DEClaser 3500 Printer

Network Interface Card User's Guide

Digital Equipment Corporation
Maynard, Massachusetts

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Preface

FCC Notice

This equipment has been tested and found to comply with the limits of a Class A digital device, Pursuant to Part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Installing this card in an FCC Level B product results in an FCC Level A Composite System as defined in the FCC Rules and Regulations.

Canadian Department of Communications compliance statement:

This equipment does not exceed Class A limits per radio noise emissions for digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

Avis de conformite aux normes du ministere des Communications du Canada:

Cet equipment ne depasse pas les limites de Classe A d'emission de bruits radioelectriques pour les appareils numerriques tells que perscrites par le Reglement sur le brouillage radioelectrique etabli par le ministere des Communications du Canada. L'exploitation faite en milieu residentiel peut entrainer le brouillage des receptions radio et tele, ce qui obligerait le proprietaire ou l'operateur a prendre les dispositions necessarires pour en eliminer les cause.

The following statements are required in accordance with CISPR-22.

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Dieses ist ein Gert der Funkstrgrenzwertklasse A. In Wohnbereichen knnen bei Betreib dieses Gertes Rundfunkstrungen auftreten, in welchen Fllen der Benutzer frentsprechende Gegenmanahmen verantwortlich ist.

Ceci est un produit de Classe A. Dans un environment domestique, ce produit risque de crer des interfrences radiolectriques, il appartiesdra alors l'utilisateur de prendre les mesures specifiques appropries.

Intended Audience

This book is written for experienced system managers and network administrators. It contains information on how to set up the network option for the DEClaser 3500 Printer in the following environments:

- NetWare
- EtherTalk
- TCP/IP
- LAT

Document Organization

Chapter 1:   Introduction — Describes the DEClaser 3500 Network Interface Card, its benefits, and network requirements.

Chapter 2:   Installing the Network Interface Card — Describes how to physically install the network interface card into your printer. This must be done for all printers in a network.

The following chapters deal with software installation on the various Network Operating Systems. Use only those chapters that apply to your operating systems.

Chapter 3:   NetWare Configuration — Describes how to configure the network interface using Novell NetWare products.

Chapter 4:   EtherTalk Configuration — Describes how to configure the network interface for an EtherTalk environment.

Chapter 5:   TCP/IP Configuration — Describes how to configure the network interface for a TCP/IP environment.

Chapter 6:   LAT Configuration — Describes how to configure the printer to function like a serial printer and how to set up print queues in OpenVMS, Ultrix, and OSF/1.

The rest of the manual deals with the network interface card in operation.

Chapter 7:   Operation and Troubleshooting — Describes how the network interface normally operates and how to diagnose problems.

Appendix A: Specifications — Contains specifications for the cable and the NIC, including the default position of all jumpers.

Conventions

The following terms and conventions are used in this guide:

Term or Convention	Meaning
Note	Notes provide important additional information.
Bold	User entries are shown in bold type.
`Display`	Screen displays are shown in monospaced type.
italics	Files, utilities, and UNIX commands are shown in italic type.
NIC	An abbreviation for "network interface card"

1

Introduction

The DEClaser 3500 Network Interface Card (NIC) is a board that you install in the DEClaser 3500 printer to enable it to become a network device. The NIC has the following features:

- A high-bandwidth I/O connection for the Ethernet interface (10BaseT or 10Base2).

- Support for these protocols or Network Operating Systems (NOS):
    – IPX on Novell NetWare
    – EtherTalk on Macintosh or Digital's DCPS software
    – TCP/IP on UNIX platforms or Microsoft's Windows NT
    – LAT on DEC ULTRIX, DEC OSF/1, or OpenVMS

The card provides automatic switching between protocols and NOS. The network interface card may be set up to interact with any combination of these network services.

Benefits

The network interface card provides these benefits:

- **High performance** – Sends data as fast as the printer can receive it.

- **Print server support** – Supports all defined print server features.

- **Reliability** – Incorporates *Streams*, a UNIX technology, to provide a common interface for error handling and to the operating system and hardware usually handled differently by each NOS.

Contents

Check your carton to make sure it contains:

- DEClaser 3500 Network Interface Card and mounting screws
- This manual
- Three 3.5" diskettes:
  - NetWare Installation Program
  - EtherTalk Installation Program
  - TCP/IP Installation Program
- Digital's PSPrinter driver software for Macintosh

The diskettes may contain a README file containing the latest information about the installation and operation. Check for these files before going any further with installation.

Requirements

The network interface card hardware and software require the following:

Version of Protocol or NOS

- Novell NetWare Version 2.15, 3.1x, or 4.0x
- EtherTalk System 7
- TCP/IP version compatible with DEC ULTRIX 4.3 or 4.4, DEC OSF/1 2.0 or 3.0, Solaris 1.1.3 or 2.3 (SunOS 4.1.3 or 5.3), System V Release 4, HP-UX 9.01, IBM AIX 3.2.5, or SCO UNIX 3.2.
- Digital's LAT protocol, V5.2

Software

- Novell NetWare printing requires NetWare Capture, NPRINT or PCONSOLE (later than 1.0) utilities. The NPmanage utility requires any IBM PC or PC-compatible with 512K bytes of available random access memory (RAM) and one 3.5 inch floppy drive. PC or MS-DOS version 3.3x or later is also required.
- EtherTalk printing requires the Macintosh EtherTalk driver, the Digital PSPrinter driver, and the NPmanage utility.
- LAT printing requires DCPS Version 1.1a or higher on OpenVMS.

Hardware:

- Support for 10 megabit Ethernet networks: either 10Base2 (also known as ThinWire or Thinnet) or 10BaseT (twisted pair) hardware.

2

Installing the Network Interface Card

To perform the installation, you need a Phillips screwdriver. The installation requires about 15 to 30 minutes.

2.1 Preparing the Printer

1. Turn off the printer and remove the power cord.

2. Position the printer so that you can see its back.

3. Press the tabs at the left and right of the panel and drop the panel down.

4. Touch the metal chassis to discharge static electricity.

5. Unscrew the captive screws at the left and right of the assembly.

6. Pull the handle to slide the assembly from the printer. Place the assembly on a flat surface.

7. The NIC must be installed in the option port on the right side. Use the Phillips screw-driver to remove the plate from the option port.
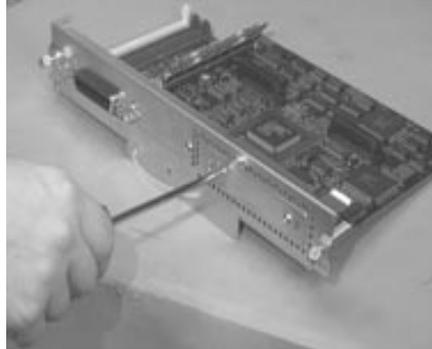
The default operation of the Network Interface Card is to operate EtherTalk, TCP/IP, and NetWare protocols. If you require any or all of these protocols, go to Section 2.3 to install the board.

If you need to use the LAT protocol, you must change the jumpers on the card, as described in Section 2.2.

2.2 Modifying the NIC for the LAT Environment

To enable the LAT protocol, determine which of the following cases meets your requirements:

If you need these protocols...	Do this...
LAT and EtherTalk LAT and NetWare LAT, EtherTalk, and NetWare	Go to Section 2.3 and finish installing the NIC. Then use the NPmanage utility to enable the LAT protocol
LAT only LAT and TCP/IP	Follow the instructions in this section to change the jumpers.

The operation of the network protocols is controlled by Jumpers 8 and 10. You also have the option of disabling the power-up status report, controlled by Jumper 11, but Digital recommends that you keep this option enabled until you are satisfied that the installation and configuration is working properly.

1. Remove the NIC and mounting screws from the shipping bag.

2. Locate Jumpers 8, 10, and 11.
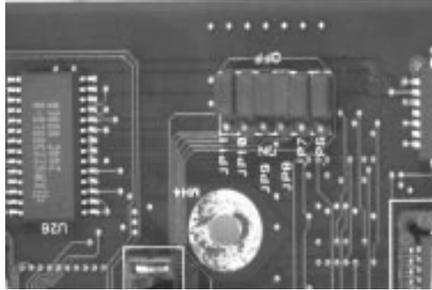
3. To enable the LAT protocol, move Jumper 8 to the ON position.
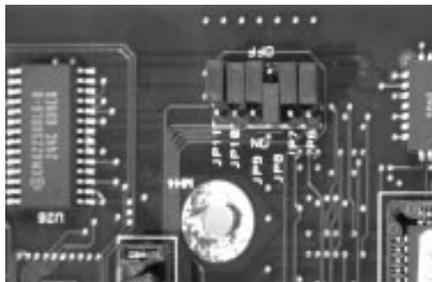
4. To enable the TCP/IP protocol, move Jumper 10 to the ON position.
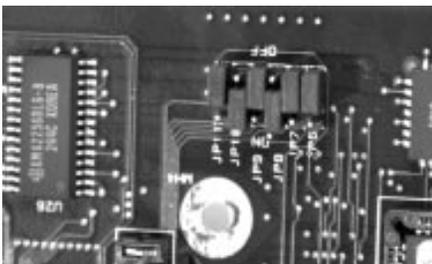
5. If you want to disable the power-on status report, move Jumper 11 to the ON position.
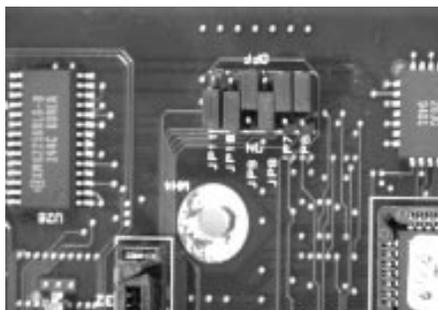
2.3 Installing the NIC Into the Printer

1. Remove the NIC and its mounting screws from the shipping bag, if you have not already done so.

2. Insert the NIC through the option port so that its face plate is on the inside of the port.

3. Align the connector on the NIC with its mate on the assembly's circuit board.
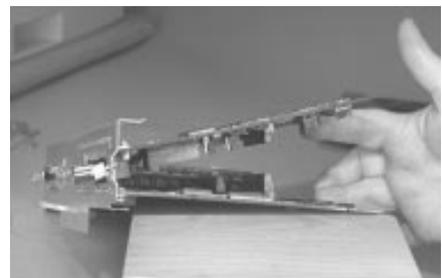
4. Press down on the NIC to insert the connector.
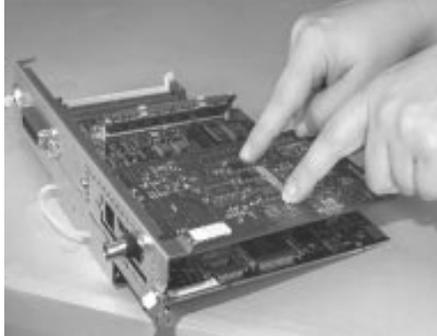
5. Use the screws supplied with the NIC to attach the face plate to the option port.
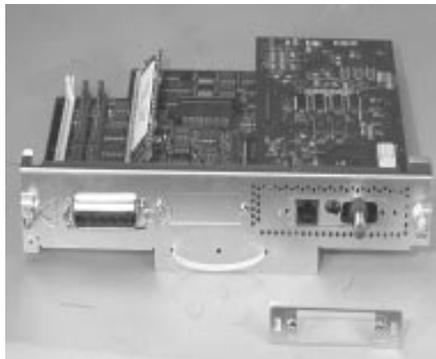
6. Slide the assembly into the printer. Press firmly and evenly on each side of the assembly to seat it.

Installation 2-7

7. Screw in the captive screws.

8. Close the back panel and plug in the power cord.

9. Turn on the power and wait for the printer to warm up. It prints the power-up status report (if you did not disable this option), and then prints the network status report.

10. Check the network status report. Record the serial number and Ethernet address or save the status report. You need this information when you configure the printer for your network.

11. Plug in the network cable.

Go to the appropriate chapter for instructions on configuring the NIC.

3

NetWare Configuration

Use this chapter if you will be printing from a Novell NetWare NOS. This chapter is divided into the following sections:

Configuring NetWare 2.15 and 3.1x describes how to configure the network interface card for use with Versions 2.15 or 3.1x. Use PCONSOLE to set up the print server function.

Configuring NetWare 4.0x describes how to configure the network interface card for use with Version 4.0x. Use PCONSOLE to set up the print server function.

Using the NPmanage Utility describes the Digital's Network Printer Management utility that configures the print server and troubleshoots problems.

Using NetWare Utilities explains how to use Novell NetWare utilities to make changes to the configuration of the Print Server function.

3.1 Configuring NetWare 2.15 and 3.1x

The following steps are the general procedure for configuring the network interface card:

1. Start PCONSOLE and select the file server you want to use.

2. Create the print queues.

3. Specify the network interface card as a print server.

4. Configure the print server and printer.

5. Assign the print queues.

6. Set up the NOTIFY options.

7. Repeat the procedure for other file servers.

When you are finished, turn the printer off and on again. The printer creates a status report that indicates the configuration is successful.

Before you begin:

• Verify that you have supervisor privileges on the file servers on which the network interface card print server is to be entered.

• Verify that your version of PCONSOLE is later than 1.0.

3.1.1 Start PCONSOLE and Select File Server

Follow these steps to start PCONSOLE:

1. Log in to the network, type **PCONSOL,E** and press the Enter key.

2. Choose **Change Current File Server** from the Available Options the menu. A list of file servers is displayed.

3. Select the file server on which you want to install the NIC print server and press Enter. If the name of the file server you want is not displayed, press the Insert key to get a list of file servers.

4. Log in to the file server.

5. Press the Esc key to return to the Available Options menu.

3.1.2 Create Print Queues

The print server must be assigned to at least one print queue on the file server. If the print queue that you want the network interface card to service already exists, and you know the name of this queue, go to Section 3.1.3. If you do not know the name of the queue, or it does not exist, use this procedure:

1. Choose **Print Queue Information** from the Available Options menu, and press Enter. A list of existing queues is displayed.

2. To create a new queue, press Insert. Enter the name of the queue and press Enter. You do not need to enter any more information at this time.

3. Press the Esc key to return to the Available Options menu.

3.1.3 Enter the Print Server Name

A print server takes the print jobs from queues and sends them to a printer. Use this procedure to specify the name of the print server:

1. Choose **Print Server Information** from the Available Options menu, and press Enter. A list of existing print servers is displayed.

2. Press the Insert key. The New Print Server Name box is displayed.

```
┌─────────────────────────────────────────────────────────┐
│  ┌─────────────────────────┐                             │
│  │    Print Servers        │                             │
│  ├─────────────────────────┤                             │
│  │ DEC_180100          ││vailable Options         ││     │
│  │ DEC_180101          │├─────────────────────────┤│     │
│  │ DEC_180109          ││ge Current File Server   ││     │
│  │ DEC_189999          ││t Queue Information      ││     │
│  │ DEC_180099──────────┴─────────────────────────┘│     │
│  │ DEC_18010Z│New Print Server Name: DEC_181354  │ │     │
│  │ DEC_180106└───────────────────────────────────┘ │     │
│  │ DEC_181109          ││                          │     │
│  │ DEC_181327          ││                          │     │
│  │ DEC_180408          ││                          │     │
│  │ DEC_181357          ││                          │     │
│  │ DEC_181Z34          ││                          │     │
│  │▼ DEC_180107         ││                          │     │
│  └─────────────────────┘│                          │     │
└─────────────────────────────────────────────────────────┘
```
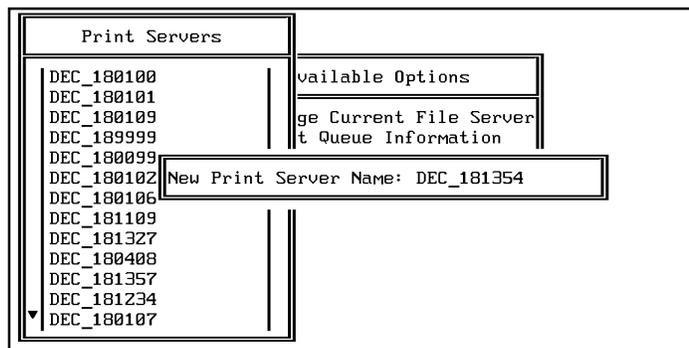
3. Type the name of the print server into the entry box. Unless the name has been changed with the NPmanage program, the print server name is the factory default *DEC_serialnumber* where *serialnumber* is the 6-digit number on the first line of the Status and Configuration report that prints each time you turn the printer on. The screen example shows how to enter the print server name for a NIC with a serial number of 181354.

4. Press Enter to add the NIC print server name to the Print Servers list.

3.1.4   Configure the NIC Print Server

Use the following procedure to configure the Print Server function:

1. Choose the NIC's print server name from the **Print Servers** list and press Enter. The **Print Server Information** menu appears.

2. Choose **Print Server Configuration** from the menu and press Enter.

3. Choose **Printer Configuration** from the menu and press Enter. The **Configured Printers** menu appears. Since this is a new Print Server entry, all printers are labeled "Not Installed".

4. Choose the printer and press Enter. The **Printer 0 Configuration** screen appears with a title of Printer 0, as shown in the example.

```
┌────────┬────────────────────────────────────────┬──────────┐
│     Co │           Printer 0 configuration      │         ═│
├────────┤                                         │ ion      │
│ Not In │Name: DEClaser3500                       │          │
│ Not In │Type: Remote Other/Unknown               │ on Menu  │
│ Not In │                                         │          │
│ Not In │Use interrupts:     Yes                  │ iced     │
│ Not In │IRQ:                7                     │          │
│ Not In │                                         │          │
│ Not In │Buffer size in K:   3                     │ ter      │
│ Not In │                                         │          │
│ Not In │Starting form:      0                    │          │
│ Not In │Queue service mode: Change forms as needed│          │
│ Not In │                                         │          │
│ Not In │Baud rate:                               │          │
│ Not In │Data bits:                               │          │
│ Not In │Stop bits:                               │          │
│ Not In │Parity:                                  │          │
│ Not In │Use X-On/X-Off:                          │          │
└────────┴─────────────────────────────────────────┘          │
```
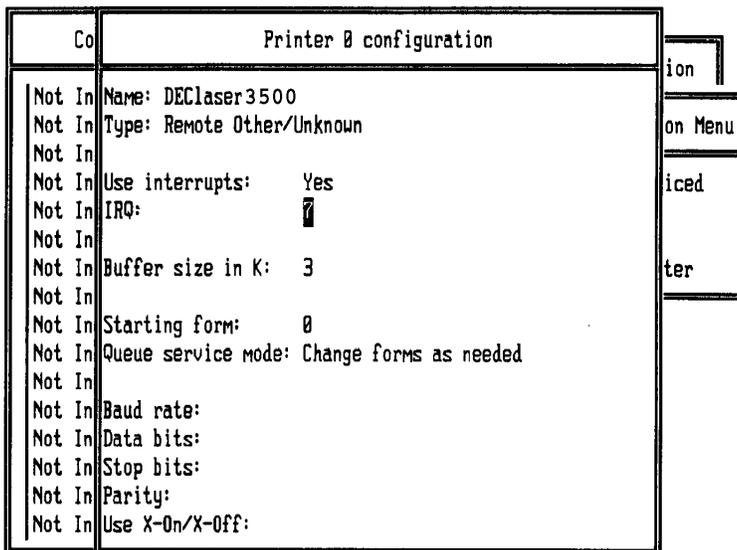
5. If you choose to, change the Name field on this form to something that helps you identify the printer, for example, DEClaser 3500. The print server uses this name in its messages. Select **Name**, enter a name, and then press Enter.

6. Select **Type** and press Enter. A list of printer types is displayed. Choose **Remote Other/Unknown** and press Enter. This causes default entries in the other fields. These defaults are usually optimal so do not change them without specific knowledge of the effects.

7. Press the Esc key. At the prompt, choose to save your changes.

8. Press the Esc key to return to the **Print Server Configuration** menu.

3.1.5 Assign Print Queues to the Printer

When you assign queues to the defined printer, you authorize the NIC print server to service these queues.

Note: Do not assign one queue to two different print servers. If a queue is assigned to multiple print servers, print jobs may not go to the intended printer.

---

1. Choose **Queues Serviced By Printer** from the Print Server Configuration menu.

2. Select the printer name from the list of defined printers.

```
┌──────────────────────────────────────────────────────────────┐
│                              ┌──────────────────────────────┐ │
│                              ║  Print Server Information    ║ │
│   ┌────────────────────────┐ ╟──────────────────────────────╢ │
│   ║     Print Servers      ║ ║ Print Server Configuration Menu │
│   ╟────────────────────────╢ ╟──────────────────────────────╢ │
│   ║ DEC_180100    ║vailable O║                              │ │
│   ║ DEC_180101    ║          ║ File Servers To Be Serviced  │ │
│   ║ DEC_180109    ║ge Current║ Notify List for Printer      │ │
│   ┌────────────────────────┐eue In║ Printer Configuration    │ │
│   ║    Defined Printers    ║rver I║ Queues Serviced by Printer │ │
│   ╟────────────────────────╢─────────────────────────────┘ │
│  │ DEClaser3500          ▒│                                  │
│   ╟────────────────────────╢                                 │
│   ║ DEC_180110    ║                                          │
│   ║ DEC_180111    ║                                          │
│   ║ DEC_180112    ║                                          │
│   ║ DEC_180113    ║                                          │
│  ▼║ DEC_180114    ║                                          │
└──────────────────────────────────────────────────────────────┘
```
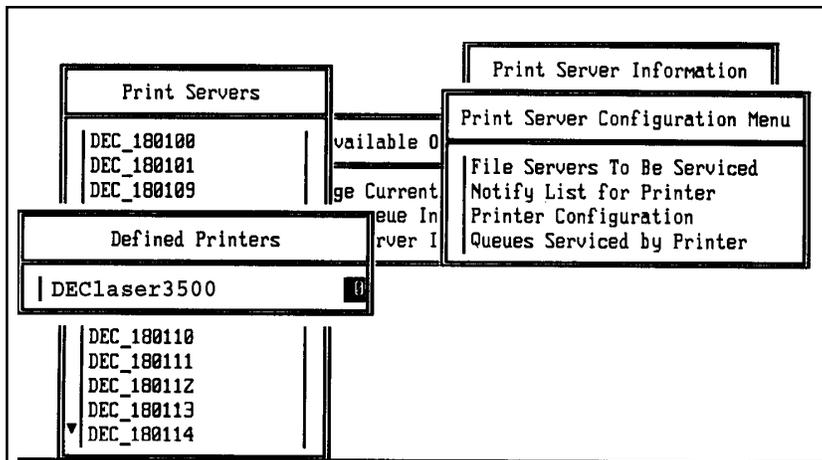
3. Press Insert to display the **Available Queue**s list for the printer.
4. Select the queue you want and then assign a priority level from 1 to 10. Digital recommends that you accept the default priority level. Press Enter. The queue appears on the list for the printer.

```
┌──────────────────────────────────────────────────────────────────────┐
│                              ┌─ Print Server Information ─┐            │
│   ┌──────────────────────┐   │                           │            │
│   ┌──── Available Queues ────┐ ue              Priority│enu           │
│   │ QZ_1                      │                                        │
│   │ QZ_1A                     │                                        │
│   │ QZ_1B                     │                                        │
│   │ QZ_1C                     │                                        │
│   │ QZ_1D        ┌─ Priority: 1 ─────────────┐                         │
│   │ QZ_2         │                           │                         │
│   │ QZ_3         └───────────────────────────┘                         │
│   │ Q0_0                                                               │
│   │ Q0_1                                                               │
│ ▼ │ Q0_2                                                               │
│   └──────────────────────┘                                            │
│   │▼│LJZP_PRINTER      │ │                                            │
└──────────────────────────────────────────────────────────────────────┘
```
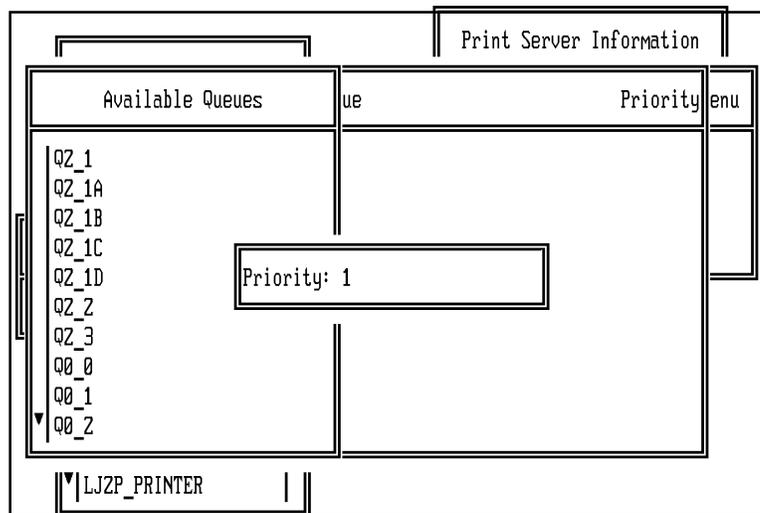
Press the Insert key again to enter additional queues.

5. When you finish assigning queues, press the Esc key and then save your changes. Continue to press the Esc key to return to the Print Server Configuration menu. If you want to set Notify options, go to Section. 3.1.6. If you are finished, continue to press the Esc key and then save your changes.

3.1.6 Set Up Notify Options for the Printer *(Optional)*

To enable the NIC to notify users or user groups if a problem occurs with the
printer, set up the Notify options. The NIC supports the enhanced NOTIFY
options for printers, including informing users when the printer:

- Is off-line, jammed, opened, or out of paper
- Requires a manual paper feed or a form change
- Has had an engine failure

1. Choose **Notify List for Printer** on the Print Server Configuration menu.

2. Select the printer from the **Defined Printers** list. The screen appears (which
   is blank for an initial installation). Press Insert to view a list of **Notify
   Candidates**.

3. Select the user or group from the list.

4. Set the **First** and **Next** intervals in the **Notify Intervals** screen. Digital
   recommends that you use the defaults. The **First** interval is the number of
   seconds the network waits before it notifies candidates about a print job
   problem. The **Next** interval specifies how often in seconds candidates are
   notified. Enter a number for each interval and press Enter.

5. Press the Esc key and then choose **Save Changes**. Press the Esc key at each
   screen until you reach the Print Server Configuration menu. If you have
   finished the configuration, press the Esc key and then save the changes.

```
┌──────────────────────────────┐  ┌─────────────────────────────────┐
│        Notify Candidates     │  ║   Print Server Information     ║
│                              │  ╚═════════════════════════════════╝
│▲ MIKE           (User)       │       Notify Type    First  Next
│  NEW            (Group)      │  ┌─────────────────────────────────┐
│  NLL            (User)       │  │                                 │
│  PAK            (User)       │  │                                 │
│  RICK           (User)       │  │                                 │
│  ROBERT         (User)       │  │                                 │
│  ROSS           (User)       │  │                                 │
│ ▌SUPERVISOR     (User)▐      │  │                                 │
│  SW_ENG         (Group)      │  │                                 │
│  TEST_ENG       (Group)      │  │                                 │
│  TEST_USER      (User)       │  │                                 │
│  WAW            (User)       │  │                                 │
└──────────────────────────────┘  └─────────────────────────────────┘
```

3.1.7   Install the Print Server on Multiple File Servers

The network interface card attaches to file servers that are no more than 4 hops and have no more than 1/4 second propagation delay. For extremely large or complex networks, this allows a bounded search time on startup. If the NIC must attach to file servers beyond this range, the file servers must be entered into the Print Server Configuration of a "primary" file server. The primary file server can be any file server within the 4-hop, 1/4-second propagation time limits.

You must use the same name and password for the print server (or no password) on all file servers. You set the password for the network interface card using the NPmanage program (Section 3.3). If you use a password, specify it on each file server using the **Change Password** option on the Print Server Information menu of the PCONSOLE utility.

To install the print server on more than one file server, perform the procedures described in Sections 3.1.1 through 3.1.6 for each file server. Then use the following procedure:

1. List the file servers to be serviced by the primary file server by selecting **File Server To Be Serviced** option from the **Print Server Configuration Menu**.

2. Press the Insert key to display the **Available File Servers** list.

3. Select the name of each file server to be serviced and press Enter to add it to the **File Servers To Be Serviced** list.

4. When the list is complete, press the Esc key to return to the menu.

5. Install the network interface card on each of the primary file servers.

3.2   Configuring NetWare 4.0x

Novell's NetWare 4.0x has two modes, Directory Services and Bindery Services, that run simultaneously and transparently to each other. The network interface card must be configured to operate with Bindery Services mode to function properly with NetWare 4.0x.

> **Note**: If the network interface card is connected to a NetWare 4.0x server and the Bindery Services mode is not running, the network interface card can not find its file servers, and the status page indicates the Novell NetWare protocol is not active.

3.2.1   Confirm Bindery Context

When you use PCONSOLE, the name of the server is displayed in the upper left corner of the Available Options menu screen. This name must be set in Bindery Service mode, and is called the Bindery Context. Before you configure the network interface card, confirm that the server is defined as the Bindery Context or, if not, set the Bindery Context.

Use the following procedure to confirm the server has a Bindery Context:

1.   Go to the 4.0x server and at the system console prompt, type:

      load install

2.   Select **Maintenace/Selective Install** from the menu.

3.   Select **NCF Files Options** from the menu.

4.   Select **Edit AUTOEXEC.NCF** from the menu.

5.   Search the file for the SET BINDERY CONTEXT command. If the command is not defined, add it.

6.   Press the Esc key repeatedly until the **install** program inquires if you want to exit. Exit the program.

7.   At the console prompt, type the SET BINDERY CONTEXT command as you entered it in the *autoexec.bat* file. The definition in the file takes effect when the server is shut down and then restarted. The command at the console prompt takes effect immediately.

3.2.2　Configure in Bindery Mode

Once you confirm that the server has Bindery Context, use the following procedure to configure the network interface card. If you encounter any errors during the process, log out and log in again.


Note: Use this procedure for Windows NT's NWADMIN.

1.　Log in to the network as ADMIN, if you have not already done so.
2.　Type **PCONSOLE** and press Enter.
3.　At the **Available Options** menu, press the F4 key to change mode.

```
┌─ Available Options ─┐
│ ▌Print Queues▐      │
│  Printers           │
│  Print Drivers      │
│  Quick Setup        │
│  Change Context     │
└─────────────────────┘
```

If you see a message asking you to log in to a server with Bindery connections, the server you are logged into does not have Bindery Mode enabled. Follow the procedure in Section 3.2.1 to add Bindery Services or log in to a server with Bindery Services activated.

4.　Select **Quick Setup** from th**e Available Option**s menu and press Enter. You use Quick Setup to connect your print server, print queue, and printer. You can modify these later, if you need to.

```
                        Print Services Quick Setup

    Print server:          DEC_993434
    New printer:           F1
    New print queue:       Q1

    Banner type:           Text

    Printer type:          Parallel
      Location:            Auto Load (Local)
      Interrupt:           None (polled mode)
      Port:                LPT1




  Specify the print server that will service the new printer and print queue.
  Press <Enter> to list available print servers.
 Enter=Select   F10=Save Changes   F3=Modify   Esc=Exit          F1=Help
```

5. Select **Print Server** and press the F3 key to modify the entry.

6. Enter name of the print server in the **Print server** field and press Enter. Unless the name has been changed with the NPmanage utility, the name is the factory default *DEC_serialnumber* where *serialnumber* is the 6-digit number on the first line of the Status and Configuration report that prints each time you turn the printer on. The screen example shows how to enter the print server name for a NIC with a serial number of 993434.

7 . Press the Esc key to move to the **New printer** field. Enter a name and press Enter.

8. Press the Esc key to move to the **New print queue** field. Enter a name and press Enter.

9. Press the Esc key to move to the **Printer type** field and press Enter. From the list of printer types, select **Other/Unknown** and press Enter.

10. When you are finished, press the F10 key.

Repeat Steps 5 through 10 for each file server that the NIC serves. If you need to view, add, delete or modify print servers or print queues after your initial setup, select either the Print Queues or Print Servers options from the Available Options Screen.

3.3 Using the NPmanage Utility

NPmanage is a PC-based program for managing your DEClaser 3500 printer from a NetWare system. Use NPmanage to do the following:

- Configure the NetWare print server and TCP/IP print server.
- Enable and disable protocols or the Configuration and Status Report.
- Troubleshoot the network interface card.

The NPmanage utility includes a context-sensitive help menu that explains its features.

Digital recommends that you load the program to an area of the file server restricted to users with Supervisor or Administrator privileges. To use the NPmanage utlity, use the following procedure:

1. Copy the NPmanage.* files from the NPmanage diskette into your working area.
2. Type **NPmanage** and press Enter. Then press the F1 key to display help.

3.4 Changing the Configuration

This section explains how to use the PCONSOLE utility to perform the following tasks:

- Attach and select a file server.
- Select or delete queues for the print server.
- Set up the Notify function.

See the *NetWare Print Server Manual* for detailed information on the this utility.

You must have Supervisor rights to perform PCONSOLE operations.

3.4.1   Changing the File Server

You can specify a file server as the current one.

1. Log in to the current file server and start the PCONSOLE utility.

2. Select **Change Current File Server** from the **Available Options** menu. A list of file servers you are attached to displays.

3. Press the Insert key to display the available file servers.

4. Select the file server you want as the current one and press Enter.

5. Enter your user name and press Enter. If the user name requires a password, the **Password** screen is displayed. Enter the password and press Enter.

6. Select **Change Current File Server** from the **Available Options** menu. A list of the attached file servers is displayed.

7. Select the current file server from the **File Server/User Name** screen.

3.4.2   Changing Print Queues

When you print a file, your system sends the file to a print queue, which in turn, sends the job to a specified printer. If a DEClaser print server is servicing queues on multiple file servers, you must assign queues to printers on each file server.

1. Start the PCONSOLE utility.

2. Select **Print Server Information** from the **Available Options** menu.

3. Select the DEClaser print server from the list.

4. Select **Print Server Configuration** from the menu.

5. Select **Queues Serviced by Printer** from the menu.

6. Select a printer from the **Defined Printers** list.

7. Press Insert at the **File Server/Queue/Priority** screen. The **Available Queue**s list appears.

8. Select a queue from the list.

9. Press Enter at the **Priority** screen to leave the priority setting at 1.

The first queue serviced by the print server is 1 and 10 is the last. To change the priority of a queue, press Enter at the **File Server/ Queue/ Priority** screen to display the **Priority** setting screen. Press the back-arrow key to delete the current setting. Type a new number from 1 to 10 and press Enter.

Repeat Steps 7, 8, and 9 to assign additional queues to the printer.

10. Press the Esc key and save all changes.

3.4.3   Removing Queues

1. Start the PCONSOLE utility.

2. Select **Print Server Information** from the **Available Options** menu.

3. Select the DEClaser print server from the list.

4. Select **Print Server Configuration** from the menu.

5. Select **Queues Serviced by Printer** from the menu.

6. Select the printer from the list.

7. Highlight a queue on the **File Server/Queue/Priority** screen.

8. Press the Delete key to remove the queue.

Repeat steps 7 and 8 to delete additional queues.

9. Press the Esc key and save all changes.

3.4.4   How to Set Up NOTIFY

You can specify users or groups of users that are notified if a problem occurs when a print job is sent to the printer. If the print server is servicing queues on multiple file servers, you must set up a NOTIFY list for each file server.

1. Start the PCONSOLE utility.

2. Select **Print Server Information** from the **Available Options** menu.

3. Select the DEClaser print server from the menu.

4. Select **Print Server Configuration** from the menu.

5. Select **Notify List for Printer** from the menu.

6. Select the DEClaser printer from the **Defined Printers** menu.

7. Press the Esc key at the **File Server/Notify Name/Notify Type/ First/Next** screen. The **Notify Candidates** screen appears.

8. Select the user or user group from the **Notify Candidates** screen. The **Notify Intervals** screen displays.

9. Set the **First** and **Next** intervals for notifying users about DEClaser printer problems. The **First** interval is the number of seconds the network waits before it notifies users about a print job problem. The **Next** interval specifies how often in seconds users are notified. Enter a number for each interval and press Enter.

10. Press the Esc key and save all changes.

11. Press the Esc key until you see the prompt to exit PCONSOLE. Select Yes and then press Enter.

4

EtherTalk Configuration

Use this chapter if you will be printing from a Macintosh. This chapter explains how to configure the network interface card using EtherTalk and how to use the NPmanage utility.

Before you begin, check that the Digital PSPrinter driver is installed.

4.1   Choosing the Printer

To choose the printer, use the following procedure:

1.   Select the EtherTalk link for AppleTalk by clicking on the Apple icon in the Macintosh menu bar.

2.   Select **Control Panel**.

3.   Click on **Networks**.

4.   Choose **EtherTalk** as the AppleTalk connection, as shown in the example.
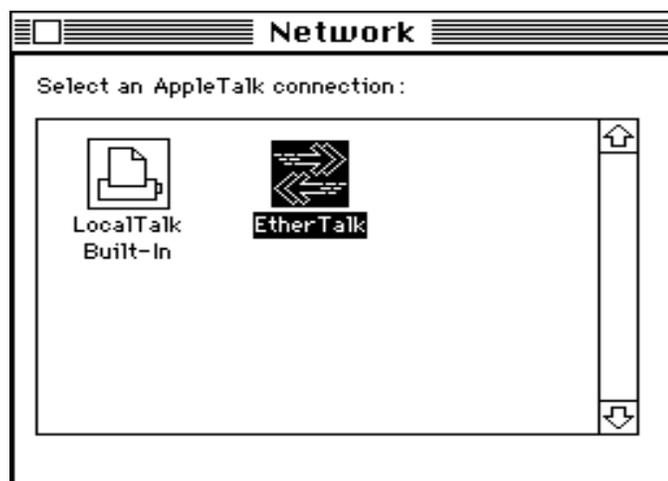
5.   Click on the Apple icon.

6.   Select **Chooser** to display the Chooser screen .

Chooser

Select a PostScript Printer:

LaserWrit...8.1.1mod   LaserWriter v8.2

PDFWriter   PSPrinter

AppleTalk Zones:
MRO Components & Peripherals
MRO MRO2 Marlboro MA
MRO MRO3 Marlboro MA
NWO Oslo LocalTalk
NWO Oslo Norway
NWO Oslo PCI
NYO New York, NY
OFO Burlington MA

Dave G's 3500
DCPS LaserWriter IIg
DEClaser 3500 2
DEClaser 5100
DEClaser 5100 2
DEClaser 5100 3
HP LaserJet 4Si
IVS Printserver 17/600
Joe's ANSI Pro 630
Joe's ColorWriter 1000
Joe's LaserWriter Pro 630

Setup...   Background Printing
○ On ○ Off

AppleTalk   ● Active
○ Inactive
7.4

7. Select the PSPrinter icon from the display panel at the left of the screen.

    The factory default AppleTalk Zone for the DEClaser 3500 printer is the default zone for your particular network segment.

8. From the display panel at the right of the screen, choose the name of the NIC from the list of printers. This name is printed on the Status/Configuration report each time you turn on the printer. The factory default name stored in the card is:

    `DEClaser 3500`

9. Select SETUP. Then select AUTO SETUP.

4.2   Loading the NPmanage Utility

The NPmanage program has the following functions:

- View and modify the names of the printer or printer zone.

- Enable or disable the Status/Configuration report.

- View the error log.

- Enable or disable other protocols and view or modify the TCP/IP address, subnet mask, and default gateway address.

Use the following procedure to get access to NPmanage:

1. Copy the files from the Macintosh NPmanage diskette to a folder.

2. When the DEClaser NPmanage icon displays on the desktop, double-click on it. The Zone and Device screen is displayed.

```
═══════════════ Select a Unit ═══════════════

 Zone:                        Device:
 ┌─────────────────────┬┐    ┌─────────────────────────┬┐
 │ LUG Luxemburg O...   △│    │ DEC_150111               △│
 │ LUO Louisville KY    ▓│    │ DEC_150112               ▓│
 │ LocalTalk Angelo ... ▓│    │ DEClaser 3500 2          ▓│
 │ MKO Merrimack NH     ▓│    │ DEClaser 5100            ▓│
 │ MKO US DESKTOP       ▓│    │ DEClaser 5100 2          ▓│
 │ MRO Components...    ▓│    │ DEClaser 5100 3          ▓│
 │ MRO MR02 Marlb...    ▓│    │ Dave G's 3500            ▓│
 │ MRO MR03 Marlb...    ▓│    │ Super Dev's 5100 ET      ▓│
 │ NWO Oslo LocalTalk   ▓│    │ Tom's HPPS - v2.15/204   ▓│
 │ NWO Oslo Norway      ▽│    │ darrin789012345678901234...▽│
 └─────────────────────┴┘    └─────────────────────────┴┘

      (  Cancel  )                  (( Select  ))
```
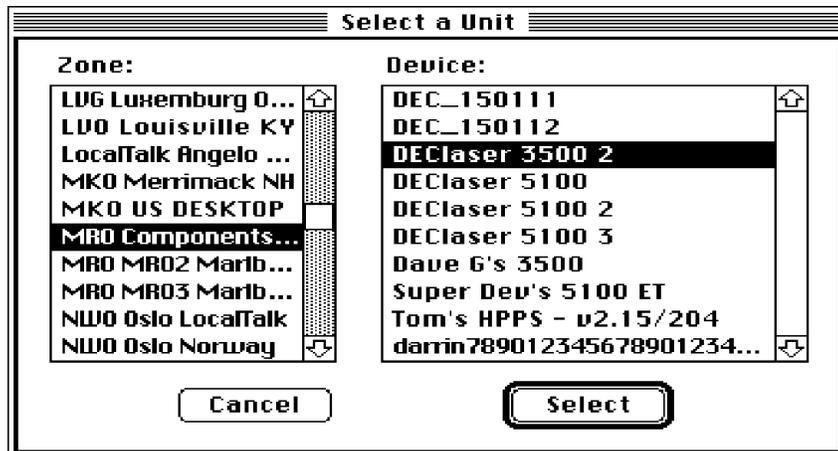
3. For each zone, the Device display panel shows the available network interface cards. If your network has no zones, the screen shows only the Device display panel. Select the name of your network zone.

4. From the Device display panel, select the network interface card.

After you select the device, a menu of options is added to the menu bar at the top of your screen.

4.3　Configuring the Network Interface Card

You use the options added to the menu bar to configure the NIC. The Reset, Printer Setup, and Serial Port options do not apply and cannot be selected.

4.3.1　Configuration

Use the Configuration function to change the names of the device and AppleTalk Zone. However, these changes are stored only in the NIC and are not passed on to the PostScript interpreter. When you choose this function, the following screen is displayed:
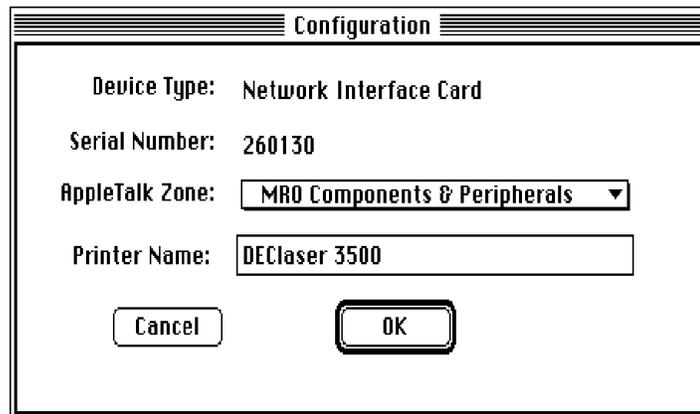
```
╔════════════════════ Configuration ════════════════════╗
║                                                        ║
║        Device Type:   Network Interface Card           ║
║                                                        ║
║      Serial Number:   260130                           ║
║                                                        ║
║      AppleTalk Zone:  ┌─────────────────────────┬──┐   ║
║                       │ MRO Components & Peripherals ▼│ ║
║                                                        ║
║       Printer Name:   ┌────────────────────────────┐  ║
║                       │ DEClaser 3500              │  ║
║                                                        ║
║              ┌────────┐          ┌─────────┐          ║
║              │ Cancel │          │   OK    │          ║
║              └────────┘          └─────────┘          ║
║                                                        ║
╚════════════════════════════════════════════════════════╝
```

1. To change the network interface card device name, click on the name displayed and then enter the new name.

2. To change the AppleTalk Zone, click on the zone displayed. A menu displays all available zones.

3. Select the new zone from the menu.

4. Click on OK when you have finished viewing this screen or when you are done making changes.

5. If you want these changes to take effect immediately, turn off the printer and then turn it on again.

4.3.2   Error Log

The Error Log function is used to view a log of events that the network interface card has registered. The log contains information as well as errors. Digital Customer Support may need the information on this screen if your network interface card encounters problems.

When you choose this function, a screen containing the text of the log is displayed. You can print the error log contents by using the Print option under the File menu. To save the contents of the error log, do one of the following:

• Use the **Save As** option from the File menu to save the entire log file.

• Use the **Edit** option to cut, copy, and paste some or all of the log file.

4.3.3   Protocol Setup

Use the Protocol Setup option to configure network protocols other than AppleTalk. When you select the Protocol Setup function, the following screen is displayed:

> **Note:** The default values for the IP address and Subnet Mask are zeros; the default Gateway address is 255.0.0.0.

1. Click the protocols to On if you want them to be active. Click those protocols that you do not want to use to Off. You can have, at most, three active protocols.

2. Enter the IP address and subnet mask if you have enabled TCP/IP. Enter the default gateway address, if you have one.

3. Click on OK when you have finished using this screen.

4. You must power the printer off and on to make the changes take effect.

4.3.4 Options

Click on Enable Powerup Display to send a status report to the printer each time you power it on, or click on Disable Display to cancel this option. The change takes effect the next time you power on the printer and its NIC.

5

TCP/IP Configuration

Use this chapter if you will be printing from a UNIX system. This chapter explains how to configure the network interface card for use with TCP/IP. After the NIC is configured, it provides standard UNIX printing services so you can use the same filters and commands that you use now. The NIC contains installation software for the following platforms:

DEC ULTRIX RISC Versions 4.3 and 4.4

DEC OSF/1 Versions 2.0 and 3.0

Solaris Versions 1.1.3 (SunOS 4.1.3) and 2.3 (SunOS 5.3)

HP-UX Series 700 and 800 Version 9.01

IBM AIX Version 3.2.5

SCO UNIX Version 3.2

The NIC also contains source code that you can recompile for configuring the card for other System V platforms.

The following general procedure enables TCP/IP printing:

1. Load the NIC software.

2. Configure the IP address.

3. Run the appropriate installation script.

4. Complete the configuration for your operating system.

5. Run the *nsconfig* utility.

5.1   Loading the Software

1. Log in as *superuser* to the system that spools directly to the NIC.

2. Insert the NIC's diskette for TCP/IP in the host drive.

3. Go to or create the directory in which you want to install the software.

> **Note**: If you already have a NIC printer at your site and you are now installing another one, verify that the previous installer deleted the files in the installation directory (not */usr/nic*). If these files remain, they can prevent the installation of a subsequent NIC or, in some cases, overwrite existing files.

4. Use the *tar* command to load the software from the diskette.

5.2   Configuring the IP Address

You can configure the IP address for the card in one of the following ways:

- Use NPmanage for NetWare, as described in Chapter 3.

- Use NPmanage for EtherTalk, as described in Chapter 4.

- Use the Internet Boot Protocol *(bootp)*.

- Use the reverse ARP (*rarp*) capability (Ethernet II frame type only).

- Use a reverse *ping* capability.

For each method, you provide the Ethernet address of the network interface card. The Ethernet address is the 12-character code that you recorded in Chapter 2 and is printed on the configuration status report each time the printer is turned on.

You can use the *bootp, rarp*, or *ping* procedures only when the NIC is in its factory default state. After the NIC has an IP address, you must use the *nsconfig* utility or, for NetWare and EtherTalk, the NPmanage utility to change an IP address.

5.2.1 Using *bootp*

The *bootp* daemon is a native TCP/IP option for configuring the IP address of a
diskless network device. To store the IP address, use the following procedure:

1. Turn off the DEClaser 3500 printer.

2. Log in as *superuser* on a host on the same subnet as the NIC. However, if
    the server resides on another subnet, complete this procedure to store the
    IP address in the NIC, reconnect the NIC anywhere on the network, and
    then use the *nsconfig* utility to change the IP address. See Section 5.5 for
    instructions on using *nsconfig*.

3. Find the Ethernet address of the network interface card. The address is
    printed on the configuration status report each time you turn the printer on.

4. Edit the *hosts* file (usually */etc/hosts*) or use NIS or DIS to add the IP
    address and network interface card's node name. See the network adminis-
    trator for the IP address. For example, a network interface card named
    printfast with an IP address of 192.9.200.200 has the following entry:

    ```
    192.9.200.200  printfast
    ```

5. Stop the *bootp* daemon if it is running.

6. Edit the */etc/bootptab* file and add the following information:
    ```
    nic_host:\
         :ht = hardware type:\
         :ha = ethernet address:\
         :ip = IP address:\
         :sm = subnet mask:\
         :gw = gateway address:
    ```

    For example, for an RFC 1048 system:
    ```
    printfast:\
         :ht = ether:\
         :ha= 0040AF03AF6E:\
         :ip = 192.9.200.200:\
         :sm = 255.0.0.0:\
         :gw =192.9.200.10:
    ```

    The same information uses the following format on an RFC 951 system:
    ```
    host       htype  haddr               iaddr            bootfile
    printfast 1     00:40:af:03:af:6e  192.9.200.200   defaultboot
    ```

7. Start the bootp daemon by typing:
   bootpd -s

8. Check the printer to verify that the network interface card is connected to the network. Turn on the printer.

9. Wait until the printer powers up and finishes initializing to allow enough time for the IP address to become known and to be saved in non-volatile memory. After the printer has powered up fully, turn the printer off.

10. Turn the printer back on again and send a ping command to verify that the NIC obtained its IP address. For example:

    ping 192.9.200.200

    If the NIC has the address, the result is a confirmation message:

    ```
    192.9.200.200 is alive
    ```

11. Remove, or comment out, your changes to the */etc/bootptab* file.

12. Stop the *bootp* daemon and, if you want it to run, restart it.

5.2.2 Using *rarp*

The Reverse Address Resolution Protocol (*rarp*) allows network devices to query a server for their IP addresses on startup. To store the IP address, use the following procedure:

1. Turn off the DEClaser 3500 printer.

2. Log in as *superuser* on the *rarpd* server. However, if the server resides on another subnet, complete this procedure to store the IP address in the NIC, reconnect the NIC anywhere on the network, and then use the *nsconfig* utility to change the IP address. See Section 5.5 for instructions on using *nsconfig*.

3. Find the Ethernet address of the network interface card. The address is printed on the configuration status report when you power on the printer.

4. Edit the *hosts* file (usually */etc/hosts*) or use NIS or DIS to add the IP Address and network interface card's node name. See the network administrator for the IP address. For example, a NIC with the name of *printfast* has the following entry:

   ```
   192.9.200.200  printfast
   ```

5. Edit the */etc/ethers* file or use NIS or DIS to add the Ethernet address. To continue the example, for the *printfast* card with an Ethernet address of 00:40:c8:00:00:ff, make the following entry:

```
0:40:c8:0:0:ff printfast
```

6. If the **rarp** daemon is running, stop it and restart it. Verify that the daemon is running.

7. Check the printer to see that the NIC is connected to the network. Turn on the printer.

8. Wait until the printer powers up and finishes initializing to allow enough time for the IP address to become known and to be saved in non-volatile memory. After the printer has powered up fully, turn the printer off.

9. Turn the printer back on again and send a ping command to verify that the NIC obtained its IP address. For example:

ping 192.9.200.200

If the NIC has the address, the result is a confirmation message:

```
192.9.200.200 is alive
```

10. Remove, or comment out, your changes to the */etc/ethers* file.

11. Stop the *rarp* daemon and, if you want it to run, restart it.

5.2.3 Using *ping*

Use the following procedure to enter the IP Address:

1. Turn off the DEClaser 3500 printer.

2. Log in as *superuser* on a host on the same subnet as the NIC. However, if the server resides on another subnet, complete this procedure to store the IP address in the NIC, reconnect the NIC anywhere on the network, and then use the *nsconfig* utility to change the IP address. See Section 5.5 for instructions on using *nsconfig*.

3. Find the Ethernet address of the network interface card. The address is printed on the configuration status report each time you turn the printer on.

4. Edit the *hosts* file (usually */etc/hosts*) or use NIS or DIS to add the IP address and NIC's node name. See the network administrator for the IP address. For example, a NIC with a name of *printfast* and an IP address of 192.9.200.200 has the following entry:

   ```
   192.9.200.200  printfast
   ```

5. Add an entry to the ***arp*** cache for the NIC's IP address and Ethernet address. For example:

   arp -s 192.9.200.200 0:40:c8:0:0:ff

6. Check the printer to see that the NIC is connected to the network. Turn on the printer.

7. Send a ping command the network interface card to verify it is running on the network. For example:

   ping 192.9.200.200
   ping printfast

   Although the network interface card cannot respond to the *ping* command, it can read its own address from the packets.

8. Turn the printer off and back on again and then send the ping command again to verify that the NIC obtained its IP address. If the NIC has the address, the result is a confirmation message:

   ```
   192.9.200.200 is alive
   ```

9. Remove the entry from the arp cache using the following command. Specify the NIC either by its IP address or by its name. For example:

   arp -d printfast

5.3   Choosing the Type of Installation

For most operating systems, you have the option of using host-resident printing or NIC-resident printing which uses the line printer daemon.

	Host-Resident	NIC-Resident
DEC ULTRIX 4.3 and 4.4	✓	✓
Solaris 1.1.3 (SunOS 4.1.3)		✓
DEC OSF/1 2.0 and 3.0	✓	✓
Solaris 2.3 (SunOS 5.3) System V Release 4	✓	
HP-UX 9.01	✓	
IBM AIX 3.2.5	✓	✓
SCO UNIX 3.2	✓	

Choose a method that is appropriate for your site, based on the following differences:

The host-resident method can report the status of the print queue; the NIC-resident method does not.

The host-resident method can print the user name and file name on its banner page; the NIC-resident method prints a banner page with the host's name.

The host-resident method requires you to repeat the configuration procedure on every host that you want to be able to print jobs. The NIC-resident method requires you to configure the printer one time, when you install the NIC.

After choosing a method, issue one of the following commands:

To perform a host-resident installation: **nicinst**

To perform a NIC-resident installation: **lpdinst**

5.4   Completing the Configuration

Go to the subsection for your operating system and follow the instructions for the type of installation you chose.

5.4.1 DEC ULTRIX and DEC OSF/1

These systems can use host-resident or NIC-resident installation.

NIC-Resident Installation

The **lpdinst** command creates the */usr/nic* directory and copies some files. You
then run the *lprsetup* utility to make changes to the contents of the */etc/printcap*
file.

1. Enter the following command:

    lprsetup

2. Select **add** and press Enter.

3. Enter a name for your printer and press Enter.

4. Press Enter at the prompt to see a list of supported printers.

5. Enter **remote** as the printer type and press Enter.

6. Either press Enter at the prompt to accept the default spooler directory or
    enter the name of your directory and press Enter.

    OSF/1 systems: At this point, the script prompts for an error log. Either
    press Enter at the prompt to accept the default location and file name or
    enter the name of your file location and name and press Enter.

7. Enter the name of the remote system and press Enter.

8. Enter **PORT1** as the name of the printer on the remote system and press
    Enter.

9. Enter **Q** and press Enter. The system displays its print configuration, based
    on your responses. For example:

```
Printer_name
Symbol    Type Value
lp        STR
rm        STR   some_name
rp        STR   PORT1
sd        STR   /usr/spool/some_dir
```

    OSF/1 systems: The list also includes the lf symbol and the file specifica-
    tion for the error log.

10. Either enter **Y** at the prompt to confirm the configuration or press Enter to
    cancel the changes.

11. You have the option of adding some text to further identify the printer. Press Enter.

12. Select **exit** to save the configuration and press Enter.

Go to Section 5.5 for instructions on running the *nsconfig* utility.

Host-Resident Installation

The **nicinst** command creates the */usr/nic* directory and copies some files. It then starts a script that prompts you for information. Your responses change the contents of the */etc/printcap* file.

1. At the prompt, enter the IP node name of the NIC and press Enter.

2. Enter a name for your printer and press Enter.
   The system displays your responses and inquires if you want to accept this configuration, based on your responses.

3. Either enter **Y** at the prompt to confirm the configuration or enter **N** to cancel the changes.
   The system displays a printcap entry based on your responses and inquires if you want to append the entry to the *etc/printcap* file.

4. Either enter **Y** at the prompt to confirm or enter **N** to cancel the change.

The script creates a spool directory in */usr/spool* for your printer.

Repeat the procedure on each system that you want to have access to the printer.

Go to Section 5.5 for instructions on running the *nsconfig* utility.

5.4.2 Solaris 1.1.3 (SunOS 4.1.3)

The **lpdinst** command creates the */usr/nic* directory and copies some files. You then edit the */etc/printcap* file to include the printer and its spooler directory. The printcap entry causes the file to be printed on the printer that contains the NIC.

1. Edit the */etc/printcap* file and locate the entry for your printer at the end of the file.

2. Add the capability codes for remote host and remote printer, **rm** and **rp**, respectively. Specify the NIC as the remote host and PORT1 as the remote printer. For example:

```
your_printername|NICprinter:\
     :lp=:\
     :rm=your_nic:\
     :rp=PORT1:\
     :sd=/usr/spool/your_dir/your_printername:
```

Exit from the file.

3. Create the spooling directory. For example:

mkdir /usr/spool/your_dir/your_dir

Go to Section 5.5 for instructions on running the *nsconfig* utility.

5.4.3 Solaris 2.3 (SunOS 5.3) and SVR4

The **nicinst** command creates the */usr/nic* directory and copies some files. It then starts a script that prompts you for information. After you complete the script, you make the information available to the *lp* utility by editing an interface program, usually a shell script. The default interface file is called *standard*, but you can use an interface file customized for a particular type of printer.

1. Make a copy of the interface file in the directory */usr/nic* for PORT1. For example:

    cp /usr/spool/lp/model/standard /usr/nic/port1_interface

2. Go to the directory */usr/nic* and edit the interface file.

3. Change the shell variable *FILTER* to invoke *nicfilter.* To accomplish this, search for the line FILTER='${LPCAT} 0" and replace it with the following:

    ```
    FILTER="/usr/nic/infilter | /usr/nic/nicfilter
    printer_name printer_port ${nobanner} \
    ${user_name} ${request_id} ${files}"
    ```

    where *printer_name* and *printer_port* are the names specified in the file */etc/hosts*. The remaining arguments are optional and are used to create a banner that includes sender name, job number, and filename. Omit the last four arguments to use the default banner.

    If your interface file does not have the FILTER shell variable defined, you can enclose the entire standard file in parentheses and piping it to *nicfilter*.

4. Use the *lpadmin* command by typing the following commands:

    lpadmin -p printer_name -v /dev/null -i interface_file
    enable printer_name
    accept printer_name

Repeat the procedure on each system that you want to have access to the printer.

Go to Section 5.5 for instructions on running the *nsconfig* utility.

5.4.4 HP-UX

The **nicinst** command creates the */usr/nic* directory and copies some files. It then starts a script that prompts you for information. After you complete the script, you add the information to the *lp* utility.

1. Use the *kill* command to stop the scheduler process.

2. Enter the following commands:

    lpadmin -p printer_name -v/dev/nic/printer_name -mlaserjet
    enable printer_name
    accept printer_name
    where *printer_name* is the name specified during the **nicinst** procedure.
    You can also use the other options for the *lpadmin* command.

3. Restart the scheduler with the following command:

    /usr/lib/lpsched

Repeat the procedure on each system that you want to have access to the printer.

Go to Section 5.5 for instructions on running the *nsconfig* utility.

5.4.5 AIX RISC System/6000

This operating systems can use either host-resident or NIC-resident installation.

The AIX operating system uses the *qdaemon* program and configuration information stored in the */usr/lpd/qconfig* file to handle printing services. The configuration information includes entries for each virtual printer and physical device known to the system.

You configure the NIC in a similar manner to configuring a local printer. The only difference is the physical printer device must be a named pipe used by the NIC's print daemon to route data.

NIC-Resident Installation

The **lpdinst** command creates the */usr/nic* directory and copies some files. Then use the following procedure:

1. Enter the following at the system prompt:

   smit spooler

2. Select **Manage Remote Printer System** from the menu.

3. Select **Client Services** from the menu.

4. Select **Remote Printer Queues** from the menu.

5. Select **Add a remote queue** from the menu. A form to be fill out is displayed, as shown in the example.

Requested Information	Example	Description
NAME of the queue to add	print1	Local print queue
ACTIVATE the queue?	yes	Default
Will this become the default queue?	no	Default
Queueing DISCIPLIN	first come, first served	Job order
ACOUNTING FILE pathname		Optional
DESTINATION HOST for remote jobs	Printfast	NIC node name
SHORT FORM FILTER for queue	usr/lpd/bsdshort	Required
LONG FORM FILTER for queue	usr/lpd/bsdlong	Required
Name of QUEUE on remote printer	PORT1	NIC port name
NAME of device to add	print1	Local device
BACKEND PROGRAM pathname	usr/lpd/rembak	Default

6. Change the values displayed on the screen. You must replace the **short form filter** and **long form filter** values.

7. When you are finished, press Enter.

Go to Section 5.5 for instructions on running the *nsconfig* utility.

Host-Resident Installation

The **nicinst** command creates the */usr/nic* directory and copies some files. It then starts a script that prompts you for information. Your responses change the contents of the */etc/qconfig* file.

1. Shut down *qdaemon* using the command:

    stopsrc -s qdaemon

2. Invoke SMIT with the following command:

    smit spooler

3. Select **Manage Local Printer Subsystem** from the menu.

4. Select **Virtual Printers** from the menu.

5. Select **Add a Virtual Printer** from the menu.

6. At the entry for **printer type**, type **1** and press Enter.

7. At the entry for **device name**, type the name for the printer that you used during the **nicinst** program and press Enter.

8. From the list of printer models, find the model number of your printer. Enter the list number (**not** the model number).

9. At the prompts for header pages and trailer pages, type **Y** to enable these pages or **N** to disable them.

10. Enter the queue name for your printer and the prompt and press Enter.

11. If you want this printer queue to be the default one, type **Y** at the prompt; otherwise, type **N**. Press Enter.

The system displays a message that the printer has been configured.

12. Press Enter and then press Enter again to exit SMIT.

13. Edit the */etc/qconfig* file

14. To search for your printer's name, type:
    /printer_name

    and press Enter. The command locates the following line:

    ```
    printer_name    :      file = /dev/printer_name
    ```

15. Replace */dev* with */dev/nic*

16. Exit from the editor and save the file.

17. Restart the qdaemon process with the following command:

    startsrc -s qdaemon

Repeat the procedure on each system that you want to have access to the printer.

Go to Section 5.5 for instructions on running the *nsconfig* utility.

5.4.6 SCO UNIX

The **nicinst** command creates the */usr/nic* directory and copies some files. It then starts a script that prompts you for information. After you complete the script, you add the information to the *lp* utility.

Enter the following commands:

lpadmin -P printer_name -v /dev/nic/printer_name
enable printer_name
accept printer_name
where *printer_name* is the name specified during the **nicinst** procedure. You can also use the other options for the *lpadmin* command.

Repeat the procedure on each system that you want to have access to the printer.

Go to Section 5.5 for instructions on running the *nsconfig* utility.

5.5 Running NSCONFIG

The *nsconfig* utility sends the *nicprint.conf* file to the NIC to define or update the information stored in the card's NVRAM. Use the following procedure to run *nsconfig*:

1. Edit the file */usr/nic/nicprint.conf*
    The file has two columns of parameters and values separated by a tab character.

2. Change the parameters to your new values. All fields must be filled, even if a parameter does not apply to your NIC. Also, the default gateway IP address must always be on the same subnet as the NIC's IP address.

3. Exit from the editor and save the file.

4. Run *nsconfig* with the NIC's IP address or its name (as entered in */etc/hosts*). For example:

    nsconfig 192.9.200.212
    nsconfig printfast

5. Turn the printer off and then on again.

You are now ready to print.

5.6 After the Configuration

Go to the directory from which you ran the **nicinst** or **lpdinst** procedure and delete the NIC files. If you do not and then install a second NIC, these files might interfere with the configuration.

Whenever you make changes to the configuration information, run the *nsconfig* utility and then turn the printer off and on again.

If you have more than one NIC printer in your network, edit the *nicprint.conf* file each time you use the *nsconfig* utility to specify the particular NIC you intend to modify. Or, make a copy of the *nicprint.conf* file for each NIC printer, giving each copy a unique name. When you use *nsconfig*, copy the unique file to the file name *nicprint.conf*.

6

LAT Configuration

When the network interface card is installed in the DEClaser 3500 printer, the printer acts like a serial printer connected to a DECserver device. Other printing software that works with serial printers connected to DECservers also works with the network interface card.

All LAT parameters in the network interface card are set and cannot be changed. Because the network interface card communicates with the DEClaser 3500 through a high-speed shared memory interface, you do not have to set flow control, baud rate, parity or other serial line parameters.

To set up the network interface card, you need to know the following:

- Ethernet hardware address of the NIC
- NIC's LAT node name
- NIC's LAT port name

Use the following procedure to find the prerequisite information:

1. Use the power-on status report to find out the Ethernet hardware address. The status report prints each time you turn your printer on, unless you have disabled this feature. The Ethernet physical address is also printed on the network interface card itself.

2. Construct the LAT node name from the Ethernet physical address. The LAT node name is the Ethernet physical address, without the hyphens and with the prefix LAT_.

The LAT port name is always PORT_1. Record the information in the following table:

Parameter	Example	Your Value
LAT Node Name	LAT_0040AF271155	
LAT Port Name	PORT_1	PORT_1

Take this information to your system manager. Advise the system manager to treat the DEClaser printer as a serial printer connected to a DECserver. Then go to the section for your operating system to set up the print queues.

6.1   Setting Up OpenVMS Print Queues

Digital recommends using DECprint Supervisor for OpenVMS software when the DEClaser 3500 is used primarily as a PostScript printer. You can also use LATSYM.

For detailed instructions on DECprint Supervisor, see the *DECprint Supervisor for OpenVMS System Manager's Guide*.

For detailed instructions on LATSYM, see the *OpenVMS System Manager's Manual* and the *OpenVMS System Management Utilities Reference Manual.*

Note: You must have OPER and PHY_IO privileges to execute the commands that set up the print queues. If you do not have these privileges, ask your system manager to set up the print queues.

6.1.1. Finding Prerequisite Information

Use the following procedure to obtain the information necessary to set up OpenVMS print queues. Write the results from each step in the table on page 6-3. Perform the following steps for each network interface card you intend to configure.

1. Choose an OpenVMS LAT port name using the form LTA*nnnn* where *nnnn* is a unique number. between 1 and 9999. To avoid potential conflicts, use the convention of numbering ports downward from 9999, because terminal services ports are numbered upward from 1.

    To show the OpenVMS LAT port names already in use, type:

    $ **SHOW DEVICE LTA**

2. Create a queue name using a string of 1 to 31 characters. The character string can include any letters, digits, the dollar sign ($), and the underscore (_), and must include at least one alphabetic character.

To see a list of queue names already in use, type:

$ **SHOW QUEUE/DEVICE=PRINTER**

3. Choose the appropriate printer data type:

   - PostScript (select PostScript if you plan to use DECprint Supervisor)
   - PCL5/5E
   - AutoSelect (automatic selection of the protocol by the printer)

4. Choose the appropriate queue processor for the data type you selected.

   - For PostScript data, select the DCPS symbiont DCPS$SMB.
   - For basic PCL-only data, select LATSYM.

5. Create a description string containing up to 255 characters.

   For example: **Finance Dept**

Use the following table to record your selections:

Parameter	Example	Your Value
NIC's physical address	00-40-AF-27-11-55	
NIC's LAT node name	LAT_0040AF2711	
NIC's port name	PORT_1	PORT_1
OpenVMS LAT port name	LAT9999	
Printer Queue Name	LATPRI	
Printer Protocol	PostScript	
Queue Processor	DCPS$SMB	
Description String	Finance Dept	

6.1.2　Using DECprint Supervisor

To set up the LAT port for the NIC, edit the LAT startup file to add the commands that create a logical port and map it to the NIC's node and port. The file is either LTLOAD.COM or LAT$SYSTARTUP.COM, depending on your system configuration, and is usually located in either the SYS$STARTUP or SYS$MANAGER directory.

You can add the same information to the DCPS$STARTUP.COM file. See the comments in the file for more information.

1. Create the OpenVMS logical port with the following command:

   $ **mcr latcp create port** *port_name/* **nolog/application**

2. Assign the logical port to the NIC's LAT node and port with the command:

   $ **mcr latcp set port** *logical-port-name* **/node=***lat-node-name-* **/port=port_1/queued/application**

   For example:

   $ **mcr latcp set port lta9998/node=lat_0040af271155 -** **/port=port_1/queued/application/nolog**

6.1.3 Using LATSYM

To set up the LAT print queues for the NIC, complete the following tasks:

• Modify the LAT startup file.

• Construct the Reset library.

• Create the queue information.

Also, verify that the system startup file invokes the LAT startup file and that this occurs after DECnet is started.

6.1.3.1 Modifying the LAT Startup File

To set up the LAT port for the NIC, edit the LAT startup file to add the commands that create a logical port and map it to the NIC's node and port. The file is either LTLOAD.COM or LAT$SYSTARTUP.COM, depending on your system configuration, and is usually located in either the SYS$STARTUP or SYS$MANAGER directory.

You can add the same information to the DCPS$STARTUP.COM file. See the comments in the file for more information.

1. Create the OpenVMS logical port with the following command:

   $ **mcr latcp create port** *port_name/* **nolog/application**

2. Assign the logical port to the NIC's LAT node and port with the command:

   $ mcr latcp set port *logical-port-name* **/node=***lat-node-name-* **/port=port_1/queued/application**

   For example:

   $ **mcr latcp set port lta9998/node=lat_0040af271155 - /port=port_1/queued/application/nolog**

6.1.3.2 Constructing the Reset Library

To ensure that each print job begins with the printer in a known state, instruct LATSYM to send a printer reset command between jobs. A device control library containing reset commands for various printer data types is located in the SYS$LIBRARY directory.

This section describes how to construct the DEClaser 3500 reset library. Digital recommends you use an editor such as EDT to create a temporary file containing the commands and then execute the resulting file.

Note: In EDT, you insert special characters as follows:
To insert <ESC>, hold the Ctrl key and press [twice.
To insert <FF>, hold the Ctrl key and press L.

---

1. Enter the editor. For example:

   $ **edit/edt construct_reset_lib.com**

2. Add the following commands to the file.

```
$ LIBRARY/TEXT/CREATE SYS$SYSCOMMON:[SYSLIB]:DEClaser
$ LIBRARY/TEXT/REPLACE SYS$SYSCOMMON:[SYSLIB]:DEClaser -
SYS$INPUT/MODULE=RESET_PCL
$DECK
<ESC>]OpenVMS;2<ESC>\<ESC>P<ESC>E<ESC>\
$EOD
```

3. Exit the editor.

4. To execute the commands, enter the following:

   @construct_reset_lib.com

6.1.3.3 Creating the Queue Information

The startup information for a queue startup is in either a queue startup file or in the system startup file, SYS$MANAGER:SYSTARTUP_V5.COM or SYS$MANAGER:SYSTARTUP_VMS.COM (for OpenVMS 6.0 or higher, and OpenVMS AXP, all versions). This section describes the commands you add to the file.

1. Define a default form for the queue, specifying a form name and form number. One convention for form numbers is to choose the lowest available form number. To display the form numbers already in use, enter:

   $ show/queue form

   To be compatible with a wide range of printers and application software, specify the form as having a width of 80 columns, no bottom margin, and no line truncation.

   For example, if you give your form the name of *DEClaser* and a form number of 2, the command to define the form is:

   $ **define/form DEClaser 2 /width=80 /margin=bottom=0 /stock=default /notruncate/description="DEClaser default"**

2. Set the LAT port to receive no broadcast messages. For example:

   $ **set terminal/nobroadcast/permanent *LTA_port_name***

3. Initialize and start the print queue, as shown in the following example. The INITIALIZE/QUEUE command creates the queue if it does not already exist, associates a name with the queue, and makes other necessary associations, such as the processor, a library for setup and reset modules, a mounted form, a specific reset module, and a port.

    $ **INIT/QUEUE** *queue-name***/START/PROC=LATSYM - /LIB=DEClaser /FORM_MOUNTED=** *form-name* **- /SEPARATE=RESET=** *reset-module* **/ON=***logical-port-name*

    When Reset = none, the Autoselect option is the default.

4. Set the queue description. The SET QUEUE command's /DESCRIPTION qualifier specifies a string of up to 255 characters used to identify information about the queue. For example:

    $ **set queue LATPR1/"Finance Dept**"

5. Set the queue default job separators and form options.

    $ **set queue** *queue-name* **/DEFAULT=(NOFEED,FORM=***name)*

    The SET QUEUE command changes the attributes of a queue. The /DEFAULT qualifier establishes defaults for options of the PRINT command: NOFEED instructs the queue processor not to send a form feed character when the printer reaches the bottom margin of the form and FORM specifies the form to use by default. For example:

    $ **set queue latpr/default=(nofeed,form=DEClaser)**

6. Start the queue with the following command:

    $ **start/queue** *queue_na***me[:]**

    The queue name can now be used in the PRINT command. For example:

    $ **print/queue/latpr1 test_file.txt**

6.2   Setting Up ULTRIX Print Queues

For detailed instructions, see the *ULTRIX Guide to System and Network Setup*. The setup procedure consists of the following tasks:

- Defining LAT terminal lines
- Updating the terminal initialization file (*/etc/ttys*) and printer capability database (*/etc/printcap*) using the *lprsetup* command

---

Note: You must be logged in as a superuser to configure print queues. If you do not have these privileges, see your system manager to set up the print queues.

The *lta* terminal driver provides support for remote terminals (which includes printer terminal lines) using Local Area Transport (LAT) protocol. The LAT protocol allows you to access printers using the network interface card. LAT lines are created in sets of 16, and the ULTRIX software provides a default of 16 LAT lines, called *lta0*. The network interface card uses only one line.

6.2.1   Verifying LAT in Your System Configuration

To display the system configuration file, type the following command:

 # egrep 'LAT|lat|lta'
/usr/sys/conf/vax/*HOSTNAME*

       or

 # egrep 'LAT|lat|lta'
/usr/sys/conf/mips/*HOSTNAME*

where *HOSTNAME* is the name of your system and also the name of the system configuration file. Use the pathname for your type of machine. The system displays the following:

```
options         LAT
pseudo-device       lat
pseudo-device       lta n
```

where *n* represents the number of LAT lines your system has configured. If the command does not result in this output, you must add LAT devices to your system configuration. Refer to the *ULTRIX Guide to System and Network Setup* for information on how to carry out this task.

6.2.2 Setting Up LAT Ports

Use the following procedure to select the LAT terminal line for your printer.

1. Using the following example as a guide, place an lcp entry in the */etc/rc.local* file. The new entry must be after the sendmail section:

    ```
    if [ -f /etc/lcp ]; then
    /etc/lcp -s -h /dev/tty03    >/dev/console
    fi
    ```
    where *ty03* is the selected terminal.

2. To make the changes take effect immediately, enter the following command or reboot the system:

    /etc/lcp -s -h /dev/tty03 ; kill -HUP 1

6.2.3 Adding Printers

If you are not using PATHWORKS for ULTRIX, you can use the *lprsetup* utility to add printers to your system. The *lprsetup* utility is a component of the optional software subset ULTPRINTxxx (for VAX machines) or UDTPRINTxxx (for MIPS machines). If you have not added the optional subset, see the *Guide to System Environment Setup* and the setld(8) reference page for information on adding software subsets.

With information you provide, the *lprsetup* command does the following:

*   Creates an entry for the file */etc/printcap*
*   Creates a spooling directory
*   Creates accounting files
*   Creates error log files
*   Modifies the */etc/ttys* file

The *lprsetup* utility provides default settings based on the type of printer you specify. The following procedure shows how to add the DEClaser 3500 printer as a PostScript printer. For an explanation of the printer parameters, see the *Guide to System and Environment Setup*, and the "printcap(5)" reference page. For sample */etc/printcap* entries, see the */etc/printcap.examples* file.

At any point during the procedure, you can terminate the *lprsetup* utility with no modifications to the system files by pressing (CTRL/C). To get Help, type ? at any prompt.

1. Log in as root or become superuser.
2. Type the following command:

   lprsetup
3. Select the **add** option from the menu.
4. At the prompt, enter the name of the printer.
5. At the prompt for printer type, select **ln03r**

   The *lprsetup* utility uses an internal numbering scheme and assigns the next available number to the printer you are adding. It then assigns the number and *lp_default-number* as printer names.
6. At the prompt for additional synonyms, you have the option of entering alternative names. If you do not want to assign a synonym, press Enter.
7. You are prompted for the values that define the printcap symbols. Accept the defaults or specify appropriate values.

   ```
   Set device pathname 'lp' [/dev/tty03] ?

   Set accounting file 'af' [/usr/adm/lp3acct] ?

   Set spooler directory 'sd' [/usr/spool/lpd3] ?

   Set printer error log file 'lf' [/usr/adm/lp3err] ?
   ```

   At the prompt for printer connection type, do not accept the default. Instead specify the connection as the LAT protocol:

   ```
   Set printer connection type 'ct' [dev] ? lat
   ```

   At the prompt for the terminal server name, enter the NIC's LAT node name (constructed from the Ethernet address).

   ```
   Set terminal server name 'ts' [] ? LAT_0040AF271155
   ```

   At the prompt for the output port, enter the NIC's port name.

   ```
   Set terminal server output port 'op' [] ? PORT_1
   ```

   At the prompt for output service, press Enter with no value.

   ```
   Set terminal server output service 'os' [] ?
   ```
8. The *lprsetup* utility lets you modify other parameters in the printcap entry. It displays all the symbols and prompts you to enter one. Unless you have special requirements, enter **q** at the prompt.

9. The *lprsetup* utility displays the result of your choices and asks you to confirm them:

   ```
   Are these the final values for printer 3 ? [y]
   ```
   If the parameters are correct, enter **y**. If the parameters are not correct, enter `no`. You are then prompted for the name of the incorrect parameter so that you can change it.

10. The lprsetup utility asks if you want to place comments in the printer entry. Enter **Y** to add comments; otherwise, press Enter to complete the procedure.

11. The lprsetup utility confirms that you have configured the printer. If you are finished adding printers, choose the **quit** optiont.

You are ready to print. However, you may need to edit the */etc/ttys* file for the selected device. In the following example, the selected device is */dev/tty03*. The entry in the etc/ttys file is:

```
tty03 "/etc/getty std.9600" network off nomodem #lat terminal
```

6.3 Setting Up OSF/1 Print Queues

For detailed instructions, see the *DEC OSF/1 Guide to System and Network Setup*. The setup procedure consists of the following tasks:

  • Defining LAT terminal lines

  • Updating the terminal initialization file (*/etc/ttys*) and printer capability database (*/etc/printcap*) using the *lprsetup* command

---

   Note: You must be logged in as a superuser to configure print queues. If you do not have these privileges, see your system manager to set up the print queues.

6.3.1 Setting Up LAT Ports

Use the following procedure to assign a terminal device to the printer:

1. Display a list of devices by issuing the following command:

    ls -l /dev/tty[0-9]?

    The command displays the list of devices similar to the following:

    ```
    crw--w-w- 1 root  terminal 5 0 Jun 29 14:42  /dev/tty04
    ```

    The entries with a major number of 5, such as the example, indicate LAT tty devices.

2. Choose a device that is not in use. Check the */etc/inittab* file to verify that the device in not being used. If there are no devices available, use the *latsetup* utility to create one and then continue with this procedure.

3. Use the following command to map the NIC to the device:

    latcp -A -ptty04 -Hnode_name -RPORT_1

    where *tty04* is the LAT device, *node_name* is the NIC's LAT node name, and PORT_1 is the name of the NIC's LAT port.

6.3.2 Adding Printers

Add the printer to your system using the *lprsetup* utility. With information you provide, the lprsetup command does the following:

*   Creates an entry for the */etc/printcap* file
*   Creates a spooling directory
*   Creates accounting files
*   Creates error log files
*   Modifies the */etc/ttys* file

The *lprsetup* utility provides default settings based on the type of printer you specify. The following procedure shows how to add the DEClaser 3500 printer as a PostScript printer.

At any point during the procedure, you can terminate lprsetup with no modifications to the system files by pressing (CTRL/C). To get Help, type ? at any prompt.

1. Log in as root or superuser.

2. Type the following command:

    lprsetup

3. Select the **add** option from the menu.

4. At the prompt, enter the name of the printer.

5. At the prompt for printer type, select **ln05r.**

   The *lprsetup* command uses an internal numbering scheme and assigns the next available number to the printer you are adding. It then assigns the number and lp_*default-number* as printer names.

6. At the prompt for additional synonyms, you have the option of entering alternative names. If you do not want to assign a synonym, press Enter.

7. You are prompted for the values that define the printcap symbols. Accept the defaults or specify appropriate values.

   ```
   Set device pathname 'lp' [/dev/tty04] ?
   ```

   ```
   Do you want to capture print job accounting data
   ([y]|[n])? y
   ```

   You have the option of collecting accounting data. If you choose to do this, entery Y at the prompt and then respond to the following prompt. If you choose not to do this, you do not see the following prompt:

   ```
   Set accounting file 'af' [/usr/adm/lp4acct] ?
   ```

   ```
   Set spooler directory 'sd' [/usr/spool/lpd4] ?
   ```

   ```
   Set printer error log file 'lf' [/usr/adm/lp4err] ?
   ```

   At the prompt for printer connection type, do not accept the default. Instead specify the connection as the LAT protocol. You must use upper-case characters.

   ```
   Set printer connection type 'ct' [dev] ? LAT
   ```

   At the prompt for the terminal server name, enter the NIC's node name.

   ```
   Set terminal server name 'ts' [] ? LAT_0040AF271155
   ```

   At the prompt for the output port, enter the NIC's port name:

   ```
   Set terminal server output port 'op' [] ? PORT_1
   ```

   At the prompt for output service, press Enter with no value:

   ```
   Set terminal server output service 'os' [] ?
   ```

8. The lprsetup utility lets you modify other parameters in the printcap entry. It displays all the symbols and prompts you to enter one. Unless you have special requirements, enter **q** at the prompt.

9. The lprsetup utility displays the result of your choices and asks you to confirm them:

```
Are these the final values for printer 4 ? [y]
```

   If the parameters are correct, enter **Y.** If the parameters are not correct, enter **N**. You are then prompted for the name of the incorrect parameter so that you can change it.

10. The *lprsetup* utility asks if you want to place comments in the printer entry. Enter **Y** to add comments; otherwise, press Enter to complete the procedure.

11. The lprsetup utility confirms that you have configured the printer. If you are finished adding printers, choose the **quit** option.

You are ready to print. Send a print job using the following command:

   lpr -Pprinter_name file

   _____

   To print a PostScript file, the file must begin with the characters %!. Otherwise, the file is translated as ASCII data.

   _____

6.3.3 Editing the System File

After you print a file successfully, make the change you made in Section 6.3.1 permanet so that it is in effect when the system boots. Edit the */sbin/init.d/lat* file and enter the same command you used in step 2 to map the port. Follow the instructions in the file to place the command in the file, as shown in the code example:

```
if [ "$9" = "S" ]
   then  if [ "$8" = "0" ]
   then  #This code is only executed the *first* time the
         #system enters run level 3.  All latcp commands used
         #for customizing LAT (such as adding additional
         #services, changing group codes, changing the multi-
         #cast timer, etc) should follow the 'latcop -r'
         #command below.  As an example, to define a service
         #name other than the node name and add group codes
         #for this service, use the following commands:
         #/usr/sbin/latcp -A -a new_service -i "DEC OSF/1"
         #/usr/sbin/latcp -g52 -a new_service
         #The 'latcp -r' command below will add a default
         #service (and have the same name as the LAT node name,
         #which will default to the system name).  If this
         #service name is not desired, comment out the
         #'latcp -r' command and replace it with the
         #appropriate 'latcp -A -a' command.
         /usr/sbin/latcp -r
         /usr/sbin/latcp -A -ptty04 -HLAT_0040AF15FC60 -RPORT_1
         #The above line is the one that was added
   fi

      #The following line(s) get executed every time
      #'sbin/init.d/lat start' is executed.
   /usr/sbin/latcp -s ; /usr/sbin/latcp -g 77,78,79,80,81 -a
   IAMOSF
   fi ;;
   #
```

7

Operation and Troubleshooting

This chapter describes normal operation of the network interface card in the printer, and also provides information on how to troubleshoot any problems you might have with the network interface card. See the *DEClaser 3500 Printer User's Guide* for information on the normal operational indications when jobs are coming from the network port.

7.1   LED Status Indicator

The network interface card has two LED status indicators: amber and green.
The amber LED indicates job activity; it flashes when a print job is being
communicated to the NIC, and it is off when no activity is occuring.

The green LED indicates the operating condition of the NIC when it is powered
on and during normal operation. The following table provides the conditions
that this LED may indicate.

When the Green LED. . .	And the printer is. . .	Then the NIC. . .	
Is ON solid	First powered on	Is performing self-tests.	**Normal**
	Awaiting print jobs	Is functioning properly.	
Blinks 3 times and stays on	Finished with self-tests	Prints out status report.	
Blinks rapidly	Performing self-tests	Detects bad RAM chip.	**Error**
Blinks rapidly 4 times and then pauses	Performing self-tests	Failed the Ethernet hardware self-test. Check the network.	
Blinks short and then blinks continuously	Performing self-tests	Did not pass the ROM checksum test.	
Blinks slowly	Awaiting print jobs sometime after power-on completes	Cannot communicate with the printer.	
Blinks rapidly	Awaiting print jobs	Has lost its NetWare connection to file server.	
Blinks rapidly 3 times, pauses, and then repeats	Finished with power-on sequence	Has been reset to factory defaults. Power off and move Jumper 6 to OFF.	

7.2 Status Report

The Status/Configuration report is sent as a print job to the printer when the NIC is powered on. The report, shown in the following example, shows the configuration of the NIC immediately before the report is printed. Any changes in configuration made while the printer is on cannot be reported until the next time the power is turned off and on again.

Digital strongly recommends that you review this report immediately after installation and any time the setup has been changed. If the report does not include a protocol that was configured, check that the procedure was done properly.

```
Unit Serial No:  260121                              Version: 01.00 e5 LPD

Network Address:        00:40:af:1f:c0:c8

Network Topology: Ethernet                           Connector:  Thinnet

Network Speed: 10 Mega Bits

Novell Network Information              enabled

     Novell Print Server Name: DEC_260121            Password Defined:   No
     Frame Type: Ethernet II

AppleTalk Network Information           enabled

     Frame  Type:   802.2 SNAP on 802.3
     Protocol Address:  Net Number  189      Node Number 241          Socket Number   129
     Preferred AppleTalk Zone:  Default Zone

TCP/IP Network Information              enabled

     Frame Type:   Unknown FT            Protocol Address:
     Subnet Mask:  255.0.0.0            Default Gateway:  0.0.0.0
DEC LAT Network Information             disabled
-----------------------------------------------------------------------------------------------------------
Novell Connection Information

     Printer Name: Printer 0

          File Server: NW386

               Queue: 3500_NIC              Priority:  1         Attached:  Yes

               No Notify Defined
AppleTalk Connection Information

          AppleTalk Printer Name  :  DEClaser 3500
TCP/IP Connection Information
     Port Number: 10001

DEC LAT inactive
```

7.3   Resetting the NIC to Factory Default

You can reset the NIC to its default values. For example, you can choose to do this when the NIC is moved to a new location where the environment (AppleTalk network zones, NetWare file servers, IP subnets, and so on) is different.

Note: Resetting to factory default means that the NIC loses all data such as names, addresses, and so on.

To reset the network interface card:

1. Power off the printer and remove the network interface card from the printer. The removal process is the reverse of the installation process in Chapter 2.

2. Locate Jumper 6, also shown in step 2 of Section 2.2.

3. Move this jumper to the ON position, so that the jumper covers the center pin and the pin nearest the JP6 designator.

4. Install the network card as shown in Chapter 2, but do not install the mounting screws as instructed.

5. Slide the assembly into the printer, but do not connect the printer to the network.

6. Power on the printer. The network card performs its diagnostic self tests, the green LED blinks 3 times, then pauses, and then repeats the pattern. When you see this pattern ,power off the printer.

7. Remove the assembly from the printer and remove the network card from the assembly.

8. Move Jumper 6 to its OFF position, so that the jumper covers the center pin and the pin nearest the OFF designation.

9. Install the network card according to Chapter 2.

7.4 How to Diagnose Problems

Use the following list to determine the cause of printing problems:

1. Verify that the DEClaser printer is functioning properly.

    • Is the printer plugged in and is the power switch in the ON position? If the printer's control panel is blank, the printer is not on. You may want to try another wall outlet.

    • Is the printer on-line? Verify that the printer is on-line or else nothing will print. The printer's control panel reads ONLINE Idle.

    • Does the control panel display an error message? Review the printer documentation for an explanation of the error messages.

2. Check the NIC's LED status indicator to ensure that there is no error condition. See Section 7.1.

3. Check the status report to confirm that you installed and configured each network protocol. See the appropriate chapter to confirm that you have installed and configured your network protocol correctly for the network interface card. See page 7-3 for an example of the status report.

4. If you added, changed, or removed any new hardware on the network, verify that it was installed correctly.

5. If you added any new software applications, make sure the program is compatible and installed correctly on the network. See your network protocol documentation to confirm.

6. Determine if other users cannot print. If they can't and they are all on the same NOS, go to the troubleshooting section for that NOS.

When you have determined the problem, use the checklists in the next section.

7.5　Troubleshooting Checklists

Use the checklists in this section to identify and solve problems.

7.5.1　Troubleshooting Network Hardware Connections

Be sure that you have set the network interface card for the connector type that you are using. The connector type is listed on the status/configuration report: 10BaseT or Thinnet.

- For Thinnet, check that network connector is plugged into the BNC connector on the network interface card.
- For 10BaseT, check that the network connector is plugged into the RJ connector on the network interface card.
- Try another cable to make sure you do not have a bad cable.

If you are using a 10BaseT concentrator hub that does not support the link signal, use Manual Ethernet Port selection instead of the factory default of Automatic Ethernet Port selection.

To select Manual Ethernet Port Selection, you change Jumper 4 on the network interface card:

1. Use the procedure described in Section 7.3 to remove the network installation card.
2. Locate Jumper 4 and change it from the AU position to the MAN position. In the MAN position, the jumper covers the center pin of JP4 and the pin nearest the MAN designation.
3. Install the network installation card.

7.5.2　Troubleshooting NetWare Protocol

Digital recommends you use NPmanage's Troubleshooting utility. If you have not resolved the problem after running NPmanage, go through the checklists in this section.

7.5.2.1 NetWare Checklist

- Is the print server name entered correctly? The factory-default name is *DEC_serial number*. The serial number is located on the card.

- Did you assign print queues to the DEClaser 3500 printer? Digital recommends you assign the print queues only to the NIC-connected printer. If print queues are assigned to other network printers, the print jobs may be going to the other network printer.

- Did you assign the printer to the type **Remote Other /Unknown**?

  If the PCONSOLE settings are correct, the connection between the printer and network may have been broken. Turn the printer off and, using PCONSOLE, wait for the status message Not Connected. Turn the printer on and the status should change to Waiting for Job.

7.5.2.2 File Server Checklist

- Is there enough disk space on the file server and is it running?

- Is the correct file server associated with the printer? Use PCONSOLE to check this.

- Did you have the proper rights to configure the printer?

- Are the file server and the print server communicating? Run NetWare's COMCHECK utility from any network workstation to check this.

7.5.2.3   Workstation Checklist

• Is the network loaded onto the workstation? See the NetWare documenta-
  tion.

• Is the application set up to print to the printer? For instance, are you using
  the correct driver?

• Is the workstation connected to the correct print queue? Print a file and
  verify that the file goes to the queue.

• Are the print queues assigned to the NIC-connected printer also assigned to
  another network printer? If they are, the print jobs may be going to that
  printer.

• Is AUTO ENDCAP enabled? Auto Endcap lets you send data to a network
  printer. Use PRINTCON to check. If not, enable it.

• Are text files printing but graphics data are not? The printing may be timing
  out. Use NetWare's PRINTCON or CAPTURE to set a longer timeout
  period. For graphics applications, set the time to at least two minutes.

7.5.2.4   NIC Configuration Checklist

If all your hardware connections are correct, check the following:

• Check the status of the print server. Use NPmanage's Troubleshoot Option.
  The Report Print Server Status screen shows the status for the selected
  network interface card. This report includes a status of file servers and
  queues assigned to a printer along with a description of any problems.

• The printer may not be assigned to the correct print queues. Use PCONSOLE
  to direct print jobs to the correct queues, then check to see if the print job is
  in the queue.

• If devices were added or changed, use PCONSOLE to make sure you config-
  ured the new devices correctly.

• Make sure the NIC's name has been entered correctly. If you changed the
  name in NPmanage, you must also change the name in PCONSOLE before
  you can print.

• You cannot use PCONSOLE Version 1.0 to configure the network interface
  card. Contact Novell for an upgrade.

7.5.2.5   Printer Server/File Server/Printer Checklist

Check the following to see if the print server and file server are sending data to the printer:

- If the network interface card can not log into the file server, or can not service jobs from a file server:
    - ✓ The print server is not created on that file server. Use PCONSOLE to create the print server on the correct file server.
    - ✓ The password assigned to the network interface card through PCONSOLE does not match the password assigned through NPmanage. Use NPmanage to update the password stored in the network interface card's memory.
- Use PCONSOLE to check if the print jobs are being sent to the printer. Make sure the print job is in the print queue and waiting to be printed. PCONSOLE must be in Remote printer mode to check this.

7.5.2.6   Workstation to NIC Connection Checklist

To make sure the workstation is communicating with the network interface card, check the following:

- Print a file from the workstation and make sure the print job gets to the print queue using PCONSOLE. If the print job does get to the queue, the problem is not with the workstation/print server connection.
- Use CAPTURE to send data to the printer from a workstation software application. See your NetWare print server manual for information.
- Make sure another printer is not taking the print jobs from the queues BEFORE the network interface card can service the job. To do this, disable the other printer until you can verify the network interface card-connected printer setup.

7.5.2.7   NIC Loses Its File Server Connection

If the network interface card loses its connection to the file server, it can take approximately 5 to 10 minutes to reconnect. If the connection is not made after a reasonable amount of time, check the error conditions to troubleshoot the problem.

7.5.3 Troubleshooting EtherTalk Protocol

- Is the Macintosh computer connected to the network through Ethernet, and, has the Macintosh EtherTalk driver been selected? Go to the Control Panel, then go to Networks to check.
- Did you select the correct network interface card and correct zone?
- Does the PSprinter driver appear in Chooser?
- Is AppleTalk enabled? Use Chooser to check this.
- If you are on a network with multiple zones, is the zone correct?
- Did you select the correct printer in Chooser? You must first select the printer icon and then select the printer name.
- If you renamed the printer in the NPmanage utility, did you reselect the printer under its new name?
- If you placed the printer in a new zone, did you reselect the zone?
- Are other printers with similar names in Chooser? Make sure you chose the NIC-connected printer.

7.5.4 Troubleshootig: TCP/IP Protocol

7.5.4.1 Changing Parameters

You can edit the *nicprint.conf* file to make changes to NIC operating parameters. For example, you might want to change the IP address or subnet mask value.

1. Change the current directory to */usr/nic.*

2. Copy the original *nicprint.conf* file to a safe location for future use.

3. Edit the *nicprint.conf* file with the information you want for your NIC. The contents of a *nicprint.conf* file are shown in this section.

Be careful in editing this file; if the parameter requires a Y or N value, you must supply exactly an uppercase, single character Y or N (not y, or YES, n, or no). The following entries can be modified:

> Internet-Address
>
> Netmask
>
> Default-Router-IP
>
> Novell-Protocol
>
> Apple-Protocol
>
> Banners-on/off

Note: You must ensure that no more than three protocols are active at a time in the NIC. For instance, if LAT is also active, you must turn off either AppleTalk, or NetWare, or both. Otherwise, the NIC cannot accept the configuration.

```
####################################################################
####################################################################
###                                                              ###
### This file contains the configurable parameters to be used when  ###
### initiating a communication with the N.I.C.                   ###
### This file can be altered manually.  Remember to leave a tab  ###
### between the description and the parameter.                   ###
###                                                              ###
####################################################################
####################################################################
#Description                    Parameter
Internet-Address               0.0.0.0
 Netmask                       255.0.0.0
 Forwarding                    N
 Trailers                      N
 Base-Port-Number             10000
 Keepalive                     Y
 Max-Transmission-Unit         1500
 Broadcast                     0
 SNMP-System-Description       Network printer
 SNMP-System-ID               1.3.6.1.4.1.24
 Ethernet                      Y
 Default-Router-IP            0.0.0.0
 Serial-Direction             out
 Serial-Baud-Rate             19200
 Serial-Data-Bits             8
 Serial-Stop-Bits             1
 Serial-Parity                None
 Serial-Ready/Busy            enabled
 Serial-XOn/XOff              Enabled
 Novell-Protocol              Y
 Apple-Protocol               Y
 Banners-on/off               OFF
 Parallel-port1-data-format   PCL PS OTHER
 Parallel-port2-data-format   UNUSED
 Parallel-port3-data-format   UNUSED
 serial-port-data-format      UNUSED
```

7.5.4.2 Error Messages from the nsconfig Utility

The *nsconfig* command uses the *nicprint.conf* file. Errors of this type cause the command to quit.

Message: "usage: [-?] [-h] <internet address."

This string is printed if the command line options are missing or invalid. Type in the correct command line options.

Message: "Unable to open file."

nicprint.conf file/directory permission not granted, file missing, or corrupted. Verify permissions and status of *nicprint.conf*.

Message: "Invalid IP Address!"

An invalid IP address was supplied. Supply the correct IP address for *nicprint.conf*.

Message: "Reading in Internet Address from configuration file. Ensure that the parameter is in the format A.B.C.D where A, B, C, and D are all numerical values between and inclusive of 0-255.

An invalid IP address was supplied. Supply the correct IP address.

Message: "Reading in Netmask from configuration file. Ensure that the parameter is one of the following: FF.0.0.0 or FF.FF.0.0 or FF.FF.FF.0."

An invalid Netmask (subnet mask) parameter was supplied. Supply the correct Netmask value for *nicprint.conf*.

Message: "Reading in Forwarding from configuration fil.e Ensure that the parameter is one of the following : Y or y or N or N."

An invalid Forwarding parameter was supplied. Use the correct Forwarding value in *nicprint.conf*.

Message: "Reading in Trailers from configuration file. Ensure that the parameter is one of the following: Y or y or N or n."

An invalid Trailers parameter was supplied. Supply the correct value in *nicprint.conf*.

Message: "Reading in Base Port Number from configuration file. Ensure that the parameter contains only numerical [0-9] values in its entry."

An invalid Base Port Number parameter was supplied. Supply the correct Base Port Number for *nicprint.conf*. Digital recommends that you do not change the default parameter.

Message: "Reading in Keepalive from configuration file. Ensure that the parameter is one of the following : Y or y or N or n."

An invalid Keepalive parameter was supplied. Supply the correct value.

Message: "Reading in Max. Transmission Unit from configuration file. Ensure that the parameter contains only numerical [0-9] values in its entry."

An invalid Max. Transmission Unit parameter was supplied. Type only numerical values for *nicprint.conf*.

Message: "Reading in Broadcast from configuration file. Ensure that the parameter is one of the following: 1 or 0."

An invalid Broadcast parameter was supplied. Type only 1 or 0 in *nicprint.conf*.

Message: "Reading in SNMP System Description from configuration file. Ensure that the parameter has less than 80 characters (including white space)."

An invalid SNMP System Description parameter was supplied. Type less than 80 characters (including spaces) for *nicprint.connf*. Digital recommends hat you do not change the default parameter.

Message: "Reading in SNMP System ID from configuration file. Ensure that the parameter is in the format: XX.XX.XX.XX."

An invalid SNMP System ID parameter was supplied. Supply the correct format of SNMP System ID for *nicprint.conf*. Digital recommends that you do not change the default parameter.

Message: "Reading in Ethernet from configuration file. Ensure that the parameter is one of the following: Y or y or N or n.

An invalid Ethernet parameter was supplied. Type only Y or N (upper or lowercase is accepted).

Message "Can't connect with the server."

This error message has two possible causes:

- The NIC's IP address has changed but the entry in the *arp* cache has not been updated. Delete the entry in the *arp* cache and then run nsconfig.

- A connection was aborted without closing the channel. When you start a new session, you get this message because the channel is still busy. Turn the printer off and then on again to deallocate the channel.

Message: "Nsconfig: Couldn't write Subnet Mask to socket."

This error message has four possible causes:

- Broken or unplugged cable. Inspect cable and plug in or replace.

- The NIC is either hung, has crashed, or is slow. Reset the card.

- Packets are being corrupted by an intervening node (between the network interface card and the workstation). Check for any failing intervening hosts.

- An attempt to communicate with the NIC is unsuccessful because TCP/IP has been disabled or TCP/IP on the NIC has crashed but other installed protocols are up and running.

  Take the following steps:

  1. Ensure that the NIC is actually running TCP/IP.
  2. Ping to determine if the NIC can be reached via IP.
  3. Determine if other NIC protocols are working.
  4. Reset the NIC.

Message: "Nsconfig: Couldn't read Acknowledgment from socket."

The handshake from the NIC was never received. Supply the correct Netmask value, FF.0.0.0 or FF.FF.0.0 or FF.FF.FF0, for *nicprint.conf*.

Message: "Nsconfig: Error on server end."

The receiver handshake was not acknowledged. Supply the correct Netmask value, FF.0.0.0 or FF.FF.0.0 or FF.FF.FF0, for *nicprint.conf*.

Message: "Nsconfig: Error reading Acknowledgment from server."

The host cannot accept the server handshake, that is, the host received a response from the NIC but the value is unexpected.

7.5.4.3 Subnet Mask Errors

The following errors are caused by the entry of an invalid Netmask (subnet mask). Supply the correct Netmask value, FF.0.0.0 or FF.FF.0.0 or FF.FF.FF0.

"Nsconfig: Couldn't write Forward Broadcast to socket."

"Nsconfig: Couldn't write Trailers to socket."

"Nsconfig: Couldn't write Base Port Number to socket."

"Nsconfig: Couldn't write Keepalive to socket."

"Nsconfig: Couldn't write Max. Transmission Unit to socket."

"Nsconfig: Couldn't write Broadcast to socket."

"Nsconfig: Couldn't write System Description to socket."

"Nsconfig: Couldn't write System Object ID to socket."

A

Specifications

A.1   Network Interface Card

.

Specification	Description
Size	9.7 cm x 16.6 cm x 1.9 cm 3 7/8 in x 6 5/8 in x 3/4 in
Weight	567 grams 20 ounces
Environment	0 to 50 degrees C 32 to 122 degrees F 5% to 8% humidity
Controls and Indicators	1 green LED 1 amber LED
Power	5 VDC at 750 MA
Configuration	Stored in nonvolatile memory
Connectors	BNC, RJ45
Setup Jumpers JP3: Connector JP4: Connector Selection JP5: Threshold Level JP6: Reset to Default JP7 to 10: Protocol Selection JP11: Status Report	Defaults: 10BaseT (10BT) Automatic (AU) Transmit (TX) OFF OFF OFF

A.2   10BaseT Cable Specifications

Use the following considerations when choosing your 10BaseT cables to connect to the RJ45 connector on the DEClaser 3500 Network Interface Card:

- Use only twisted pair cable with at least two twists per foot or six twists per meter.
- When making the twisted pair connections, keep conductor pairs together. Do not form a pair by taking a conductor from one pair and twisting it with a conductor of another pair. Use the following diagram to make a correct twisted pair connection.

Pair Number	Pin Number	Color	Description
2	1	white/orange	Data Transmit (Hub Receive)
2	2	orange/white	
3	3	white/green	
1	4	white/blue	Not used
1	5	blue/white	Not used
3	6	green/white	Data Receive (Hub Transmit)
4	7	white/brown	Not used
4	8	brown/white	Not used

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