies that you want information only about ports with a certain ACCESS type. The possible values are LOCAL, REMOTE, DYNAMIC, and NONE (see SET PORT ACCESS). Port numbers are not used if you specify an access type. For example, to display the STATUS screen for all ports with remote access, enter the command SHOW PORT ACCESS REMOTE STATUS.
CHARACTERISTICS <i>type</i>	Three screens per port. Displays the CHARACTERISTICS screens for each port you specify. This is the default if one port is specified. These screens display (1) port options that are strictly LOCAL, (2) options that affect HARDWARE settings, and (3) options that affect NETWORK usage. If the SET PORT PAUSE option is enabled, all three screens are shown in rotation (see note below); otherwise you can specify a particular screen (LOCAL is the default). See subsection 5.33.1 for further details.
SUMMARY	One screen. Displays a brief summary of each port you specify. This is the default if multiple ports are specified. See subsection 5.33.2 for further details.

continued on next page

Table 5-23. SHOW/MONITOR/LIST PORT Options (continued)

Option	Definition
STATUS	One screen per port. Displays the STATUS screen for each port you specify. This screen contains the port's username, access setting, etc. See subsection 5.33.3 for further details.
SESSIONS	One screen per port. Displays the active sessions for the specified port. This display is identical to the SHOW SESSIONS PORT <i>x</i> command. See subsection 5.37 for further details.
COUNTERS	One screen per port. Displays the COUNTERS screen for each port you specify. This screen contains information about the number of connections the port has made, number of errors detected, etc. See subsection 5.33.5 for further details.
Note: If the SET PORT PAUSE option is enabled, use the right-arrow key to move forward from port to port. Use the left-arrow key to move backward through the ports. If a display has more than one screen, use the up-arrow and down-arrow keys to change screens.	

5.33.1 The SHOW PORT CHARACTERISTICS Display

The CHARACTERISTICS display is a detailed listing of all port options. It is the default if a single port is specified by the SHOW PORT command (for example, SHOW PORT). Three screens of information are available:

- Local Group screen
- Hardware Group screen
- Network Group screen

If the PORT PAUSE option is enabled, you need only enter the command SHOW PORT *x*; the Local Group screen appears and you can press the up-arrow and down-arrow keys to move between the three screens.

If PAUSE is disabled, only one screen is shown and you must specify which one you want (for example, SHOW PORT *x* HARDWARE). The Local Group screen is the default.

All three screens are shown on the next page. They contain the following groups of information:

Local Group

Characteristics:

These are port characteristics that have been set by the SET PORT command. Refer to subsection 5.28 if you require detailed descriptions of these options.

Identification:

- *Username* is the port's username, set either at login or by the SET PORT USERNAME command.
- *Portname* is the logical name of the port, set by the SET PORT NAME command. This is the name used by remote devices to connect to the port if the port is not defined as a service.

Switch Characters:

- *Forward* and *Backward* are the characters (if any) defined by the SET PORT FORWARD SWITCH and SET PORT BACKWARD SWITCH commands.
- *Local* is the character (if any) set by the SET PORT LOCAL SWITCH command.

Show Port Characteristics

```
Current Characteristics for Port 1 — Network Group
Current Characteristics for Port 1 — Hardware Group
Current Characteristics for Port 1 — Local Group

Characteristics:
Access:          local
Break:          local
Broadcast:      enabled
Inactivity Logout: disabled
Interrupts:     disabled
Loss Notification: enabled
Message Codes:  enabled
Password:       enabled
Pause:          enabled
Security:       disabled
Session Limit:  4
Type:           vt100
Verification:   enabled

Identification:
Username:       J Smith
Portname:      PORT_1

Switch Characters:
Forward:        ^F
Backward:       ^B
Local:          none

07-JUN-1989 15:00:00
```

```
Current Characteristics for Port 1 — Local Group
Current Characteristics for Port 1 — Network Group
Current Characteristics for Port 1 — Hardware Group

Serial Configuration:
Input Speed:    9600
Output Speed:   9600
Parity:         none
Character Size: 8
Autobaud:      disabled

Modem Control:
Modem Control: disabled
DCDlogout Delay: enabled
Dialup:         disabled
DSRlogout:      disabled
DTRwait:        disabled
Ring:           disabled

Flow Control:
Flow Control:   xon
Input Flow Ctrl: enabled
Output Flow Ctrl: enabled

07-JUN-1989 15:00:00
```

```
Current Characteristics for Port 1 — Hardware Group
Current Characteristics for Port 1 — Local Group
Current Characteristics for Port 1 — Network Group

Preferred Service:
Service Name:    ACTG
Node Name:       ACTG
Port Name:       Port_4

Characteristics:
Autoconnect:    disabled
Autoprompt:     enabled

Groups:
Authorized:     0
Current:        0

07-JUN-1989 15:00:00
```

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Figure 5-4. The SHOW PORT CHARACTERISTICS Display

Hardware Group**Serial Configuration, Modem Control, and Flow Control:**

All the options in the Hardware Group screen are set by the SET PORT command. Refer to subsection 5.28 if you require detailed explanations of these options.

Network Group**Dedicated/Preferred Service:**

- *Service Name* is the name of the port's dedicated or preferred service (if any), as defined by either the SET PORT PREFERRED or SET PORT DEDICATED command.
- *Node Name* is the name of the node that provides the dedicated or preferred service. The node name is shown only if a particular node was specified when the service was specified.
- *Port Name* is the name of the port on the node that provides the dedicated or preferred service. The port name is shown only if a particular port was specified when the service was specified.

Characteristics:

- *Autoconnect* is either enabled or disabled, depending on how it was set by the SET PORT AUTOCONNECT command.
- *Autoprompt* is either enabled or disabled, depending on how it was set by the SET PORT AUTOPROMPT command.

Groups:

- *Authorized* is the list of authorized group codes for the port, as set by the SET PORT AUTHORIZED GROUP CODES command. You are allowed to connect only to nodes that have a group code in common with the authorized group codes listed here.
- *Current* is the list of group codes actually enabled for the port, as set by the SET PORT GROUPS command.

```
Current Status Summary for Specified Ports
Port  Status          Port  Status          Port  Status
  1  connected        2  idle           3  connected
  4  not installed    5  connected      6  idle
Remote Console: local
07-JUN-1989 15:00:00
```

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Figure 5-5. The SHOW PORT SUMMARY Display

5.33.2 The SHOW PORT SUMMARY Display

The SUMMARY display is the default when multiple ports are specified by the SHOW PORT command (for example, SHOW PORT ALL). Each server port is listed along with its current connect status. The connect status can have the following values:

- AUTOBAUD - The port is in the process of autobauding.
- CONNECTED - The port is connected to a service.
- CONNECTING - The port is in the process of connecting to a service.
- DIAGNOSTIC - A TEST PORT command has been executed for the port.
- IDLE - The port exists (its hardware interface is installed) but is not active (is not logged in).
- LOCAL - The port is logged in but has no active sessions (no connections to services).
- LOCKED - A LOCK command has been entered at the port.
- LOGGING IN - A user is logging in to the port.
- LOGGING OFF - A user is logging off the port.
- MONITORING - A MONITOR command has been executed at the port.
- NOT INSTALLED - The hardware interface for this port is not installed.
- OUT OF SERVICE - The port failed the self-test.
- RESUME PENDING - The port is trying to resume a session.
- SEALED - The user has exceeded the allowable number of password attempts.
- TRANSITION - The port is changing from one state to another.
- WAKING UP - The port is responding to modem handshaking.

```

Current Status for Port 1
-----
Local Status:
Username:      J_Smith
Priv Status:   normal
Access Mode:   local
State:         local
Inactivity:    0 min
Input XOFFed:  no
Output XOFFed: no

ELT Status:
Total Sessions: 1
To Service:     ACTG
Node:           ACTG
Port:          Port_4

Hardware Status:
Hardware Port Type: full modem
Selftest Result:   passed
Active Modem Controls: DSRs RTS DTR
-----
07-JUN-1989 15:00:00

```

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Figure 5-6. The SHOW PORT STATUS Display

5.33.3 The SHOW PORT STATUS Display

The STATUS display is a single screen of information about the requested port. It contains the following groups of information:

Local Status:

- *Username* is the port's username, set either at login or by the SET PORT USERNAME command.
- *Priv Status* is the privilege level of the port. It is either privileged, nonprivileged, or secure.
- *Access Mode* is set by the SET PORT ACCESS command. It can be local, remote, dynamic, or none.
- *State* is the port's current state. The possible states are the same ones listed by the SHOW PORT SUMMARY command, shown on the previous page.
- *Inactivity* is the number of minutes the port has been inactive. If the PORT INACTIVITY LOGOUT option is enabled for the port, the port is logged out when this number reaches the value set by the SERVER INACTIVITY TIMER option.
- *Input XOFFed*, if set to yes, means that the server has halted input from the port by sending the port an XOFF character.
- *Output XOFFed*, if set to yes, means that the device connected to the port has halted output to the port by sending the server an XOFF character.

ELT Status:

- *Total Sessions* is the number of current sessions on the port.
- *Service* is the name of the port's currently active session.
- *Node* specifies the node that offers the port's current service. The service can be either a remote service to which the server connected, or a local service to which a remote node connected.
- *Port* is the port on the remote node to which the server port is connected. It is listed only if a specific port was requested in the CONNECT command.

Hardware Status:

- *Hardware Port Type* is one of the following:
 - "full modem" (serial ports with 25-pin D connectors)
 - "partial modem" (serial ports with RJ12 connectors)
 - "parallel printer" (parallel ports)
- *Selftest Result* indicates the result of the server's power-up self-test. It can be either passed or failed.
- *Active Modem Controls* lists the modem controls (both incoming and outgoing) currently asserted on the port.

5.33.4 The SHOW PORT SESSIONS Display

This display is identical to the SHOW SESSIONS display. See subsection 5.35 for details.


```
Current Counters for Port 1
Seconds since zeroed: 7055 (0 01:57:35)

Port Statistics:
Local Accesses:      0
Remote Accesses:    0
Inactivity Logoff:  0
Password Logoff:    0

Port Errors:
Framing:            0
Parity:             0
Overrun:           0

07-JUN-1989 15:00:00
P3000-19
```

Figure 5-7. The SHOW PORT COUNTERS Display

5.33.5 The SHOW PORT COUNTERS Display

The COUNTERS display lists statistics about port activity. It contains the following groups of information:

Seconds since zeroed:

The number of seconds since either (1) the server was initialized, or (2) the ZERO COUNTERS command was issued for the port. The value in parentheses indicates the same period in a different format (days, hours, minutes, and seconds).

Port Statistics:

- *Local Accesses* is the number of times a user has logged into the port.
- *Remote Accesses* is the number of times a remote node has connected to the port.
- *Inactivity Logoff* is the number of times the port has been automatically logged out due to inactivity (enabled by the SET PORT INACTIVITY LOGOUT command).
- *Password Logoff* is the number of time the port has been logged out because the user failed to enter the login password within the allowed number of attempts (as specified by the SET SERVER PASSWORD LIMIT command).

Port Errors:

The number of errors the server has detected on incoming characters at the port. The following error types are listed:

- *Framing* indicates the number of characters received with a missing stop bit. If this number is not zero, it indicates either (1) a problem with the port or the device attached to the port, or (2) a mismatch between the serial parameters of the port (baud rate, number of data bits, type of parity, and number of stop bits) and the serial parameters of the device attached to the port.
- *Parity* indicates the number of characters received with a bad parity bit. If this number is not zero, it indicates either (1) a problem with the port or the device attached to the port, or (2) a mismatch between the serial parameters of the port (baud rate, number of data bits, type of parity, and number of stop bits) and the serial parameters of the device attached to the port.
- *Overrun* indicates that characters were lost because the server's internal buffer was full. It should be zero. If it is over zero, the most likely cause is a mismatch between the type of flow control set for the port and the type of flow control used by the device attached to the port.

5.34 SHOW/MONITOR QUEUE

The SHOW QUEUE and MONITOR QUEUE commands display entries in the server queue. The two commands work as follows:

- SHOW - Displays the current status of the server queue.
- MONITOR - Similar to SHOW, but the display is updated every second for privileged users and every 10 seconds for nonprivileged users. MONITOR displays are terminated by pressing any key.

Syntax SHOW/MONITOR QUEUE [*NODE name*
 PORT number
 SERVICE name
 ALL]

Privilege Available to nonprivileged and privileged users. Not available to secure users

Examples SHOW QUEUE

 SHOW QUEUE NODE ACTG

 SHOW QUEUE SERVICE MODEM

Comments There is a single SHOW QUEUE display (although the types of entries shown vary depending on the command options you enter). It is described in detail in subsection 5.34.1.

Table 5-24. SHOW/MONITOR QUEUE Options

Option	Definition
<i>NODE name</i>	Displays service requests <i>from</i> the specified node.
<i>PORT number</i>	Displays service requests <i>to</i> the specified server port (that is, all requests that potentially could be serviced by the specified port).
<i>SERVICE name</i>	Displays service requests <i>to</i> the specified local service.
ALL	Displays all service requests in the server queue. This is the default.

Current Service Queue				
Pos	Service	Port Name (#)	Source Node	Entry #
1	MODEM	MODEM1 (1)	SERV1	7
2	MODEM		SERV1	8
3	PRINT	PRINTER1 (6)	ENGR	10
4	LZRPRINT	PRINTER2 (5)	ACTG	12

07-JUN-1989 15:00:00

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Figure 5-8. The SHOW QUEUE Display

5.34.1 The SHOW QUEUE Display

The SHOW QUEUE display is a summary list of entries in the server's internal queue. Entries are placed in the server queue when a remote node requests queuing because its connection request could not be serviced immediately (for example, a VMS request for a printer service).

Each line in the display has the following information:

- *Pos* is the position of the entry in the queue. When a queue entry is serviced, the position numbers of all other entries are decremented. The top entry (position 1) is always the next request serviced, if possible.
- *Service* is the name of the local service the remote node has requested.
- *Port Name (#)* is the name of the port the remote node requested (if any). The port number is in parentheses. If the service was requested without specifying a specific port, no port name is shown.
- *Source Node* is the node requesting the connection.
- *Entry #* is a permanent number given to the queue entry. It stays the same when the entry moves up in the queue. If you delete a queue entry with the REMOVE QUEUE command, be sure to specify its entry number, not its position number.

5.35 SHOW/MONITOR/LIST SERVER

The SHOW SERVER, MONITOR SERVER, and LIST SERVER commands display information about the Performance 3000 itself. The three commands work as follows:

- SHOW - Displays current information about the server, including server options that have been changed temporarily by the SET command.
- MONITOR - Similar to SHOW, but the display is updated every second for privileged users and every 10 seconds for nonprivileged users. MONITOR displays are terminated by pressing any key.
- LIST - Displays permanent information about the server. These are the parameters that will take effect (if they haven't already) the next time the server is initialized.

Syntax SHOW/MONITOR/LIST SERVER [CHARACTERISTICS *type*
 STATUS
 COUNTERS *type*
 ALARMS]

Privilege Available to nonprivileged and privileged users. Not available to secure users. Privileged status is required for the ALARMS option.

Examples SHOW SERVER

 SHOW SERVER COUNTERS

 SHOW SERVER ALARMS

Comments Only the CHARACTERISTICS option is valid with the LIST SERVER command.

Four different displays about the server are available:

- CHARACTERISTICS display (default)
- STATUS display
- COUNTERS display
- ALARMS display

Each of these displays is described briefly in the Options Table and then in full detail in the subsections following the table.

Table 5-25. SHOW/MONITOR/LIST SERVER Options

Option	Definition
<p>CHARACTERISTICS <i>type</i></p>	<p>Three screens. Displays the CHARACTERISTICS screens for the server (this is the default). These screens display (1) server options that are strictly LOCAL, (2) options that affect NETWORK operation, and (3) a description of the server HARDWARE (hardware revision, installed memory, etc.). If the SET PORT PAUSE option is enabled, all three screens are shown in rotation (see note below); otherwise you can specify a particular screen (LOCAL is the default). See subsection 5.35.1 for further details.</p>
<p>STATUS</p>	<p>One screen. Displays the STATUS screen for the server. This screen contains information about the number of users on the server, number of queue entries, an error summary, and so forth. See subsection 5.35.2 for further details.</p>
<p>COUNTERS <i>type</i></p>	<p>Two screens. Displays the COUNTERS screens for the server. These screens display (1) server counters that relate to ETHERNET activity, and (2) counters that relate to ELT activity (that is, user and system data packets transmitted and received by the server). If the SET PORT PAUSE option is enabled, both screens are shown in rotation (see note below); otherwise you can specify a particular screen (ETHERNET is the default). See subsection 5.35.3 for further details.</p>
<p>ALARMS</p>	<p>One screen. Displays the number of nonfatal console errors that have occurred since the server was last booted, and the times and error numbers of the most recent 16 errors. This command can be used to display nonfatal error information in lieu of (or in addition to) enabling Emulex Option 6 to display all nonfatal errors to the console port. See subsection 5.35.4 for further details.</p>
<p>Note: If the SET PORT PAUSE option is enabled and you specify a multiscreen display, use the up-arrow and down-arrow keys to change screens.</p>	

5.35.1

The SHOW SERVER CHARACTERISTICS Display

The CHARACTERISTICS display is the default for the SHOW SERVER command. It contains information about server options, settings, and hardware configurations. Three screens of information are available:

- Local Group screen
- Network Group screen
- Hardware Group screen

If the SET PORT PAUSE option is enabled, you need only enter the command SHOW SERVER CHARACTERISTICS; the Local Group screen appears and you can press the up-arrow and down-arrow keys to move between the three screens.

If PAUSE is disabled, only one screen is shown and you must specify which one you want (for example, SHOW SERVER CHARACTERISTICS HARDWARE). The Local Group screen is the default.

All three screens are shown on the next page. They contain the following groups of information:

**Local
Group****Performance 3000:**

This group contains mostly options that are set by the SET SERVER command. Refer to subsection 5.29 if you require detailed descriptions of these options.

Software is the name of the download software that will be requested from the load host the next time the server is initialized. It is usually, but not necessarily, the same as the software that is currently loaded.

Hardware:

The revision level of the Performance 3000 hardware.

Software:

The revision level of the Performance 3000 operational software.

```

Current Server Characteristics — Network Group
Current Server Characteristics — Hardware Group
Current Server Characteristics — Local Group

Performance 3000                                Hardware: A.1  Software: 1.00

Announcements:      enabled                    Load: netload (Transceiver)
AUTOreinit:         enabled                    Lock:              enabled
Broadcast:          enabled                    Password Limit:    3
Console Port:       1                          Prompt:            Server
Emulex Options:     none                       Security:          enabled
Heartbeat:          disabled                   Software:          P3KL00E
Dump:               enabled
Inactivity Timer:   30

07-JUN-1989 15:00:00
    
```

```

Current Server Characteristics — Hardware Group
Current Server Characteristics — Local Group
Current Server Characteristics — Network Group

Identification:                                Internal Software:
Name:          SERV1                           Revision:      2.1
Number:        24                               ELT Protocol: 5.1
Address: 00-00-C9-00-00-07                     Frame Size:   1500
Id: Performance 3000 (First Floor)

Configured Timers & Limits:
Circuit (ms):  80                               Retransmit Limit: 8
Keepalive (sec): 20                             Session Limit:    48
Multicast (sec): 30                             Queue Limit:     64
Node Limit:    48

Enabled Groups (all local services):
0

07-JUN-1989 15:00:00
    
```

```

Current Server Characteristics — Local Group
Current Server Characteristics — Network Group
Current Server Characteristics — Hardware Group

Hardware:
Hardware Revision:  A.1                         Front Panel:
Status:              enabled
Display:             message
Message:             Performance 3000

Installed Memory:   512K
Installed Ports:    6

Selftest Result:
System: ++++++ (ok)
Ports:  ++++++ (ok)

07-JUN-1989 15:00:00
    
```

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Figure 5-9. The SHOW SERVER CHARACTERISTICS Display

**Network
Group****Identification:**

Name, *Number*, and *ID* are options that are set by the SET SERVER command. *Address* is the Ethernet address of the server. Other network nodes use these values to specify particular servers. Refer to subsection 5.29 if you require detailed descriptions of these options.

Configured Timers and Limits:

These are internal server timers that are configured by the SET SERVER command. Refer to subsection 5.29 if you require detailed descriptions of these options.

Internal Software:

- *Revision* is the revision level of the Performance 3000 operational software.
- *ELT Protocol* is the revision level of the ELT protocol used by the Performance 3000. ELT is compatible with DEC's LAT protocol. Note that only revision levels 5.1 or higher support host-initiated connections.
- *Frame Size* is the maximum size of the Ethernet packets that the server transmits over the network.

Enabled Groups:

The group code (or codes) of the server, as defined by the SET SERVER SERVICE GROUP command. Refer to Appendix C, Technical Notes, if you require a detailed discussion of server group codes.

Hardware
Group

Hardware:

- *Hardware Revision* is the revision level of the server's hardware.
- *Installed Memory* is the amount of internal memory in the server.
- *Installed Ports* is the number of ports the server contains.

Front Panel:

- *Status* indicates whether the front panel buttons are enabled or disabled (as specified by the SET SERVER FRONTANEL command).
- *Display* indicates the nonprivileged contents of the LCD front panel display (time of day, Ethernet address, user message, etc.). This is set by the SET SERVER FRONTANEL command.
- *Message* is the message that is displayed in the LCD front panel. It is normally, "Performance 3000" unless it has been changed by the SET SERVER FRONTANEL command.

Selftest Result:

- *System* shows the results of the server's power-up self-test. Each plus sign represents one internal subtest that passed successfully; if one of the plus signs is replaced by a number, the server detected that number of errors in the subtest. Refer to the description of error message number 922 in Section 6, Troubleshooting, for further details.
- *Ports* displays one plus sign for each serial port on the server. If a plus sign is replaced by a minus sign, that port is bad. Refer to Section 6, Troubleshooting, for further details.

Current Server Status			
Minutes to Shutdown: none		Uptime: 7087 (0 01:58:07)	
Resource Usage	Cur	High/Max	Diagnostic Summary
Ports	2	2/6	ELT Errors: 0
Users	2	2/4	Port Errors: 0
Circuits	1	4/16	Resource Errors: 0
Con Sessions	1	1/48	Selftest: ++++++
Queue Entries	0	2/64	
Services-Local	0	0/16	Dump/Load Summary
-Total	11	11/250	Load Host Name: ACTG
Nodes-Connected	1	1/125	Load Host Addr: AA-00-04-00-04-04
-Reachable	4	6/125	Network Addr: 2.78
CPU Busy (%):	31	73/100	Network Name: SERV1
Memory Used (%):	56	62/100	Dump Host Address:

07-JUN-1989 15:00:00

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Figure 5-10. The SHOW SERVER STATUS Display

5.35.2 The SHOW SERVER STATUS Display

The SERVER STATUS display shows statistical information about the server and the server's current activity level. It contains the following groups of information:

Minutes to Shutdown:

The number of minutes remaining before the server is reinitialized. There is a value here only if an INITIALIZE command has been issued with the DELAY option.

Uptime:

The number of seconds since the server has been initialized. The value in parentheses indicates the same period in a different format (days, hours, minutes, and seconds).

Resource Usage:

For each option in this group, the current activity is shown, the highest usage since the last initialization is shown, and the maximum available usage is shown.

- *Ports* is the number of ports that are logged in, with a maximum of 6.
- *Users* is the number of ports with active sessions, with a maximum of 6.

Resource Usage (continued):

- *Circuits* is the number of virtual circuits the server has established. One virtual circuit is established for each node that has active sessions connected to server ports or services.
- *Con Sessions* is the number of sessions currently in use by all ports.
- *Queue Entries* is the number of entries in the server queue.
- *Services-Local* is the number of local services defined on the server.
- *Services-Total* is the total number of local and remote services available to users on the server.
- *Nodes-Connected* is the number of Ethernet nodes that currently have sessions connected to server ports or services.
- *Nodes-Reachable* is the number of Ethernet nodes accessible to users on the server.
- *CPU Busy (%)* is the percentage of the server's internal microprocessor that is being used.
- *Memory Used (%)* is the percentage of the server's internal buffers that are in use.

Diagnostic Summary:

- *ELT Errors* is the sum of all the various types of ELT errors for each node. Refer to the SHOW NODE COUNTERS display for detailed information about ELT errors for each node.
- *Port Errors* is the sum of all data errors on all ports. Use the SHOW PORT COUNTERS command to identify the number of the bad port and the type of error.
- *Resource Errors* is the number of times a user request was denied due to lack of internal memory (for example, if the maximum allowed number of simultaneous sessions was exceeded).

- *Selftest* shows the results of the server's power-up self-test. It should be six plus signs; if one of the plus signs is replaced by a number, the self-test detected an error. Refer to the explanation of error message number 922 in Section 6, Troubleshooting, for further details.

Dump/Load Summary:

This group shows the name and Ethernet address of the server's load host (the host that downloads the server's software).

This group also shows the server's DECnet name and DECnet address are shown. The name is blank if it was not specified by the server configuration utility during installation (see subsection 2.5).

In addition, if the server has successfully dumped its memory to a host, this group shows the host's Ethernet address.

5.35.3 The SHOW SERVER COUNTERS Display

The COUNTERS display contains statistics about server activity. Two screens of information are available:

- Ethernet Group screen
- ELT Protocol Group screen

If the SET PORT PAUSE option is enabled, you need only enter the command SHOW SERVER COUNTERS; the Ethernet Group screen appears and you can press the up-arrow and down-arrow keys to move between the two screens.

If PAUSE is disabled, only one screen is shown and you must specify which one you want (for example, SHOW SERVER COUNTERS ELT). The Ethernet Group screen is the default.

Both screens are shown on the next page. They contain the following groups of information:

Ethernet Group

Seconds since zeroed:

The number of seconds since either (1) the server was reinitialized or (2) the ZERO COUNTERS ALL command was issued.

Directly Addressed:

These are statistics about data sent directly to and from the server:

- *Bytes Received* and *Bytes Transmitted* are the number of bytes exchanged by the server and all remote nodes.
- *Frames Received* and *Frames Transmitted* are the number of Ethernet frames exchanged by the server and all remote nodes.
- *Frames Sent, def* is the number of times the server deferred a transmission because the Ethernet link was busy. It should be less than 20 percent of all frames transmitted.
- *Frames Sent, 1 col* is the number of Ethernet frames successfully transmitted after one collision. *Frames Sent, 2+ col* is the number of frames successfully transmitted after two or more collisions. These two categories should total less than five percent of all frames transmitted. A higher percentage indicates either (1) your network exceeds Ethernet specifications, or (2) it is very heavily loaded.

```

Current Server Counters — ELT Protocol Group
Current Server Counters — Ethernet Group

Seconds since zeroed: 7062 (0 01:57:42)

Directly Addressed:
Bytes Received:      795440
Bytes Transmitted:   241396
Frames Received:     4782
Frames Transmitted:  2446
Frames Sent, def:    6
Frames Sent, 1 col:  1
Frames Sent 2+ col: 0

Multicast Addressed:
Bytes Received:      477590
Bytes Transmitted:   1548
Frames Received:     5565
Frames Transmitted:  12

Ethernet Failures:
Send Failures:      0
Send Failure Cause: 0
Receive Failures:   0
Rec Failure Cause:  0
Unrec Destination: 0
Data Overrun:       0
No Rx Buffer:        0
No Tx Buffer:        0

07-JUN-1989 15:00:00

```

```

Current Server Counters — Ethernet Group
Current Server Counters — ELT Protocol Group

Seconds since zeroed: 7064 (0 01:57:44)

ELT Messages:
Received:            1261
Transmitted:         1228
Re-Transmitted:     0
Max Consec Retry:   0

Solicitations:
Accepted:            0
Rejected:            0

ELT Errors:
Discarded Nodes:    0
Discarded Serv:     0
Duplicates Rec'd:   0
Illegal Messages:   0
Illegal Slots:      0
Illegal Multicast:  0
Mult Node Addr:     0

07-JUN-1989 15:00:00

```

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Figure 5-11. The SHOW SERVER COUNTERS Display

Ethernet Failures:

- *Send Failures* is the number of times the server canceled a transmission. It should be zero. If this number is greater than zero, *Send Failure Cause* gives the reason for the cancellations.
- *Send Failure Cause* is the reason transmissions were canceled (if *Send Failures* is greater than zero). This value is a collection of binary flags, and more than one bit can be set. For example, the value 100001 indicates that bits 0 (rightmost) and 5 are set. Each bit has the following meaning:

Bit	Meaning
0	The transmission failed after 16 attempts. Indicates that either your network is too busy or you have a hardware problem somewhere on the network.
1	Carrier was lost on the Ethernet during transmission. Indicates a transceiver, cable, or other hardware failure.
4	The frame exceeded the maximum allowed length. Indicates faulty host software.
5	A late collision. Indicates the Ethernet cable is too long.
8	Heartbeat error. This can occur only if the SERVER HEARTBEAT option is enabled and can then be expected up to 200 times per day. It does not indicate a problem.
9	Data underflow. The server tried to transmit something but could not retrieve information from internal memory fast enough. Indicates a server hardware problem.

Once these bits are set, they stay set until the server is reinitialized or the ZERO COUNTERS ALL command is issued.

Note that some receive errors are expected due to the nature of the Ethernet protocol. These errors are recovered and no data is lost. You should check the error counters periodically, however, so you can see if the number of errors is increasing. This could indicate that you have violated a network configuration rule or that you have a hardware failure somewhere on the network.

Ethernet Failures (continued):

- *Receive Failures* is the number of Ethernet frames that were received with errors. It should be zero. If this number is greater than zero, *Receive Failure Cause* indicates the nature of the error.
- *Receive Failure Cause* indicates the nature of received data errors (if *Receive Failures* is greater than zero). This value is a collection of binary flags, and more than one bit can be set. Each bit has the following meaning (bit 0 is the rightmost bit):

Bit	Meaning
0	CRC error.
1	Framing error.
2	Frame length error. The frame exceeded 1518 bytes or is less than 64 bytes.

Once these bits are set, they stay set until the server is reinitialized or the ZERO COUNTERS ALL command is issued.

- *Unrecognized Dest* is the number of multicast messages the server discarded (for example, because of an invalid type code).
- *Data Overrun* is the number of times the server lost data because of inadequate memory. It indicates a server hardware problem.
- *No Rx Buffer* and *No Tx Buffer* are the number of times the server rejected messages from other nodes due to inadequate internal memory.

Multicast Addressed:

This group is the same as the Directly Addressed group except that it refers to bytes and frames transmitted to and from multicast addresses, rather than directly to and from the server.

ELT Protocol Group

Seconds since zeroed:

The number of seconds since either (1) the server was reinitialized or (2) the ZERO COUNTERS ALL command was issued. The value in parentheses indicates the same period in a different format (days, hours, minutes, and seconds).

ELT Messages:

This group shows the number of ELT packets sent and received by the server, the number of packets that were retransmitted, and the maximum number of consecutive retries. The number of retransmissions should be less than 1/1000 of the total messages. The maximum number of consecutive retries is the maximum number of times the server has retried the transmission of a message.

ELT stands for Ethernet Local Transport. It is compatible with LAT, the protocol DEC uses to communicate with DEC servers.

ELT Errors:

- *Discarded Nodes* is the number of Ethernet nodes that are not known to the server because it could not store them in its internal memory.

The Performance 3000 stores information about other network nodes in internal tables. The server stores information about a node if at least one port on the server is authorized to use it, so if users are authorized to use every node on the network the tables can fill up, forcing the server to discard node information. By restricting the authorized groups for each port to only those that are likely to be used, you can reduce the risk of overloading the server's memory.

Refer to Appendix C, Technical Notes, for further discussion of how the server stores information internally.

- *Discarded Serv* is similar to *Discarded Nodes* but lists the number of services not known to the server because it could not store them internally.
- *Duplicates Rec'd* is the number of ELT packets received twice by the server. It should be less than 1/1000 of the total messages received.
- *Illegal Messages* is the number of badly formatted ELT packets received by the server. It should be zero.
- *Illegal Slots* is the number of ELT packets with badly formatted slots received by the server. It should be zero. Refer to Appendix C, Technical Notes, if you would like further information about how the ELT protocol works.
- *Illegal Multicast* is the number of badly-formatted multicast ELT packets received by the server. It should be zero.

- *Multi Node Addr* is the number of times that node addresses have changed. The server increments this number if it receives a multicast announcement from a particular node name and discovers that its address is different from the last time it received an announcement. You can find out how many times a particular node address has changed via the *Address Errors* field in the SHOW NODE STATUS display.

Solicitations:

- *Accepted* is the number of host-initiated requests from all nodes that the server has accepted (that is, either the connection was made immediately or was placed in the server queue).
- *Rejected* is the number of host-initiated requests from all nodes that the server has rejected.

Note that the number of solicitations accepted and rejected from individual nodes can be displayed by the SHOW NODE COUNTERS command.

```
Server>>SHOW SERVER ALARMS

There are 2 software errors as of 01-Oct-1989 12:00:00

5005 at 01-Oct-1989 11:41:16
5010 at 30-Sep-1989 16:21:22
```

Figure 5-12. The SHOW SERVER ALARMS Display

5.35.4 The SHOW SERVER ALARMS Display

The SERVER ALARMS display, shown in Figure 5-12 above, shows the number of nonfatal console errors that the server has logged since it was last booted. For each of the most-recent 16 errors, the display also lists the error number and time/date stamp. In most cases, the error information can be ignored, unless the logging of an error coincides with a more severe or user-noticeable problem.

Enabling Emulex Option 6 (see the SET SERVER EMULEX OPTIONS command) will display the full error messages at the console port as they are logged. The SHOW SEVER ALARMS command can be used to display nonfatal error information in lieu of (or in addition to) enabling Emulex Option 6.

SERVER ALARMS requires privileged status.

5.36 SHOW/MONITOR/LIST SERVICE

The SHOW SERVICE, MONITOR SERVICE, and LIST SERVICE commands display information about the local and remote Ethernet services that you are authorized to access. The three commands work as follows:

- SHOW - Displays current information about services, including services that have been created or changed temporarily by the SET command.
- MONITOR - Similar to SHOW, but the display is updated every second for privileged users and every 10 seconds for nonprivileged users. MONITOR displays are terminated by pressing any key.
- LIST - Displays permanent information about services. These are the parameters that will take effect (if they haven't already) the next time the server is initialized.

Syntax	SHOW/MONITOR/LIST SERVICE <i>name</i> [STATUS LOCAL SUMMARY ALL CHARACTERISTICS]
Privilege	Available to all users. Privileged status is required to display information about services you are not currently authorized to use.
Examples	SHOW SERVICE ENGR SHOW SERVICE LOCAL STATUS
Comments	Only the CHARACTERISTICS option is valid with the LIST SERVICE command. Three different displays are available about each service: <ul style="list-style-type: none"> ■ STATUS display (default if a single service is specified) ■ SUMMARY display (default if multiple services are specified) ■ CHARACTERISTICS display Each of these displays is described briefly in the Options Table and then in full detail in the subsections following the table.

Table 5-26. SHOW/MONITOR/LIST SERVICE Options

Option	Definition
<i>name</i>	Specifies the name of a single service about which you want information.
LOCAL	Specifies that you want information about all local services.
ALL	Specifies that you want information about all services on the network.
STATUS	One screen. Displays several lines of STATUS information for each service you specify. This is the default if one service is specified. See subsection 5.36.1 for further details.
SUMMARY	One screen. Displays the SUMMARY screen for the services you specify. This is the default if more than one service is specified. See subsection 5.36.2 for further details.
CHARACTERISTICS	One screen. Displays several lines of CHARACTERISTICS for each service you specify. See subsection 5.36.3 for further details.

```
Current Services Status
Service Name: ACTG
Node: ACTG           Rating: 219  Sessions: 1
*-local  --status unknown  07-JUN-1989 15:00:00
```

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Figure 5-13. The SHOW SERVICE STATUS Display

5.36.1 The SHOW SERVICE STATUS Display

The STATUS display is the default if one service is specified by the SHOW SERVICE command (for example, SHOW SERVICE ENGR).

The STATUS display lists each service name and every node on which the service is offered. For each node, the node name is given, the node rating, and the number of server sessions currently connected between the server and the node. Note that the server can not display information about a service if no port is authorized to connect to it. Refer to the discussion of groups in Appendix C for further details.

A dash is listed beside a service if it is not currently available. This usually means either (1) the server has not received a multicast announcement from the service in the last few minutes, or (2) a recent connect attempt to the service was rejected for some reason.

```
Current Services Summary
Service Name      Sessions  Identification
  ACTG             4  VAX-11/780 - main building
  ENGR            23  VAX 8600 - engineering building
- SALES            0  MicroVAX II - main building
* MODEM            1  Dialout modem pool
MORE  *=local  --status unknown  07-JUN-1989 15:00:00
```

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Figure 5-14. The SHOW SERVICE SUMMARY Display

5.36.2 The SHOW SERVICE SUMMARY Display

The SUMMARY display is the default if more than one service is specified by the SHOW SERVICE command (for example, SHOW SERVICE ALL).

For each service specified, the name of the service is given, the number of server sessions currently connected to the service, and the identification phrase associated with the service (if any). An asterisk next to the service name indicates it is a local service; a dash next to a service name indicates that it has not recently multicast an announcement of itself on the network and is therefore unavailable.


```
Current Services Characteristics
Name: ACTG                Type: Remote
ID: VAX-11/780 - main building
Name: MODEM              Type: Local
ID: Dialout modem pool
Queue: enabled           Ports: 1-4
Password: disabled       Connections: enabled
07-JUN-1989 15:00:00
```

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Figure 5-15. The SHOW SERVICE CHARACTERISTICS Display

5.36.3 The SHOW SERVICE CHARACTERISTICS Display

The CHARACTERISTICS display is similar to the STATUS display.

For remote services, the service name and the identification phrase associated with the service are given.

For local services, the service name is given along with the service options set by the SET SERVICE command. Refer to subsection 5.30 for detailed descriptions of these options.

5.37 SHOW/MONITOR SESSIONS

The SHOW SESSIONS and MONITOR SESSIONS commands display the current sessions on a port. The two commands work as follows:

- SHOW - Displays the current sessions on a port.
- MONITOR - Similar to SHOW, but the display is updated every second for privileged users and every 10 seconds for nonprivileged users. MONITOR displays are terminated by pressing any key.

Syntax SHOW/MONITOR SESSIONS [PORT *number*]

Privilege Available to all users. Secure users can not display information about sessions other than their own.

Examples SHOW SESSIONS

 SHOW SESSIONS PORTS 2-5

Comments There is a single SHOW SESSIONS display. It is described in detail in subsection 5.37.1.

Table 5-27. SHOW/MONITOR SESSIONS Options

Option	Definition
PORT <i>number</i>	The number of the port (or ports) for which you want a session list. If no port number is specified, sessions are listed for your port. SHOW SESSIONS PORT ALL displays all the sessions on all the ports.
Note: If the SET PORT PAUSE option is enabled, you can use the right-arrow key to switch screens forward from port to port. The left-arrow key moves you backward through the ports.	

```

Current Session Summary for Port 1
# Service Name      Node      Type      Status
! 1 ACTG            ACTG      interactive  connected
* 2 ACTG            ACTG      passall     connecting
! 3 SALES          SALES     interactive  connected
*-current session  !-output waiting  07-JUN-1989 15:00:00

```

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Figure 5-16. The SHOW SESSIONS Display

5.37.1 The SHOW SESSIONS Display

The SHOW SESSIONS display contains the following information about each session on the specified port:

- # is the number of the session. This number stays the same until the port is logged out (that is, it does not change when other sessions are disconnected). Session numbers are reused when sessions are disconnected.

The current session is indicated by an asterisk (*) next to the session number. If a remote host has generated output for a session that has not been sent to the port (for example, because the port is in local mode), an exclamation point (!) is placed next to the session number.

- *Service Name* is the name of the service to which the session is connected.
- *Node* is the name of the remote node that offers the service.
- *Type* is either interactive, passall, or pasthru. See subsection 5.31 for further details on these options.
- *Status* is the connect status of the session. It can have the following values:

CONNECTED - The session is active.

CONNECTING - The session is in the process of connecting.

DISCONNECTED - The session is inactive.

DISCONNECTING - The session is disconnecting.

WAITING - The session is waiting to autoconnect to a service.

TRANSIT - The session is changing states.

5.38 SHOW/MONITOR USERS

The SHOW USERS and MONITOR USERS commands display status information about each port user. The two commands work as follows:

- SHOW - Displays information about each user on the server.
- MONITOR - Similar to SHOW, but the display is updated every second for privileged users and every 10 seconds for nonprivileged users. MONITOR displays are terminated by pressing any key.

Syntax SHOW/MONITOR USERS

Privilege Available to nonprivileged and privileged users. Not available to secure users.

Example SHOW USERS

Comments There is a single SHOW USERS display, shown below. For every port on the Performance 3000, the current username is shown (if any) and an asterisk is placed next to the port number if the port is currently logged in.

```
Current User Summary
-----
Port Username      Port Username      Port Username
* 1 J_Smith        2 M_Jones          3
* 4 SYSTEM        5 Laserprinter    6 Printer
Remote Console: J_Smith
*-logged in _____ 07-JUN-1989 15:00:00
```

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Figure 5-17. The SHOW USERS Display

5.39 TEST LOOP

The TEST LOOP command tests the physical connection between the Performance 3000 and another compatible Ethernet node on the network (for example, VMS nodes and other terminal and printer servers). Press <break> to end the test. The server prints either status message 512 or 513 to inform you of the results of the test.

Syntax TEST LOOP *target_address* [HELP *type* ASSISTANT *helper_address*]

Privilege Available to privileged users only.

Examples TEST LOOP 00-00-C9-00-65-87

TEST LOOP 00-00-C9-00-56-87 HELP FULL ASSISTANT 00-00-C9-00-12-34

Table 5-28. TEST LOOP Options

Option	Definition
<i>target_address</i>	The Ethernet address of the target node. It is in the form of six pairs of hexadecimal digits separated by dashes.
HELP <i>type</i>	Use this option if you wish to have an assistant node relay transmissions. For example, you can specify an assistant at the far end of your Ethernet cable so that the test pattern is transmitted along the full length of your network. Three types of HELP are available: FULL - The assistant relays both outgoing and incoming transmissions. RECEIVE - The assistant relays transmissions coming into the server. TRANSMIT - The assistant relays transmissions coming from the server.
ASSISTANT <i>helper_address</i>	The Ethernet address of the assistant node, if you are using one.

5.40 TEST PORT

The TEST PORT command causes the server to transmit a repeating pattern of ASCII characters to the specified port. If a terminal is connected to the port, the data pattern can be observed and checked for errors.

Syntax TEST PORT [*number*] [COUNT *number*
 WIDTH *number*
 LOOPBACK *type*]

Privilege Nonprivileged users can test only their own port. Secure users can not issue this command at all.

Examples TEST PORT
 TEST PORT COUNT 100
 TEST PORT 4 COUNT 50 WIDTH 132

Table 5-29. TEST PORT Options

Option	Definition
<i>number</i>	The port you wish to test. It must be a single port. If no port is specified, your own port is tested.
COUNT <i>number</i>	The number of times the test pattern is sent to the port. NONE specifies a continuous test. The default is 23. Press the <break> key at any time to terminate the test.
WIDTH <i>number</i>	The number of characters transmitted in each line. The range is 1 to 132; the default is 80.
LOOPBACK <i>type</i>	This option can be used only to test someone else's port. If this option is selected, the data pattern is looped back from the port (that is, it is not displayed on a terminal connected to the port) and checked for errors. At the end of the test a message is displayed telling how many errors were detected. You can specify either LOOPBACK INTERNAL or LOOPBACK EXTERNAL. External loopback requires that a physical loopback connector be placed on the port (see Appendix A for a schematic of the required connector). LOOPBACK can be specified for serial ports only.

5.41 ZERO COUNTERS

The ZERO COUNTERS command resets to zero some or all of the internal counters used by the server.

Syntax ZERO [COUNTERS] [*NODE name*
[*PORT number*
ALL]

Privilege Available to privileged users only.

Examples ZERO
ZERO COUNTERS PORT 2-5
ZERO COUNTERS NODE VAX
ZERO COUNTERS ALL

Comments Server counters keep track of such things as data exchanges between nodes, transmission errors, number of port logins, etc. These counters can be viewed by the following commands:

- SHOW NODE COUNTERS
- SHOW SERVER COUNTERS
- SHOW PORT COUNTERS

Table 5-30. ZERO COUNTERS Options

Option	Definition
<i>NODE name</i>	Zeroes counters maintained by the server that relate to the specified node.
<i>PORT number</i>	Zeroes error and status counters for the specified port. You can specify a single port, several ports, or PORT ALL.
ALL	Zeroes all internal counters maintained by the server. This is the default.

BLANK

6.1 Overview

This section explains how to isolate any problems you might have with the Performance 3000. Most common problems are discussed and resolutions are suggested.

6.1.1 Emulex Service

If, after following the instructions in this section, you are unable to solve your problem, call Emulex Technical Support at the number below. They can suggest further troubleshooting procedures and can also authorize return of your Performance 3000 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 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

TWX: (910) 595-2521

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

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

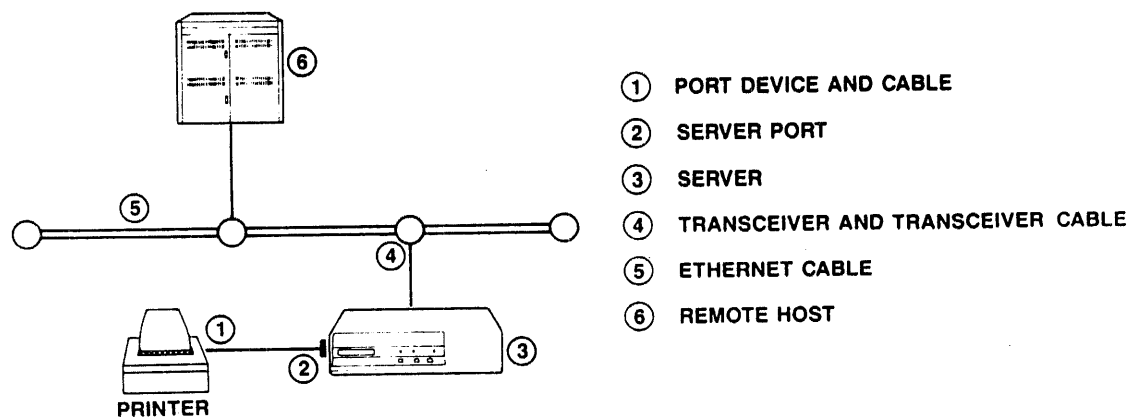
6.2 Isolating Problems

The most important step in troubleshooting a problem with the server is isolating the component that has either failed or has been configured incorrectly. Figure 6-1 illustrates a typical Performance 3000 installation and shows the possible trouble areas.

There is one common rule for isolating problem areas: *Determine which component is causing problems by swapping components one at a time.* For example, if you can not connect to a printer through a service:

- Try a different printer on the same port (maybe the printer is bad or is configured incorrectly).
- Try the same printer on a different port (maybe the server port is bad or is configured incorrectly).
- Using the same printer and port, try connecting to the printer through a different service (maybe the problem is with the service).
- Try connecting through the same service to a different server (maybe the entire server is bad).

Potential problems and solutions are discussed in the next few subsections. Table 6-1, on the opposite page, lists the most common problem areas and directs you to the specific subsection of this manual that discusses the problem.



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Figure 6-1. Components in a Printer Server Network

6.2.1 The Console Port

When a problem occurs, always check the server's 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 re-enable it and then try to recreate your problem. The error message generated might lead you directly to the problem's cause. Subsection 4.4 explains how the console port operates; Appendix D describes all Performance 3000 status and error messages.

Table 6-1. Performance 3000 Troubleshooting Guide

Problem Area	Section in the Manual
Initialization and Downloading	Subsection 6.3. This subsection discusses problems that occur when the server is powering up. This includes self-test errors, software downloading problems, and hardware problems.
Logging In	Subsection 6.4. This subsection discusses problems logging in to the server. This includes terminal-related problems, server limitations, and cabling problems.
Connecting to Services	Subsection 6.5. This subsection discusses problems connecting to local and remote services. Note, however, that if the connection failure generates an error messages you can refer directly to Appendix D for an explanation of the message.
Host Connections (Printers, Modems, etc.)	Subsection 6.6. This subsection discusses problems with host-initiated connections. This includes connection request problems, queuing problems, and device problems (printers, modems, data switches, and so forth).
Error Messages	Appendix D. This appendix explains all server status and error messages. In many cases, problems with the server are accompanied by error messages either on the port that generated the problem or on the console port. In these cases, the error message is often all you need to isolate the failure.

6.3 Initialization and Downloading Problems

This subsection describes in detail the entire procedure the Performance 3000 goes through when it is powered up. At every stage, potential errors are discussed and resolutions suggested.

6.3.1 Step 1 - Power-Up

When you plug in the server, the green Power LED lights.

- **If the Power LED does not light**, try plugging the server into another outlet.

If your AC power outlet is OK, but the server still refuses to power up, it has a hardware failure. Call Emulex Technical Support and return the unit for repair.

6.3.2 Step 2 - Self-Test

After the server is powered up, it begins its self-test immediately. The names of the internal subtests it is running are shown in the front panel LCD display; they should flash by quickly.

In order for the network portion of the self-test to pass, the server must have its thinwire BNC coaxial connector connected to a properly-terminated thinwire network, or its 15-pin Ethernet connector connected to a properly-terminated Ethernet transceiver or multiport transceiver. Alternatively, the server can have the proper type of loopback connector connected to its rear panel, to either the 15-pin Ethernet connector or to the thinwire BNC coaxial connector. See Appendix A for loopback connector schematics.

- **If the self-test detects an error, it will display a "LAN XLP Error" message** which means there is a problem with either your transceiver or your transceiver cable. Check the transceiver connection and reinitialize the server.
- **Any other message displayed is the name of a failed test.** This indicates a fatal hardware error. Call Emulex Technical support and return the unit for repair.

At the end of a successful self-test, the LCD display looks like this:

```
++++++ nn
```

This display lasts only a couple of seconds. The value "nn" is the number of the port configured as the console port. Make sure you have a terminal plugged into this port.

- **If one of the plus signs is replaced by a number**, the self-test detected a nonfatal error. It is accompanied by message 922 on the console port, which indicates the nature of the problem (see Appendix D for further details).
- **If the server's TDR test detects a cable break**, message 910 is displayed indicating the approximate position of the break. The position is listed for both thinwire and thickwire cable.

6.3.3 Step 3 - Downloading

The server begins downloading its internal software when the self-test is complete. Messages that indicate the status of the download are displayed on both the LCD display and the console port.

- **If there is no activity on the console port**, check the following:

The terminal you are using must be connected to the correct port. The number of the console port is displayed on the server's front panel at the end of the power-up self-test (it is usually port 1).

The terminal must be set for 9600 baud, 8-bit characters, no parity, one stop bit, and XON/XOFF flow control. Note, however, that if this is not the first time the server has been used, these parameters might have been changed.

Make sure the terminal and the terminal cable are working properly. If the cables are bad, refer to Appendix A to make sure you are using the right cable type.

If the console device sends an XOFF but does not quickly follow with an XON to the host, the download will continue but at a reduced rate.

- If you can't find a load host from which to download, try the following solutions:

Make sure that the Performance 3000 host software kit has been installed on a system running DECNET Phase IV. (See subsection 2.5.)

Run ESVCONFIG.COM and "add" at least one server. This enables download capability on the appropriate DECnet circuit. (See subsection 2.5.)

If the load host is a VAX running VMS, ensure the logical 'MOM\$LOAD' points to the directory 'SYS\$SYSROOT:[DECSERVER]'.

If these suggestions do not solve the problem, wait a minute or so until the message NL: Load Complt appears in the LCD display. Then plug a terminal into another port and configure the console port via the SET SERVER CONSOLE command. If the Load Complt message never appears, try reinitializing the server to its factory defaults by pressing the Next and Last keys on the front panel as you apply power. If that still does not solve the problem, call Emulex Technical Support for further help.

If the console port is working normally, the following messages should appear:

LCD Display	Console Port
Network Load x.x	-901- Performance 3000 Network Load
NL: Seeking Host	-902- Seeking load host for <i>filename</i>
NL: Found Host	-903- Loading from host: <i>address</i>
NL: Loading...
NL: Load Complt	-904- Load complete at <i>time</i> on <i>date</i>

If there are any problems with the download, error messages appear on the console port. Refer to Appendix D for explanations of error messages.

If you receive an error message, follow the suggestions in Appendix D and see if they resolve the problem. If they don't, or if you have a server hardware failure, call Emulex Technical Support for further help.

6.4 Login Problems

To log in from an interactive terminal, you must press the <return> key to get a response from the server.

- **If you get no prompt from the server at all**, press <return> a second or third time. This is required if the port is configured for autobaud operation.
- **If you still get absolutely no response**, check the following:

Make sure the server is powered up by checking the green Power LED on the front panel.

Make sure your terminal is working by plugging it into another port and trying to log in.

Verify the correct cable type shown in Appendix A.

From another port, check to make sure the access for the suspect port is set to LOCAL or DYNAMIC (via the SET PORT ACCESS command).

From another port, check to see if MODEM CONTROL is enabled for the suspect port. If so, the port will not respond unless it detects DSR from the terminal (partial-modem ports); or DSR, CTS, and DCD from the terminal (full-modem ports). If your terminal can not supply the necessary modem signals, you must disable the MODEM CONTROL via SET PORT *x* MODEM DISABLE.

Finally, from another port or from the front panel, check the port status. It should be "idle." If it is not, issue a LOGOUT PORT command for the port and then try logging in again.

If none of these suggestions solves the problem, execute the TEST PORT command for the bad port from another port, as described in subsection 5.38. If the port fails, call Emulex Technical Support for further help.

- **If you get odd characters on the screen but no prompt**, check the terminal's serial parameters (baud rate, number of data bits, type of parity, and number of stop bits). They must match the settings of the port. If autobaud is enabled for the port, the terminal must be configured for 7-bit characters with even parity or 8-bit characters with no parity. You can check the settings of the port via the SHOW PORT command or the server's front panel display (see subsection 4.7 for details).

The next thing you see depends on how the port is configured. If server passwords are enabled, you see a pound sign prompt (#) and you must enter a password (the default password is ACCESS, but it might have been changed).

- **If you tried to log in before**, but exceeded the maximum allowed number of password attempts, the port stays "dead" for one minute. Try again when the minute is up. (If the SERVER SECURITY feature is enabled, the port stays logged out permanently until a privileged user logs it out.)

If no username has been assigned, you are asked for a username. You then receive the local mode prompt:

```
Server>
```

When you receive the local mode prompt, the server is ready for use.

- **If you occasionally get odd characters on the screen after logging in**, check to see if the port is configured for the correct terminal type. If you have a VT series terminal or compatible, it should be set to VT100. Other options are SOFTCOPY (the default), ANSI, and HARDCOPY (for hardcopy style terminals). Refer to the SET PORT TYPE command for further details.

Also check to make sure the port and the terminal are configured for the same type of flow control (VT terminals and compatibles normally use XON/XOFF flow control).

If you log in successfully but have problems executing server commands or connecting to services, refer to the next subsection.

6.5 Service Connection Problems

Once you have logged in successfully, you are assured of the following:

- Your terminal is working.
- Your server port is working.
- The server itself is working.

Thus, if you have problems connecting to services after a successful login, there are only a few options left:

- **Your port is not authorized to connect to the service.** At least one of the group codes authorized for your port must match a group code that belongs to the service. If you are not authorized for the service, message number 716 ("Access to service *name* denied") is displayed on your terminal. Group codes must be authorized for a port by a privileged user via the SET PORT AUTHORIZED GROUPS command and then enabled via the SET PORT GROUPS command.
- **The service does not exist.** Issue the SHOW SERVICE command and see if the desired service appears. If a dash appears before the service name, it is not currently available. Check with the system manager to find out why.
- **The service has no ports left.** If the service is offered only on specific ports, issue the SHOW SERVICE *name* STATUS command and check the service's rating. If it is zero, all ports offering the service are currently in use or are improperly configured.
- **There is a problem with the service on the host end.** Privileged users can issue the TEST LOOP command to check the physical connection between the server and the remote node that offers the service.

If the service is a set of ports on a terminal server or printer server (either local or remote), make sure the service is defined correctly and the server ports are configured properly. See subsection 3.4 for detailed port configuration requirements for specific types of devices.

If the service appears to be functioning correctly (that is, you can connect to it from another port or another server), you might have an unusual server or port hardware failure. Call Emulex Technical Support for further help.

6.6 Host Connection Problems

Host-initiated connections are most often made to printers, but they can also be made to modem pools, data switches, and other devices. If a host in your network is trying to make connections to server ports or services but has been failing, check the following things:

- **Issue the SHOW NODE *name* COUNTERS command**, described fully in subsection 5.30.3, and look at the *Solicitations* block.
- **If the number of solicitations accepted and rejected are both zero**, the server is not receiving the host requests. Check to make sure the remote host is requesting the connections with the server's name, not the server's DECnet name. The server name is defined by the SET SERVER NAME command.
- **If solicitations are being received but rejected**, check the following things:

The port that offers the requested service must be defined as either REMOTE or DYNAMIC and can not be configured for autobaud. Refer to subsection 3.4 for detailed port configuration requirements for specific types of devices.

If the host is making the request by service name, rather than by port name, the service must be correctly named and defined and connections must be enabled, as described in subsection 3.3.

Passwords are not allowed on host-initiated connections. If the host is requesting a service with a password, you can disable the password by entering CHANGE SERVICE *name* PASSWORD "". Alternatively, if you wish to keep the password, the host can connect directly to the port name rather than the service name.

The remote host must be authorized to access at least one of the group codes that belong to the server. The server's group codes are defined by the SET SERVER SERVICE GROUPS command.

A port can accept only one connection from a remote host at a time. If host requests are being rejected because the requested service or port is busy, the host must simply retry at a later time.

If queuing is enabled for the requested service, operating systems that support queuing, such as VMS, can have their requests stored in the server's internal queue for connection at a later time.

A.1 Overview

Tables A-1 and A-2 list pin and signal assignments for the Performance 3000 serial ports. Two types of serial ports are listed: full modem control (25-pin connectors) and partial modem control (RJ12 connectors). Full-modem ports are available only on plug-in serial port modules (serial PortPaks) (see Section 1 for model number and ordering information).

All signals on the serial ports are electrically RS-232 compatible. Pin and signal assignments on the full-modem ports are standard RS-232; pin and signal assignments on the partial-modem ports are identical to DECconnect (MMJ) pinning assignments.

Tables A-3 through A-5 list the pin and signal assignments for the Performance 3000 parallel ports. These parallel ports are compatible with standard PC printer cables, Centronics cables, and DEC/Dataproducs cables.

The figures that follow the tables are cabling schematics for some of the cables commonly used with the Performance 3000.

Table A-1. Full-Modem Serial Port (25-Pin) Pin and Signal Assignments

Pin	Signal Name	CCITT Number	Mnemonic
1	Chassis Ground	101	Ground
2	Transmit Data	104	Tx
3	Receive Data	103	Rx
4	Request to Send	105	RTS
5	Clear to Send	106	CTS
6	Data Set Ready	107	DSR
7	Signal Ground	102	SG
8	Carrier Detect	109	CD
12	Speed Mode Indicator	112	SMI
20	Data Terminal Ready	108.2	DTR
22	Ring	125	RI
23	Data Signal Rate Select	111	DSRS

Table A-2. Partial-Modem Serial Port (RJ12) Pin and Signal Assignments

Pin	Signal Name	CCITT Number	Mnemonic
1	Data Terminal Ready	108.2	DTR
2	Transmit Data	104	Tx
3	Signal Ground	102	SG
4	Receive Common	--	RxC
5	Receive Data	103	Rx
6	Data Set Ready	107	DSR

Table A-3. IBM PC (Centronics or Dataproducts) (25-Pin) Parallel Port
Pin and Signal Assignments

Pin	Signal Name	Mnemonic
1	Data Strobe	Strobe
2	Data Bit 1	D1
3	Data Bit 2	D2
4	Data Bit 3	D3
5	Data Bit 4	D4
6	Data Bit 5	D5
7	Data Bit 6	D6
8	Data Bit 7	D7
9	Data Bit 8	D8
10	Printer Acknowledge	Acknlg
11	Printer Busy	Busy
12	Paper End	PE
13	Printer Select Status	Slct
14	Auto Line Feed	Auto Feed
15	Printer Error	Error
16	Printer Initialize	Init
17	Inhibit Decode of Select/Deselect	Slct In
18	Logic Ground	Gnd
19	Data Strobe & Data Bit 1 Return	Gnd
20	Data Bits 2 & 3 Return	Gnd
21	Data Bits 4 & 5 Return	Gnd
22	Data Bits 6 & 7 Return	Gnd
23	Data Bit 8 & Printer Acknowledge Return	Gnd
24	Printer Busy & Paper End Return	Gnd
25	Logic Ground	Gnd

Table A-4. Centronics (36-Pin) Parallel Port Pin and Signal Assignments

Pin	Signal Name	Mnemonic
1	Data Strobe	Strobe
2	Data Bit 1	D1
3	Data Bit 2	D2
4	Data Bit 3	D3
5	Data Bit 4	D4
6	Data Bit 5	D5
7	Data Bit 6	D6
8	Data Bit 7	D7
9	Data Bit 8	D8
10	Printer Acknowledge	Acknlg
11	Printer Busy	Busy
12	Paper End	PE
13	Printer Select Status	Slct
14	Auto Line Feed	Auto Feed
15	No Connection	NC
16	Logic Ground	Gnd
17	No Connection	NC
18	No Connection	NC
19	Data Strobe Return	Gnd
20	Data Bit 1 Return	Gnd
21	Data Bit 2 Return	Gnd
22	Data Bit 3 Return	Gnd
23	Data Bit 4 Return	Gnd
24	Data Bit 5 Return	Gnd
25	Data Bit 6 Return	Gnd
26	Data Bit 7 Return	Gnd
27	Data Bit 8 Return	Gnd
28	Printer Acknowledge Return	Gnd
29	Printer Busy Return	Gnd
30	Paper End Return	Gnd
31	Printer Initialize	Init
32	Printer Error	Error
33	Logic Ground	Gnd
34	No Connection	NC
35	No Connection	NC
36	Inhibit Decode of Select/Deselect	Slct In

Table A-5. DEC/Dataproducts (37-Pin) Parallel Port Pin and Signal Assignments

Pin	Signal Name	Mnemonic
1	Data Bit 4	D4
2	No Connection	NC
3	No Connection	NC
4	No Connection	NC
5	Data Bit 7	D7
6	Data Bit 8 (Paper Instruction)	D8 (P Instr)
7	No Connection	NC
8	Data Strobe	Strobe
9	No Connection	NC
10	Buffer Clear	Buf Clr
11	No Connection	NC
12	Printer Online	Online
13	No Connection	NC
14	Interface Connect Verify	IF Cnct Vfy
15	No Connection	NC
16	No Connection	NC
17	VFU Ready	DAVFU Rdy
18	Demand	Demand
19	No Connection	NC
20	Data Bit 2	D2
21	No Connection	NC
22	Data Bit 3	D3
23	Data Bit 6	D6
24	Data Bit 5	D5
25	No Connection	NC
26	Data Bit 1	D1
27	Buffer Clear Return	Gnd
28	Data Bits 3 & 8 Return	Gnd
29	Return	Gnd
30	Data Bits 1 & 7 Return	Gnd
31	VFU Data Ready Return	Gnd
32	Printer Online Return	Gnd
33	Data Bit 4 & Demand Return	Gnd
34	Data Bits 2 & 6 Return	Gnd
35	Data Bit 5 & Data Strobe Return	Gnd
36	No Connection	NC
37	No Connection	NC
Case	Chassis Gnd	Chassis

A.2 Making Cables

The cabling diagrams on the following pages show how to connect a variety of devices to the ports on the Performance 3000. Each cable shown has a different purpose, uses a specific type of cable, and might or might not require an adapter to make it work. It is important that you understand the following points:

- **DB25 versus RJ12.** Although all serial ports on the Performance 3000 are configured as DTE, some use DB25 connectors and some use RJ12 modular connectors. Most terminals, serial printers, and modems use DB25 connectors. Thus, most of the cabling diagrams show two cable types: DB25-to-DB25 and DB25-to-RJ12. Be sure to use the right one.
- **Modular cable versus standard cable.** RJ12 connectors can be attached only to modular cable. This cable is typically flat and unshielded, and often silver colored. To attach an RJ12 connector to modular cable, you must use a special crimping tool (available at most electronics stores). Modular cable has six conductors.

Standard cable is usually round and comes with as many conductors as you wish. You can not attach an RJ12 connector to standard cable. Use standard cable if you are making your own cable with DB25 connectors on both ends.

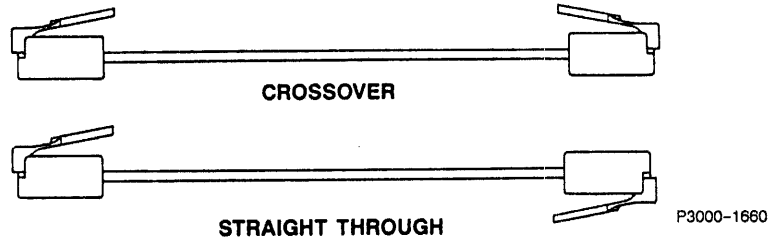
- **Crossover versus straight through.** To connect a terminal (a DTE device) to a server port (also a DTE device), you *must* use a cable that crosses the input and output signals. This is required so that the terminal's transmit pin is connected to the server's receive pin.

You can determine easily if the wires in a modular cable are crossed over by holding the RJ12 connectors side by side, tabs down. If the wiring's color order is the same from left to right in both connectors, the wiring is straight through. If not, the wiring is crossed over.

When connecting a server port (a DTE device) to a modem (a DCE device), you *must not* cross the signals. Use a straight pin-to-pin cable.

Be sure to use the correct cable for each device.

- **Crossing a modular cable.** There is a simple way to add a crossover to a modular cable: simply crimp the connector in the same direction on both ends (see illustration). This crosses all the wires in the cable.

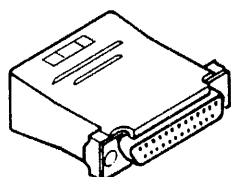


- **The Emulex adapter.** Whenever you require a DB25-to-RJ12 connection, you must use an adapter that converts the DB25 to RJ12. This gives you RJ12 on both ends so that you can use an ordinary modular cable to connect them.

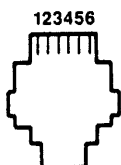
Emulex makes an adapter that converts DB25 to RJ12. Refer to Table 1-2, *Performance 3000 Options and Accessories*, for model numbers. The adapter is shown in Figure A-1 below, and its pin assignments are shown in some of the cabling diagrams (for example, in Figure A-2). If you wish, you may buy your own adapter kits instead. Be sure to wire them correctly.

One more note: 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 a three-wire cable (Tx, Rx, and Signal Ground).

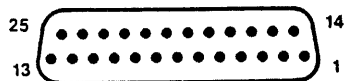
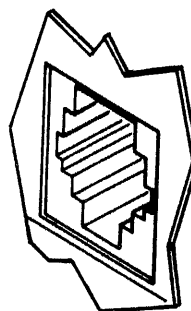
It is impossible to cover every possible type of cable here. If you think you can get by with a simpler cable for some of your applications, refer to the instruction manuals for your devices for information about their requirements.



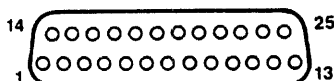
EMULEX RJ12-DB25 ADAPTER



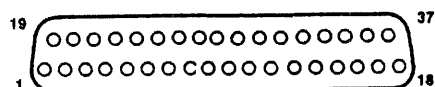
RJ12 SERIAL CONNECTOR



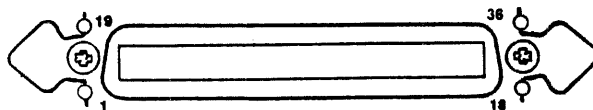
25-PIN SERIAL CONNECTOR (MALE)



25-PIN PARALLEL CONNECTOR (FEMALE)



37-PIN PARALLEL CONNECTOR (FEMALE)



36-PIN PARALLEL CONNECTOR (FEMALE)

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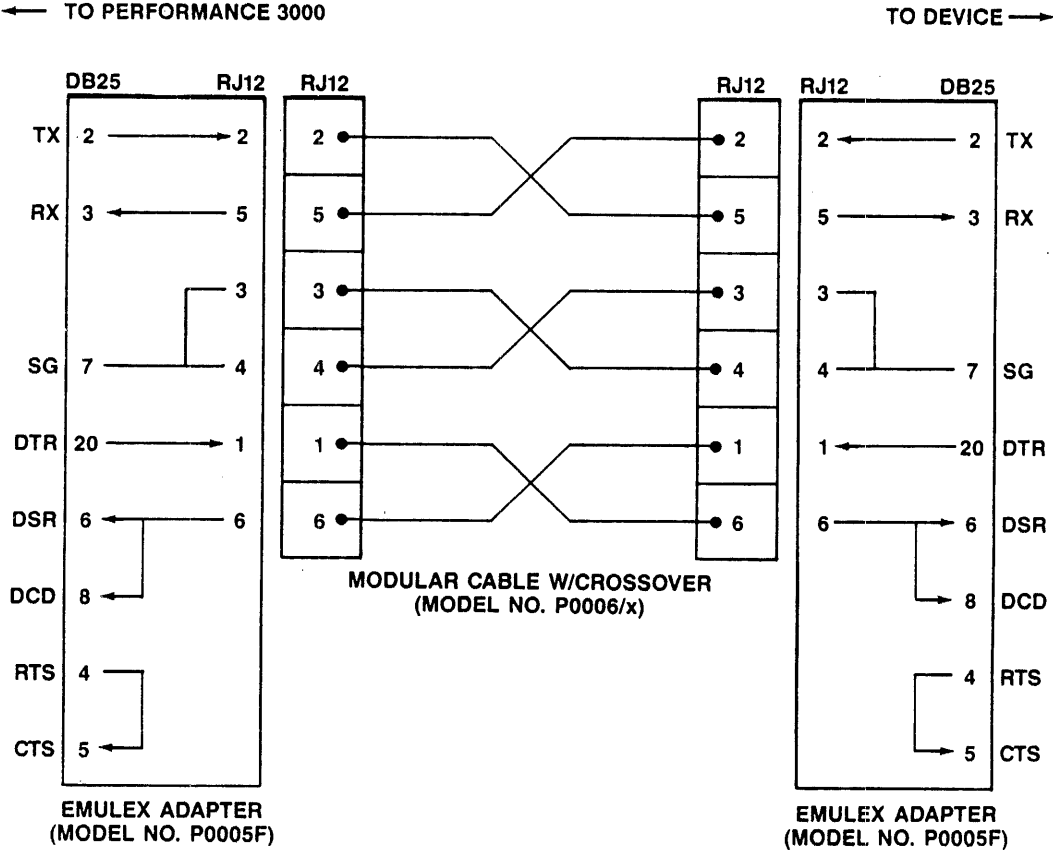
Figure A-1. Pin Locations on Performance 3000 I/O Ports

RS-232 Terminal or Serial Printer Cable (full modem/modular cable)

- 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.

If your serial printer uses CTS/RTS flow control, refer to the cabling diagrams later in this section titled, "Serial Printer Cable with CTS/RTS Flow Control".



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Figure A-2. RS-232 Terminal or Serial Printer Cable (Full Modem/Modular Cable)

RS-232 Terminal or Serial Printer Cable (full modem/standard cable)

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

Connectors: DB25S to DB25S or DB25P

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 might 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.

If your serial printer uses CTS/RTS flow control, refer to the cabling diagrams later in this section titled, "Serial Printer Cable with CTS/RTS Flow Control".

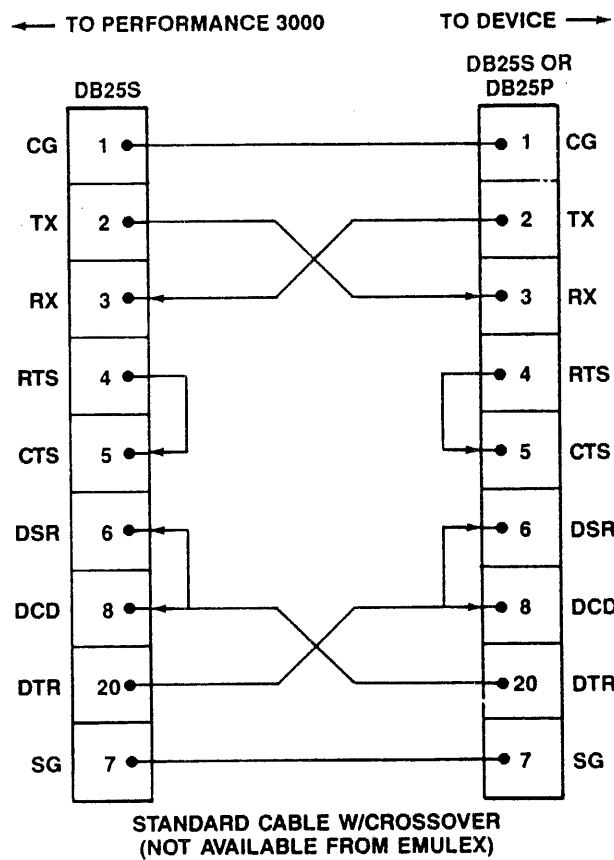


Figure A-3. RS-232 Terminal or Serial Printer Cable (Full Modem/Standard Cable)

RS-232 Terminal or Serial Printer Cable (partial modem/modular cable)

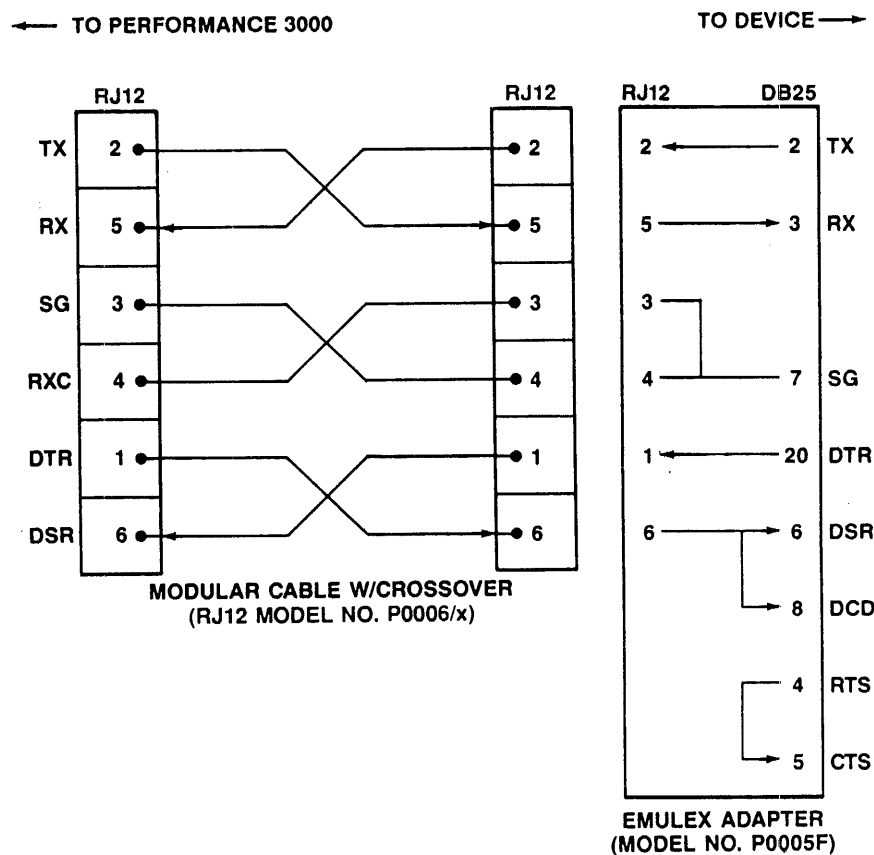
Function: Connects partial-modem server port to terminal or serial printer

Connectors: RJ12 to RJ12

Cable Type: 6 wire modular, crossover, with Emulex adapter on device end

This diagram shows how to cable a terminal, data switch, or printer to a partial-modem port 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 each end.

If your serial printer uses CTS/RTS flow control, refer to the cabling diagrams later in this section titled, "Serial Printer Cable with CTS/RTS Flow Control".



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Figure A-4. RS-232 Terminal or Serial Printer Cable (Partial Modem/Modular Cable)

Modem Cable (full modem/standard cable)

Function: Connects full-modem server port to modem.

Connectors: DB25S to DB25P

Cable Type: 12 wire standard cable

Note: For Hayes Smartmodems, the drawing below is correct except that the connection on pin 23 *must be eliminated*.

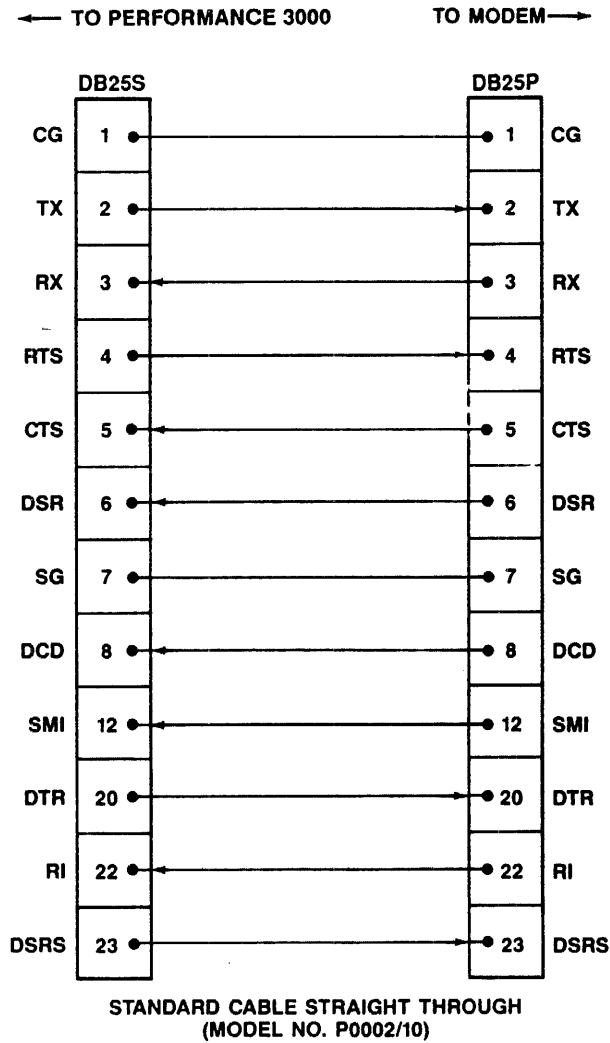


Figure A-5. Modem Cable (Full Modem/Standard Cable)

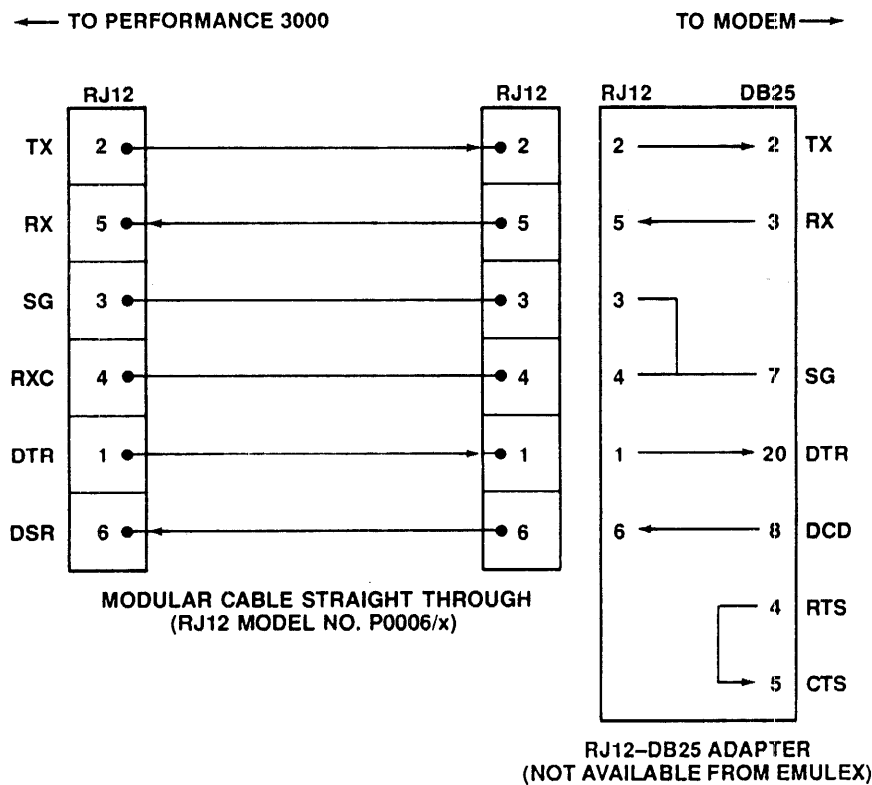
Modem Cable (partial modem/modular cable)

Function: Connects partial-modem server port to modem.

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. See Appendix C for full details about how the modem signals work.



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Figure A-6. Modem Cable (Partial Modem/Modular Cable)

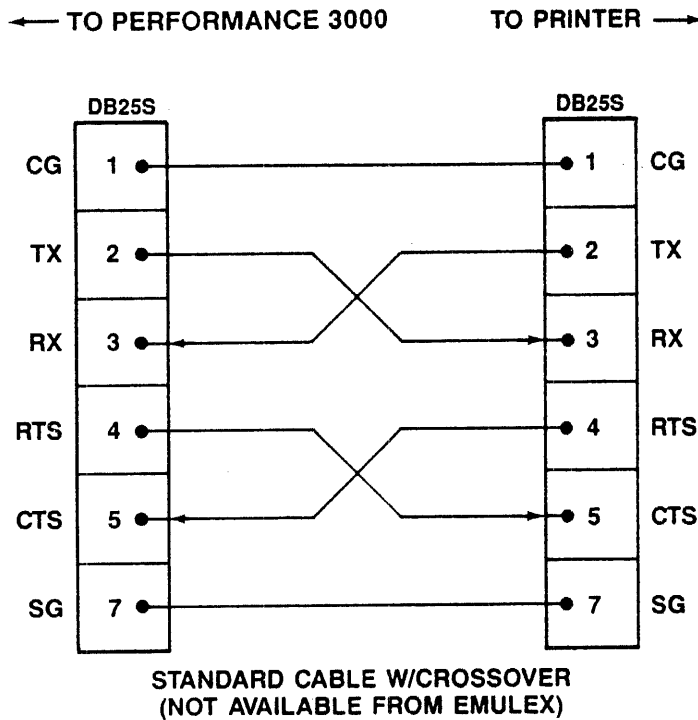
Serial Printer Cable with CTS/RTS Flow Control (full modem/standard cable)

Function: Connects full-modem server port to serial printer using CTS/RTS flow control

Connectors: DB25S to DB25S

Cable Type: 6 wire standard cable with crossover

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.



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Figure A-7. Serial Printer Cable with CTS/RTS Flow Control (Full Modem/Standard Cable)

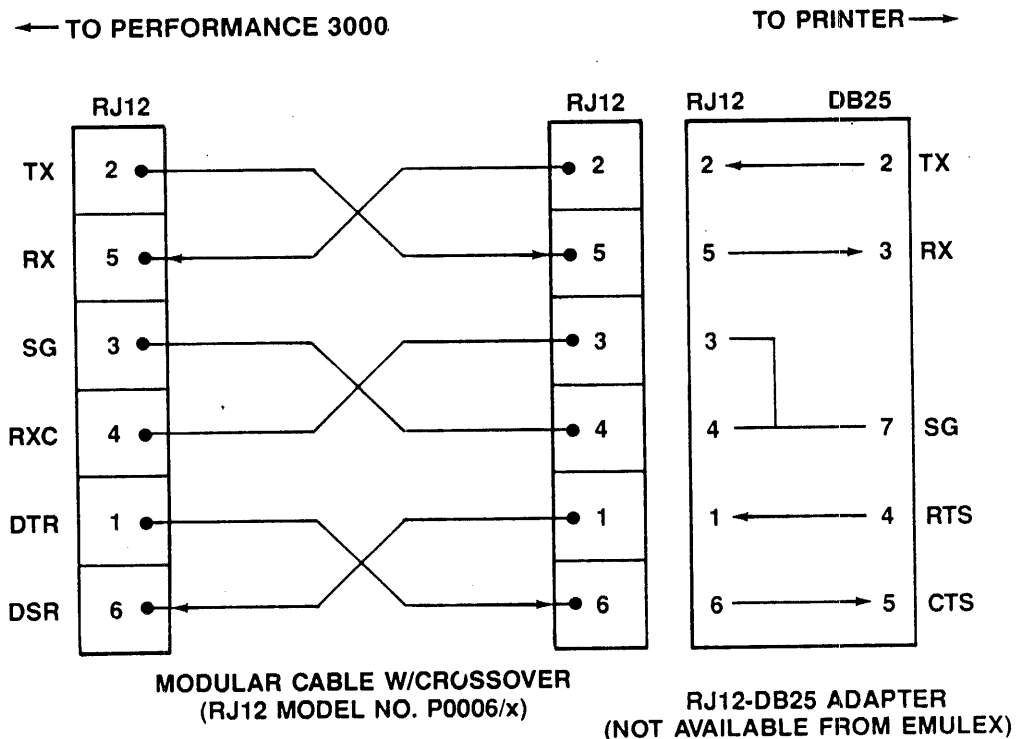
Serial Printer Cable with CTS/RTS Flow Control (partial modem/modular cable)

Function: Connects partial-modem server port to serial printer using CTS/RTS flow control

Connectors: RJ12 to RJ12

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.



P3000-37

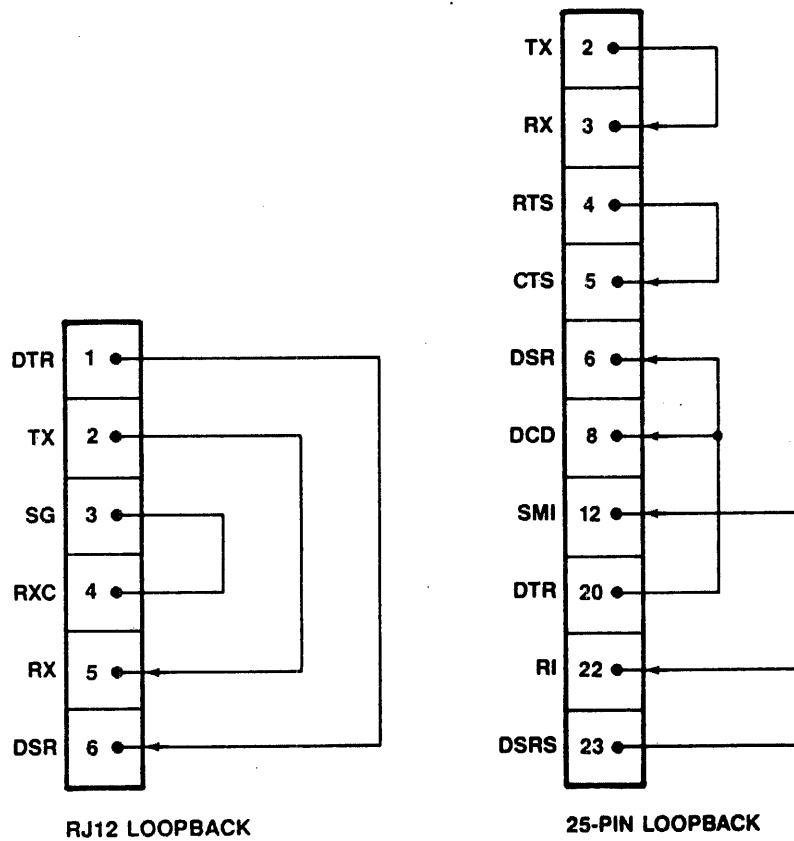
Figure A-8. Serial Printer Cable with CTS/RTS Flow Control (Partial Modem/Modular Cable)

Serial Port Loopback Connectors

Function: Loopback connector for diagnostic testing

Connectors: Full-modem ports: DB25S
Partial-modem ports: RJ12

Cable Type: None



(NOT AVAILABLE FROM EMULEX)

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Figure A-9. Serial Port Loopback Connectors

**Parallel Printer Cable
Centronics Type Printer to Performance 3000 or Performance 4000
25-Pin IBM PC Type Connector**

Function: Connects 25-pin IBM PC type parallel port to Centronics type printer

Connectors: DB25P to 36-pin Centronics

Note: The polarity of the INITIALIZE signal is jumper selectable on individual Performance 3000 PortPaks. The factory setting of this jumper is for the INITIALIZE signal to be low true. This signal is high true on some printers, but low true on most. You must match the polarity of this signal on the Performance 3000 to the polarity expected by the printer, or else do not include this line in your cable. For further information on setting this jumper, see subsection 2.2.

Note: The maximum cable length is typically 30 feet with this interface.

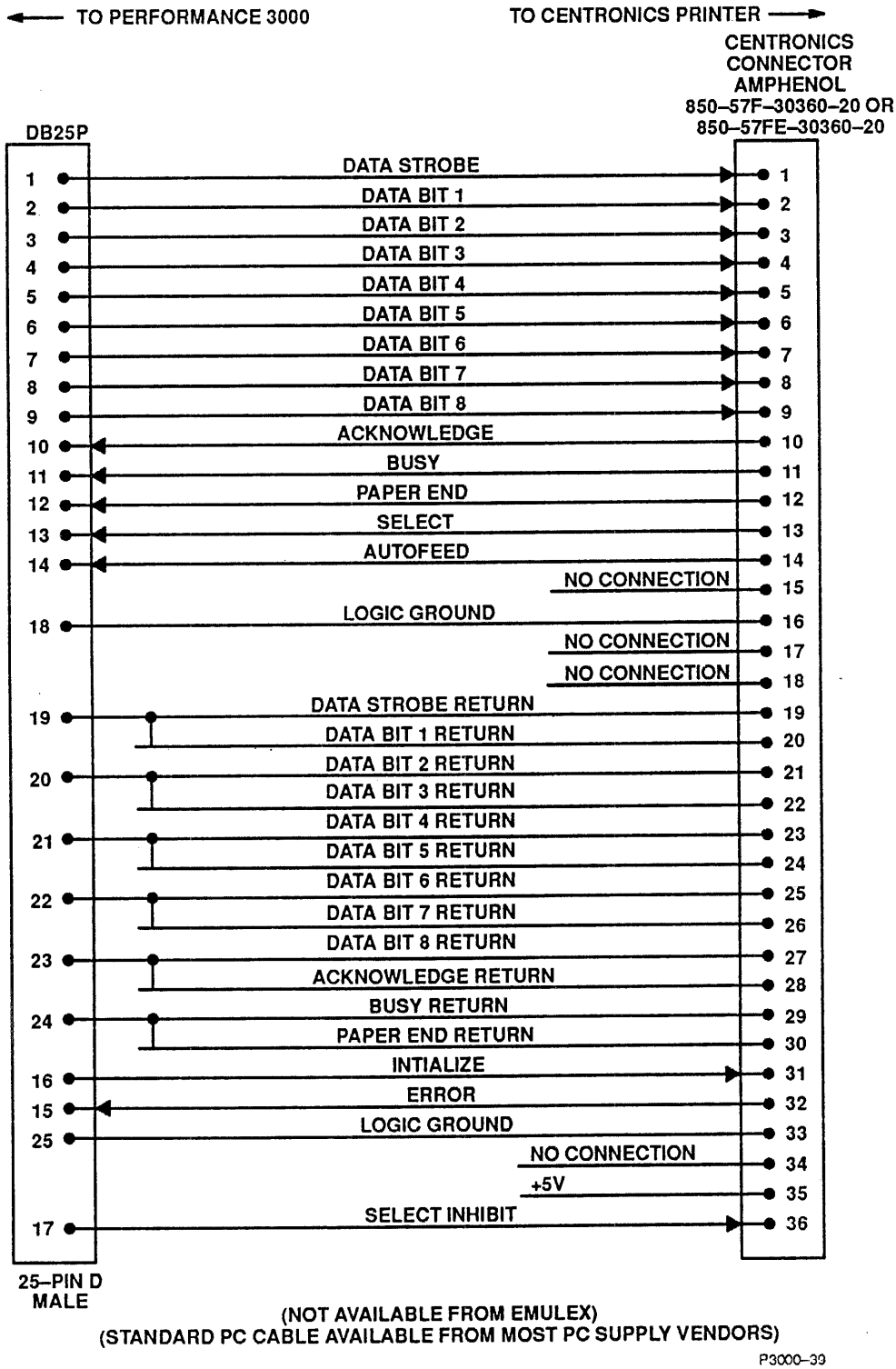


Figure A-10. Cable, 25-Pin Parallel Port to Centronics Type Printer

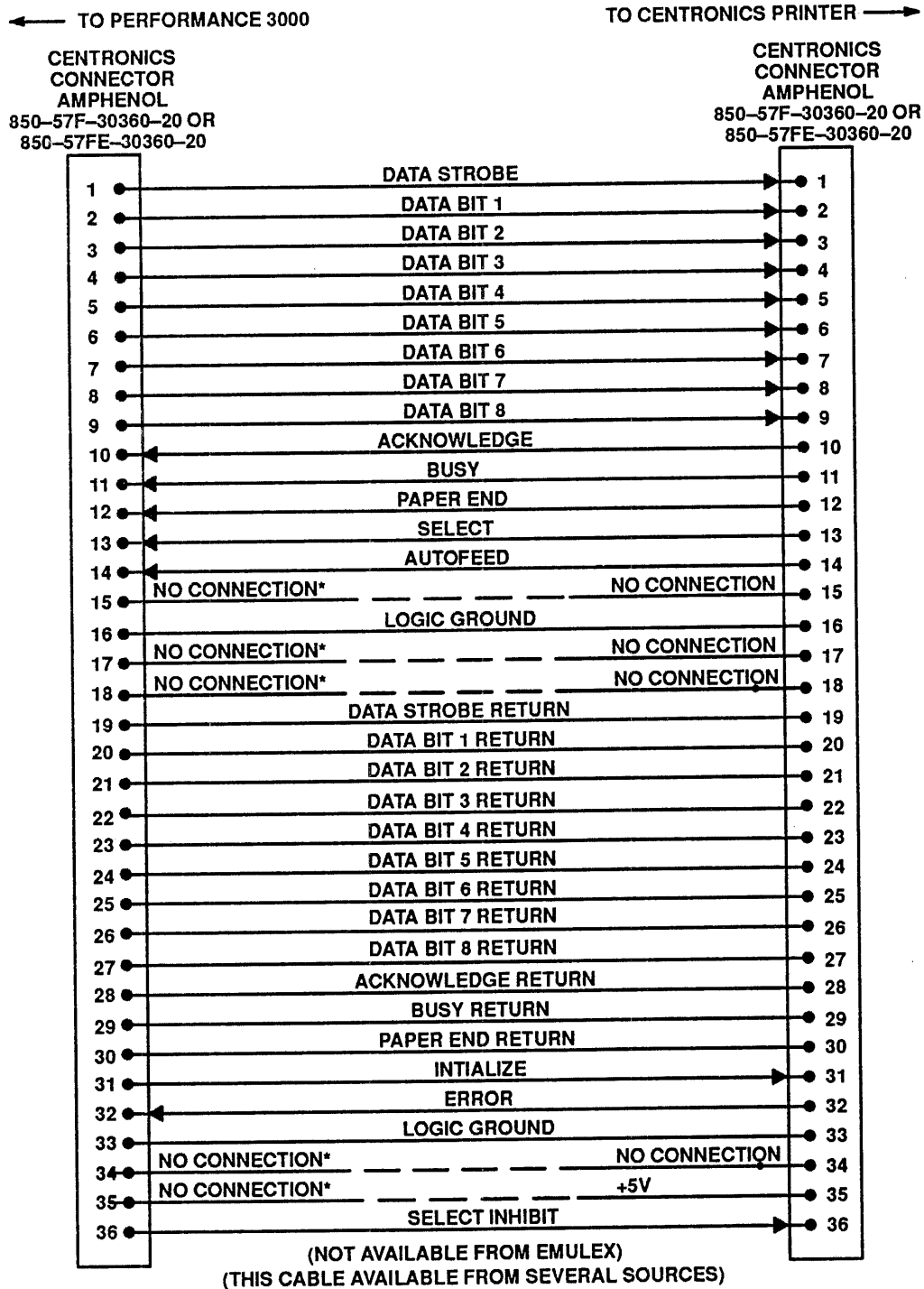
Parallel Printer Cable Centronics Type Printer to Performance 3000 36-Pin Centronics Type Connector

Function: Connects 36-pin Centronics type parallel port to Centronics type printer

Connectors: 36-pin Centronics to 36-pin Centronics

Note: The polarity of the INITIALIZE signal is jumper selectable on individual Performance 3000 PortPaks. The factory setting of this jumper is for the INITIALIZE signal to be low true. This signal is high true on some printers, but low true on most. You must match the polarity of this signal on the Performance 3000 to the polarity expected by the printer, or else do not include this line in your cable. For further information on setting this jumper, see subsection 2.2.

Note: The maximum cable length is typically 30 feet with this interface.



*THESE CONNECTIONS MIGHT BE PRESENT IN OFF-THE-SHELF CABLES BUT ARE NOT NECESSARY FOR OPERATION.

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Figure A-11. Cable, 36-Pin Parallel Port to Centronics Type Printer

Parallel Printer Cable Dataproducts Type Printer to Performance 3000 25-Pin IBM PC Type Connector

Function: Connects 25-pin IBM PC type parallel port to Dataproducts type printer

Connectors: DB25P to 50-pin Dataproducts (DD50P or Winchester 50)

Note: This interface does not support the long-line interface. Your printer must have the short-line interface.

Note: This cable is different from the cable specified for the Performance 4000. This cable has the additional features (over the Performance 4000 cable) of detecting that the cable is not connected, and of better control of printer vertical formatting (DAVFU) options. If you do not need these features, you can use a Performance 4000 cable on the Performance 3000 with no degradation in performance. The cable specified below can not be used on a Performance 4000, however.

Note: The polarity of the BUFFER CLEAR signal is jumper selectable on individual Performance 3000 PortPaks. The factory setting of this jumper is for the BUFFER CLEAR signal to be low true. (This is opposite from the Performance 4000.) This signal is high true on some printers, but low true on most. You must match the polarity of this signal on the Performance 3000 to the polarity expected by the printer, or else do not include this line in your cable. For further information on setting this jumper, see subsection 2.2.

Note: In the cable shown, DATA BIT 8 of the Performance 3000 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. In addition, some 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.

Note: The maximum cable length is typically 50 feet with this interface.

Parallel Printer Cable Dataproducts Type Printer to Performance 3000 37-Pin DEC Type Connector (DEC Type BC27A and BC27B Cable)

Function: Connects 37-pin DEC/Dataproducts type parallel port to Dataproducts type printer

Connectors: DC37P to 50-pin Dataproducts (DD50P or Winchester 50)

Note: This interface does not support the long-line interface. Your printer must have the short-line interface.

Note: The two signals BUFFER CLEAR and BUFFER CLEAR RTN, shown in the cable schematic below, are not present in the DEC BC27A and BC27B cables. These two signals are not required. These signals must be wired, however, if you are using the BUFFER CLEAR option. The polarity of the BUFFER CLEAR signal is jumper selectable on individual Performance 3000 PortPaks. The factory setting of this jumper is for the BUFFER CLEAR signal to be low true. (This is opposite from the Performance 4000.) This signal is high true on some printers, but low true on most. You must match the polarity of this signal on the Performance 3000 to the polarity expected by the printer, or else do not include this line in your cable. For further information on setting this jumper, see subsection 2.2.

Note: In the cable shown, DATA BIT 8 of the Performance 3000 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. In addition, some 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.

Note: The maximum cable length is typically 50 feet with this interface.

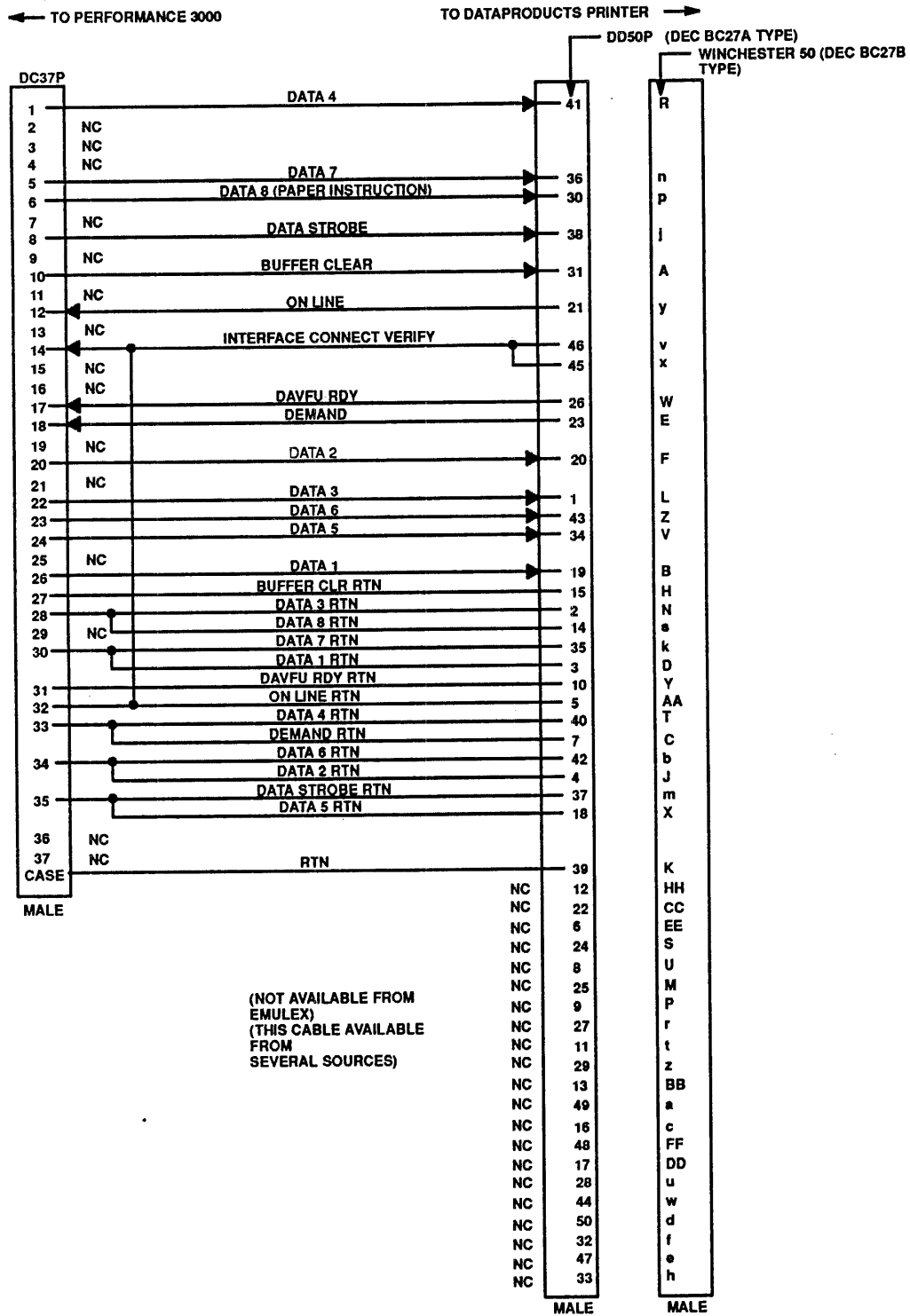


Figure A-13. Cable, 37-Pin Parallel Port to Dataproducts Type Printer

Ethernet Port Loopback Connector

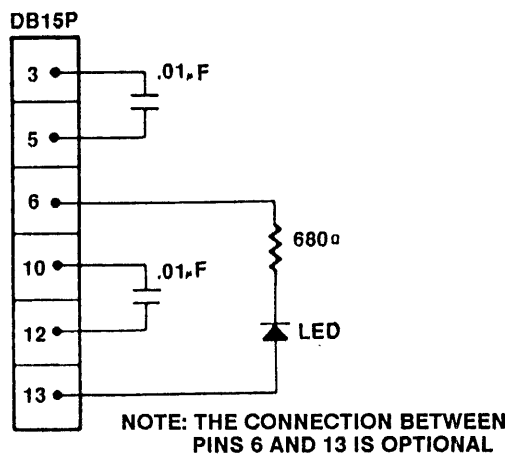
Function: AUI loopback connector for Ethernet diagnostic testing

Connectors: DB15P

Cable Type: None

Table A-6. Ethernet Port Pin and Signal Assignments

Pin	Signal Name
1	Ground
2	Collision +
3	Transmit +
4	Ground
5	Receive +
6	Power -
7	Not Used
8	Ground
9	Collision -
10	Transmit -
11	Ground
12	Receive -
13	Power +
14	Ground
15	Not Used



ETHERNET LOOPBACK CONNECTOR
(NOT AVAILABLE FROM EMULEX)

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Figure A-14. Ethernet Port Loopback Connector

Thinwire Port Loopback Connector

Function: BNC thinwire loopback connector for thinwire diagnostic testing

Connectors: Two BNC coaxial 50 Ohm terminators (not available from Emulex); one BNC coaxial "T" adapter (supplied with the Performance 3000)

Cable Type: None

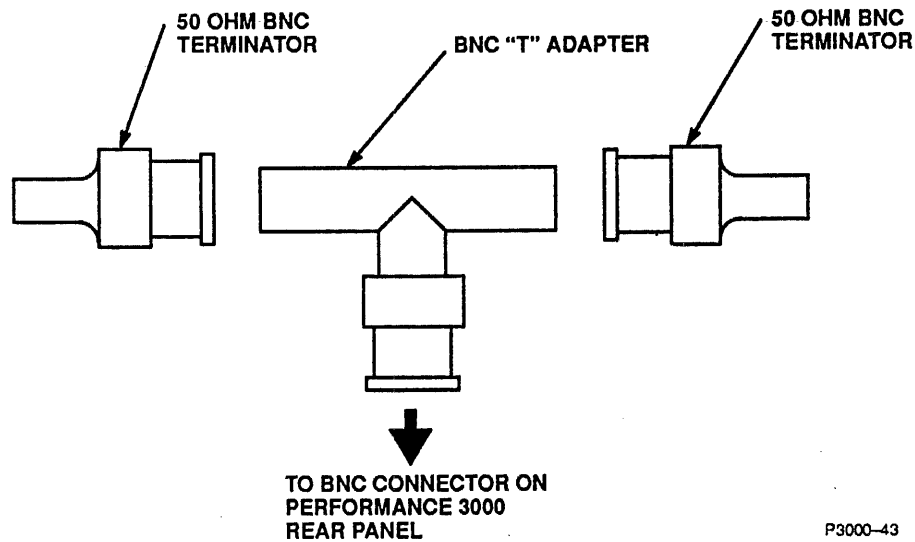


Figure A-15. Thinwire Port Loopback Connector

B.1 Overview

This appendix contains specifications for the Performance 3000. The specifications are contained in Table B-1.

Table B-1. Performance 3000 Specifications

Parameter	Description
Function	Allows asynchronous terminals, serial printers, and parallel printers to be connected to an Ethernet network.
Ethernet Compatibility	Ethernet Version 2 IEEE 802.3 10base5 Thinwire Ethernet (Cheapernet) 10base2
Operating System Compatibility	VMS (V4.5 and above) Ultrix-32 (V2.0 and above) RSX-11M-Plus (V3.0 and above)
Serial Ports	
Number	2 to 6 (see Section 1 for details)
Configuration	Asynchronous DTE
Interface	RS-232 V.24/V.28
Modem Signals	
Full-modem ports	RTS, CTS, DSR, DCD, SMI, DTR, RI, DSRS
Partial-modem ports	DSR, DTR (see Appendix A)
Connectors	
Full-modem ports	25-pin D male
Partial-modem ports	RJ12 (6 pin)

continued on next page

Table B-1. Performance 3000 Specifications (continued)

Parameter	Description
Serial Ports (continued)	
Transmission Speeds	75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19200, 38400 bps
Character Lengths	5, 6, 7, or 8 bits
Stop Bits	1, 1.5, or 2. The number of stop bits per character is set automatically to 1.5 for 75 bps; 2 for 110, 134.5, and 150; and 1 for all other speeds.
Parity	Odd, even, mark, space, or none
Split Speed	All channels
Parallel Ports	
Number	0 to 4 (see Section 1 for details)
Interface	IBM PC parallel printer (to Dataproducts or Centronics type printers), DEC/Dataproducts, or Centronics
Connectors	
IBM PC parallel ports	25-pin D female
DEC/Dataproducts ports	37-pin D female
Centronics ports	36-pin ribbon female
Server Maximums	
Aggregate Throughput	25,000 characters per second maximum
Simultaneous Sessions	48
Known Services	250
Known Nodes	125
Local Services	16
Virtual Circuits	16
Queue Entries	64

continued on next page

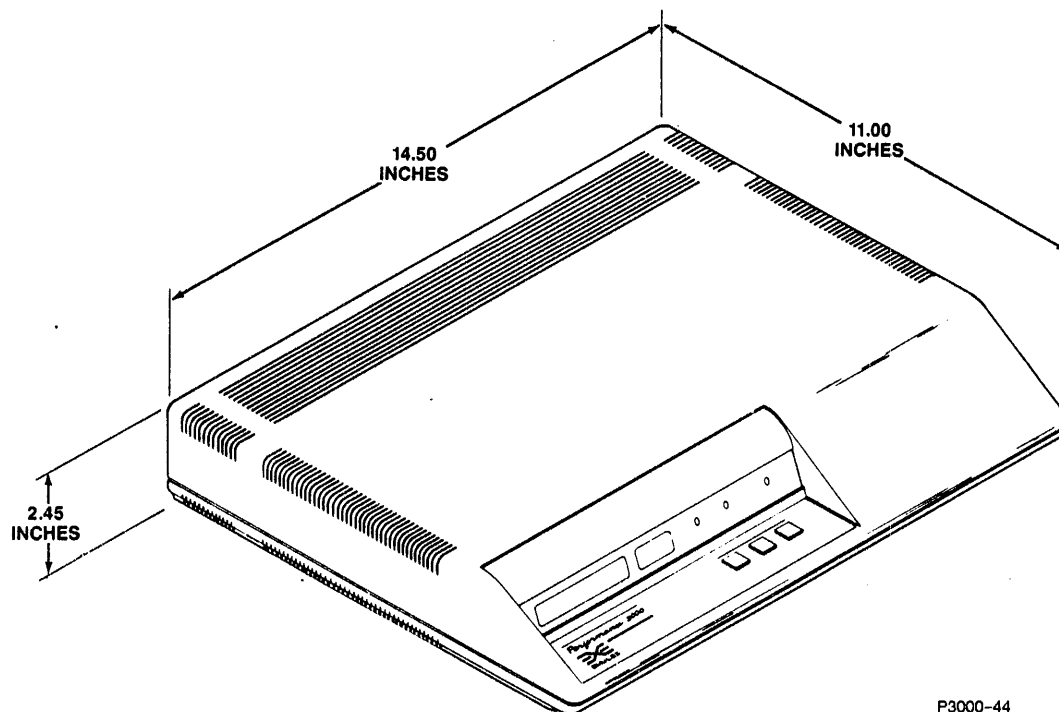


Figure B-1. Performance 3000 Dimensions

Table B-1. Performance 3000 Specifications (continued)

Parameter	Description
Physical	
Dimensions	2.45 inches (h) x 14.50 inches (w) x 11.00 inches (d)
Shipping Weight	7 lbs
Electrical	
Voltage	Wide range input: 100 VAC to 240 VAC 50 or 60 Hz
Power	50 watts

continued on next page

Table B-1. Performance 3000 Specifications (continued)

Parameter	Description
Environmental Operating Temperature Storage Temperature Relative Humidity	5°C to 43°C (41°F to 109°F) -40°C to 66°C (-68°F to 151°F) Maximum temperature is reduced 1.8°C per 1000 meters (1°F per 1000 feet) altitude 10% to 95% noncondensing

C.1 Overview

This appendix contains more detailed descriptions of some server operations than are found in the main body of this manual.

None of the information in this appendix is required to operate the server. It is included strictly for the benefit of readers who wish to learn some of the internal details of how the server works.

C.2 Initialization

When the server is powered on or initialized, it goes through the following steps:

1. If any sessions are active, they are disconnected and the ports are logged out.
2. The server runs its internal self-test. As it does this, the names of the subtests it is executing appear in the front panel LCD display.

During the self-test, the green Power LED is lit. If an error is detected, the red Alarm LED lights and the name of the failed subtest is frozen in the LCD display. If this happens, refer to Section 6 for troubleshooting details.

3. The server multicasts a message to all DECnet hosts asking for a software download. The multicast address used is AB-00-00-01-00-00 and the filename requested is P3KL00E.SYS (although this can be changed if desired).
4. Every host running DECnet checks to see if service is enabled on its ethernet circuit. If so, the directory pointed to by "MOM\$LOAD" is scanned for the requested file name (P3KL00E.SYS). If all criteria are met, the host sends a packet offering its download service. The first host to respond initiates the download, which is conducted via DECnet MOP protocol.
5. When the download is finished, the server is operational.

C.3 Ethernet Protocols

The basic Ethernet frame is defined by the IEEE 802.3 specification and has the following format:

Destination Address (6 bytes)	Source Address (6 bytes)	Type Code (2 bytes)	Information Field (variable)	Pad Field (variable)	CRC Code (4 bytes)
----------------------------------	-----------------------------	------------------------	---------------------------------	-------------------------	-----------------------

Destination Address and *Source Address* are the Ethernet addresses of the receiving and sending nodes. In addition to ordinary Ethernet addresses, there are also certain addresses defined as *multicast addresses*. These addresses work like a master key: many different nodes will respond to them.

The following addresses are of interest to the printer server:

Address	Usage
AB-00-00-01-00-00	Download requests. When the server requests a software download, it multicasts the request to this address. All potential DECnet load hosts respond to this address and look for the proper software.
09-00-2B-00-00-0F	ELT Multicast. This address is used to multicast a message to all nodes that use the ELT protocol. ELT is compatible with LAT, the protocol used by DEC printer servers.
AB-00-00-02-00-00	RCF. Used to inform other nodes that the server is able to accept RCF connections.
Variable	Printer Server. The address of your server is unique and is printed on the back of the unit, just above the Ethernet port. You can also view the server's Ethernet address by using the front panel LCD (see subsection 4.7.1) or on a terminal by issuing the SHOW SERVER CHARACTERISTICS NETWORK command (see subsection 5.35.1)

Type Code is a variable field that can be used by different vendors for their own purposes. The following type codes are used by the Performance 3000:

Type Code (Hexadecimal)	Usage
60-01	Dump/Download. Indicates that the information field contains download software (in response to a download request from the server). The Performance 3000 does not transmit dump information.
60-02	RCF. Indicates that data is being transmitted via an RCF connection.
60-03	DNA Routing. Indicates that the packet contains DNA routing information.
60-04	ELT. Indicates that the packet contains ELT data. This is the standard type code used by the server for printer-to-host and server-to-server communications. DEC's LAT protocol uses the same type code.
90-00	TEST LOOP command. Indicates that the packet contains test data.
90-02	Ethernet communications test. Indicates that the packet contains test data.

Information Field is the actual data to be transmitted.

Pad Field is padding used only if the Ethernet packet is less than the required 64 bytes.

CRC Code is a check code for the entire frame.

C.3.1 Ethernet Performance Considerations

There are several server parameters that affect the overall performance of the server and the Ethernet network as a whole. All of these parameters are set via the SET SERVER command:

- **Announcements.** This parameter specifies whether the server transmits multicast announcements on the network. These announcements are used to inform other network nodes of services offered by the server.

Announcements work in the other direction too: when the server powers up, it listens for announcements from other nodes. When it receives one, it stores information about that node in its internal tables. This information includes the node's Ethernet address and the names of the services it offers.

This announcement process allows ELT-compatible devices on the network to configure themselves automatically when they power up. Announcements are typically made every 30 seconds or so, which means that the configuration process usually takes about that long to complete.

Should announcements be enabled on the Performance 3000? That depends on whether you want local services to be accessible to other nodes. If so, announcements must be enabled so that other nodes are aware of the services and can connect to them. If no local services are defined, no announcements are sent regardless of the setting of the announcements option.

- **Multicast Timer.** This parameter is related to the ANNOUNCEMENTS parameter. If announcements are enabled and local services exist, it specifies how often announcements are made. On most networks, the default value of 30 seconds is adequate, but you might wish to increase or decrease it (the range is 10 to 180 seconds).

If you increase the multicast timer, other nodes will take longer to configure themselves when they power up. If you decrease the timer, you increase the number of announcements and, thus, the total Ethernet traffic. This is not usually a problem, but it can be if you have a large network with a lot of devices all configured to transmit multicast messages frequently.

- **Circuit Timer.** This parameter determines how often data is transmitted from the server to other nodes. It can have a significant impact on total network performance.

The ELT protocol used by the Performance 3000 and the LAT protocol used by DEC servers both work the same way: instead of transmitting characters immediately when they are received from terminals, they collect them for a certain period and then transmit them all to the destination node in a single packet. This makes much more efficient use of Ethernet.

The circuit timer is the length of time the server waits before transmitting a packet. The default value is 80 milliseconds, with a range of 30 to 200 milliseconds. The tradeoff between long and short circuit timers is straightforward: a short circuit timer sends packets more often and improves character echoing, but increases total Ethernet loading because more packets are sent.

The value you choose depends on your network requirements. The default of 80 milliseconds is usually adequate, but you might wish to decrease it if you have a small network and Ethernet loading is not a problem. Conversely, if you have a large, heavily loaded network you might want to increase the circuit timer in order to decrease Ethernet traffic. If you do this, experiment with different values to find the largest one that does not result in unacceptable character echoing delays.

- **Keepalive Timer.** This parameter specifies how often the server transmits a null message on a virtual circuit if there is no other traffic. The purpose is simply to keep the other node aware that the server is still alive. The default value is 20 seconds, with a range of 10 to 180 seconds. If the keepalive timer period is long, it takes other nodes a long time to find out if the server is down. If the keepalive timer is short, it increases the load on your network.
- **Retransmit Limit.** This parameter specifies the number of times a message is retransmitted to a remote node if no acknowledgement is received. The default value is 32, with a range of 4 to 120. You might wish to increase this from its default value if you have a heavily loaded network or a busy node that is preventing packets from being acknowledged.

C.3.2 Making Connections

When a connection request is made (that is, a CONNECT command is issued), the server goes through the following steps:

1. The server looks for the requested service in its internal tables. If it can not find it, it returns an error message.

A service can be missing for a variety of reasons. It could be that the requested service has not announced itself on the network, so the server is unaware of its presence. Further, the server stores information only about services to which at least one user is authorized to connect (see subsection C.4, Group Codes). If no one is authorized to connect to the service, the server is unaware of it. Finally, the server has limited space for its internal tables. If the network has more services than can be stored by the server in its service table, any new incoming services are discarded. (You can see if this is happening by looking at the Discarded Nodes and Discarded Services fields in the SHOW SERVER COUNTERS ELT display.)

2. Assuming the service exists, the server checks to see if a *virtual circuit* exists to the node that offers the service. The virtual circuit is the data path used between the server and a remote node, and it is used for all traffic between the two. Thus, if a virtual circuit does not exist, the server creates one; if one does exist, the server adds the new connection to it.
3. The server attempts to connect to the service. If the service itself rejects the connection, the server returns an error message to the user who requested the connection.
4. If the service accepts the connection, the connection is successful.

C.4 Group Codes

Every device in an ELT-compatible Ethernet network is assigned a group code (or codes). Group codes serve three basic purposes:

- **Security.** They partition the network into separate "subnetworks" that are available only to certain users. For example, if a user's port is configured to have access only to group code 4, he can not access a VAX with a group code of, say, 13.
- **Convenience.** Users can voluntarily restrict their own group codes. For example, if a user has access to all group codes and issues a command such as SHOW SERVICES, he might get a very long list. By restricting his access only to those services that he uses frequently, he can make the SHOW SERVICES screen (and others) much shorter and easier to read.
- **Table Space.** The server has limited internal space for storing information about network services and discards information if the tables fill up. However, the server stores information only about services with group codes it has access to, so you can avoid table space problems by enabling for each port only those group codes that are actually used.

C.4.1 Setting Group Codes

Ethernet nodes are assigned group codes in various ways. On a VAX, for example, the group code(s) are set via LATCP. The group codes for the Performance 3000 are set by the following command (note that you must be in privileged mode):

```
Server>> CHANGE SERVER SERVICE GROUPS x
```

The group codes for the server are important only if you have defined local services to which users might connect. For example, if you have defined a printer port as a service named PRINTER, users (and hosts) can access this service only if they are authorized to use one of the server's group codes.

You can assign the server (or any other device) multiple group codes. If you do this, a user with access to any of the group codes can connect to the server. For example:

```
Server>> CHANGE SERVER SERVICE GROUPS 0,170
```

C.4.2 Authorizing Group Codes

Users are authorized to access groups by the following command:

```
Server>> CHANGE PORT x AUTHORIZED GROUPS y
```

Note that this command requires privileged status. Only a privileged user can change the groups another user is authorized to access. Privileged users themselves have access to every group code authorized for any user on the server, regardless of their AUTHORIZED GROUPS setting.

Users also can be authorized to access multiple group codes. For example:

```
Server>> CHANGE PORT x AUTHORIZED GROUPS 3,4,9
```

The server stores information about every node on the network that at least one person is authorized to use. It is possible, therefore, for the server's internal tables to fill up if users are authorized to use every node. Because of this, managers of large networks might need to be careful about which group codes users are authorized to access. If the server is discarding nodes (see the SHOW SERVER STATUS display), try restricting the group codes to those that are actually used by the server users.

C.4.3 Restricting Access

Users might wish to voluntarily restrict their own access to group codes. When you log in to the server, you are automatically able to access all group codes for which you are authorized. The following command restricts the group codes you can view:

```
Server> SET PORT GROUPS x
```

Note two things: (1) any user can do this on his own port, and (2) you can use only the SET command. The next time you log in, you will once again be able to view all nodes and services for which you are authorized.

It is important also to note that this command restricts only your *view* of other nodes. It might make screens such as SHOW NODES or SHOW SERVICES shorter and easier to read, but you can still connect to all services for which you are authorized.

C.5 Modem Sequencing

This subsection describes how the Performance 3000 handles modem signaling sequences used on different types of ports with different types of devices.

For information on Modem Signals, refer to Table 5-18 in Section 5 of this manual.

C.5.1 Dual Speed Modems

The Performance 3000 supports a protocol for dual speed modems that uses the modem signals DSRS and SMI. It works like this:

For a dialout modem, the server asserts DSRS to tell the modem to place the call at its highest speed. After the call is placed, the modem asserts SMI to confirm the higher speed or deasserts it to inform the server that the connection was finally established at the fallback speed. If the PORT ALTERNATE SPEED option is enabled, the server adjusts the port speed as required by the SMI signal.

For a dialin modem, the server simply waits for SMI. If it is asserted, it sets the port to its primary speed; if deasserted it sets the port to its fallback speed.

C.5.2 Dual Speed Hayes Smartmodem Protocol

The Hayes Smartmodem uses a different protocol than the one described above. In Hayes modems, DSRS is tied internally to SMI, which requires that DSRS be opened in the cable, preferably at the modem end (see Appendix A for a cable schematic).

For a dialout modem, the modem sets itself automatically to the port speed by autobauding on the "AT" that precedes the telephone number. For a dialin modem, SMI is used normally (that is, it is asserted if the connection is made at the primary speed and deasserted if it is made at the fallback speed).

C.5.3 DialIn Modem Sequencing on a Full-Modem Port

A dialin modem on a full-modem port uses the following modem signal sequencing:

1. DTRwait is enabled, so the server waits for RING and asserts DTR and RTS in return.
2. The modem asserts DSR and CTS after a minimum two-second delay. (If DSR is present before two seconds, the server assumes it is talking to a null modem device.)
3. When a connection is established and a carrier signal is detected, the modem asserts DCD. If DCD is not asserted within 30 seconds, the server negates DTR and RTS.

In order for the server port to function, DSR, CTS, and DCD must all be asserted. If CTS is lost at any time, no data will be transmitted out the port.

4. If the modem is dual-speed, it asserts SMI if it is using its primary (higher) speed and deasserts it if it is using its fallback (lower) speed. If the PORT ALTERNATE SPEED option is set, the server adjusts the port speed as required by the SMI signal.
5. The server waits two minutes for a login. If it is not received, DTR and RTS are deasserted and the port is logged out.

C.5.4 DialIn Modem Sequencing on a Partial-Modem Port

A dialin modem on a partial-modem port uses the following modem signal sequencing:

1. DTRwait is disabled, so DTR is asserted continually by the server.
2. The modem establishes communication with the remote modem. When a carrier signal is detected, it asserts DCD (which is connected to DSR on the server).
3. The server waits two minutes for a login. If it is not received, DTR is deasserted and the port is logged out.

C.5.5 Dialout Modem Sequencing on a Full-Modem Port

A dialout modem on a full-modem port uses the following modem signal sequencing:

1. DTRwait is enabled, so the server waits for a connection from a user and then asserts DTR and RTS.
2. After a minimum two-second delay, the modem asserts DSR and CTS. (If DSR is present before two seconds, the server assumes it is talking to a null modem device.)
3. If a dual-speed modem is being used, the server asserts DSRS to instruct the modem to use its primary speed.
4. The server reports to the user that the connection has been made and waits for the user to enter a telephone number.
5. When a connection is established and a carrier signal is detected, the modem asserts DCD. If DCD is not asserted within 30 seconds, the server negates DTR and RTS. In order for the server port to function, DSR, CTS, and DCD must all be asserted. If CTS is lost at any time, no data will be transmitted out the port.
6. If the connection ends up being made at the modem's primary speed, it asserts SMI; if it is made at the fallback speed SMI is deasserted. If the PORT ALTERNATE SPEED option is set, the server adjusts the port speed as required by the SMI signal.

C.5.6 Dialout Modem Sequencing on a Partial-Modem Port

A dialout modem on a partial-modem port uses the following modem signal sequencing:

1. DTRwait is enabled, so the server waits for a connection from a user and then asserts DTR.
2. The server reports to the user that the connection has been made and waits for the user to enter a telephone number in the appropriate format.
3. When a carrier signal is detected, the modem asserts DCD, which is connected to DSR on the server. If DCD is not asserted within 30 seconds, the server negates DTR.

C.5.7 Computer Port Sequencing on a Full-Modem Port

A full-modem port on the Performance 3000 can be connected directly to a serial port on a computer, allowing server users access to computers that are not part of the Ethernet network. Connections can be made in either direction.

If the remote computer is trying to log in to the server, the sequence is as follows:

1. If the computer periodically asserts DSRS (or possibly some other signal), which is connected to RING on the server, DTRwait should be enabled. The server responds to the RING by asserting DTR and RTS.
2. If the computer does not provide a RING input, DTRwait is disabled and the server asserts DTR and RTS at all times.
3. The computer port asserts DTR and RTS.

If a server user is trying to log in to the computer, the modem sequence is as follows:

1. A user connects to the local service which contains a port that is connected to the computer.
2. RING is enabled, so the server asserts DSRS periodically. DSRS is connected to RING on the computer port.
3. The computer responds by asserting DTR and RTS, which are connected to DCD, DSR, and CTS on the server.
4. DTRwait is enabled, so the server responds by asserting DTR and RTS, which are connected to DCD, DSR, and CTS on the computer.

C.5.8 Computer Port Sequencing on a Partial-Modem Port

A partial-modem port on the Performance 3000 can be connected directly to a serial port on a computer, allowing server users access to computers that are not part of the Ethernet network. Connections can be made in either direction.

If the remote computer is trying to log in to the server, the sequence is as follows:

1. DTRwait is disabled, so the server has DTR asserted continually.
2. When the computer connects to the server, it asserts DTR.
3. The connection is complete. Either side can break the connection by dropping DTR.

If a server user is trying to log in to the computer, the modem sequence is as follows:

1. A user connects to the local service which contains a port that is connected to the computer.
2. DTRwait is enabled, so the server responds by asserting DTR, which is connected to DSR on the computer.
3. The computer responds by asserting DTR, which is connected to DSR on the server. Either side can break the connection by dropping DTR.

C.5.9 Data Switch Sequencing on a Full-Modem Port

If the switch is trying to log in to the server:

1. If the switch periodically asserts RING, DTRwait should be enabled and the server responds by asserting DTR and RTS.

If the switch does not provide RING, DTRwait should be disabled and the server asserts DTR and RTS continuously.

2. The switch asserts DTR and RTS.
3. The server waits two minutes for a login. If there is no login, the server drops DTR and RTS.

If a server user is trying to log in to the switch, the modem sequence is as follows:

1. A user connects to the local service which contains a port that is connected to the switch.
2. If a RING input is required by the switch, the RING option is enabled and the server periodically asserts DSRS, which is connected to RING on the switch. DTRwait is enabled.

If no RING input is required, DTRwait should be disabled so the server continuously asserts DTR and RTS.

3. The switch responds by asserting DTR and RTS.
4. The server reports to the user that the connection has been made.

C.5.10 Data Switch Sequencing on a Partial-Modem Port

If the switch is trying to log in to the server:

1. The switch asserts DTR.
2. DTRwait is disabled, so the server has DTR asserted continually.
3. The server waits two minutes for a login. If there is no login, the server momentarily deasserts DTR.

If a server user is trying to log in to the switch, the modem sequence is as follows:

1. A user connects to the local service which contains a port that is connected to the switch.
2. DTRwait is enabled and the server now asserts DTR.
3. The switch responds by asserting DTR.
4. The server reports to the user that the connection has been made.

C.6 Host-Initiated Connections

Any network node can connect to services offered by the Performance 3000. Additionally, for certain types of nodes (for example, VMS hosts), the server is able to queue connect requests that it can not service immediately.

The following are a few points to be aware of that relate to host-initiated connections. Figure C-1, on the next page, shows a sample VAX command file that sets up a printer queue directed to a port on the server.

- Connections can be made by specifying a service name, a port name, or both. The example on the next page shows both a service name and a node name; only one is necessary (although both can be used if desired).
- Hosts can not connect to services that are password protected. Note, however, that a host can still connect to the service by connecting to a port name (which is never password protected) rather than the service name.
- The node name used in the host connection request must match the server name specified by the SET SERVER NAME command. This is not necessarily the same as the DECnet name for the server (although it is recommended that both names be the same).
- The server queue is nonblocking. That is, all entries in the queue are checked for servicing, even if the top entry can not be serviced.
- It is possible to issue requests faster than the server can handle them. You can check to see if requests are being discarded by looking at the *No Rx Buffer* and *No Tx Buffer* fields on the SHOW SERVER COUNTERS display.
- If the queue size is reduced below the current number of queue entries (via the SET SERVER QUEUE LIMIT command), no entries are deleted. No more entries are accepted until the number of entries falls below the new queue size.
- Server group codes must match the requesting node or the connection attempt is rejected prior to entering the queue.

- Group codes are not checked when a request is placed in the queue. If the requester is not authorized to access local services, a reject message is not returned until the connection is actually attempted.

```
$ run sys$system:latcp
create port lta901: /log
set port lta901: /application /node=xxx /service=yyy /port=zzz
exit
$
$ set terminal lta901: /perm /device=la36 /width=80 /page=66 -
    /lowercase /nobroadcast
$ set protection=(s:rwlp,o,g,w:rwlp) /device lta901:
$ set device lta901: /spooled=(queue_name, sys$sysdevice:)
$ initialize /queue /start /processor=latsym /retain=error /on=lta901: -
    /default=(noburst, flag=one, notrailer) /record_blocking queue_name
```

NOTE: For further explanation, refer to the DEC manual, *LAT/VMS Management Guide*.

Figure C-1. Sample VMS Print Queue Command File

BLANK

D.1 Overview

This appendix lists all Performance 3000 status and error messages. Status messages are printed for a variety of reasons (for example, when a connection is made) and are displayed on whichever port is appropriate. Error messages (900 series) are displayed on the port defined as the console by the SET SERVER CONSOLE PORT command. All Performance 3000 messages contain an optional error code and a message. For example:

```
Server -701- Command Syntax Error
```

The word "Server" can be changed by the CHANGE SERVER PROMPT command and the error code can be suppressed via the CHANGE PORT MESSAGE CODES command, if you wish. The basic families of error codes are listed below, followed by a detailed list of all error messages and their meanings.

Error Code	Meaning
000-099	Normal responses to user commands
100-199	Warning messages
200-299	Connection error messages
500-599	Server generated informational messages
600-699	Security violation messages
700-799	User error messages
900-999	Server-specific error messages

D.2 000 Series Messages

000 series messages are primarily notifications that a command has been executed.

010 Session *n* connected to *service-name* on node *name*

This is the normal notification that a connection was successful. The node name is included only if it is different from the service name.

011 Session *n* disconnected from *service-name*

This is the normal notification that a disconnect request was successful.

012 *service-name* session *n* resumed

This is the normal notification that a RESUME command was successful.

013 Continuing attempts to connect to *service-name*

This indicates that a connection was unsuccessful but the server is retrying the request. It is usually preceded by a 200 series message explaining why the connection was unsuccessful. Refer to the explanation of the 200 series message for specific troubleshooting suggestions.

014 All sessions disconnected

This is the normal notification that all sessions have been terminated. It follows a DISCONNECT ALL command. Note that all sessions are also disconnected if the port is logged out, but this message is not displayed.

016 Attempting failover to *service-name* on node *name*

This message follows a host failure. It indicates that the server is attempting to reconnect you to the same service on a different node.

020 Logged out port *n*

This is the normal notification that a LOGOUT command was successful.

090 Port characteristic(s) update is assumed

This message follows a SET, DEFINE, or CHANGE command when no object was specified and the object could be either a port or the server (for example, SET BROADCAST). It indicates that the server assumed the command was directed at a port rather than the server.

If this is not what you intended, reissue the command and specify the object (for example, SET SERVER BROADCAST). You might also need to reissue the original SET PORT command if you inadvertently changed a port characteristic.

D.3 100 Series Messages

100 series messages are mostly warning messages that follow a command that was either not executed or not executed fully.

101 *n* other session(s) active

This is the normal notification given when you connect to a service while other sessions are active.

102 No other session(s) active

This message is displayed if you issue a FORWARD or BACKWARD command and you have only one current session. The server then returns you to that session.

111 Port(s) with broadcast disabled not notified

This notifies you that some of the ports specified in a BROADCAST command did not receive the broadcast message because they had their PORT BROADCAST option disabled.

123 Session resume pending -- save buffer not empty

This message is displayed when you resume a session that was previously halted by the host and is still halted. You should exit the session immediately.

The most likely cause for this message is some problem with the remote host. It might have crashed or it might have enabled flow control and never disabled it.

199 System shutdown in *n* minutes

This message is displayed on all logged-in ports when a privileged user executes an INITIALIZE command. The warning is sent every 30 minutes. Five minutes before the shutdown, it is sent every minute.

D.4 200 Series Messages

200 series messages are displayed after either (1) a connection request failed, or (2) a connection was forcibly terminated. These messages are always two lines long. The first line of the message is:

Connection to *service name* not established (or terminated)

The second line states the reason the remote service refused the connection (or terminated it).

201 No response within timeout period

Indicates that the server attempted to connect to the service but the service did not respond. The number of times the server tries to connect to a service before it gives up is defined by the SERVER RETRANSMIT LIMIT option.

The most likely cause of this message is that the host that offers the service is down. Issue the SHOW NODE STATUS command to check the status of remote nodes. Another possibility is that the service was too heavily loaded to respond within the timeout period.

202 Communication protocol error

Indicates that the connection failed because the service did not respond to the connect request properly. The most likely cause is faulty host software. Try reloading the Emulex host software and reinitializing the server. If this does not work, call Emulex Technical Support for further help.

203 Service node retransmission limit exceeded

or
208

Indicates that the connection failed because the service tried repeatedly to transmit data to the server but failed to get a response. The most likely causes are (1) a noisy Ethernet cable, (2) heavy Ethernet traffic, possibly caused by too many multicast or broadcast messages on the network, or (3) the host is too heavily loaded to process replies from the server.

Another possibility is that the server is not responding to the host transmissions. Issue the `SHOW SERVER COUNTERS` command and check the No Buffer value to see if the server has been rejecting messages due to inadequate internal memory.

223 Node user disconnect

This is a host-dependent message. Check your host software documentation for further details.

224 Circuit timer out of range

This message indicates that the server's circuit timer value is not acceptable to the remote service. Check the remote host's operating system documentation and then reset the `SERVER CIRCUIT TIMER` option to an acceptable value.

226 Invalid message or slot received

Indicates that the connection failed because of bad data in a received Ethernet packet. This is probably caused by a failure in the host software or hardware. Try reloading the Emulex host software and reinitializing the server. If this does not work, call Emulex Technical Support for further help.

227 Time limit expired

This is a host-dependent message. Check your host software documentation for further details.

228 No progress being made

This message indicates that the remote service is too heavily loaded to accept the connection. Try again when the service is less busy.

229 Service not offered on requested port

This message is displayed if you request a connection to a specific port on the remote node and the service is not available on that port. You must either (1) issue a `CONNECT` command that specifies the service without specifying a port, or (2) use the `SHOW SERVICE CHARACTERISTICS` command on the target server to find out which ports on the target server offer the service.

230 Object port name not known

This message is displayed if you request a connection to a specific port name on a remote node and no such port name exists. You must either (1) issue a CONNECT command that specifies the service without specifying a port, or (2) find out the correct port name.

231 Invalid password

Indicates that the password you used when you connected to the service is incorrect. Try again with the correct password.

232 Service in use

This message is displayed if the desired service is offered only on certain ports on the remote node and all ports are already in use. Try again later.

233 No such service

This message indicates either (1) a host failure, or (2) the service has been deleted recently. If the service has been nonexistent for more than a few minutes, you will get message number 711 instead.

234 Service disabled

Indicates that connections have been disabled for the service.

235 Requested entry not in queue

Indicates that a remote host tried to delete a nonexistent entry from the server's internal queue.

236 Immediate access rejected

Indicates that the port is available but the device attached to the port is not. This could happen if modem controls are enabled on the port but the port device is not responding to them.

237 Access denied

This is a generic message issued when the host does not have a more specific reason for denying the connection request.

238 Corrupted solicitation request

This message is displayed when a host tries to initiate a connection to a service or port on the server. It usually indicates faulty host software. Try reloading the Emulex host software and reinitializing the server. If this does not work, call Emulex Technical Support for further help.

261 Insufficient node resources

Indicates that the remote service terminated the connection because it became too busy or too heavily loaded. Try reconnecting later.

262 System shutdown in progress

Indicates that the system manager is shutting down the network (or some part of it) and has disabled connections to the desired service.

263 Node user disconnect

This is a host-dependent message. Check your host software documentation for further details.

264 Circuit timer out of range

This message indicates that the server's circuit timer value is not acceptable to the remote service. Check the remote host's operating system documentation and then reset the SERVER CIRCUIT TIMER option to an acceptable value.

265 Invalid service class

This message indicates that you tried to use the SET SESSION command to change your session characteristic (interactive, passall, or passthru) to a value not acceptable to the remote service. Check your host operating system documentation for further details.

266 Invalid message or slot received

Indicates that the connection was terminated because of bad data in a received Ethernet packet. This is probably caused by a failure in the host software or hardware. Try reloading the Emulex host software and reinitializing the server. If this does not work, call Emulex Technical Support for further help.

267 Time limit expired

This is a host-dependent message. Check your host software documentation for further details.

268 No progress being made

This message indicates that the remote service terminated the connection because it was too heavily loaded. Try reconnecting when the service is less busy.

269 Service not offered on requested port

This message is displayed if the service is not available on that port. You must either (1) issue a CONNECT command that specifies the service without specifying a port, or (2) use the SHOW SERVICE CHARACTERISTICS command on the target server to find out which ports on the target server offer the service.

270 Object port name not known

This message is displayed if you request a connection to a specific port name on a remote node and no such port name exists. You must either (1) issue a CONNECT command that specifies the service without specifying a port, or (2) find out the correct port name.

271 Invalid password

Indicates that the password you used when you connected to the service is incorrect. Try again with the correct password.

272 Service in use

This message is displayed if the desired service is offered only on certain ports on the remote node and all ports are already in use. Try again later.

273 No such service

This message indicates either (1) a host failure, or (2) the service has been deleted recently. If the service has been nonexistent for more than a few minutes, you will get message number 711 instead.

274 Service disabled

Indicates that connections have been disabled for the service.

275 Requested entry not in queue

Indicates that a remote host tried to delete a nonexistent entry from the server's internal queue.

276 Immediate access rejected

Indicates that the port is available but the device attached to the port is not. This could happen if modem controls are enabled on the port but the port device is not responding to them.

277 Access denied

This is a generic message issued when the host does not have a more specific reason for denying the connection request.

278 Corrupted solicit request

This message is displayed when a host tries to initiate a connection to a service or port on the server. It usually indicates faulty host software. Try reloading the Emulex host software and reinitializing the server. If this does not work, call Emulex Technical Support for further help.

279 Invalid/unexpected reason code

This message indicates that the connection failed for some reason that the server does not understand.

D.5 500 Series Messages

500 series messages are informational messages that the server displays when a command is executed or a test is finished.

501 From port *n*, *name*

This message is displayed when another port transmits a message to you via the BROADCAST command. The broadcast message follows immediately.

511 Test complete *n* bytes written, *n* errors detected

This message is displayed at the completion of a TEST PORT command if you tested a port other than your own. If the number of errors is not zero, it indicates a hardware problem with the port.

512 Loop test successful

This message is displayed after the successful completion of a TEST LOOP command.

513 Loop test failure - *reason*

This message is displayed after a TEST LOOP command has completed with errors. It indicates a problem with the physical connection between the server and the remote node being tested or with the remote node itself. The following reasons are displayed:

Insufficient buffers

Indicates that the server did not have enough internal buffer space to execute the command. Try again later when the server is less busy.

Timeout

There was no response from the target node.

Data error

The data received from the target node was bad. This is the basic cause of most TEST LOOP failures and usually indicates a problem with the remote node.

Sequence number error

Indicates a bad packet from the target node. This is essentially the same as having corrupted data.

515 Target port not installed or out of service, command aborted

This message is displayed if you issue a command to logged in port that is allowed to be issued only to inactive ports. Log out the port and try again.

542 Last access to privilege status by port *n* on *time/date*

This message is displayed whenever you enter privileged mode if the SERVER SECURITY option is enabled. It tells you who entered privileged mode last so that you can detect unauthorized privileged accesses.

D.6 600 Series Messages

600 series messages warn of potential security violations. They are displayed only if the SERVER SECURITY feature is enabled.

641 **Illegal access attempt by port *n* on *time/date***

Indicates that a user tried to log in to the server but failed to enter the proper password. This message is displayed only if SERVER LOGIN PASSWORD is enabled.

642 **Illegal SET PRIVILEGE attempt by port *n* on *time/date***

Indicates that a user tried to enter privileged mode but failed to enter the proper password.

D.7 700 Series Messages

700 series messages are displayed when a command can not be executed for some reason.

701 Command syntax error

This message is displayed when a command is entered incorrectly. It is used when none of the more specific error messages is applicable.

702 Keyword *nnn* not known, ambiguous, or invalid for port type

Indicates that a word in the command line is either incorrectly spelled or was abbreviated in a way the server does not recognize. This message can also occur if a specified option is not valid for the type of port that is specified in the command; for example, attempting to SET PORT *number* AUTOBAUD ENABLED on a parallel port.

703 Value unknown, invalid for port type, or out of range, *nnn*

Indicates that you specified an unacceptable value for an option (for example, a baud rate of 700). Refer to the command description in Section 5 for a description of the acceptable range of values for the option. This message can also occur if a specified option is not valid for the type of port that is specified in the command; for example, attempting to SET PORT *number* TYPE CENTRONICS on a serial port.

704 Operation requires privileged status

Indicates that you tried to execute a command that is available only to privileged users. You must enter privileged mode and reissue the command.

705 Element not in queue

This message is displayed when you issue the REMOVE QUEUE command for a specific queue entry and the entry does not exist. Use the SHOW QUEUE command to get a current list of all queue entries.

706 Secure operation requires privilege

Indicates that you issued a command that is not available to secure users. You must have a privileged user either disable the SECURE option on your port or execute the command for you.

707 Existing or queued connections prevent operation

This message is displayed when you enter a CLEAR or PURGE SERVICE command while (1) there are sessions currently connected to the service, or (2) connection requests are pending in the server queue. You can forcibly disconnect sessions via the LOGOUT PORT command; queued requests can be deleted via the REMOVE QUEUE command.

709 Service *name* not offered by node *name*

This message is displayed if you request a service on a particular node and the node does not offer the service. Use either the SHOW NODE command to find out what services are offered on the desired node or the SHOW SERVICE *name* STATUS command to find out what nodes offer the desired service.

710 Node *name* not known

This message is displayed if you try to connect to a service on a particular node and the node name does not exist. Possible causes are (1) the node name was spelled incorrectly, or (2) the node name has been changed. Use the SHOW NODE ALL command to get a list of all nodes known to the server.

711 Service *name* not known

This message is similar to message number 710. It is displayed if you try to connect to a service that does not exist. Possible causes are (1) the service name was spelled incorrectly, or (2) the service name has been changed. Use the SHOW SERVICE ALL command to get a list of all services known to the server.

712 No connection established

This message is displayed when you issue a RESUME command and you have no active sessions. You must establish a connection with the CONNECT command.

713 Connection already established

Indicates that you tried to use the CONNECT PORT command on a port that is already connected to a service.

714 Preferred service has not been defined

This message is displayed when you enter a CONNECT command with no service name, but no preferred service has been defined. Use the CHANGE PORT PREFERRED SERVICE command to define a preferred service for your port. You will then be connected to this service whenever you issue a nonspecific CONNECT command.

715 Service *name* not currently available

Indicates that you tried to connect to a service that is too busy to accept new connections. Use the SHOW SERVICE command to check the service's rating. If it is zero, either all available ports are being used or it has reached its maximum user limit.

716 Access to service *name* denied

Indicates that you are not authorized to connect to the desired service. To gain authorization, your port must have at least one group code in common with the service.

To find out the group codes used by the service, issue the SHOW NODE command for the node that offers the service and see which group codes are enabled for the node. Then have a privileged user enable at least one of those group codes for your port via the SET PORT AUTHORIZED GROUPS command and then enable it via the SET PORT GROUPS command.

717 Session *n* not established

Indicates that you tried to RESUME a session number that does not exist. Type SHOW SESSIONS or RESUME ? to get a list of all your current sessions.

718 Port session limit reached

Indicates that you can not open another session because you would exceed the maximum number of active sessions allowed for your port (as defined by the PORT SESSION LIMIT option). You must either disconnect one of your old sessions or have a privileged user increase your session limit.

719 Insufficient resources to complete operation - *keyword*

This message is displayed when the server is unable to execute a command because of internal limitations (for example, the maximum number of sessions has been reached).

Issue the SHOW SERVER STATUS command and check the number of sessions, nodes, and so forth to which the server is currently connected. If any of these numbers is at its maximum, no further connections are accepted. Try the command again later.

721 No dedicated service on port *n*

This message is displayed if you issue a CONNECT PORT command for a port that does not have a dedicated service defined.

722 Connections disabled

Indicates that connections have been disabled via the INITIALIZE DISABLE command. No connections are allowed until the server is reinitialized without the DISABLE option.

724 Service node connection limit reached

Indicates that the server has reached its maximum connection limit. Try again later when the server is less busy.

725 Access to node *name* denied

Indicates that you are not authorized to connect to the desired node. To gain authorization, your port must have at least one group code in common with the node.

To find out the group codes used by the node, issue the SHOW NODE command. Then have a privileged user enable at least one of those group codes for your port via the SET PORT AUTHORIZED GROUPS command and then enable it via the SET PORT GROUPS command.

726 Node *name* not reachable

Indicates that you tried to connect to a node that is unreachable. The most likely cause is a host hardware or software failure. Use the TEST LOOP command to check the physical connection between the server and the node.

728 Parameter cannot be modified with connections established or pending

This message is displayed if you try to modify an option that can not be modified while sessions are active on the server. Refer to the command description in Section 5 for further details.

To get around this, either (1) disconnect all active sessions on the server, or (2) use the DEFINE command and then set the server to reinitialize at a later time.

729 Parameter cannot be modified by a SET or CHANGE command

This message is displayed when you try to modify an option with the SET or CHANGE command that can be modified only with the DEFINE command (for example, DEFINE SERVER SOFTWARE). These options are ones that can not be changed dynamically; they can be set only during server initialization.

Refer to the command description in Section 5 for further details.

734 Invalid operation from a remote console

This message is displayed if you try to issue a DEFINE PORT or CHANGE PORT command from an RCF connection and the command specifies your own port (only SET PORT is allowed). Note, however, that you can use DEFINE PORT or CHANGE PORT to modify *other* ports from an RCF connection.

736 Parameter cannot be modified by a DEFINE or CHANGE command

This message is displayed if you use the DEFINE or CHANGE command on an option that requires the SET command (for example, SET PRIVILEGED). Refer to the command description in Section 5 for further details.

741 Illegal password

Indicates that you entered an unacceptable value when setting a password (for example, after issuing the LOCK command). All passwords must be 1 to 16 ASCII characters.

742 Password verification failed

This message applies to the LOCK and SET PRIVILEGED commands. It indicates that when the server asked you to verify your password, you made a mistake. Try again.

743 Another port already privileged - use OVERRIDE option

This message is displayed if you enter the SET PRIVILEGED command while another port already has privileged status. Use the SET PRIVILEGED OVERRIDE command if you want to transfer privileged status from the other port to yours. Note that this removes privileged status from the original port without warning.

750 Another port has this name

Indicates that the name defined by a SET PORT NAME command is already used by another port. All ports on a single server must be named differently.

751 Requested command is not enabled for your port

Indicates that you tried to execute a command that has not been enabled for the server (for example, LOCK or BROADCAST). If you wish to execute the command, you must get a privileged user to enable it.

771 No current session - please specify a session number

This message is displayed if you issue a DISCONNECT command without a session number and the server has lost track of which session is the current one. Use the SHOW SESSIONS command to get a list of your active sessions and then reissue the DISCONNECT command with a specific session number.

772 Parameter cannot be set, port *n* is active

This message is displayed if you try to modify a port option that can not be modified while the port is logged in. Refer to the command description in Section 5 for further details.

A privileged user can forcibly log out a port with the LOGOUT PORT command and then reenter the command if desired.

774 Server session limit reached - try again later

Indicates that you can not open another session because you would exceed the maximum number of active sessions allowed for the server. You must disconnect one of your old sessions (or someone else's) before you can initiate a new connection.

775 Characteristic can not be updated for multiple ports

This message is displayed when you specify multiple ports for options that must be different for each port (for example, SET PORT NAME).

780 Command or parameter inappropriate for specified port

This message indicates that you tried to set a parameter on a port that does not support it (for example, setting TYPE VT100 on a parallel printer port).

782 Invalid speed

Indicates that you specified an unsupported speed with the SET PORT SPEED command. See the SET PORT command in Section 5 for a list of valid speeds.

789 Syntax error - supply more parameters

Indicates an incomplete command line. Check the description of the command in Section 5 and try again.

790 Specified option is not valid with LIST

Indicates that you specified an option that is not allowed with the LIST command (for example, LIST SESSIONS). Use the SHOW command instead.

793 Specified option is not valid with DEFINE or CHANGE

This message is displayed if you use the DEFINE or CHANGE command on an option that requires the SET command (for example, SET PRIVILEGED). Refer to the command description in Section 5 for further details.

798 There are no items of the requested type to display

This message is displayed if you try to use the SHOW command for an item that does not exist (for example, SHOW PORT ACCESS REMOTE when no ports are defined as ACCESS REMOTE).

D.8 900 Series Messages

900 series messages relate to server-wide status and errors. They are always output on the console port.

901 Performance 3000 (NL1.0) hardware address *ethernet_address*

This message is displayed during server initialization. It indicates that the server is beginning the download process and displays the server's Ethernet address and the revision level of the loader PROMs.

902 Seeking load host for *filename*

Indicates that the server is multicasting a download request for the specified file to all hosts on the network.

903 Loading from host *node_name*

Indicates that the specified node is downloading software to the server. It is followed by a series of dots that shows the progress of the download.

904 Load complete at *hh:mm:ss* on *dd:mm:yyyy*

Indicates that the download was completed successfully. Message 990 normally follows.

910 Ethernet cable possibly open at *xx* ns (*yy* ft thin, *zz* ft thick)

Indicates that the server's TDR test detected a cable break. The distance of the break from the server is listed for both thinwire and thickwire cable, and has a resolution of plus or minus 100 feet.

911 Port *n* out of service

Indicates that the power-up self-test detected a bad port. The other ports can still be used, but the server should be returned for service as soon as possible. Call Emulex Technical Support for further help.

912 Load host timeout

Indicates that the load host stopped the download for more than 30 seconds. This might indicate a host problem or heavy loading on the host. The server automatically retries the download when this happens.

915 Download error - transmission limit exceeded

Indicates that the download transmission failed ten times. The entire download procedure is restarted. The most likely cause of this error is a hardware failure in (1) the host, (2) a transceiver, (3) the Ethernet cable, or (4) the server.

916 Unexpected data in received software, aborting

Indicates that the download software is corrupted. This might mean that you have out-of-date download software that is not compatible with your server. Make sure your software installation is correct and make sure that no other host has a copy of old software that the server might be mistakenly trying to download.

920 Parameter checksum error, default parameters apply to port *n*

Indicates an internal problem that forced the server to reset a port to its factory default settings. The server should be returned for service as soon as possible. Call Emulex Technical Support for further help.

921 Invalid port type error, default parameters applied to port *n*

Indicates an internal problem that forced the server to reset a port to its factory default settings. This message occurs if the user swaps serial and parallel PortPaks around such that when the server boots, it finds a serial PortPak to be set as TYPE CENTRONICS or DATAPRODUCTS, or a parallel PortPak to be set as TYPE SOFTCOPY, HARDCOPY, VT100, or ANSI. The server sets the port to its factory defaults; this will set the port type to whatever matches the PortPak installed.

922 Nonfatal error detected by selftest, code = *nnn*

This message is displayed if the server's power-up self-test detects an error that does not prevent the server from beginning operation. The code at the end of the message is a series of plusses and minuses that indicates which test failed (for example, +++-++ indicates test 4). It is followed by the name of the test that failed (listed below). If you receive this message, you should call Emulex Technical Support for further help.

Front panel LCD error

Indicates a problem with the front panel display. This does not generally prevent the server from performing normally.

Internal interrupt hardware error

Indicates an internal problem with the microprocessor's interrupt hardware.

Internal DMA controller hardware error

Indicates an internal problem with the microprocessor's DMA controller.

Internal I/O processor (AIOP) error

Indicates an internal problem with the server's serial transmission circuitry.

Async I/O port error, port code = *nnn*

Indicates a problem with one or more of the server's serial ports. The code at the end of the message is a series of 6 plusses, minuses, and periods, which corresponds to the server's serial ports: a plus indicates a port is good, a minus indicates a port is bad, and a period indicates the port does not exist. Note that a bad port generally does not prevent you from bringing the server up and using the remaining ports, if you wish.

LAN error, check cables and transceiver

Indicates a possible transceiver or cable problem.

930 Server parameters checksum error, default parameters applied

Indicates a hardware problem that forced the server to reset itself to its factory default settings. The server should be returned for service as soon as possible. Call Emulex Technical Support for further help.

931 Permanent configuration parameters reset to factory defaults due to...

This message is displayed during initialization and indicates that all server option settings are being reset to their factory defaults. There are two possible reasons for this:

...operator request

Indicates that you requested a return to the factory defaults when you powered up the server (by holding down the Next and Last keys on the server front panel). This message is displayed when the reset is started; message 999 is displayed when the reset is finished.

...Internal configuration checksum error

Indicates a possible problem with the server's internal EAROM. Try resetting the server to its factory defaults and trying again. If this message appears more than once, call Emulex Technical Support for further help.

950 Internal error, aborting load, code = *nnn*

Indicates a server hardware error found during initialization. The specific problem is specified by the code at the end of the line.

If this message appears, try resetting the server to its factory defaults (by pressing the Next and Last keys on the front panel as you plug in the server) and reinitializing. If this does not work, report the error code to Emulex Technical Support and ask for further help.

951 No response to load request, will try again in *n* minutes

This message indicates that the server is retrying the download after an initial failure. After three retries, downloads are requested every five minutes and then every 15 minutes. You can restart the load process yourself at any time by pressing any key on the console port or the server's front panel.

The most likely causes of a download failure are (1) a software error, (2) host failure, or (3) transceiver failure.

980 Fatal software error, code = *nnn*

This code indicates a problem with the server's software. If AUTOREINIT is enabled, the server resets itself and reboots. Write down the code number and call Emulex Technical Support for further help.

981 Nonfatal software warning, code = *nnn*

This code indicates a problem with the server's software. Write down the code number and call Emulex Technical Support for further help.

983 Parallel printer (Port *nn*) status: *status* at *time/date*

If the PORT LOGGING option is enabled, this message is displayed whenever the status of a parallel printer port changes. The possible statuses are power off, offline, and paper out.

984 Parallel printer (Port *m*) error: *type* at *time/date*

This message is displayed only if the PORT LOGGING option is enabled. It indicates a hardware problem with a parallel printer port. Check to make sure you are using the proper cable and that the port is configured for the correct printer type (Centronics, DEC/Dataproducts, or IBM PC parallel printer). If the problem persists, call Emulex Technical Support for help.

990 Server version *x.x* initializing - please wait

This message is displayed after the download is completed and the server is building its internal configuration tables.

991 Resetting system configuration

This message is displayed after message 990 if system parameters are being reset (for example, if the server is reset to its factory defaults).

992 Resetting port configuration

This message is displayed after message 990 if any port parameters are being reset.

993 Server ready for logins

This message is displayed after all internal configuration is finished and the server is ready for use.

998 Permanent configuration is not compatible with received software. Reset configuration or abort load (R/A)?

Indicates that your version of the download software is not compatible with the server's internal EAROM (that is, its permanent configuration parameters). You are asked if you wish to reset the server and continue anyway, or abort the load. If you answer "R", all server settings are returned to their factory defaults. If you answer "A", the download is halted.

999 EAROM factory default request complete

This message is displayed if the server was reset to its factory defaults by pressing the Next and Last switches while powering up. It indicates the reset has been completed (see also message 931).

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Active session

Any connected session. A user can have several active sessions at one time. A list of all active sessions is available via the SHOW SESSIONS command.

Alternate speed

A fallback speed for a multispeed modem. A 2400 bps modem, for example, might fall back to 1200 bps if line conditions are bad or if the receiving modem has a top speed of 1200 bps. If a multispeed modem is connected to a port, the PORT ALTERNATE SPEED option should be set to the modem's fallback speed. The Performance 3000 supports multispeed modems only on full-modem ports.

Autobaud

A process whereby a local device sets its asynchronous communications speed (baud) to match the speed of a remote device by examining one or more characters received from the remote device.

On the Performance 3000, if a port is configured for an interactive terminal and autobaud operation, you must press the <return> key two or three times on the terminal connected to the port, in order to log in. The Performance 3000 will then automatically determine the terminal's baud rate based on the <return> characters from the terminal, and set the port's baud rate to match.

AUI

The name given by the IEEE 802.3 standard to the cable (physical interface) between an Ethernet transceiver and a 15-pin Ethernet connector on an Ethernet device (such as the 15-pin connector on the Performance 3000 rear panel). AUI stands for Attachment Unit Interface.

Current session

The session in which a user is currently engaged. If a user is in local mode, his current session is the one he was most recently in. A user has only one current session at a time.

DECnet

A layered software product sold by Digital Equipment Corporation that controls communication between CPUs on a single Ethernet network. DECnet is also used for other purposes (for example, downloading operational software to terminal servers and printer servers).

Download

The process of transferring the server's operational software from a host CPU to the server's internal memory. The server requests a download every time it is powered up or initialized.

EAROM

A type of internal memory that stores data permanently (that is, it is not affected by removing power from the server). When a CHANGE, DEFINE, or PURGE command is used to modify server parameters, the changes are made to the server's EAROM.

EAROM stands for Electrically Alterable Read Only Memory.

ELT

The protocol used by the Performance 3000 to communicate over the Ethernet with DEC host CPUs and other servers. Refer to Appendix C for a discussion of how the protocol works.

ELT stands for Ethernet Local Transport. It is compatible with LAT (Local Area Transport), the protocol used by DEC servers.

Flow Control

A method of stopping and starting the flow of data between host computers and devices that communicate with them.

There are several types of flow control. The most common method is XON/XOFF flow control, in which a device transmits an XOFF character if data is coming in too quickly and an XON character when it is able to accept more data. The transmitting device responds to the XOFF and XON characters by stopping and starting transmission.

Another method is "level" or "EIA" flow control, which uses modem signals to control the flow of data. In this method, a device deasserts a modem signal to stop the data flow and reasserts it when it is able to accept more data.

The type of flow control used by the Performance 3000 is selectable on a port-by-port basis via the SET PORT FLOW CONTROL command.

Group codes

Numbers assigned to nodes offering services. They range from 0 to 255.

Group codes are used to logically segment a network. For example, if some nodes on a network have group codes of 0 and other nodes on the same network have group codes of 1, the two sets of nodes can not communicate with each other. In addition, nodes in one group generally don't even know that nodes in the other group exist.

A device can have more than one group code (in the example above, a device with group codes of 0 and 1 could communicate with the entire network). Refer to Appendix C for a complete discussion of group codes.

Host

A CPU on the network. The word is generally interchangeable with CPU, host CPU, VAX, remote host, etc.

LAT

The protocol used by DEC servers to communicate with DEC host computers.

LAT stands for Local Area Transport. It is compatible with ELT, the protocol used by the Performance 3000.

Load host

A host CPU in a network that contains the download software that the server requests when it is powered up. A network might have one load host or several (for backup in case one of the load hosts is unavailable).

Local mode

The mode in which you can communicate directly with the server and enter server commands. It is indicated by the local mode prompt: `Server>`. You are in local mode when you first log in to the server. When you connect to a service, you are in service mode.

Multicast

A message on the Ethernet that is sent out to several nodes instead of just one. The address used by the message, called a multicast address, is like a master key. Many nodes will respond to the message even though they each have separate Ethernet addresses.

Multicast messages are frequently sent out by Ethernet nodes. For example, most nodes send out periodic multicast messages that tell other network nodes about the services offered by the node. Printer servers such as the Performance 3000 learn about services on the network by monitoring these messages. See Appendix C for further details.

NCP

A DEC utility that allows you to monitor and control nodes on an Ethernet Network. It stands for Network Control Program.

Node

A device directly connected to a network. This includes host CPUs, terminal servers, printer servers, file servers, etc. It does not include devices such as terminals and printers, which are connected to a server rather than directly to the network.

RAM

A type of internal memory that stores data temporarily (that is, the data is lost when power is removed from the server). When a SET command is used to modify server parameters, the changes are made to the server's RAM. The changes are erased when the server is initialized (individual port changes are also erased when the port is logged out).

RAM stands for Random Access Memory.

Rating

The ability of a service to accept connections from users. Ratings range from 0 to 255.

A high rating indicates that a service is not very busy and can easily accept new connections. A low rating indicates that the service is heavily loaded. A rating of zero indicates that the service can not accept any new connection. If you connect to a service that is offered on several nodes, the server generally connects you to the node with the highest rating.

RCF

RCF stands for Remote Console Facility. The Remote Console Facility of the Performance 3000 allows you to log in to the Performance 3000 remotely, from any host on your network that has either VMS V4.5 (or higher) and DECnet up and running, or Ultrix-32 version 3.0 (or higher) up and running. This feature lets you control all the servers on your network from a single central terminal.

Service

A service is anything on a network to which users or host CPUs can connect. A host CPU itself, for example, is a service. Likewise, a printer server port with a printer attached to it is usually defined as a service since host CPUs might want to connect to it.

On printer servers, local services are services offered by the server itself (for example, a printer to which other ports or nodes can connect). A remote service is a service offered by another network node.

Service mode

The mode in which you are connected to a service. You enter this mode from local mode by issuing a CONNECT command. For example, if you connect to a VAX and log in, you are in service mode.

Session

A connection to a service. A user can have several sessions active at a time.

Split speed

Refers to different input and output speeds on a port. All serial ports on the Performance 3000 support split speed via the port options INPUT SPEED and OUTPUT SPEED.

Slot

A field in an Ethernet packet transmitted by the server. Each slot carries information about a single session on the server.

Virtual circuit

A logical connection between the server and a remote node. A single virtual circuit carries data for all sessions between the server and the remote node. Thus, (1) a virtual circuit exists between the server and a node only if there is at least one user connected to the node, and (2) there is never more than one virtual circuit between the server and a single node.

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PERFORMANCE 3000 COMMAND AND OPTION SUMMARY

BACKWARD

BROADCAST PORT *number* "*message*"

CHANGE -- *see SET commands*

CLEAR/PURGE SERVICE *name*
LOCAL

CLS

CONNECT [*service_name* [*NODE name*] [*DESTINATION port*]]

CONNECT PORT *number* [*service_name* [*NODE name*] [*DESTINATION port*]]

CONNECT RCF NODE *name* [*PASSWORD maintenance*] [*TRIGGER [load node]*]
ADDRESS *number*

CRASH 300

CRASH MESSAGE *number*

CRASH ADDRESS *segment:offset*

DEFINE -- *see SET commands*

DISCONNECT [*SESSION*] [*number*
range
ALL]

DISCONNECT PORT *number*

FORWARD

HELP [*command name and options*]

INITIALIZE [SERVER] [DELAY *minutes*] [DISABLE]
[CANCEL]

LIST -- *see SHOW commands*

LOCK

LOGOUT [PORT *number*]

MONITOR -- *see SHOW commands*

PURGE SERVICE -- *see CLEAR SERVICE command*

REMOVE QUEUE ENTRY *number*
 NODE *name*
 SERVICE *name*
 ALL

RESUME [SESSION *number*]

SET HOST -- *see CONNECT command*

SET PRIVILEGED/NOPRIVILEGED [OVERRIDE]

SET/DEFINE/CHANGE [PORT *number*] [*options and modifiers*]

SET/DEFINE/CHANGE SERVER [*options and modifiers*]

SET/DEFINE/CHANGE SERVICE *name* [*options and modifiers*]

SET SESSION INTERACTIVE
PASSALL
PASTHRU

SHOW/MONITOR NODE [*name*] [STATUS
[ALL] [SUMMARY
COUNTERS]

SHOW/MONITOR/LIST PORT [*number*] [CHARACTERISTICS *type*
[ACCESS *type*] [SUMMARY
STATUS
SESSIONS
COUNTERS]

SHOW/MONITOR QUEUE [NODE *name*
PORT *number*
SERVICE *name*
ALL]

SHOW/MONITOR/LIST SERVER [CHARACTERISTICS *type*
STATUS
COUNTERS *type*
ALARMS]

SHOW/MONITOR/LIST SERVICE *name* [STATUS
LOCAL SUMMARY
ALL CHARACTERISTICS]

SHOW/MONITOR SESSIONS [PORT *number*]

SHOW/MONITOR USERS

TEST LOOP *target_address* [HELP *type* ASSISTANT *helper_address*]

TEST PORT [*number*] [COUNT *number*
WIDTH *number*
LOOPBACK *type*]

ZERO [COUNTERS] [NODE *name*
PORT *number*
ALL]

SET/DEFINE/CHANGE PORT OPTIONS

Option	Parameters (defaults in red)
Access	Local, Remote, Dynamic, None
Alternate Speed	None (see Speed for possible settings)
Authorized Groups	0 (range is 0-255)
Autobaud	Enabled, Disabled
Autoconnect	Disabled, Enabled
Autoprompt	Enabled, Disabled
Backward Switch	None (can be any key or control key)
Break	Local, Remote, Disabled
Broadcast	Enabled, Disabled
Character Size	8, 7, 6, 5
DCDlogout	Enabled, Disabled
Dedicated	None (can be any network service)
Dialup	Disabled, Enabled
DSRlogout	Disabled, Enabled
DTRwait	Disabled, Enabled
Errorlogoff	Disabled, Enabled
Flow Control	XON, CTS, DSR, XOFFANY
Forward Switch	None (can be any key or control key)
Groups	All authorized groups (range is 0-255)
Inactivity Logout	Disabled, Enabled
Input Flow Control	Enabled, Disabled
Interrupts	Disabled, Enabled
Local Switch	None (can be any key or control key)
Logging	Disabled, Enabled
Loss Notification	Enabled, Disabled
Message Codes	Enabled, Disabled
Modem Control	Disabled, Enabled
Name	PORT n (can be any 16-character name)
Output Flow Control	Enabled, Disabled
Parity	None, Odd, Even, Space, Mark
Password	Disabled, Enabled
Pause	Disabled, Enabled
Preferred	None (can be any network service)
Ring	Disabled, Enabled
Security	Disabled, Enabled
Session Limit	4 (range is 0-8)
Speed	9600 (possible values are 75, 110, 134, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, 19200, and 38400.)
Type	Serial: Softcopy, VT100, ANSI, Hardcopy Parallel: Centronics, Dataproducts
Username	None (can be any 16-character name)
Verification	Enabled, Disabled

SET/DEFINE/CHANGE SERVER OPTIONS

Option	Parameters (defaults in red)
Announcements	Enabled, Disabled
AUTOreinit	Enabled, Disabled
Broadcast	Enabled, Disabled
Circuit Timer	80 ms (range is 30-200 ms)
Console Port	Lowest numbered port (range is 1-6 or None)
Date	Downloaded date (range is any date)
Dump	Enabled, Disabled
Emulex Options	Enabled/Disabled
Frontpanel	Enabled, Disabled
	<i>"message"</i> , Name, Number, Time
Heartbeat	Disabled, Enabled
Identification	None (can be any 40-character string)
Inactivity Timer	30 minutes (range is 1-120 minutes)
Keepalive Timer	20 seconds (range is 10-180 seconds)
Local Prompt	<i>"Server"</i> (can be any 8-character string)
Lock	Enabled, Disabled
Login Password	ACCESS (can be any 16-character string)
Login Prompt	# (can be any 8-character string)
Maintenance Password	No password (can be any 16-character hexadecimal number)
	30 seconds (range is 10-180 seconds)
Multicast Timer	P3K_ <i>ethernet address</i> (can be any 16-character string)
Name	
Node Limit	125 (range is 1-125)
Number	0 (range is 0-32767)
Password Limit	3 (range is 0-250)
Privileged Password	SYSTEM (can be any 16-character string)
Queue Limit	64 (range is 1-64)
Retransmit Limit	32 (range is 4-120)
Security	Disabled, Enabled
Service Groups	0 (range is 0-255)
Session Limit	48 (range is 0-48)
Software	P3KL00E (can be any 9-character string)
Time	Downloaded time (can be any time)
Welcome	<i>"Welcome to Performance 3000"</i> (can be any 80-character string)



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