

***The Xerox
DocuPrint 4512/4512N
Network Interface Card***

User Guide

Xerox Corporation
701 South Aviation Blvd.
El Segundo, CA
90245
USA

Xerox Canada, Limited
5650 Yonge Street
North York, Ontario
Canada
M2M 4G7

Americas Operations Support
800 Long Ridge Road
Stamford, CT
06904-1600
USA

Rank Xerox, Limited
Parkway
Marlow
Buckinghamshire
SL7 1YL
United Kingdom

Copyright © 1995, 1996 Xerox Corporation. All Rights Reserved.

Copyright protection claimed includes all forms of matters of copyrightable materials and information now allowed by statutory or judicial law or hereinafter granted, including without limitation, material generated from the software programs which are displayed on the screen such as styles, templates, icons, screen displays, looks, etc.

XEROX®, The Document Company®, the stylized X, DocuPrint, 4512 and Ethernet are trademarks of Xerox Corporation or its subsidiaries.

PostScript® is a trademarks of Adobe Systems Incorporated.

AppleTalk is a trademark of Apple Computer Inc.

HP, HP UNIX and LaserJet are trademarks of Hewlett Packard Company.

JETXPrint 1000 is a trademark of DPI, Inc.

Microsoft, Windows and Windows NT are trademarks of Microsoft Corporation.

Novell, NetWare and UNIX are trademarks of Novell, Inc.

IBM, PC and Token Ring are trademarks of International Business Machines Corporation.

SCO UNIX is a trademark of The Santa Cruz Operation, Inc.

SUN and Solaris are trademarks of SUN Microsystems, Inc.

ULTRIX is a trademark of Digital Equipment Corporation.

NIManage is a trademark of Digital Products, Inc.

All other product names are trademarks/tradenames of their respective owners.

PCL and *PCL 5e* are trademarks of Hewlett-Packard Company. This printer contains an emulation of the Hewlett-Packard *PCL 5e* command language, recognizes HP *PCL 5e* commands, and processes these commands in a manner comparable with Hewlett-Packard LaserJet printer products.

Notice

Specifications described in this publication are subject to change without notice. Use of some features may be limited by your hardware or software configuration. Contact your dealer, Xerox, or Rank Xerox for details.

Table of Contents

Chapter 1	Introduction	1-1
	Overview	1-2
	What's in Your Package	1-3
	Requirements	1-4
Chapter 2	Installing the Network Interface Card	2-1
	Preparing the Printer	2-2
	Powering Up the Printer	2-3
Chapter 3	NetWare Configuration	3-1
	Overview	3-3
	Configuring NetWare 2.15 and 3.1x	3-4
	Configuring NetWare 4.0x — Bindery Emulation	3-13
	Configuring the NIC in NetWare Directory Services	3-17
	Configuration	3-19
	Using the NIManage Utility	3-28
	Using the Novell PCONSOLE Utility	3-33

Chapter 4	<i>EtherTalk Configuration</i>	4-1
	Overview	4-2
	Choosing the Printer	4-3
	Loading the NIManage for AppleTalk Program	4-5
	Configuring the NIC	4-7
Chapter 5	<i>TCPIIP Configuration</i>	5-1
	Overview	5-2
	Installation in a Windows Environment	5-3
	UNIX Printing	5-17
	Running TELNET	5-47
Chapter 6	<i>Operation and Troubleshooting</i>	6-1
	Overview	6-2
	LED Status Indicator	6-3
	Status Report	6-4
	Resetting the NIC to Factory Default	6-6
	How to Diagnose Problems	6-7
	Troubleshooting Checklists	6-9
Appendix A	<i>Jumper Settings</i>	A-1
	Overview	A-2
	Print Server Board and Jumper Locations	A-3
	Ethernet Jumpers	A-4
	Reset to Factory Default	A-7
	Address Select	A-7
	BUS Handshake	A-7
Appendix B	<i>Specifications</i>	B-1
	Network Interface Card	B-2
Appendix C	<i>NIC MIB Definition</i>	C-1
Appendix D	<i>Environmental Specifications</i>	D-1



Chapter 1

Introduction

<i>Overview</i>	1-2
<i>What's in Your Package</i>	1-3
<i>Requirements</i>	1-4

Overview

The Network Interface Card is a Network Interface Controller that you install into compatible printers to provide Ethernet network connectivity. The Network Interface Card has the following features:

- Automatic selection of 10Base2 (Thinnet) or 10BaseT Ethernet connection
- Fully transparent EtherTalk printing support for the Macintosh, including support for bindery printing
- Novell NetWare PSERVER on both bindery based and Novell Directory Services (DNS)
- lpd/lpr over TCP/IP for UNIX platforms, Microsoft's Windows NT, and Windows 95
- Raw sockets support over selectable TCP/IP port with filters for selected UNIX environments
- IP and IPX SNMP support of MIB-2 and DPI proprietary NIC MIB
- SNMP support of standard MIB and proprietary printer MIB's on compatible printers
- Flash memory to allow field upgrades (an OTP version is also available)

What's in Your Package

The package contains the following:

- Network Interface Card
- This manual
- Three 3 1/2" diskettes which contain the following:
 - – NetWare NIManage for Windows Utility Diskette
 - – EtherTalk NIManage for Macintosh Utility Diskette
 - – TCP/IP Utility Diskette

The NetWare diskette also contains the ASN.1 coded SNMP MIB for the Network Interface Card (NIC). This MIB can be loaded into a standard SNMP console to provide SNMP access to all NIC parameters. The MIB is included in this manual as *NIC MIB Definition, NIC MIB Definition*.

DOS formatted versions of the BOOTP Lite program for Windows (to assist entering IP parameters in a Windows environment) are also included on the NetWare NIManage diskette.

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.

Instructions and software to perform flash downloads are provided with any update or upgrade package and are not included in this manual.

Requirements

The Network Interface Card hardware and software require the following:

Table 1.1 Print Server requirements

Version of Protocol or NOS	Novell NetWare Version 2.15, 3.1x, or 4.0x
	Macintosh System 7
	UNIX, Windows, or LAN Server systems supporting LPR over TCP/IP
	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 2 for DPI TCP/IP port 10001
Software	Novell NetWare printing requires NetWare Capture, NPRINT or PCONSOLE (later than 1.0) utilities.
	The NIManage for Windows utility requires Windows 3.1 or later; Windows for Workgroups 3.11; or Windows NT 3.5 or later.
	EtherTalk printing requires printer PPD appropriate to the printer. NIManage for Macintosh is provided for setup and maintenance.
	TCP/IP setup and maintenance requires Telnet.
Hardware	Support for 10 megabit Ethernet networks: either 10Base2 (also known as ThinWire or Thinnet) or 10BaseT (twisted pair) cables and hardware.
	3 1/2" diskette drive on the workstation to accept Windows, Macintosh or UNIX utilities.



Chapter 2

Installing the Network Interface Card

<i>Preparing the Printer</i>	2-2
<i>Powering Up the Printer</i>	2-3

Preparing the Printer

If the printer can generate a test or status page, you should generate one before you begin.

1. Make sure that the printer is operating properly. Check to see that paper is in the paper tray and toner cartridge is full. If the printer handles multiple printer languages, make sure it is set up for automatic emulation sensing or PCL or ASCII mode.
2. Turn off the printer and remove the power cord.
3. Install the Network Interface Card in the option port, according to the printer manufacturer instructions.



Note

Handling Precautions for Static Sensitive Devices:

The Network Interface Card is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment.

Powering Up the Printer

Use the following procedures to power up the printer:

1. Plug in the power cord.
2. Turn on the power and wait for the printer to warm up.
The printer may print out a status or start-up page (if this option is not disabled). The Network Interface Card then provides a print job to the printer which contains the Network Interface Card status information. Refer to *"Status Report"* (page 6-4) for more information.
3. Check the Network Interface Card status report. Record the serial number and the Ethernet address or save the status report. You need this information when you configure the printer for your network.
4. Power down the printer.
5. Connect the Ethernet cable between the Network Interface Card and a network drop.

Go to one or more of the appropriate chapters for instructions on configuring the network for the Network Interface Card.



Chapter 3

NetWare Configuration

Overview	3-3
Configuring NetWare 2.15 and 3.1x	3-4
<i>Start PCONSOLE and Select File Server</i>	3-5
<i>Create Print Queues</i>	3-5
<i>Enter the Print Server Name</i>	3-6
<i>Configure the Print Server</i>	3-7
<i>Assign Print Queues to the Printer</i>	3-8
<i>Set Up Notify Options for the Printer (Optional)</i>	3-9
<i>Install the Print Server on Multiple File Servers</i>	3-11
<i>Installing the Printer on Multiple File Servers</i>	3-11
<i>Primary File Server</i>	3-12
Configuring NetWare 4.0x — Bindery Emulation	3-13
<i>Confirm Bindery Context</i>	3-13
<i>Configure in Bindery Mode with PCONSOLE</i>	3-14
Configuring the NIC in NetWare Directory Services	3-17

Configuration	3-19
Configure Printer in NIManage	3-19
Configure Printer in NWADMIN	3-20
Assign Printer Object	3-23
Assign Print Server Object	3-25
Check Assignments	3-26
Power Cycle the Printer	3-27
Using the NIManage Utility	3-28
Installing NIManage	3-28
Hints to Running NIManage	3-29
Using the Novell PCONSOLE Utility	3-33
Changing the File Server	3-33
Changing Print Queues	3-34
How to Set Up Notify	3-35

Overview

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 (NIC) for use with Versions 2.15 or 3.1x. Use PCONSOLE to set up the print server function.
- **Configuring NetWare 4.0x in Bindery Emulation** describes how to configure the NIC for use with Version 4.0x — Bindery Services. Use PCONSOLE to set up the print server function.
- **Configuring the NIC in NetWare Directory Services** describes how to configure the NIC for use with Version 4.0x Directory Services. Use NWADMIN to set up the print server function.
- **Using the NIManage Utility** describes the NIC management utility that configures the print server and troubleshoots problems.
- **Using NetWare Utilities** explains how to use standard Novell NetWare utilities to make changes to the configuration of the Print Server function.

Configuring NetWare 2.15 and 3.1x

Before configuring the NIC for NetWare, you must determine if the NIC has its desired name. If you want to change the name, use NIManage to change the name. Refer to *“Using the NIManage Utility”* (page 3-28) for more details.

The following steps are the general procedure for configuring the NIC. You must have supervisor privileges to do this configuration. These steps are covered in detail in the following paragraphs:

1. Start PCONSOLE and select the file server you want to use.
2. Create the print queues.
3. Specify the *<print server>* 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 file servers to which the unit is attached and the queues which it services.

Before you begin:

- Verify that you have supervisor privileges on the file servers on which the NIC print server is to be entered.
- Verify that your version of PCONSOLE is later than 1.0.

Start PCONSOLE and Select File Server

Follow these steps to start PCONSOLE:

1. Log in to the network, type **PCONSOLE** and press **ENTER**.
2. Choose **Change Current File Server** from the **Available Options** menu. A list of file servers is displayed.
3. Select the file server on which you want to install the print server and press **ENTER**. If the name of the file server you want is not displayed, press the **INS** 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.

Create Print Queues

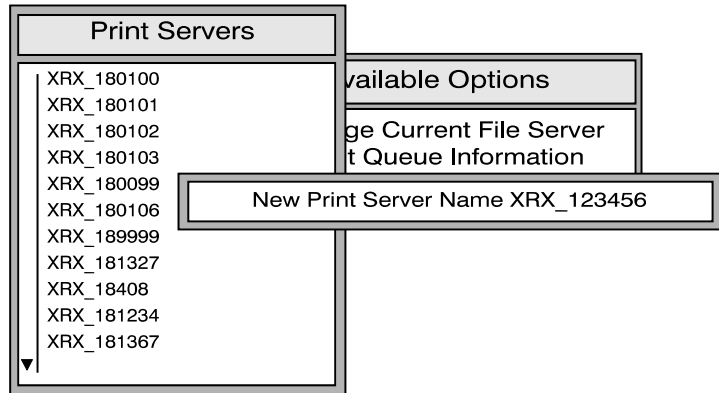
The print server must be assigned to at least one print queue on the file server.

- If the print queue that you want the *<print server>* card to service already exists, and you know the name of this queue, go to "Enter the Print Server Name" (page 3-6).
- If you do not know the name of the queue, or it does not exist, use the following 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 **INS**. 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.

Enter the Print Server Name

A print server takes the print jobs from queues and sends them to the 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 **INS** key. The New Print Server Name box is displayed.
3. Type the name of the print server into the entry box. The Novell print server name is printed under Novell NetWare information on the Print Server status sheet. Note, if desired, this name can be changed using NIManage. The screen example shows how to enter the print server name for a print server with a serial number of XRX_123456.
4. Press **ENTER** to add the print server name to the Print Servers list.

Configure the Print Server

Use the following procedures to configure the Print Server's function:

1. Choose the 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 following example.

Co	Printer 0 configuration
Not In	Name: Printer_0
Not In	Type: Remote Other/Unknown
Not In	
Not In	Use interrupts: Yes
Not In	IRQ: 7
Not In	
Not In	Buffer size in K: 3
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 default in the Name field on this form to something that helps you identify the printer, for example, LASER_PRINTER. The print server uses this name in its message back to the users on the Notify list. 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 creates 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.

Assign Print Queues to the Printer

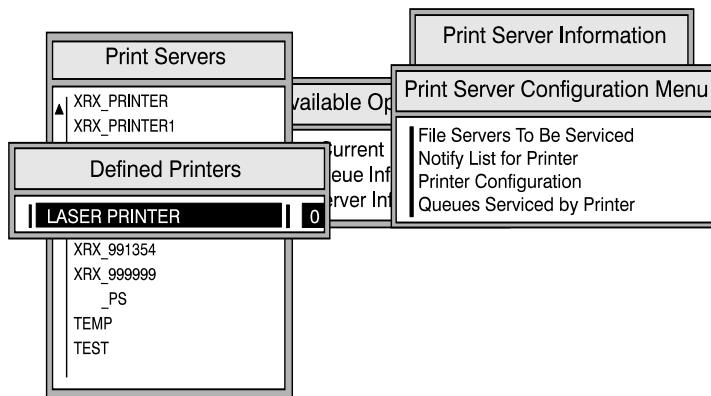
When you assign queues to the defined printer, you authorize the print server to service these queues.



Note

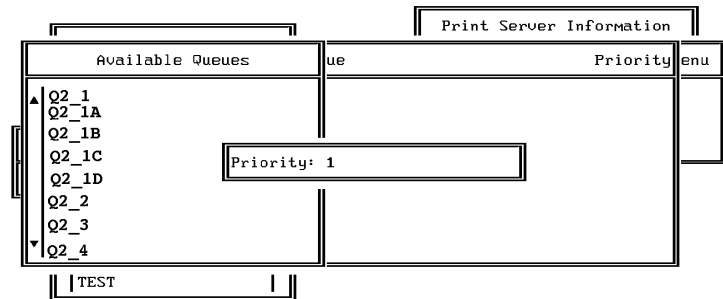
Do not assign the same queue to two different print servers. If a queue is assigned to multiple print servers, print jobs may not go to the intended printer.

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



2. Select the printer name from the list of defined printers.
3. Press **INS** to display the **Available Queues** list for the printer.
4. Select the queue you want and then assign a priority level from 1 to 10. It is recommended that you accept the

default priority level. Press **ENTER**. The queue appears on the list for the printer.



Press the **INS** key again to assign 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 "Set Up Notify Options for the Printer (Optional)" below. If you are finished, continue to press the **ESC** key and then save your changes.

Set Up Notify Options for the Printer (Optional)

To enable the print server to notify users or user groups if a problem occurs with the printer, set up the Notify options. The print server 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 **INS** to view a list of **Notify Candidates**.
 3. Select the user or group from the list.

Notify Candidates	
(Job Owner)	(Unknown Type)
CHG	(User)
DAS	(User)
DXL	(User)
EVERYONE	(Group)
JCT	(User)
GUEST	(User)
PUBS	(Group)
SUPERVISOR	(User)
TEST	(Group)

4. Set the **First** and **Next** intervals in the **Notify Intervals** screen. It is recommended 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.

Install the Print Server on Multiple File Servers

When the NIC comes up, it automatically searches for and attaches to the file servers that are no more than four hops and have no more than eight ticks propagation delay. For extremely large or complex networks, this allows a bounded search time on start-up. If the print server must attach to file servers beyond this range, or, if you wish to accelerate start-up by eliminating the need to search all file servers in the four hops/eight ticks radius, the file servers with which the print server is to operate may be entered into the Print Server Configuration of a "primary" file server. The primary file server can be any file server within the four hops/eight ticks propagation time limits, but ideally is as close as possible to the print server. Once the print server locates the primary file server and the list of file servers to be serviced, the automatic search is dropped and the print server will go directly to those file servers listed (and to no others).

The NIManage for Windows program also allows the operator to identify a "preferred" file server, which is identified within the NIC itself. If a preferred file server is listed, the NIC will first attach to this identified file server before initiating the automatic search. If the preferred file server is also a primary file server (for example, has file servers listed under file servers to be serviced), the NIC will connect directly to these file servers and will bypass any automatic search.

Installing the Printer on Multiple File Servers

To install the print server on more than one file server, perform the procedures for each file server. 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 NIC using the NIManage program. Refer to "Configuring the NIC in NetWare Directory Services" (page 3-17). 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.



Note

- If you assign a preferred file server via NIManage or SNMP, the print server on coming up will try to locate that file server without doing any general search and, if listed as a print server device on that file server, will remain attached to that file server.
- If you have identified other file servers to be serviced for that print server, and the appropriate file exists, the print server will attempt to attach to each of the other file servers listed, up to the maximum capacity of the print server.
- If you assign a primary (preferred) file server and it contains no additional file servers in its list (i.e., contains no file listing file servers to be serviced), and the (preferred) file server is up, then the NIC should stop after finding that file server and not perform the general file server discovery process.
- If the primary (preferred) file server is assigned and unavailable (e.g., server down or the print server is not configured on the file server, or due to network conditions, the file server was not located), the Novell portion of the print server will sleep for 5 (or so) minutes and then retry to establish the connection. Any other protocols configured should run normally. This retry will continue indefinitely; there will be no search.

Primary File Server

To use the primary file server option, use the following procedure on a file server close to the printer:

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 NIC on each of the primary file servers.

Configuring NetWare 4.0x — Bindery Emulation

Novell's NetWare 4.0x can operate in two modes — NetWare Directory Services (NDS) and Bindery Services Emulation. For Directory Services, see “*Configuring the NIC in NetWare Directory Services*” (page 3-17). These services run simultaneously and transparently to each other. The NIC may be configured to operate with Bindery Services mode only (this section), or to operate under NDS (*Configuring the NIC in NetWare Directory Services*). When configured under NDS, the NIC will also service older file servers operating in bindery mode.



Note

If the NIC is not properly set up for NDS and the Bindery Services mode is not running, the NIC can not find its file servers, and the status page indicates the Novell NetWare protocol is not active.

Disable Bindery if operating only in the NDS mode.

Confirm Bindery Context

Before installing the NIC on a Novell NetWare 4.x server in Bindery Emulation mode, check that the server has a Bindery Context (name for the server under Bindery Services mode). If the server does not have Bindery Context, it may be preferable to install in NDS mode. If the NIC must be installed in the Bindery Emulation mode, the server must have Bindery Context. Perform the following steps to confirm the server has Bindery Context:

1. Go to the 4.0x server and at the system console type: **load install**
2. Select **Maintenance/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 to see if you have a statement similar to the following included:

SET BINDERY CONTEXT=0U=ENG

Where **=0U=ENG** is an example of a name for the file server context. Use your own file server context in place of **=0U=ENG**.

6. At the console prompt, type the **SET BINDERY CONTEXT** statement that you entered in the `autoexec.ncf` file.



Note

The command at the console prompt takes effect immediately. The definition in the file takes effect when the server is shut down and then restarted.

Configure in Bindery Mode with PCONSOLE

Once you confirm the server has Bindery Context, use the following procedures to configure the NIC.

1. Log into the network as ADMIN.
2. Type **PCONSOLE** and press **ENTER**. The following screen appears.

Available Options
Print Queues
Printers
Print Drivers
Quick Setup
Change Context

3. When the **Available Options** menu appears, press the **F4** key (for the Bindery Mode).

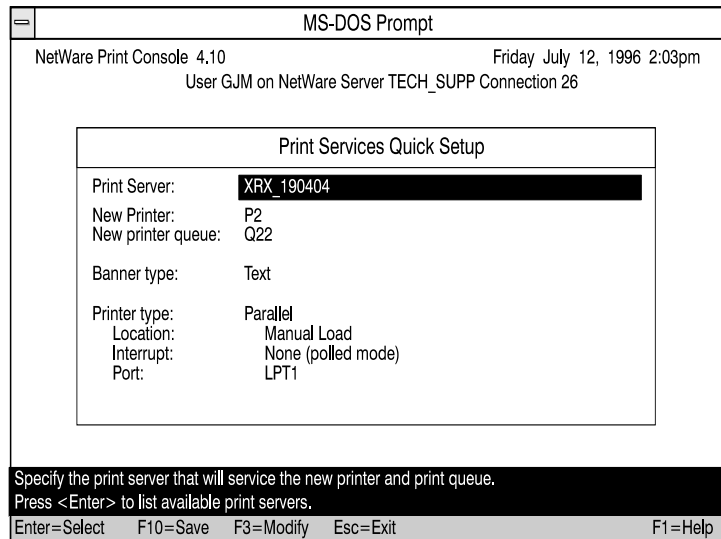


Note

If you receive a message asking you to login to a server with Bindery connections, the server you are attached to does not have Bindery Mode enabled. Follow the procedures in “Confirm Bindery Context” (page 3-13) or log onto a server with Bindery Services activated.

4. From the **Available Options** screen, select **Quick Setup** and press **ENTER**.

Use **Quick Setup** to connect your print server, print queue and printer correctly. You can modify these later if you need to.



5. Select **Print server** and press the **F3** key to modify the entry.
6. Enter the name of the print server in the **Print server** field and press **ENTER**.



Note

Unless the name has been changed with the NIManage utility, the name is the factory default serial number (the 6-digit number on the first line of the Status and Configuration report that prints each time you power-up the printer.)

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 to save the configuration.

Repeat steps 5 through 10 for each file server that the printer server services.
11. To view, add, delete, or modify print servers or queues after the initial setup, select either the **Print Queues** or **Print Servers** option on the **Available Options** screen.

Configuring the NIC in NetWare Directory Services

NetWare Directory Services (NDS) offers a different, more advanced approach to network management than previous NetWare versions. Generally, it stores and tracks all network objects. As a rule, all 4.x servers must have NDS loaded in order to function. In this way, every NetWare 4.x server is a Directory server, because it services named Directory objects such as printers, print servers and print queues. With the appropriate privileges, you can create a print server *object*, which, once configured in its *context* (or location) on the network, eliminates the cumbersome setup of print servers on every network server. NDS provides true *enterprise* networking based on a shared network database rather than a individually defined physical sites. The result is greatly improved print server setup and management.

NetWare 4.x also provides backward compatibility for 2.x, 3.x and 4.x print service in *Bindery* emulation.



Note

The Directory Information Base (DIB) is used to store information about servers and services, users, printers, gateways, etc. It is a distributed database, allowing access to data anywhere on the network wherever it is stored.

Pre-4.x NetWare versions provide the same data found in the DIB but the data is stored in the NetWare Bindery. The DIB was designed with more flexible access, more specific security, and, since it is distributed, it was designed to be partitioned. The Directory uses an object-oriented structure rather than the flat-file structure of the Bindery, and offers network-oriented access, rather than server-oriented access found in the Bindery.

The Directory is backward-compatible with the NetWare Bindery through Bindery emulation mode. When Bindery emulation is enabled, Directory Services will accept Bindery requests and respond just as if a Bindery existed on the NetWare server being accessed.

Be aware that information obtained from the Bindery query may not be stored in the server since the Directory is a partitioned and distributed database. Even though the NetWare 4.x server is not operating from a Bindery, the applications making Bindery requests will not know the difference.

Configuration

The NIManage program provided with the NIC is used to configure the context of the print server. The Novell NWADMIN program is used to create the directory tree, print server, printer and print queue objects within the tree.

Configure Printer in NIManage

Follow the steps below to complete the configuration in NIManage.

1. If you haven't done so already, install the NIManage for Windows utility on your system. For directions, see *"Using the NIManage Utility"* (page 3-28). Make sure the printer with the NIC is powered up and connected to the network.
2. Start NIManage on a Windows station. At the **Select Novell Based Device** window, choose the desired print server from the list provided and click on the **OK** button. At the unit verification screen, again click on the **OK** button.
3. Select **Protocols** from the main menu and Setup Protocols from the choices offered.
4. Select **Novell NetWare** and click on the OK button (an *A* appears before enabled protocols).
5. At the **Novell NetWare** screen, type in values for **Print Server Name**. **Password** may also be entered (and reentered) in the fields provided. Since the NIC has a single port, nothing needs to be done in the **Setup Port** box. Click on the **Directory Services** dialog box.

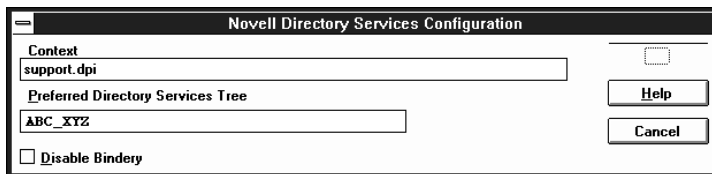
The screenshot shows a dialog box titled "Novell Network". It has the following elements:

- Print Server Name:** A text box containing "NDS_PS".
- Password:** A text box containing asterisks "*****".
- retype:** A text box containing asterisks "*****".
- Select Port:** A section with a list box containing "NETWORK PORT" and an "Enable Port" checkbox that is checked.
- Buttons:** "OK", "Cancel", and "Help" buttons are at the bottom left.
- Checkboxes:** "Directory Services" and "Enable Network" checkboxes are at the bottom right.

- At the **Novell Directory Services Configuration** screen, type in a **Context** entry and **Preferred Directory Services Tree** entry in the open fields. Be sure to give the *whole* context, whether *typed* or *typeless*, and do not begin your context path with a trailing period (.). You do not need to write a container name (Print Server Name) because it was provided in the previous Novell NetWare window. If you don't know your tree, type: *whoami* at the DOS command line. A *typed* context name example is:

ou=standard.ou=organization_1

You can also **Disable Bindery** mode on the print server if you wish by clicking on that box. If you disable Bindery, The NIC will not support print servers on a Bindery file server. Now click on the **OK** button to conclude configuration in NIManage for Windows. If you change any default values, you must power cycle the unit or, reset the NIC from NIManage.



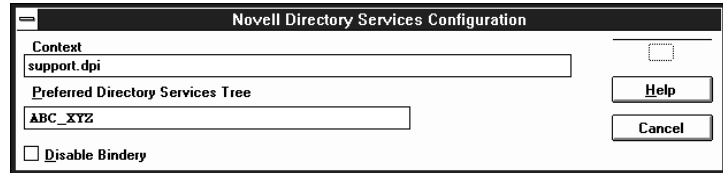
Configure Printer in NWADMIN

See the steps below to complete NWADMIN configuration. You will create printer, print server and print queue objects. Then, you will assign, or associate, those objects with each other. If you wish to keep Bindery resources on any server, you can under NetWare 4.x if you declare a **SET** statement in your **AUTOEXEC.NCF** file.

For those who prefer, NetWare does offer PCONSOLE as an alternative to NWADMIN. PCONSOLE can be used to set up static information about print servers such as: which queues to service, and whom to notify in the event of a problem. See Novell NetWare documentation for more information about the use of PCONSOLE for NDS.

Create Printer Object

1. Click on the NWADMIN icon in the NetWare Tools group in Windows. The NetWare Administrator window will appear. To bring up your Directory Tree, open a Browser window by clicking on the **T**ools menu item and, the **B**rowse item.



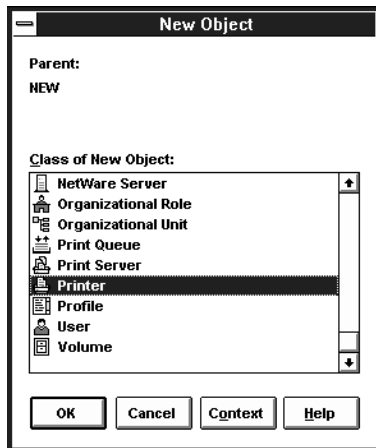
2. Highlight the Organizational Unit or Organization where you want to create the print service in the Directory Tree, select the **O**bject item from the main menu and choose **C**reate...



Note

*If you wish, you can create objects another way in NWADMIN by: selecting an Organizational Unit, clicking on the right mouse button (which produces a pop-up menu), and clicking on **C**reate... use the left mouse button to bring up the **N**ew **O**bject window). From this point, the procedure continues as described.*

3. When the **N**ew **O**bject window appears, scroll down the **C**lass of **N**ew **O**bject icon list, select the Printer icon and click on the **O**K button.



4. When the **Create Printer** window appears, type a value in the **Printer Name** field and click on the **Create** button.

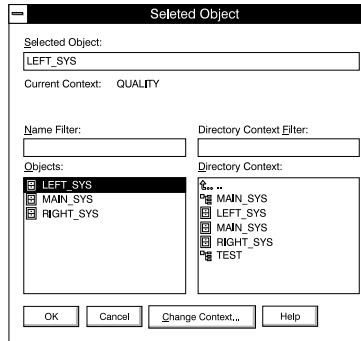
Create Print Server Object

1. Again, highlight the Organizational Unit, select the **Object** item from the menu and choose **Create...**
2. At the **New Object** window, scroll down the **Class of New Object** icon list, select the Print Server icon, and click on the **OK** button.
3. At the **Create Print Server** window, type a value in the **Print Server Name** field and click on the **Create** button.

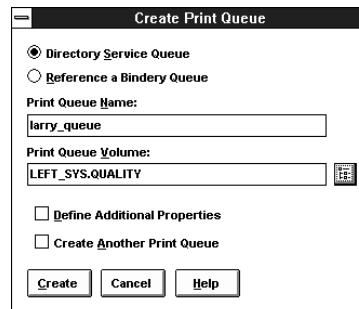
Create Print Queue Object

1. Once again, highlight the Organizational Unit, select the **Object** item from the menu and choose **Create**.
2. At the **New Object** window, scroll down the **Class of New Object** icon list, select the Print Queue icon, and click on the **OK** button.
3. At the **Create Print Queue** screen, click on the **Directory_ Service Queue** button, then type in values for **Print Queue Name** and **Print Queue Volume** and click on the **Create** button. If you don't know the **Print Queue Volume** name

(the hard drive you will be accessing), click on the icon to the right of the volume field. The **Select Object** window will appear with the volume listed in **Objects**. If the volume is *not* listed, scroll the **Directory Context** items until you find the volume where you want the queue to reside.



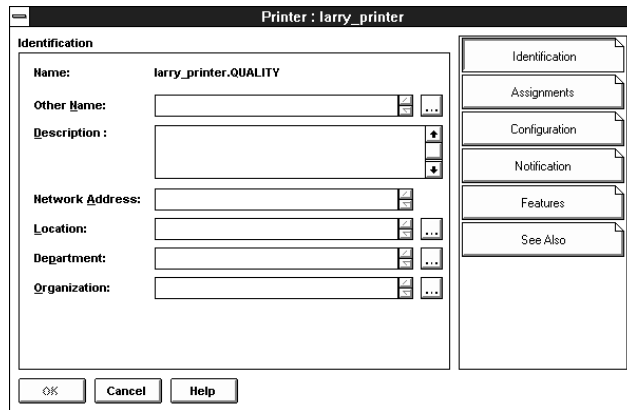
Click on the object (hard drive) of your choice and it will appear in the **Selected Object:** field. Click on the **OK** button. The full volume will now appear in the **Print Queue Volume** field. Finally, click on the **Create** button.



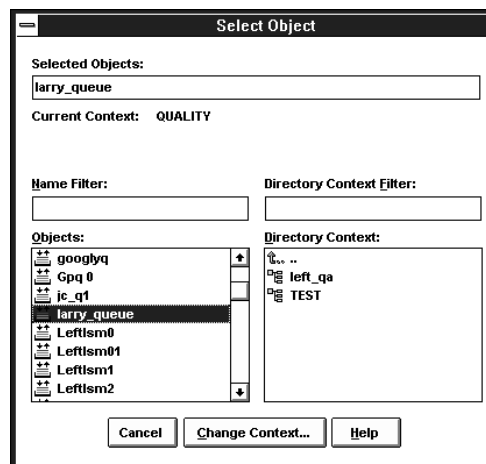
Assign Printer Object

1. Go to the **Directory Tree**. Double click on the printer object just created and bring up the **Printer** window. See

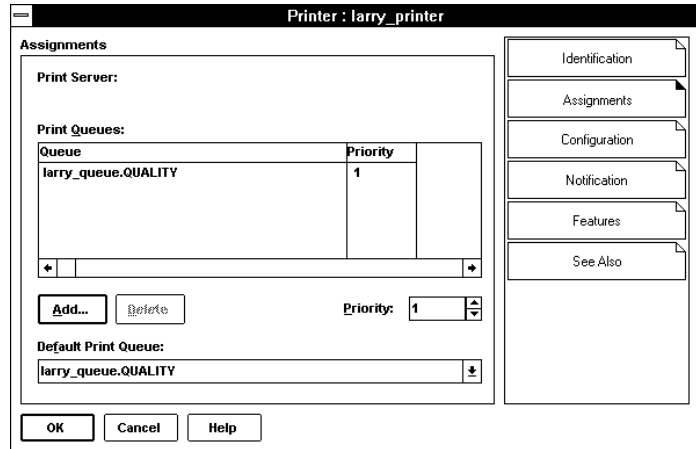
below. Find the **Assignments** button on the right-side of the window and click on the **Add** button.



2. When the **Select Object** window appears, find the print queue object just created among the choices listed in the **Objects** box and select it.

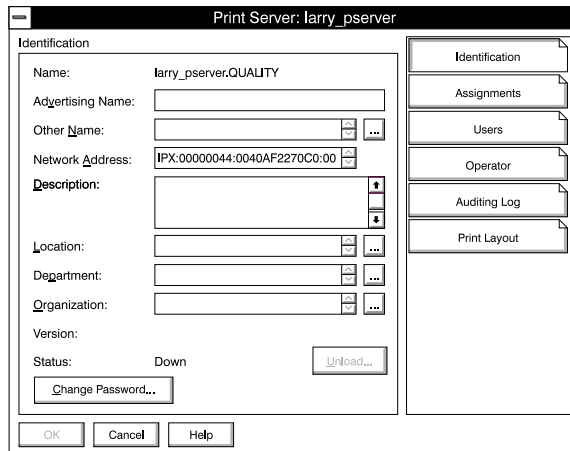


Click on the **OK** button and the print queue just created is added to the **Print Queues:** box in the **Printer:** window. Click on the **OK** button again.



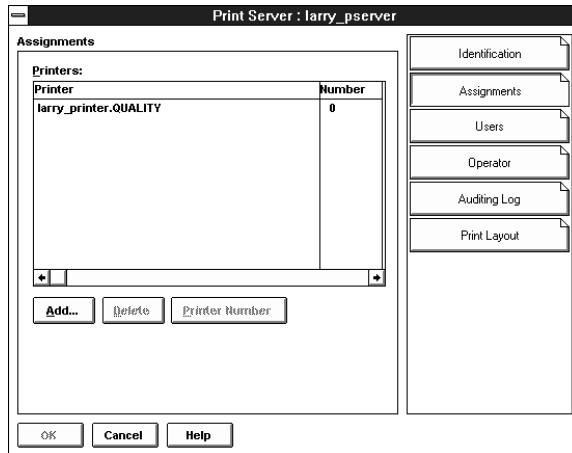
Assign Print Server Object

1. At the **Directory Tree**, double click on the print server object you just created and bring up the **Print Server** window.



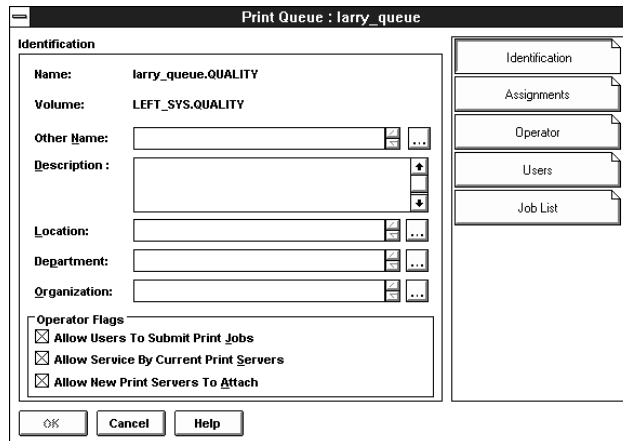
2. At the **Print Server:** window, click on the **Assignments** button and **Add** button to bring up the **Select Object** window. Select the printer object just created from the **Objects:** box and click on the **OK** button. Now the printer

(with its context) appears in the **Printers:** box of the **Print Server** window. Click on the **OK** button.

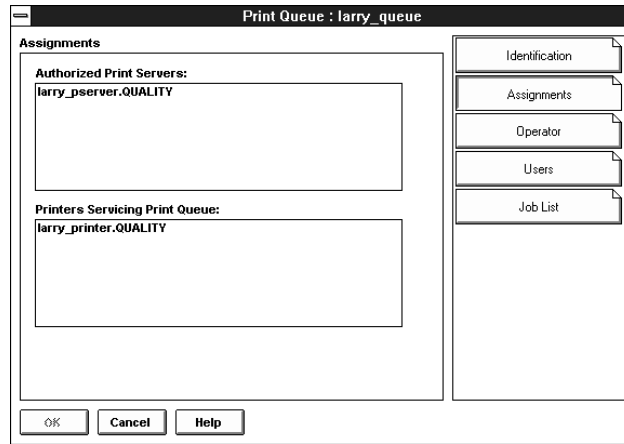


Check Assignments

At the **Directory Tree**, double click on the **Print Queue** object you just created. At the **Print Queue** window, click on the **Assignments** button.



If you configured the print queue and printer correctly they will appear in the proper boxes on the **Print Queue** window. Press the **Cancel** button.



Power Cycle the Printer

NWADMIN configuration is complete. Before you can begin printing, though, be sure to power cycle the printer or use NIManage to save the configuration and reset the unit.

Using the NIManage Utility

NIManage is a Windows-based program for managing the NIC. Use NIManage to do the following:

- Configure the NetWare print server and IP parameters.
- Enable and disable protocols or the Configuration and Status Report.
- Troubleshoot the NIC.
- Software upgrade to the NIC.

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



Note

To have full use of NIManage, you need Supervisor or Administrator privileges.

Installing NIManage

To install the NIManage utility, use the following procedures:

1. Start Windows on your PC or workstation.
2. Insert the NIManage diskette into the disk drive.
3. In the Windows Program Manager, select the **File** menu.
4. Select **RUN** from the menu.
5. In the RUN command line field, type **A:\INSTALL.EXE** or **B:\INSTALL.EXE** and click on the **OK** button.
6. Follow the installation instructions on the screen.
7. Remove the NIManage diskette when complete. Use the on-line help for information on the program.

Hints to Running NIManage

NIManage includes extensive help screens. The features of this utility are not explicitly covered in this manual. However, this section provides some information about the significance of certain provisions and the ramifications of certain settings.

Startup

NIManage is started up like any Windows program. It first checks the NetWare connectivity. Any problems with the NetWare driver are immediately displayed. It then checks the administrative level of the user and reports this on the screen. If you do not have supervisor or administrator level permissions on the file server to which you are attached, NIManage access will be restricted to read-only access and non state-changing tests. If you have supervisor level access, you may modify the setup of any accessible print server.

Select Device

The program then prompts you to select a print server NIC (NIC) to be accessed from a list of compatible print servers. The print servers are listed by their SAP identification string derived from their serial number. The identification string appear in the form XRX_123456. You can find this identification name on the Print Server status sheet. Since this list is derived from the SAP broadcasts of each unit, even units that are not installed as NetWare print servers will appear.

Show Detail will access the highlighted unit to obtain print server characteristics including assigned name and firmware revision. **Show All** will access all units on a network with many compatible print servers. **Show All** may take a long time to complete. If the print server has not been assigned a new name, its default name is not displayed.

A print server is selected by double-clicking on the corresponding entry, or by highlighting the entry and clicking on **OK**. When it is accessed, a product description string is displayed. Click on **OK**. After a print server device has been

selected, the main menu string and the icon tool bar is displayed. Selecting a menu header will bring down a specific set of options, most of which are self explanatory. Options that are grayed out are not accessible.

File

Under **File**, the **Execute NSUpdate** operation is displayed. This operation permits launch of the utility to download updated executable code to the flash memory in the print servers. An installable version of this program is distributed, with the flash image to be downloaded, only when an update is provided. Attempting to launch the program if it has not been loaded will produce an explanatory message to the effect that the program could not be found.

Protocols

The **Setup Protocols** operations allows setting up NetWare print server options, and AppleTalk and TCP/IP parameters. **Setup Protocols** provides extensive access to NetWare print server parameters, both for bindery and NDS-based systems. Setup also allows you to disable/enable AppleTalk and TCP/IP, and to setup IP parameters (IP address, subnet mask, and default gateway).

Novell parameters include:

- **Print Server Name** — This allows a more descriptive name to be given to the print server. If a name is entered here, this newly assigned name must be the one by which the print server is installed in file servers or contexts (using PCONSOLE or NW Admin). However, NIMManage will continue to locate the print server by the NIC name: XRX_123456.
- **Preferred File Server Name** — The operator may enter the name of the file server to which the NIC should attach to first. This name can be keyed in directly, or can be chosen from a pulled-down list of accessible file servers. The pull-down list is limited to 1200 entries, and only the

first 1200 file servers located will be listed. Therefore, if there are more than 1200 file servers accessed and the desired one is not listed, the name should be typed in.

The ability to define a **Preferred File Server** is useful in large systems where the NIC file-server-search process is time consuming, and in systems where the file server to be serviced is beyond the 4-hop/8 tick search radius. Once the NIC attaches to the preferred file server, it will start the search process for other file servers unless the preferred file server has been set up as a primary file server.

A primary file server is one which contains a file indicating the file servers to be serviced by the print server. If a NIC locates such a file (either in a preferred file server or in a file server found via a search), the NIC will attach directly to the listed file server(s) (and only the listed file servers), and will not search for any others. The combination of preferred and primary file servers is effective in minimizing the time for a NIC to come up on a Novell network. The preferred and primary file server concepts are applicable only to bindery-based systems and will have no effect on NDS setup.

- **Password** — The password can be assigned here, and must be used consistently in all file servers or contexts in which the print server is installed.
- **Ethernet Frame Type** — If the subject NIC is an Ethernet card, part of its startup is an automatic search to determine the frame type used for NetWare on the subject LAN. It will sequentially try 802.3, Ethernet II, and so on until it finds a NetWare frame type in use, and will then lock onto that frame type. If the network has multiple frame types being used, setting this parameter to the desired frame type will cause the search to start with the selected frame type. If that frame type is found, there is no search.

- **Scan Rate** — Once during a scan process, the NIC will check all assigned queues for new print products to be extracted and printed (provided it is not currently servicing a queue). A slow scan rate will increase the latency of a job sitting in the queue. A fast scan rate will increase background network traffic.

Using the Novell PCONSOLE Utility

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 this utility.



Note

You must have Supervisor privileges to perform many PCONSOLE operations.

Changing the File Server

You can specify a file server as the current one. To change the file server, use the following procedures:

1. Log into the current file server and start the PCONSOLE utility.
2. Select **Change Current File Server** from the Available Options menu.
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 username and press **ENTER**. If the username 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/Username** screen.

Changing Print Queues

When you print a file, your system sends the file to a print queue. The print server assigned to that queue extracts the print job and sends it to the assigned printer. If a print server is servicing queues on multiple file servers, you must assign queues to the printer on each file server. To change the print queues, use the following procedures:

1. Start the PCONSOLE utility.
2. Select **Print Server Information** from the **Available Options** menu.
3. Select the 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 **INS** at the **File Server/Queue/Priority** screen. The **Available Queues** list appears.
8. Select a queue from the list.
9. Press **ENTER** at the **Priority** screen to leave the priority setting at 1.

The highest priority queue is 1; 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.

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. To set up NOTIFY, use the following procedures:

1. Start the PCONSOLE utility.
2. Select **Print Server Information** from the **Available Options** menu.
3. Select the 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 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 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**.



Chapter 4

EtherTalk Configuration

<i>Overview</i>	4-2
<i>Choosing the Printer</i>	4-3
<i>Loading the NIManage for AppleTalk Program</i>	4-5
<i>Configuring the NIC</i>	4-7
<i>Configuration</i>	4-7
<i>Error Log</i>	4-8
<i>Protocol Setup</i>	4-9
<i>Options</i>	4-10

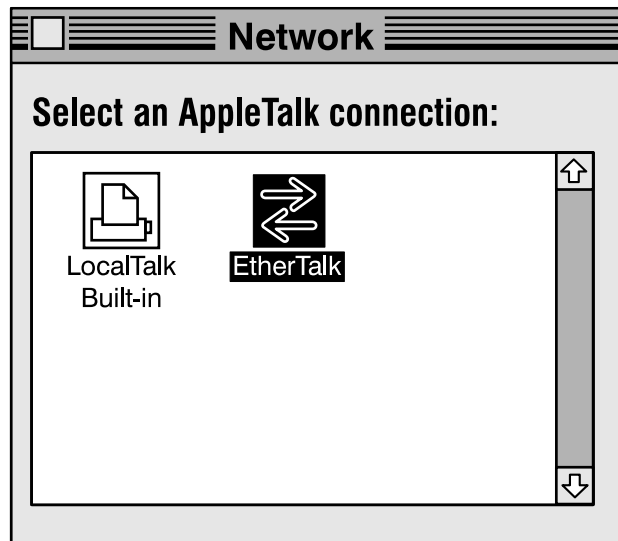
Overview

Use this chapter if you will be printing from a Macintosh. This chapter explains how to configure the NIC using EtherTalk and how to use the NIMange for AppleTalk program.

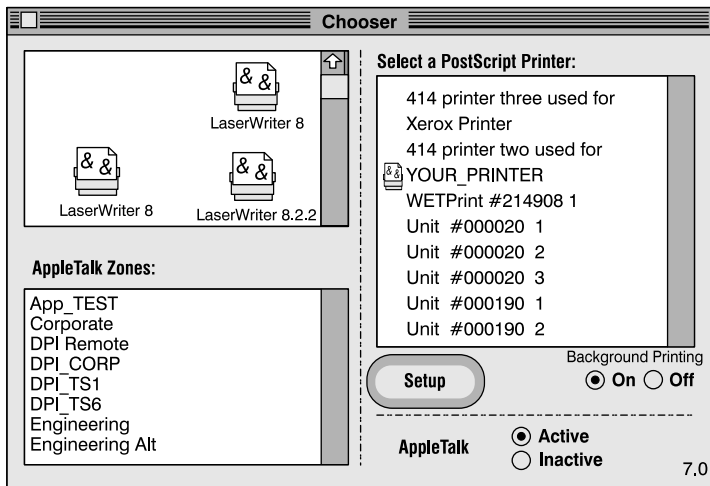
Choosing the Printer

To choose the printer, use the following procedure:

1. Make sure you have loaded the print driver and file drivers appropriate to your printer.
2. Select the EtherTalk link for AppleTalk by clicking on the Apple icon in the Macintosh menu bar.
3. Select **Control Panel**.
4. Click on **Networks**.
5. Choose **EtherTalk** as the AppleTalk connection, as shown in the example.



6. Click on the Apple icon.
7. Select **Chooser** to display the Chooser screen.



Note

The screen shown above will not show AppleTalk zones if your network does not have more than one zone.

8. Select the AppleTalk Zone containing the printer from the list at the lower left of the screen. Select the appropriate print driver from those indicated at the upper left of the screen. A list of printers will appear in the "Select a Postscript Printer" display panel at the right of the screen.
9. From the display panel at the right of the screen, choose the name of the print server from the list of printers. The factory default name stored in the card is:

Xerox Printer
10. Select **SETUP**. Then select **AUTO SETUP**. There will be a series of messages as the Chooser communicates with the printer and locates the proper PPD. The setup screen will return, listing the PPD file selected. Select **OK**. Then exit from Chooser.

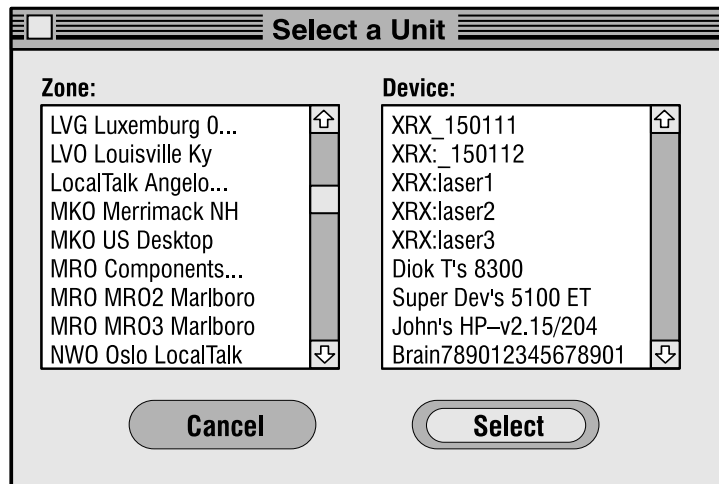
Loading the NIManage for AppleTalk Program

The NIManage for AppleTalk 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 NIManage for AppleTalk program:

1. Copy the files from the Macintosh NIManage for AppleTalk program diskette to a folder.
2. When the NIManage for AppleTalk program icon displays on the desktop, double-click on it. The Zone and Device screen is displayed.



3. For each zone, the Device display panel shows the available NICs. If your network has no zones, the screen shows only the Device display panel. Select the name of your network zone.



Note

If you have one zone, the above screen will not display.

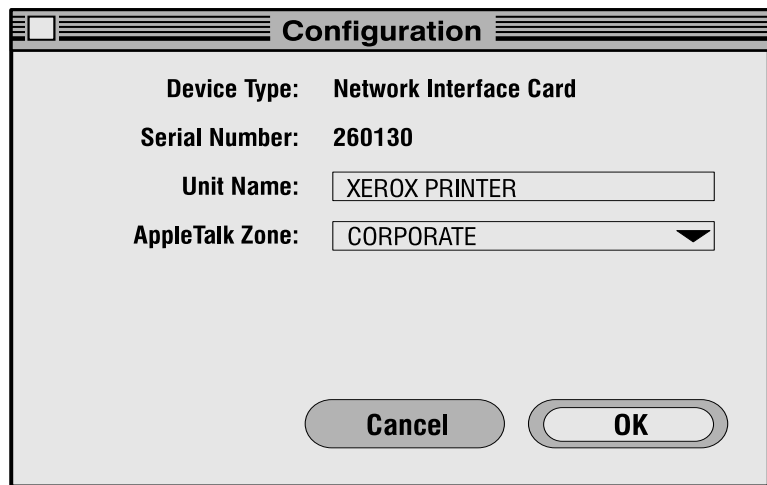
-
4. From the Device display panel, select the NIC. After you select the device, a menu of options is added to the menu bar at the top of your screen.

Configuring the NIC

You use the options added to the menu bar to configure the print server. Depending on your printer, certain operations may not be available. These functions will be “grayed” out and cannot be selected.

Configuration

Use the Configuration function to change the names of the device and AppleTalk Zone. These changes are stored only in the print server and are not passed on to the PostScript interpreter. When you choose this function, the following screen is displayed:



1. To change the print server 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. Turn off the printer and then turn it on again to make the changes take effect. The status sheet should identify the new printer name and the new zone preference.

Error Log

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



Note

This does not enter data into the error log itself. The data is cleared each time the printer is power cycled.

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:

Protocol	On	Off	IP Address:
NetWare	<input checked="" type="radio"/>	<input type="radio"/>	<input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
TCP/IP	<input checked="" type="radio"/>	<input type="radio"/>	Subnet Mask: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>
			Default Gateway: <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/>

Cancel OK



Note

The default values for the IP address and Subnet Mask are shown as zeros. However, this represents a “no IP address” condition, not an IP address.

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**. The utility will not let you make active any protocol that the NIC does not support or cannot handle because of active protocol limitations.
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.

Options

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

Chapter 5

TCP/IP Configuration

Overview	5-2
Installation in a Windows Environment	5-3
<i>Windows for Workgroups</i>	<i>5-3</i>
<i>Windows NT Instructions</i>	<i>5-12</i>
UNIX Printing	5-17
<i>Configuring the IP Address on the NIC</i>	<i>5-18</i>
<i>lpd Printing</i>	<i>5-24</i>
<i>Installing TCP/IP for NIC If Not Running lpd</i>	<i>5-31</i>
Running TELNET	5-47
<i>Making Connection and Main Menu</i>	<i>5-47</i>
<i>Configure IP Parameters</i>	<i>5-48</i>
<i>Select Printer Languages</i>	<i>5-50</i>
<i>Enable/Disable Network Protocols</i>	<i>5-51</i>
<i>Restore Factory Defaults</i>	<i>5-51</i>
<i>Change Password</i>	<i>5-52</i>

Overview

This chapter explains how to configure the Network Interface Card (NIC) and your network for use with TCP/IP communication in various environments. Independent setup and installation procedures are provided for Windows systems and for most popular UNIX systems. The NIC TCP/IP capability will also operate with lpr spoolers on other systems, and with spooler/supervisor capabilities that communicate raw print jobs to the Print Server TCP/IP Port. This port number defaults to 10001, but may be changed to any desired number using the *Telnet* utility or SNMP. The section “*Running TELNET*” (page 5-47) describes the interactive setup capability accessible through the *Telnet* utility on any TCP/IP platform, and is equally applicable to Windows, UNIX, and other TCP/IP environments.

Installation in a Windows Environment

The several versions and variations of Microsoft Windows may be used on a NetWare and/or TCP/IP networks, as well as in a native Microsoft Windows network. This flexibility allows various options for setting up the network printing system even though this NIC does not support Netbeui. If the Windows workstations are connected to a NetWare network, configure the printer interfaces for NetWare, and use standard Windows/NetWare utilities to provide access to the printer. If NetWare is not to be used, the users may access the printer using TCP/IP. The following sections describe installation using TCP/IP under Windows for Workgroups, Windows 95, and Windows NT.

Windows for Workgroups

Printing with TCP/IP requires that the workstation have TCP/IP capability and the corresponding spooler, *lpr*; or that the workstation can share an *lpr* queue on a Windows NT server (for example) that has one. In general, if printers are not shared, an *lpr* queue must be created on each workstation from which printing is initiated. See the Windows documentation about sharing printers.

Windows for Workgroups does not normally come with TCP/IP. However, various TCP/IP facilities are available for Windows for Workgroups workstations, including a free TCP/IP provided by Microsoft. There are third party *lpr* spoolers available. The following instructions are based on the Microsoft TCP/IP and a shareware *lpr* application that is available from various sources, including the NIC manufacturer. You will need the files *WFWTCP32.zip* and *WFWTCP32.txt* for the TCP/IP, and *wlprs41.zip* and *wlprspl.txt* for the *lpr*.

You will need the *BOOTPL.exe* file if you wish to use the BOOTP Lite program to set up IP parameters. The *BOOTPL.exe* file is provided with the NIC on the NIManage for Windows diskette.

Installing TCP/IP

Follow the instructions in the text file for the TCP/IP stack to set up TCP/IP on the workstations. These instructions are copyright by Microsoft and cannot be included here.

Loading the lpr Spooler

The Windows lpr Spooler Version 4.1 - User's Guide (**wlprspl.txt**), provides detailed instructions for decompressing and installing the shareware lpr spooler.

Setting up the NIC

The NIC must be given IP address and routing information to be used with TCP/IP. This can be done with NIManage for Windows if you have a NetWare connection on your network, or with NIManage for Macintosh if there is an Apple Macintosh on the network. Follow the instructions for these programs which are documented elsewhere. If you cannot use these programs, you can use either the ARP procedure or the BOOTP Lite program.

Prior to running these programs, install the NIC in your printer.

Power -up the printer. Keep the status sheet handy for the Ethernet (MAC) address. It should show that TCP/IP is enabled, but that the Protocol address is not configured. If the unit already has an IP address, these procedures will not work. However, you can *Telnet* to the unit to change the IP parameters.

Assigning IP Address with ARP

This procedure uses the BOOTP protocol. The NIC must be on the same network segment as the workstation that you are using to configure it. The TCP/IP stack must be installed and operating.

Use the procedures in *Assigning IP Address with BOOTP Lite* if you need to use BootP Lite to configure the IP address instead of ARP:

1. From Windows, enter the MS/DOS box.
2. At the command prompt enter:
 - ping** [any valid IP address on your network - not the print server]; the identified unit should reply
 - arp -s** [IP address of NIC] [MAC Address of NIC]; the entry should be accepted
 - ping** [IP address of NIC]; request should time out
3. Recycle the power on the printer, or let the NIC reset itself. The NIC will produce a status page that should include the entered IP address.
4. When the NIC is up again, type the following at the command prompt:
 - ping** [IP address of NIC] (continue until you get a reply)



Note

This this only enters the IP address; you must use the Telnet facility. See "Running TELNET" (page 5-47) for instructions on how to enter the other IP parameters.

Assigning IP Address with BOOTP Lite

This program uses the BOOTP protocol. The NIC must be on the same network segment as the workstation that you are using to configure it. The TCP/IP stack must be installed and operating.

The BOOTPL.exe program will work with a 16 Bit TCP/IP Stack (FTP, NetManage, B&W, or WFWG).

1. Copy the BOOTPL.exe file to the Windows directory of your workstation.
2. Reset the printer.



Note

The NIC issues the BOOTP request for a finite period of time. The print server must be freshly reset for this program to work.

3. From Program Manager under **File**, select **Run \windows\BOOTPL.exe**.
4. Pull down the Admin menu to Configure option.
5. Enter the IP address that you want to assign to the NIC, its Subnet Mask (make sure it matches what you are using on your subnet), the Default Gateway (your router's IP address), and the MAC address of the NIC (Hardware Address, listed on the Status sheet as Ethernet Address). Use colons as delimiters as shown on the status sheet rather than the dashes that Windows uses.
6. Click on **Go**. You will get a message that the program is Verifying, and then it will tell you whether the unit is active or not.
7. Wait for about five minutes for the NIC to reset. The Status sheet should report the newly entered IP information.
8. Enter the MS/DOS box. At the command prompt enter:
ping [IP address of NIC] (continue until you get a reply)

If it does not respond, verify that TCP/IP is enabled on the status sheet. If the status sheet does not show the IP information, then repeat the above procedures.

Setting up IP and lpr Parameters

The NIC provides for a setup connection via the standard *Telnet* port. To be able to make changes to a unit with factory default settings, you must logon as "**sysadm**". The default password is also "**sysadm**" (This password can be changed from the *Telnet* utility). The section "*Running TELNET*" (page 5-47) describes the use of the *Telnet* utility.

1. *Telnet* to the NIC (the login and password are both **sysadm**).
2. Turn off the protocols that you are not utilizing (option 3).
3. Setup the subnet mask and default gateway for the NIC if applicable (menu option 1). (If you used BOOTP, this will already have been done).
4. Exit, Save and Reset the NIC

Creating an lpr Queue on the Workstation

Once you install the spooler onto the workstation, the setup program will create a group and icon.

1. Double click on the spooler icon.
2. Click on **setup**, and define a new queue.
3. At the Remote Host Name prompt:
Enter the NIC IP Address, and enter **PORT1** for the Remote Printer Name
4. Go to Control Panel, Printers, and choose **Connect**.
5. Select your driver and click on **Next**.

At this point, you should see an entry for your Windows lpr Spooler's printer in the "Available ports" listing. For example, C:\SPOOL\PRINTER_NAME.

Microsoft Windows 95

Windows 95 comes with a TCP/IP stack. To print with this protocol, a client also requires an lpr utility. This program is available from various sources. The lpr queue can be created on each workstation or the lpr queue can be created on one workstation and shared on the network. Windows 95 workstations can also share a lpr printer installed on an Windows NT server on the network.

The following instructions are based on the a shareware lpr application that is available from various sources, including the NIC manufacturer. You will need the **wlprs41.zip** and **wlprspl.txt** for the lpr.

If you wish to use the Bootp Lite program, you will also need the **NTBOOTP.exe** and **NTBOOTP.txt** file provided with this NIC on the NIManage for Windows diskette.

Loading the lpr Spooler

The Windows lpr Spooler Version 4.1 - User's Guide (**wlprspl.txt**) provides detailed instructions for decompressing and installing the shareware lpr spooler.

Setting up the NIC

The NIC must be given IP address and routing information to be used with TCP/IP. This can be done with NIManage for Windows if you have a NetWare connection on your network, or with NIManage for Macintosh if there is an Apple Macintosh on the network. Follow the instructions for these programs which are documented elsewhere. If you cannot use these programs, you can use either the ARP procedure, or the ntBOOTP program.

1. Install the NIC in your printer.
2. Power-up the printer.

Keep the status sheet handy for the Ethernet (MAC) address. It should show that TCP/IP is enabled but that the Protocol address is not configured.

If the unit already has an IP address, these procedures will not work. However, you can *Telnet* to the unit to change the IP parameters.

Assigning IP Address with ARP

This procedure uses the BOOTP protocol. The NIC must be on the same network segment as the workstation that you are using to configure it. The TCP/IP stack must be installed and operating.

You can use NTBOOTP Lite to configure the IP address instead of ARP.

1. From Windows, enter the MS/DOS box. At the command prompt enter:

ping [any valid IP address on your network - not the print server]. The identified unit should reply.

arp -s [IP address of the NIC] [MAC Address of the NIC]. The entry should be accepted

ping [IP address of the NIC]. Request should time out.

2. Recycle the power on the printer, or let the NIC reset itself. The NIC will produce a status page that should include the entered IP address.
3. When the NIC is up again, at the command prompt, enter:
ping [IP address of NIC] (continue until you get a reply).



Note

This this only enters the IP address. You must use the Telnet facility, as described in the section "Running TELNET" (page 5-47), to enter the other IP parameters.

Assigning IP Address with ntBOOTP

You may provide the IP address and other IP parameters to the printer NIC on 32 Bit TCP/IP Stack (Windows NT & Windows 95) using the NTBOOTP.exe program. You will have to store the ntBOOTP.exe file in the Windows directory.

This program uses the BOOTP protocol. The NIC must be on the same network segment as the workstation that you are using to configure it. The TCP/IP stack must be installed and operating.

1. Reset the printer.



Note

The NIC issues the BOOTP request for a finite period of time. The print server must be freshly reset for this program to work.

2. From Program Manager under **File**, select **Run ntBOOTP.exe**.
3. Pull down the Admin menu to Configure option.
4. Enter the IP address that you want to assign to the NIC, its Subnet Mask (make sure it matches what you are using on your subnet), Default Gateway (your router's IP address), and the MAC address of the NIC (Hardware Address, listed on the Status sheet as Ethernet Address). Use colons as delimiters as shown on the status sheet rather than the dashes Windows uses.
5. Click on **Go**.
6. Wait about five minutes. The NIC should recycle and produce a status sheet showing the IP parameters you have just entered.
7. Pull down Admin menu to Verify. You should get a message back stating that the Unit is Active. If you do not

get this message, verify that TCP/IP is enabled on the status sheet.

8. When you get a response that your unit is active, you should be able to ping and *Telnet* to the NIC.

Setting up IP and lpr Parameters

The NIC provides for a setup connection via the standard *Telnet* port. To be able to make changes to a unit at factory default settings, you must logon as *sysadm*. The default password is also "**sysadm**". (This password can be changed from the *Telnet* utility.) See "*Running TELNET*" (page 5-47) for instructions on using *Telnet*.

1. *Telnet* to the NIC (the login and password are both "**sysadm**").
2. Turn off the protocols that you are not utilizing (option 3).
3. Setup the subnet mask and default gateway for the NIC if applicable (option 1).
4. Exit, Save, and Reset the NIC.

Setting up lpr on the Workstation

Once you install the spooler onto the workstation; the setup program will create a group and icon.

1. Double click on the spooler icon.
2. Click on **setup**, define new queue.
3. At the Remote Host Name prompt:

Enter the NIC's IP Address, and for the Remote Printer Name enter **PORT1**.

4. Go to **Settings**.
5. Select **Printers**.
6. Choose **Add Printer**.
7. Click on **Next**.

8. Select your driver and click on **Next**.

At this point, you should see an entry for your Windows lpr Spooler's printer in the "Available Ports" listing. For example, C:\SPOOL\PRINTER_NAME.

Windows NT Instructions

Windows NT (version 3.5 or higher) does come with TCP/IP and lpr capabilities, although these must be installed when the unit is configured. You must install the TCP/IP Protocol, Simple TCP/IP Services, and Microsoft TCP/IP Printing prior to entering the network printer on the workstation.



Note

Once you have lpr installed on an Windows NT Server workstation and have allowed printer sharing, other workstations may use the printer through the Microsoft Windows Network without having to have separate lpr queues installed on each workstation.

*If you wish to use ntBOOTP, you will need the **ntBOOTP.exe** file. This file is on the NIManage for Windows diskettes supplied with the NIC.*

Setting Up the NIC

The NIC must be given an IP address and routing information to be used with TCP/IP. This can be done with NIManage for Windows if you have a NetWare connection on your network, or with NIManage for Macintosh if there is an Apple Macintosh on the network. Follow the instructions for these programs which are documented elsewhere. If you cannot use these programs, you can use either the ARP procedure or the ntBOOTP program.

1. Install the NIC in your printer.
2. Power-up the printer.

Keep the status sheet handy for the Ethernet (MAC) address. It should show that TCP/IP is enabled but that the Protocol address is not configured.

If the unit already has an IP address, these procedures will not work. However, you can TELNET to the unit to change the IP parameters.

Assigning IP Address with ARP

This procedure uses the BOOTP protocol. The NIC must be on the same network segment as the workstation that you are using to configure it. The TCP/IP stack must be installed and operating.

You can use ntBOOTP Lite to configure the IP address instead of ARP.

1. From Windows, enter the MS/DOS box. At the command prompt enter:

ping [any valid IP address on your network - not the print server]. The identified unit should reply

arp -s [IP address of the NIC] [MAC Address of the NIC]. The entry should be accepted

ping [IP address of the NIC]. Request should time out

2. Recycle the power on the printer or let the NIC reset itself. The NIC will produce a status page that should include the entered IP address.
3. When the NIC is up again, at the command prompt, enter:
ping [IP address of NIC] (continue until you get a reply).



Note

This only enters the IP address; you must use the Telnet facility. See "Running TELNET" (page 5-47) to enter the other IP parameters.

Assigning IP Address with ntBOOTP

You may provide the IP address and other IP parameters to the printer NIC on 32 Bit TCP/IP Stack (Windows NT & Windows 95) using the ntBOOTP.exe program.

This program uses the BOOTP protocol. The NIC must be on the same network segment as the workstation that you are using to configure it. The TCP/IP stack must be installed and operating.

1. Reset the NIC.



Note

The NIC issues the BOOTP request for a finite period of time. The print server must be freshly reset for this program to work.

2. From Windows Program Manager under **File**, select **Run ntBOOTP.exe**.
3. Pull down the Admin menu to Configure option.
4. Enter the IP address that you want to assign to the NIC, its Subnet Mask (make sure it matches what you are using on your subnet), Default Gateway (your router's IP address), and the MAC address of the NIC (Hardware Address, listed on the Status sheet as Ethernet Address). Use colons as delimiters as shown on the status sheet rather than the dashes Windows uses.
5. Click on **Go**.
6. Wait about five minutes. The NIC should recycle and produce a status sheet showing the IP parameters you have just entered.
7. Pull down Admin menu to Verify. You should get a message back stating that the Unit is Active. If you do not

get this message, check that TCP/IP is enabled on the status sheet

8. When you get a response that your unit is active, you should be able to ping and *Telnet* to the NIC.

Setting up IP and lpr Parameters

The NIC provides for a setup connection via the standard *Telnet* port. To be able to make changes to a unit at factory default settings, you must logon as **sysadm**. The default password is also "**sysadm**" (this password can be changed from the *Telnet* utility). The use of the *Telnet* utility is described elsewhere.

1. *Telnet* to the NIC (the login and password are both "**sysadm**").
2. Turn off the protocols that you are not utilizing (option 3).
3. Setup the subnet mask and default gateway for the NIC if applicable (option 1).
4. Exit, Save, and Reset the NIC

Setting up lpr on the Workstation

The following procedure is used to set up the lpr spooler on the Windows NT server.

1. Open **Control Panel**.
2. Go to **Printers**.
3. Choose **Printer Menu**.
4. Choose **Create Printer**.
5. Enter a **printer name** (For example, lprprinter).
6. Select the proper **printer driver**.
7. Enter a description. This is optional.
8. In the **Print To** dialog, choose **Other**.
9. In Print Destinations window, **select lpr port**. This leaves you with **add lpr compatible printer** window.

10. Line 1: Address of host providing lpd (Print server); enter **IP address**.
11. Line 2: Name of printer on that machine - enter **PORT1** (the word **PORT** *MUST* be in uppercase format followed by the number 1).
12. Choose **OK** to exit.

Your NIC is now configured to operate Windows NT. You may print from any application by the following the normal print instructions for that application.

UNIX Printing

The NIC can support UNIX TCP/IP printing in two modes:

- Host-based lpd where a supplied line printer daemon is run on one or more workstations and print data is communicated to the NIC via a TCP/IP port or,
- Printer-based lpd where the printer appears as a host running a line printer daemon.
- In general, printer-based lpd is easiest to use on BSD UNIX systems, requiring an entry in the printcap file once the NIC has its IP information. Some UNIX System V systems have restrictions on support of remote LPD printers, requiring that the host-based LPD approach be used. For many operating systems, you have the option of using host-resident printing or print server-resident printing. Each mode has certain advantages.
- The host-resident method can print the username and filename on its banner page; the print server-resident method prints a banner page with the host's name.
- The print server-resident method requires you to configure the printer only one time, when you install the print server. The host-resident method requires that a printing daemon be installed on every host that you want to be able to print jobs.



Note

The NIC will also operate with other host-resident print supervisor/spooler programs that present a print image to the printer over a TCP/IP port. See "Running TELNET" (page 5-47) for instructions on how to change the port number to that used by such applications.

Between the host-based and printer-based TCP/IP printing capabilities, the NIC works with:

- All UNIX systems that support lpd
- System V Rel. 4 (on 386 platforms)
- DEC ULTRIX RISC Versions 4.3 and 4.4
- DEC OSF/1 Versions 2.0 and 3.0
- Solaris:
Version 1.1.3 (SunOS 4.1.3),
Version 2.3 (SunOS 5.3),
Version 2.4, and
Version 2.5
- HP-UX Series 700 and 800 Version 9.01 and Version 10.0
- IBM AIX Version 3.2.5
- SCO UNIX Version 3.2
- AS400

The TCP/IP diskette also includes source code that you can recompile host-based code for configuring on other System V platforms.

Configuring the IP Address on the NIC

Regardless of the printing mode selected, the NIC must be given IP address and routing parameters. You can configure the IP address for the NIC in one of the following ways:

- Use NIManage for Windows, as described in *Chapter 3: NetWare Configuration*.
- Use NIManage for Macintosh, as described in *Chapter 4: EtherTalk Configuration*.
- 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 NIC. The Ethernet address is the 12-character code that 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 print server is in its factory default state (no IP information entered.) After the print server has an IP address, you must use the *Telnet* utility or, the NIManage utility and the NIManage for the Macintosh to change an IP address, Subnet Mask and Default Gateway.

Using BOOTP

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

1. Turn off the printer.
2. Log in as superuser on a host on the same subnet as the print server. However, if the server resides on another subnet, complete this procedure to store the IP address in the print server. Reconnect the print server anywhere on the network, and then use the *Telnet* utility to change the IP address. See "*Running TELNET*" (page 5-47) for instructions on using *Telnet*.
3. Find the Ethernet address of the NIC. 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 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:\
```

If running with a more recent BOOTP implementation, such as with SCO UNIX, add:

```
:vm = rfc1048:
```

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 NIC 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. The NIC should reinitialize itself.

10. After the NIC has reinitialize, send a ping command to verify that the print server obtained its IP address. For example:

```
ping 192.9.200.200
```

If the print server 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.

Using *rarp*

The Reverse Address Resolution Protocol (*rarp*) allows network devices to query a server for their IP addresses on start-up. For this procedure, there needs to be a workstation with a *rarp* server. To store the IP address, use the following procedure:

1. Turn off the printer.
2. Log in as *superuser* on the *rarp* server. However, if the server resides on another subnet, complete this procedure to store the IP address in the print server. Reconnect the print server anywhere on the network, and then use the *Telnet* procedure (See “Running TELNET” (page 5-47) for instructions on using *Telnet*) to adjust the IP parameters for the subnet on which the NIC is to operate.
3. Find the Ethernet address of the NIC. 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 NIC's node name. See the

network administrator for the IP address. For example, a print server 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 print server 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. The NIC should then reset itself.
9. After the NIC has reset, send a ping command to verify that the print server obtained its IP address. For example:

```
ping 192.9.200.200
```

If the print server 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.

Using *ping*

Use the following procedure to enter the IP Address:

1. Turn off the printer.
2. Log in as *superuser* on a host on the same subnet as the print server. However, if the server resides on another

subnet, complete this procedure to store the IP address in the print server. Reconnect the print server anywhere on the network, and then use *Telnet* to change the IP address. See “*Running TELNET*” (page 5-47) for instructions on using *Telnet*.

3. Find the Ethernet address of the NIC. 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 [print server's node name. See the network administrator for the IP address. For example, a print server 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 print server'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 print server is connected to the network. Turn on the printer.
7. Send a ping command the NIC to verify it is running on the network. For example:

```
ping 192.9.200.200 or
ping printfast
```

The NIC will not respond to this *ping* command but it will read its IP address from the packets.

8. Turn the printer off and back on again and then send the ping command again to verify that the print server obtained its IP address. If the print server 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 print server either by its IP address or by its name. For example:

```
arp -d printfast
```

lpd Printing

lpd is an implementation of the standard UNIX line printer daemon which lets you print across a TCP/IP network without the need to install software on your workstation with all filtering and banners done by NIC. Remote printing uses the same commands (lpr, lpq, lpc) as local printing.

The process begins when the lpr call finds a printer on a remote system by looking at the remote (rm) entry in the */etc/printcap* file for that printer. lpr handles a print job for a remote printer by opening a connection with the lpd process on the remote system and sending the data file (followed by the control file containing control information for this job) to the remote system. The printer-based lpd then filters the data and prints the job according to information contained in the control file and its own printcap file.

NIC lpd recognizes the format of a certain printer emulations and filters the data, if possible, so it can be printed on the printer type you specify. You can indicate to the NIC lpd what type of printer is attached to by either:

1. Accepting the default port setting (PCL, PostScript and other), or
2. Changing the listed emulations via the *Telnet* utility.

The following sections give specifics lpd setup instructions for various systems.

Setting Up a BSD Remote Printer to Use lpd

To set up a remote printer on the host that sends jobs to NIC using printer resident lpd, add an entry to the */etc/printcap* file on your host for each printer you use. The steps are described below.

1. Open the `/etc/printcap` file. Make an entry naming the NIC as the remote host and PORT1 as the remote printer name. A typical printcap entry is shown below:

```

<printer_name>\ (for example, lprprinter)
:lp=\
:rm=<remote_host>\ (for example, name as entered in
/etc/hosts)
:rp=PORT1:\
:sd=/usr/spool/lpd/<printer_name>: (for example,
spool directory on system used to spool data and
control files)

```

This entry will send jobs spooled at `/usr/spool/lpd/<printer_name>` to the printer designated `<printer_name>` to be printed at port 1 (the internal connection to the printer) of the NIC designated as `<remote_host>`.

2. Create the spooling directory. For example, type:

```
mkdir /usr/spool/lpd/<printer_name>
```

3. To print via the spooler, use the `lpr` command. Type:

```
lpr-P <printer_name>< file_name>
```

Installation and testing is done. You are now ready to print.

Setting Up an AIX Version 2.5 Remote Printer to Use lpd

Set up a remote printer on the host that sends jobs to the NIC using the NIC's lpd. Use the following procedures to do this:

1. At the prompt, type:

```
#smit spooler <cr>
```

2. When a window appears, select **Manage Remote Printers**.
3. When a menu appears, select **Client Services**.
4. Another menu appears, select **Remote Printer Queues**.

5. Another menu appears, select **Add a Remote Queue**.
6. When a window appears, change the values shown to configure the NIC. The values displayed are default values. You must replace the short and long form filter values with the values shown on the next page.

Requested Information Inputted Data	Example	Description of Inputted Data
Name of queue to add	print1	Name of local printer
queue Destination Host	printfast	NIC IP hostname
Short Form Filter	/usr/lpd/bsdshort	Required value
Long Form Filter	/usr/lpd/bsdlong	Required value
Name of remote printer queue	PORT1	NIC
Name of device to add	print1	Name of local queue

1. After you have supplied all values, press **ENTER**.

You can now print.

Setting Up an AIX 4.0 System

Use the following procedures to install a NIC in an AIX 4.0 system:

1. Run **SMIT Printer**.
2. Select **Print Spooling**.
3. Select **Add a Print Queue**
4. Select **Remote**.
5. Use **Standard Processing**.
6. Assign a queue name.
7. Use the host address of the NIC for the Remote System.
8. Use **PORT1** for the queue on the remote system.
9. Add a description (optional).

10. Press **ENTER** to generate.

Installation is complete. Test your printer by executing the following command:

```
lp -d<queue_name> <file_name>
```

Setting Up an HP/UX Remote Printer to Use lpd

Set up a remote printer on the host that sends jobs to a NIC using the NIC lpd. To do this:

1. At the prompt, type: **sam**
2. When a window appears, select **Printer/Plotter Manager**.
3. When the menu appears, select **List printer and plotters**.
4. When a list appears, select **Actions in the title bar**.
5. From the pull-down menu, select **Add Remote Printer**.
6. When a window appears, add values to configure NIC.
See the following example.

Printer Name	myprinter	name to be used in lp command
Remote System Name	fastprint	NIC hostname as in /etc/hosts
Remote printer Name	PORT1	lpd queue name

1. At the bottom of the screen, select **Remote Printer is on BSD system** from the three choices available.
2. Click on the **OK** button.
3. Ping the unit to test communications. Type:
ping <NIC IP address>
4. Ping should confirm your IP address with the message:
<NIC IP address> is alive
5. If the connection is confirmed, you can now print.

Setting Up an AS/400 Systems to Use lpd

When working with the output queue description (WORKOUTQD), there are several fields that must be defined for the NIC to function properly as a remote printer device. Use the following procedures to do this:

1. When prompted for the remote system, type **INTNETADR** so the AS/400 recognizes the device as an IP device.
2. Type **PORT1** for parallel port 1. Type **PORT2** for parallel port 2, etc.
3. Connection type *must* be **IP**.
4. Internet address *must* be the IP address of the NIC device.
5. Destination type *must* be **OTHER**.
6. When prompted for transforming SCS to ASCII, type **YES** to allow the AS/400 do the character translation.
7. Manufacturer type and model *must* be the print driver that goes with your printer. For example, OKI320IBM.

Setting Up a DEC ULTRIX 4.3 RISC or OSF1/ALPHA Remote Printer

Set up a remote printer on the host that sends jobs to a NIC.

1. At the prompt, type:

```
lprsetup
```
2. Select **add**.
3. Enter a name for your printer and press **ENTER**.
4. "Do you want more information on specific printer types?" Press **e**.
5. A list of ULTRIX-supported printers is listed. Type **remote** and press **ENTER**.
6. Enter a printer synonym (alias) and press **ENTER**.

7. Designate a spooler directory and press **ENTER**, or accept the default spooler directory displayed and press **ENTER**.
8. Designate a remote system name and press **ENTER**.
9. Designate **PORT1** as the remote system printer name and press **ENTER**.
10. You are asked to enter the name of a printcap symbol from a displayed list. Type **Q** and press **ENTER**.
11. Your configuration is displayed. You are asked whether these values are final. Type **Y** or **N** and press **ENTER**. An example is shown on the next page.

lp (line printer)	STR	
rm (remote host)	STR	Printer Server Card_host
rp (remote printer)	STR	PORT1
sd (spooler directory)	STR	/usr/spool/lpd7

1. Add comments to the printcap file. For example, you can type:

Dick's printer down the hall **ENTER**

2. Select **exit** to save your configuration and press **ENTER**.

You are now prepared to print.

Setting Up a SCO UNIX Remote Printer to Use lpd

Set up a remote printer on the host that sends jobs to a NIC using lpd. Use the following procedures to do this:

1. At the prompt, type: **mkdev rlp**



Note

*You cannot run **mkdev rlp** twice. If you have additional printers to be configured, use the **rlpconf** command.*

2. You will now be asked a series of questions. Respond as follows. Do you want to install or remove a remote printer? Type: **I**
3. Do you want to change printer description file /etc/printcap? Type: **Y**
4. Write a printer name. For example, type: **lprprinter1**
5. Is lprprinter1 a remote printer or a local printer? Type: **R**
6. Enter remote host name: type host name entered in printcap for NIC. For example, type: **lprprinter**
7. Confirm the information you have entered. Type: **Y**
8. Confirm the preceding connection as your system default. Type: **Y**
9. Enter another printer name or quit setup. Type: **Q**
10. Do you want to start the remote daemon now? Type: **Y**
11. Using a line editor of your choice, edit the /etc/printcap file by changing the :rp= entry to **PORT1**. For example,

```
printer1:\
```

```
:lp=\ (used to specify the device name for a local printer; this field must be empty)
```

```
:rm=lprprinter:\ (remote machine name or network name of the print server)
```

```
:rp=PORT1:\ (remote printer name or the name of the print server)
```

```
:sd=/usr/spool/lpd/printer1: (name of the spool directory on the client)
```

Setting Up System V Release 4 and Solaris 2.X to Use lpd

If your system recognizes the LPSYSTEM command, you can use lpd. Another option is the admintool if your system supports it.

LPSYSTEM Installation

Use the following procedures to install LPSYSTEM:

**Note**

*The following must be executed from the Bourne Shell. Type: **SH** to enter the Bourne Shell program.*

1. lpsystem -t bsd

Enter NIC host name in */etc/hosts* file. Your system may want its IP address instead of the remote host name.

2. lpadmin -p <local printername> -s <remote host name or IP address>!PORT#**Note**

*There is no space after the remote host name. The # represents the port number for that printer. For example, **PORT1**.*

3. Enable <local printername>**4. Accept <local printername>**

Installing TCP/IP for NIC If Not Running lpd

The TCP/IP diskette provided with the NIC includes install scripts for various UNIX systems. This section describes how to install TCP/IP printing to the NIC on any of the following operating systems:

- DEC ULTRIX 4.3 RISC
- System V Rel. 4
- Solaris (Ver. 1.x, 2.x)
- SCO UNIX

- OSF1/ALPHA
- IBM AIX
- HP/UX

Once the NIC has its IP information loaded, the following steps are necessary for Host-Side TCP/IP printing:

1. Load the print server software on your workstation. It is presented as a *tar* file on the TCP/IP diskette.
2. Run the appropriate installation script, if available.
3. Complete the configuration for your operating system.

Loading the Software

The following procedures are only necessary when using the supplied host-based *lpr* capability. Loading the software is not necessary if printer-based *lpr* is used.

1. Log in as *superuser* to the system that spools directly to the print server.
2. Insert the print server's TCP/IP diskette in the host drive.
3. Go to or create the directory in which you want to install the software. For example:

```
mkdir /usr/PSC_install
```



Note

If you already have a NIC printer at your site and you are now installing another one, delete the files in the installation directory (not /usr/nic). If these files remain, they can prevent the installation of a subsequent print server.

4. Use the *tar* command to load the software from the diskette. Choose your UNIX version from the example

from the following table, or if not shown, consult the man page for your system:

BSD/ULTRIX/AIX/SCO	tar -xvf/dev/rfd0
System V	tar -xvf/dev/rdisk/f13ht
System V/Solaris 2.3	tar -xvf/dev/rdiskette



Note

The device name varies depending on the computer and its peripheral designations. The first BSD floppy device is often called rfd0.

1. After performing the tar, the system will display a list of NIC files copied by the tar. At this point, go to the specific section for your system for instructions on running the installation script.

Script Selection of Filters

There will be certain options in executing the script for various systems. The installation script can create an entry in the /etc/printcap file for your printer:

ASCII, PCLfiles

One of the questions posed by the install script is whether the printer is a PostScript printer. If you answered *no* to this question, the install script uses an input filter (infilter) that supplies CR/LF translation to print ASCII files on a PCL printer. If you answered *yes* to this question, your printcap file will reference **psfilter** which offers easy ASCII-to-PostScript conversion. Normal PostScript format files are not affected. Proprietary and public domain filters are available for broader filtering capabilities.

Manual Selection of Filters

The NIC ships with an input filter called **psfilter** and an output filter called **psbanner** to print PostScript banners.

You may wish to change **infilter** or **outfilter** entries in the `/etc/printcap` file. The following is a sample printcap entry using these filters:

```
<print_name> | NIC printer:\
:lp=/dev/nic/<printer_name>:\
:if=/usr/nic/psfilter:\
:of=/usr/nic/psbanner:\
:sd=/usr/spool/<printer_name>:
```

Installing and Printing on Ver. 1 Solaris and OSF1 Systems

1. Run the Installation script by typing: **nicinst**.

The script automatically downloads the correct NIC utilities for your particular system and prompts you for information as needed.

2. What is the node name of the Print Server unit?

Type the node name entered in `/etc/hosts`. For example: `printfast` and press **ENTER**.

3. What is the printer name?

Type the desired printer name and press **ENTER**.

4. Your screen will now display the information you provided to the install script. For example:

Node name of the NIC: `printfast`

Printer name to be used: `<printer_name>`

The printer is attached on: `PORT 1`

You are asked to OK this configuration. Type **yes** or **no** and press **ENTER**.

5. Is this printer PostScript?

Type **yes** or **no** and press `ENTER`.

6. The script creates a printcap entry for the printer just configured. The screen displays the entry and asks if you want the script to append it to your `/etc/printcap` file. See below for a sample printcap file. Type **yes** or **no** and press `ENTER`. If you type no, you may perform manual edits.

In your `/etc/printcap` file, be sure not to change the name of the device given NIC in Step 2. You must reference the same `lp:` entry you wrote on the `lp` command line of the printcap file. For example:

```
<printer_name> | NIC printer:\
:lp=/dev/<printer_name>:\
:if=/usr/nic/infilter:\
:sd=/usr/spool/<printer_name>:
```

All printcap entries must be prefaced with a tab except for the entry on the first line.

7. The script creates a spool directory in `/usr/spool` and starts the daemon for the newly configured printer. It also displays the path used if you ever need to restart the daemon. For example:

```
/usr/nic/lpr_print /dev/nic/<printer_name> printfast
10001 &
```

8. Run the `ps` command so that you can view all your `lpd` processes.

Type: **`ps -ax | grep lpd`**

9. Kill all of your `lpd` processes. Type: **`kill -9 <Process ID>`** (this will stop **ALL** printing).

10. Restart the daemon.

Type: **`/use/lib/lpd`**

11. Installation for the system is done. You are prompted to configure any more printers.

Type **yes** or **no** and press **ENTER**. We also suggest you ping the NIC to test communications.

Installing & Printing on an DEC ULTRIX 4.3 System

1. Run the Installation script by typing: **nicinst**.

The script automatically downloads the correct NIC utilities for your particular system and prompts you for information as needed.

2. What is the node name of the Print Server unit?

Type the node name entered in `/etc/hosts`. For example, `printfast` and press **ENTER**.

3. What is the printer name?

Type the desired printer name and press **ENTER**.

4. Your screen will now display the information you provided to the install script. For example:

Node name of the NIC: `printfast`

Printer name to be used: `<printer_name>`

The printer is attached on: `PORT 1`

You are asked to OK this configuration. Type **yes** or **no** and press **ENTER**.

5. Is this printer PostScript?

Type **yes** or **no** and press **ENTER**.

6. The script creates a printcap entry for the printer just configured. The screen displays the entry and asks if you want the script to append it to your `/etc/printcap` file. See

below for a sample printcap file. Type **yes** or **no** and press **ENTER**. If you type no, you may perform manual edits.

```
<printer_name> | NIC printer:\
:lp=/dev/<printer_name>:\
:if=/usr/nic/infilter:\
:sd=/usr/spool/<printer_name>:
```

7. Installation for the system is done. The program prompts you to configure any more printers. Type **yes** or **no** and press **ENTER**. We suggest pinging the NIC to test communications.

Like all BSD systems, ULTRIX uses the `/etc/printcap` file to configure a printer. The interface to the installation script is the same for all BSD systems, however, the printcap entry is different.

If you use the printcap entry generated automatically by the installation script, this will be transparent to you.

Installing and Printing on the HP/UX System

1. Run the Installation script by typing: **nicinst**.

The script automatically downloads the correct NIC utilities for your particular system and prompts you for information as needed.

2. What is the node name of the Print Server unit?

Type the node name entered in `/etc/hosts`. For example, **printfast** and press **ENTER**.

3. What is the printer name?

Type the desired printer name and press **ENTER**.

4. Your screen will now display the information you provided to the install script. For example:

Node name of the NIC: printfast

Printer name to be used: <printer_name>

The printer is attached on: PORT 1

You are asked to OK this configuration. Type **yes** or **no** and press **ENTER**.

5. Is this printer PostScript?

Type **yes** or **no** and press **ENTER**.

6. The script starts the daemon for the newly configured printer automatically. It also displays the path used should you ever need to restart the daemon. In the following example, the path would be:

```
/usr/nic/lpr_print /dev/nic/printer_name printfast  
10001 &
```

This example reflects names supplied to the script earlier.

When the installation script is complete, you *must* configure the printer and make it known to the lp system. The HP/UX lp system uses the lpadmin maintenance command to configure a printer (there is not a /etc/printcap file). The specific commands to do this are:

```
lpadmin -p printer_name -v /dev/nic/printer_name  
enable printer_name  
accept printer_name
```

You can also use other options for the lpadmin command. See your system documentation for details.

**Note**

The printer name must be the same as the one you entered during the NIC installation. HP supplies the `sam` program as an alternative to configure the printer.

When using **sam**, specify everything as if the printer were directly connected to `/dev/lprprinter/printer_name`.

The software installed with your HP system can satisfy most of your printing needs. HP supplies ASCII-to-PostScript filters and the system will invoke them automatically if you define the content type of the printer as PostScript. The HP/UX `lp` system also supplies interface scripts that produce PostScript banners. Use the **lpfilter** command to define new filters and content types if necessary. The full power and flexibility of the `lp` print service is now available to you. The fact that you are printing across the network is completely transparent.

Installing and Printing on a System V (Solaris Ver. 2)/System V Rel. 4 386-based Machine

Installation and setup is exactly the same for System V Solaris and SVR4 i386-based machines. Solution uses a network direct filter called **nicfilter**. The system invokes `nicfilter` directly from the printer interface file.

After completing software download in the section “*Loading the Software*” (page 5-32) you must configure the printer and make it known to the `lp` system.

1. Run the Installation script by typing: **nicinst**.

The script automatically downloads the correct NIC utilities for your particular system and prompts you for information as needed.

2. Select your system. Choose one from these options:

- 1) AT&T/SVR4; 386
- 2) SCO UNIX System V
- 3) None of the above

Type 1, 2, or 3 and press `ENTER`.

3. You have now installed TCP/IP on the NIC. Copy your interface file (`/usr/nic` is a good place to keep your copy).

4. You must edit the printer interface program this printer uses to redirect output to the NIC. You can then configure your printer using **lpadmin**.

In most cases you will use the default interface script named **standard** (usually found in the `/usr/spool/lp/admins/lp/model` directory). Sometimes you may wish to use an interface tuned to a specific printer. You must have a copy of the of the interface file for the port you want to initialize. For example:

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

Most Version 2 Solaris machines have a shell variable called `FILTER` that you can changed to invoke `nicfilter`. A typical example is:

```
FILTER="/usr/nic/infilter | /usr/nic/nicfilter \  
PSC_name 10001 ${nobanner} \  
${user_name} ${request_id} ${files}"
```

You must specify the NIC name (`PSC_name`) and NIC port (10001) for **nicfilter** to connect to the NIC unit. The name must be the same one that you entered in `/etc/hosts` for this NIC.

The remaining arguments are optional. **nicfilter** uses them to produce a high quality banner. The `lp` print service user name, request id, file names and options always passes to the interface file. They will be available in any interface script as shell variables, although they may have different names.

If you disable banners in the `lp` command, the system will set the `$(nobanner)` option to `yes`. This will suppress the NIC banner generation.

If you don't define the `FILTER` shell variable in your interface file, you can usually modify it to pipe data to **nicfilter**. The simplest way to accomplish this is to enclose the entire script in parentheses and pipe it to **nicfilter**, using the arguments described above.

If you wish to use the banner generated by the interface file, simply omit the last four arguments.



Note

These arguments are shell variables from the interface file. They may have different names (names used above are from the standard interface file supplied with most Version 2 and i386 systems).

Installing & Printing on a SCO UNIX System

Installation and setup is similar for HP/UX and SCO UNIX systems. The NIC solution uses a network direct filter called **nicfilter**. The system invokes **nicfilter** directly from the printer interface file.

After completing software download in the section “*Loading the Software*” (page 5-32) you *must* configure the printer and make it known to the `lp` system. Follow the steps below:

1. Run the Installation script by typing: **nicinst**.

The script automatically downloads the correct NIC utilities for your particular system and prompts you for information as needed.

2. Select your system. Choose one from these options:

- 1) AT&T/SVR4; 386
- 2) SCO UNIX System V
- 3) None of the above

Type 1, 2, or 3 and press `ENTER`.

3. What is the node name of the NIC?

Type the name assigned in the `/etc/hosts` file and press `ENTER`. For example, `printfast`

4. What is the printer name for this NIC-linked printer?

Type a printer name and press `ENTER`.

5. Your screen will now display the information you provided the install script. For example:

Node name of the NIC: `printfast`

Printer name to be used: `<printer_name>`

The printer is attached on: `PORT1`

Do you want to accept this configuration? Type **yes** or **no** and press `ENTER`.

6. Is this printer PostScript?

Type **yes** or **no** and press `ENTER`.

7. The script automatically starts the daemon for the newly configured printer. It also displays the path used should you ever need to restart the daemon. In the preceding example, the path would be:

```
/usr/nic/lpr_print /dev/nic/printer_name printfast  
10001 &
```

This example reflects names supplied the script earlier.

When the installation script is complete, you must still configure the printer and make it known to the `lp` system.

The SCO UNIX `lp` system uses the `lpadmin` maintenance command to configure a printer (there is no `/etc/printcap` file).

The specific commands to do this are:

```
lpadmin -p printer_name -v /dev/nic/printer_name
enable printer_name
accept printer_name
```

You can also use other options for the `lpadmin` command. See your system documentation for details. Note that the printer name must be the same as the one you entered during NIC installation. SCO supplies the **sam** program as an alternative to configure the printer.

When using **sam**, specify everything as if the printer were directly connected to `/dev/nic/printer_name`.

The software installed with your SCO system can satisfy most of your printing needs. SCO supplies ASCII-to-PostScript filters and the system will invoke them automatically if you define the content type of the printer as PostScript. The SCO UNIX `lp` system also supplies interface scripts that produce PostScript banners. Use the `lpfilter` command to define new filters and content types if necessary. The full power and flexibility of the `lp` print service is now apparent. Your printing across the network is completely transparent.

Installing and Printing on an AIX RISC System/6000

The AIX printing subsystem is driven by the `qdaemon` program. The `qdaemon` uses configuration information stored in the `/usr/lpd/qconfig` file to manage queues and route jobs to the proper devices. This information includes entries for each virtual printer and physical device known to the system.

An AIX virtual printer is simply a high level software view of a data stream, queue, and device that controls how a given job will be processed. A different virtual printer should be defined for each data stream that a real printer supports. For example, you would use different virtual printers for PostScript and PCL jobs even though they are destined for the same physical printer.

Configuring a NIC printer on an AIX system approximates configuration of a local printer as closely as possible. The only difference is that the physical device associated with your NIC printer must be a named pipe used by the print daemon to route data to NIC. The most straightforward way to add a printer to your system is:

1. Run the Install script by typing: **nicinst**.

The script automatically downloads the correct NIC utilities for your particular system and prompts you for information as needed.

2. What is the node name of the Print Server unit?

Type the node name entered in /etc/hosts, for example: **printfast** and press **ENTER**.

3. What is the printer name?

Type the desired printer name and press **ENTER**.

4. Your screen will now display the information you provided to the install script. For example:

Node name of the NIC: printfast

Printer name to be used: <printer_name>

The printer is attached on: PORT 1

You are asked to OK this configuration. Type **yes** or **no** and press **ENTER**.

5. Configure a virtual printer using printer_name as the physical device, where printer_name is the same printer name chosen during install.

6. Shut down the qdaemon using the command

```
stopsrc -s qdaemon
```

7. Edit /usr/lpd/qconfig to change the special file for device printer_name from /dev/printer_name to /dev/nic/printer_name.

8. Restart the daemon with:

```
startsrc -s daemon."
```

The installation script then will create the named pipe and starts the supplied print daemon using the printer name and NIC information you supplied. Since the AIX System Management Interface Tool (SMIT) will not accept a named pipe as a printer device, the installation script also creates a null character device in `/dev/printer_name`.

Virtual Printer Commands

Virtual printers can be added either through SMIT or through the **mkvirprt** command, entering the device name `printer_name` for configuration purposes. During this process you also select a particular printer type for the new printer, which inherits the set of predefined attributes for that printer type. In most cases, this set of attributes will be sufficient, but it can be changed either through SMIT or by using the **chvirprt** command. If you need more extensive changes on your printer, see the *AIX RISC System/6000* documentation for assistance. After the virtual printer has been added, there will be a stanza in `/usr/lpd/qconfig` for device `printer_name` that looks like the following:

```
printer_name:
file=/dev/printer_name
backend=/usr/lpd/piobe
```

Edit `/usr/qconfig` and change

```
file=/dev/printer_name to file=/dev/nic/printer_name.
```

Output spooled on the virtual printer as defined above, will now be sent to the named pipe and routed to NIC. Before you edit the files above, be sure that the following daemon is running:

```
/usr/nic/lpr_print /dev/nic/printer_name printfast 10001 &
```

AIX Print Commands

The AIX lp command works slightly differently than the lp command for other System V Release 4 systems. The following lp commands can be used to print files:

```
lp -d <queue_name> <filename> or
```

```
lp -d <queue_name>:<device_name> <file_name>
```


Running TELNET

The *Telnet* utility uses the standard remote terminal protocol to configure the IP address, lpd printers, and other parameters on your system. Use the following guidelines to run *Telnet*:

- Most often, you make selections from menus by toggling between one choice or another, by selecting/deselecting or enabling/disabling an item.
- Press **Enter**, when not selecting an item. This will return you to a previous menu.
- If you do not make a menu selection for 2 minutes, you get a "**Two Minute Warning**" that within 2 more minutes your *Telnet* session will end. This ensures that one user does not leave a session idle for too long.

Making Connection and Main Menu

1. At the prompt, type:

```
telnet <network interface card IP address>
```

2. When *login:* appears, type **guest** if you are only interested in browsing the menus or **sysadm** if you want to change the configuration. Press **e**. When *password:* appears, again type **guest** or **sysadm** and press **ENTER**.
3. The main menu is displayed. This utility lets you change the IP Parameters, lpd printers, protocols, restore to factory defaults, and change password. Press the number for the parameter you wish to check or change and press **ENTER**.

```
The Configuration Utility
Unit Serial no. 221963

Main Menu
```

1. IP Parameters
2. LPD Printers
3. Protocols
4. Restore Factory Defaults
5. Change Password
- E. Exit

4. To end your *Telnet* session, type **E** at the Main Menu. If you have made any changes you are prompted to either *Save Changes and Exit* or *Exit Without Saving Changes*. Choose your option and press **ENTER**.



Note

Press ? to access the Telnet help utility.

Configure IP Parameters

Although the NIC must have an IP address before a *Telnet* Connection can be made, you can use the utility to change the address or the other IP parameters. The NIC will automatically initiate a soft reset when the IP address change is sensed.



Note

This will cause the Telnet connection to be broken. It is advisable to make all other desired changes before changing the IP address.

1. At the Main Menu, type **1** and press **ENTER** to bring up the IP Parameters menu (shown on the next page).

2. Type **1** again and press **ENTER**. The IP Address submenu will appear:

The Configuration Utility	
Unit Serial no. 221963	
1. IP Address	199.92.187.37
2. Subnet Mask	000.000.000
3. Default Gateway	000.000.000

1. Enter a new **IP Address** and press **ENTER**. Repeat the previous steps to change **Subnet Mask** and **Default Gateways**.
2. Enter **4** to change the base port number.

**Note**

The base port number is one less than the actual TCP/IP port number used by the printer. For example, to set the port number to 9100, enter 9099.

Select Printer Languages

Selection 2 in the Main Menu allows you to designate which emulations (printer interpreter languages) the printer supports. This is to allow the resident lpd to modify files intended for other emulations so that they may be printed. The menu also allows you to enable or disable banners attached to lpd handled jobs.

The emulation choices are Printer Control Language (PCL), PostScript (PS), ASCII (simple text) and Other (any print job not recognized as PCL, PS, or ASCII). The file modifications and conditions are:

PCL, (PostScript)	ASCII	<CR> changed to <CR><LF>
PostScript	PCL, Other	PostScript header added
not PostScript	PostScript	Job discarded
PostScript	ASCII	PostScript header added, <CR> changed to <CR><LF>
PCL, PS, ASCII	any	no action

- To access the LPD Printers menu, type **2** and press **ENTER**. For a unit at factory default, the menu shown below will appear.

LPD Printers	
1. Printer 1	PCL PS OTHER
2. Banners	DISABLED

- To change the set of emulations, type **1** and press **ENTER**. The options shown below will appear.

Printer 1	PCL PS OTHER
1. PCL	
2. PS	
3. ASCII	
4. OTHER	

- To delete an emulation, select the number opposite the language listed. For example, type **1** and press **ENTER** to delete PCL. Typing **1** again will again select PCL.
- From the LPD Printers menu, press **2** to toggle Banners between Enabled/Disabled.

Enable/Disable Network Protocols

To enable network protocols, at the Main menu type **3** and press **ENTER**. You are given the choice of disabling either **NetWare** or **AppleTalk** since both network OS's are enabled by default. For example, to disable Appletalk, type **2** and press **ENTER**.

Restore Factory Defaults

When it is necessary to restore factory defaults on your print server, choose **4** on the Main Menu and press **ENTER**. Your *Telnet* session will end immediately. The printer must be powered off then powered on for the factory default settings to be restored.

Change Password

When you want to establish a new password, enter **5** from the Main menu. Type up to eight characters after the **New Password** query and press **[ENTER]**. Retype the same characters at the **Retype New Password** query and press **[ENTER]**. Use the **Save Changes and Exit** option. Once you have established your password using Change Password, the password **sysadm** will be rejected.

Also, if you have forgotten your password, call Technical Support.

Exit Telnet

Use the following procedures to exit *Telnet*:

1. To end your *Telnet* session, type **E** at the main menu. If you have made any changes, the following menu will appear:

The Configuration Utility Unit Serial no. 221963
Exit
1. Save Changes and Exit
2. Exit Without Saving Changes

1. Choose your option and press **[ENTER]**. For example, type **1** and press **[ENTER]**. The program will save your changes and reset the print server.

Chapter 6

Operation and Troubleshooting

<i>Overview</i>	6-2
<i>LED Status Indicator</i>	6-3
<i>Status Report</i>	6-4
<i>Resetting the NIC to Factory Default</i>	6-6
<i>How to Diagnose Problems</i>	6-7
<i>Troubleshooting Checklists</i>	6-9
<i>Troubleshooting Network Hardware Connections</i>	6-9
<i>Troubleshooting NetWare Protocol</i>	6-10

Overview

This chapter describes normal operation of the Network Interface Card (NIC) in the printer, and also provides information on how to troubleshoot any problems you might have with the NIC.

LED Status Indicator

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

The green LED indicates the operating condition of the NIC when it is powered on during normal operation. Table 6.1 provides the conditions that this LED may indicate.

Table 6.1 LED indicators

LED Patterns	And the printer is...	THEN THE NIC...	Operating Condition
Green LED is ON solid.	First powered on.	Is performing self-tests.	Normal
	Awaiting print jobs.	Is functioning properly.	Normal
Green LED blinks 3 times and stays on.	Finished with self-tests.	Prints out status report	Normal
Green LED blinks rapidly.	Performing self-tests.	Detects bad RAM chip.	Error
Green LED blinks rapidly 4 times then pauses.	Performing self-tests.	Failed the Ethernet hardware self-test. Check the network.	Error
Amber LED blinks short for 10 seconds. Amber LED goes off and the Green LED blinks continuously.	Performing flash memory self-tests	Did not pass the checksum test unit automatically. Goes into download mode and awaits flash update.	Error
Green LED blinks slowly.	Awaiting print jobs sometime after power-on completes.	Some printer error reported.	Error
Green LED blinks rapidly.	Awaiting print jobs.	Has lost its NetWare connection to file server.	Error
Green LED alternately blinks with amber indicator.	Finished with power-on sequence.	Has been reset to factory defaults. Power off and move jumper JP2 to OFF position.	Error

Status Report

The Status/Configuration report is sent as a print job to the printer when the print server is powered on. For example, the report in Table 6.2 on page 6-5 shows the configuration of the NIC immediately before the report is printed. Some printers also allow you to use a command from the front panel that will produce a status report.

It is strongly recommended 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.

Table 6.2 NIC configuration report

Unit Serial No: 990007	Version: 03.03
Network Address: 00:40:af:78:d9:b8	
Network Topology: Ethernet	Connector: 10 Base T
Network Speed: 10 Mega Bits	
Novell Network Information	enabled
Novell Print Server Name: OTS_260121	Password Defined: no
Directory Services Context not defined	
Frame Type: Novell 802.3	
AppleTalk Network Information	enabled
Frame Type: 802.2 SNAP On 802.3	
Protocol Address: Net Number 010	Node Number 19 Socket Number
129	
Preferred AppleTalk Zone: Default Zone	
TCP/IP Network Information	enabled
Frame Type: Ethernet II	Protocol Address : Not
Configured	
Subnet Mask: 255.0.0.0	Default Gateway: 0.0.0.0

Novell Connection Information	
Printer Name: Printer 0	
File Server: PS280	
Queue: 3500_NIC	Priority: 1 Attached: Yes
No Notify Defined	
File Server: 55SX	
Queue: 3500_NIC	Priority: 1 Attached: Yes
No Notify Defined	
AppleTalk Connection Information	
AppleTalk Printer Name: Xerox Printer	
TCP/IP Connection Information	
Port Number: 10001	

Resetting the NIC to Factory Default

You can reset the NIC to its factory default values. You may choose to do this when the print server 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 print server loses all data such as names and IP addresses. It does not lose its serial number or Ethernet address.

To reset the NIC:

1. Power off the printer and remove the NIC from the printer. The removal process is the reverse of the installation process in *Chapter 2: Installing the Network Interface Card*.
2. Locate the Reset Jumper. It is labeled **OP2**. See the diagram in *Appendix A: Jumper Settings*.
3. Move this jumper to the **ON** position, so that the jumper covers the center pin and the pin nearest the jumper designator.
4. Install the NIC as shown in *Chapter 2*. Do not connect the printer to the network.
5. Power on the printer. The NIC performs its diagnostic self tests — the green LED blinks 3 times then goes into an alternating green/amber light sequence. When you see this pattern, power off the printer.
6. Remove the assembly from the printer and remove the NIC from the printer.
7. Move the JP2 jumper to its **OFF** position, so that the jumper covers the center pin and the pin nearest the OFF designation.
8. Reinstall the NIC according to *Chapter 2*.

How to Diagnose Problems

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

1. Verify that the printer is functioning properly.
 - Is the printer printing? Did you receive a PostScript start page? Make sure the printer is operating properly by causing it to generate a test page. See your printer's owner's manual for instructions on generating a test page.
 - Is the printer on-line? Verify that the printer is on-line or else nothing will print.
 - Does the control panel display an error message? Review the printer documentation for an explanation of the error messages.
 - Did you get a NIC status page? On power-up, the print server sends a status page which may contain information that can be useful for troubleshooting. Keep the status page available until a problem is resolved.
2. Check the print server's LED status indicator to ensure that there is no error condition. See *"LED Status Indicator"* (page 6-3) for more information.
3. Check the status report to see what protocols are enabled and active. See the appropriate chapter to confirm that you have installed and configured your network protocol correctly for the NIC. See *"Status Report"* (page 6-4) 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 can 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 nature of the problem, use the checklists in the next section.

Trouble- shooting Checklists

Troubleshooting Network Hardware Connections

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

Be sure that the NIC has properly selected 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 NIC. If the printer is at the end of a run, ensure that a 50-ohm terminator is installed.
- For 10BaseT, check that the network connector is plugged into the RJ connector on the NIC.
- 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 use Manual Ethernet Port Selection, you change Jumper 4 on the NIC:

1. Power down the printer and remove the NIC.
2. Locate the jumper and change its position from the AU position to the MAN position. In the MAN position, the jumper covers the center pin of the jumper and the pin nearest the MAN designation.
3. Install the NIC.

Troubleshooting NetWare Protocol

It is recommended you use NIManage's Troubleshooting utility. If you have not resolved the problem after running NIManage, go through the checklists in this section.

NetWare Checklist

- Is the print server name entered correctly? The factory-default name is *OTS_serial number*. The serial number is located on the card.
- Did you assign print queues to the printer? It is recommended you assign each print queues to only one NIC-connected printer. If print queues are assigned to other network printers, the print jobs may be going to an 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.

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.

Workstation Checklist

- Is the network loaded onto the workstation? See the NetWare documentation.
- 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.

NIC Configuration Checklist

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

- Check the status of the print server. Use NIManage'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 configured the new devices correctly.

- Make sure the NIC's name has been entered correctly. If you changed the name in NIManage, 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.

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 NIC can not log into the file server, or cannot 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 NIC through PCONSOLE does not match the password assigned through NIManage. Use NIManage to update the password stored in the network print server'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.

Workstation to NIC Connection Checklist

To make sure the workstation is communicating with the NIC, 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 NIC can service the job. To do this, disable the other printer until you can verify the NIC-connected printer setup.

NIC Loses Its File Server Connection

If the NIC 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.

Unable to Print from a Different Context

The NIC does not support printing from a context different from the context you are installed upon. If you want to do this, you must create an alias queue. See your NetWare Manual for more information.

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 NIC and correct zone?
- 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 driver in Chooser? You must first select the printer icon and then select the printer name.
- If you renamed the printer in the AppleTalk Administration Program, did you reselect the printer under its new name?
- If you placed the printer in a new zone, did you reselect the zone?

Troubleshooting Checklists

- Are other printers with similar names in Chooser? Make sure you chose the NIC-connected printer.

Appendix A

Jumper Settings

<i>Overview</i>	A-2
<i>Print Server Board and Jumper Locations</i>	A-3
<i>Ethernet Jumpers</i>	A-4
<i>Reset to Factory Default</i>	A-7
<i>Address Select</i>	A-7
<i>BUS Handshake</i>	A-7

Overview

The Network Interface Card (NIC) will normally automatically configure the network configuration without the need to access internal jumpers. However, there are certain jumpers on the board that you may have to access under certain circumstances. If you need to change the jumpers, follow the steps in this section.



Caution

HANDLING PRECAUTIONS FOR STATIC SENSITIVE DEVICES

The NIC is normally contained within the printer which acts to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment.

Make sure you do not have the printer plugged into a wall outlet. If it is, unplug the power cord **BEFORE** you open the unit.

Print Server Board and Jumper Locations

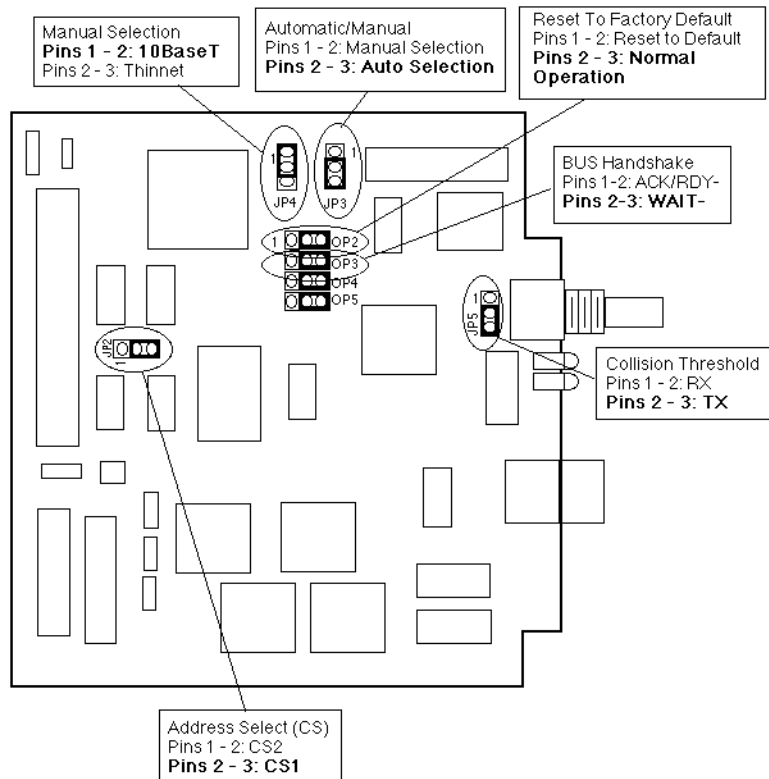
Figure A.1 shows the location of each of the jumpers on the NIC.



Note

The **bold print** indicates the default pin positions.

Figure A.1 Jumper locations

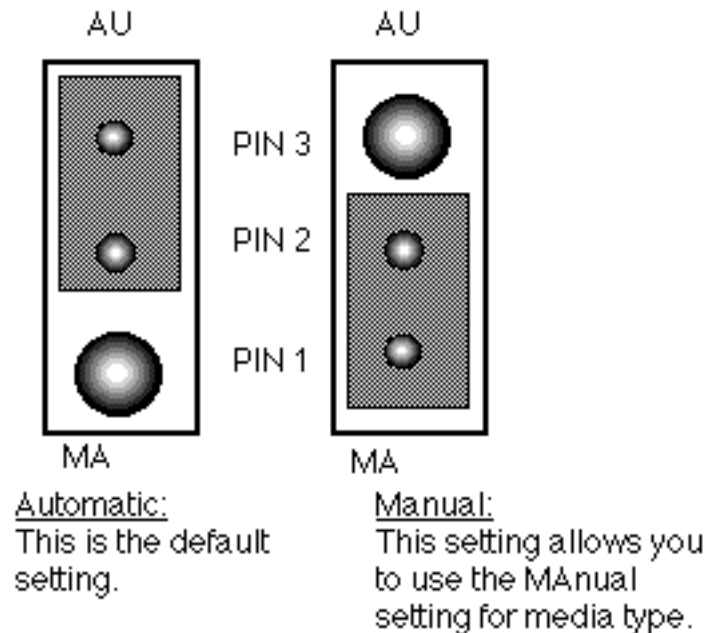


Ethernet Jumpers

There are three jumpers that affect Ethernet operations: Automatic/Manual (JP4), Manual Selection (JP3), and Collision Threshold (JP5).

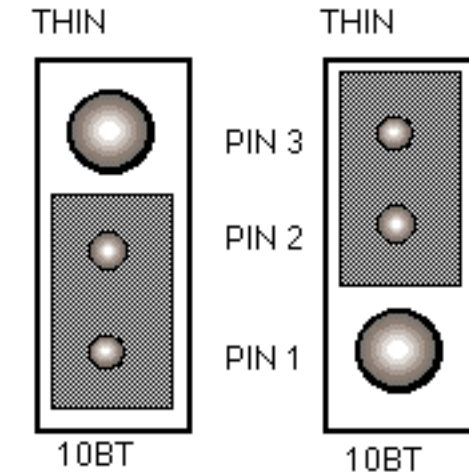
The **Automatic/Manual** jumper (Figure A.2) causes the NIC to select Ethernet network type automatically when in the AU position. In the MA position, the selection is covered by the Manual Selection jumper.

Figure A.2 Automatic/Manual Ethernet jumper



The **Manual Select** jumper (Figure A.3) allows the user to force the NIC to operate from the indicated connector. Note that with the Manual-10BaseT connection, the card will operate 10BaseT without the support of the LINK connect signal.

Figure A.3 Manual Select jumper

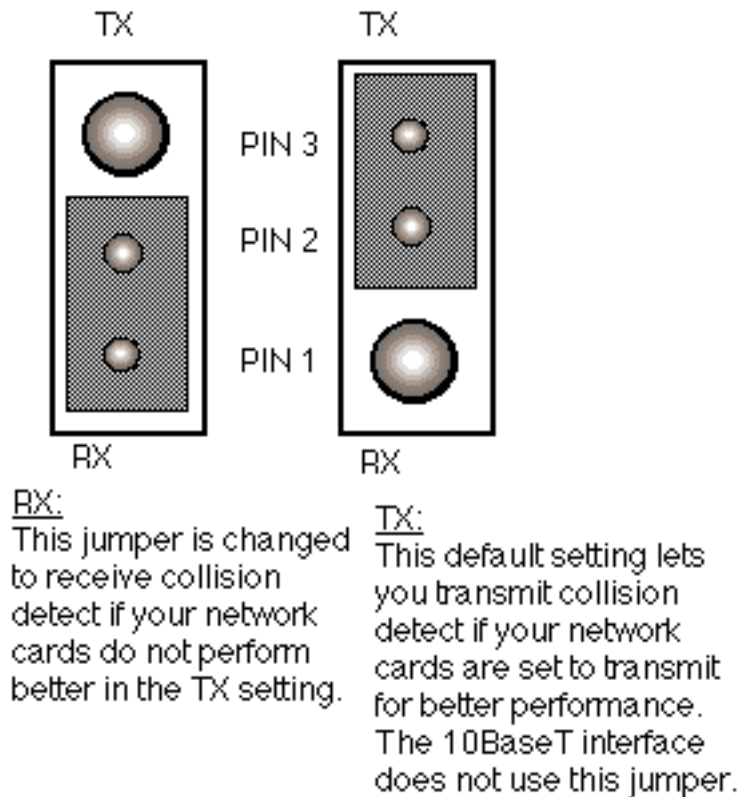


10BaseT:
This is the default setting. Move the jumper labeled 10BT to the pins labeled THIN to change the setting.

Thinnet:
This is what the jumper will look like once you set it for Thinnet connections.

The **Collision Threshold** jumper (Figure A.4) is for Thinnet interfaces only. The 10BaseT Ethernet interface does not use this jumper. The default setting is TX for Transmit Threshold. You may wish to change this jumper to RX (Receive Threshold) if you are using the Thinnet interface and you wish to adjust the collision threshold.

Figure A.4 Collision Threshold jumper



Reset to Factory Default

The NIC may be restored to factory default conditions by jumper (OP2). The function of OP2 is to reconfigure NVRAM. This is done when a unit is moved from one site to another and should be restored to as "*as-new*" condition. In the case of an OTP rather than flash product, it may also be necessary to do a "*reset to factory default*" after changing to a ROM with a different assignment of NVRAM.

If the unit is powered up with a jumper in the OP2 position (closer to the 68340 integrated chip), the board will go into a "*reset all parameters to Factory Default*" state. This will be indicated by the three quick green flashes followed by the alternating red and green indications (once per second rate). This special indicator sequence means that the NVRAM parameters have been reset to factory default values. Now turn off power and shift the OP2 jumper to the pins (labeled **CUST**) further away from the 68340 integrated chip. The unit will operate normally when you turn the power on again.

Address Select

Access to the shared memory interface by the printer can be within one of two memory address blocks. They are identified as CS1 and CS2. If just one card is used, the CS1 space is used. The address space is selected by JP2. With the jumper set to pins 1-2, CS2 is selected. With the jumper set to pins 2-3, CS1 is selected.

BUS Handshake

The bus handshake signal may be altered to match with your printer controller. Normal handshake signal is **WAIT-** signal (OP3 set to pins 2 and 3). Check your printer manual to determine if your controller requires the alternate handshake signal **ACK/RDY-**(OP3 set to pins 1 and 2).



Appendix B

Specifications

Network Interface Card

Use the following considerations when choosing your 10BaseT cables to connect to the RJ45 connector on the NIC:

- 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 table 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	Not Used
1	4	white/blue	Not Used
1	5	blue/white	Data Receive (Hub Transmit)
3	6	green/white	
4	7	white/brown	Not Used
4	8	brown/white	Not Used



Appendix C

NIC MIB Definition

NIC MIB Definition

```
DPI-NPS-MIB DEFINITIONS ::= BEGIN
IMPORTS
mgmt, enterprises, NetworkAddress, IPAddress
FROM RFC1155-SMI
OBJECT-TYPE
FROM RFC-1212
DisplayString, PhysAddress
FROM RFC1213-MIB
FROM RFC-1213
```

```
TRAP-TYPE
FROM RFC-1215;
```

This version of the NICMIB is annotated to provide additional information about the objects and variable values. As an explanation for some of the items, the NICMIB is accessing a structure already accessed by proprietary programs running under various environments. It is anticipated that these programs and the MIB approach must co-exist for some period. Therefore the existing structure was retained rather than optimizing it for MIB compatibility. Objects which are not applicable to the device being queried are responded back with 'N/A'. Any such object will not accept a write access.

DPI Proprietary MIB definition, intended for all print server products.

```
dpi                OBJECT IDENTIFIER ::= { enterprises 901 }
dpiProducts        OBJECT IDENTIFIER ::= { dpi 1 }
dpiNPS             OBJECT IDENTIFIER ::= { dpiProducts 1 }
groups in dpiNPS
dpisys            OBJECT IDENTIFIER ::= { dpiNPS 1 }
dpidiag           OBJECT IDENTIFIER ::= { dpiNPS 2 }
dpiNetworkware    OBJECT IDENTIFIER ::= { dpiNPS 3 }
dpiTCP            OBJECT IDENTIFIER ::= { dpiNPS 4 }
dpivines          OBJECT IDENTIFIER ::= { dpiNPS 5 }
dpiAppleTalk      OBJECT IDENTIFIER ::= { dpiNPS 6 }
dpiIPLAT          OBJECT IDENTIFIER ::= { dpiNPS 7 }
```

The DPI system group

```
romver OBJECT-TYPE
SYNTAX DisplayString (SIZE (0..6))
ACCESS read-only
STATUS mandatory
DESCRIPTION
```

"A string specifying the software rom version. General form is XX.XX indicating major and minor revision. Decimal point is ASCII-coded period."

```
::= { dpisys 1 }
```

```
hardwaretype OBJECT-TYPE
```

```
SYNTAX INTEGER { ns50(1), ns100(2), ns150(3), ns200(4), jetprint(5) , NIC (7) }
ACCESS read-only
STATUS mandatory
DESCRIPTION
```

"This variable specifies the current hardware platform."

```
::= { dpisys 2 }
```

The NIC boards have an enumeration of 7

```
productdescription OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..255))
ACCESS read-only
STATUS mandatory
```



```

DESCRIPTION
"This string provides a textual description of the product. For example 'NIC Option
Supporting Novell (NDS), TCP/IP and AppleTalk"
 ::= { dpisys 3 }
producttype OBJECT-TYPE
SYNTAX INTEGER { printserver (1), commserver (2)}
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Specifies the product family that this unit belongs to)"
 ::= { dpisys 4 }
NIC is a printserver (1)
interfaces OBJECT-TYPE
SYNTAX INTEGER (0..255)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Bit map of supported protocols:
 1 -- Novell
 2 -- Appletalk
 4 -- Banyan/Vines
 8 -- TCP/IP
16 -- DEC/LAT
 ::= { dpisys 5 }
standard NIC maps to 11 decimal
The DPI diagnostic group
reset OBJECT-TYPE
SYNTAX INTEGER (1..1)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"Writing a '1' to this variable causes the unit to reset. Variable reads back as '0' "
 ::= { dpidiag 1 }
factory OBJECT-TYPE
SYNTAX INTEGER (1..1)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"Writing a '1' to this variable causes the unit to initialize itself to the factory default
settings. Variable reads back as '0'."
 ::= { dpidiag 2 }
downloadreset OBJECT-TYPE
SYNTAX INTEGER (1..1)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"Writing a '1' to this variable causes the unit to initialize for flash download. Variable
reads back as a '0'"
 ::= { dpidiag 3 }
downloadprotocol OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-write

```

NIC MIB Definition

STATUS mandatory

DESCRIPTION

"This variable specifies which protocol to use for flash download. The default is NetWare. ::= { dpidiag 4 } the only download presently implemented is NetWare, regardless of value set. Variable reads back as 65535

downloadpath OBJECT-TYPE

SYNTAX DisplayString (SIZE(0..255))

ACCESS read-write

STATUS mandatory

DESCRIPTION

"This variable specifies a pathname to retrieve a download file. This variable is currently not used."

::= { dpidiag 5 }

NIC variable reads back as N/A.

Statusreporttype OBJECT-TYPE

SYNTAX INTEGER (0..3)

ACCESS read-write

STATUS mandatory

DESCRIPTION

"This variable contains the status report on power up options. The state can be no report, print ascii report or print postscript report.

0 - no ASCII report

1 - print ASCII report

2 - no postscript report

3 - print postscript report

65535 - unsupported"

::= { dpidiag 6 }

NIC defaults to enum 3

serialnumber OBJECT-TYPE

SYNTAX DisplayString (SIZE(0..6))

ACCESS read-write

STATUS mandatory

DESCRIPTION

"This variable specifies the Serial Number of the unit; form is six decimal digits."

::= { dpidiag 7 }

enetAddress OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0..6))

ACCESS read-only

STATUS mandatory

DESCRIPTION

"Ethernet Address, six 8-bit binary values. Derived ethernet address is given even on token ring boards"

::= { dpidiag 8 }

tokenAddress OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0..6))

ACCESS read-only

STATUS mandatory

DESCRIPTION

"Token Ring Address, six 8-bit binary values. Derived Token Ring address is given even on ethernet boards"

::= { dpidiag 9 }

totalports OBJECT-TYPE

```

SYNTAX  INTEGER (0..65535)
ACCESS  read-only
STATUS  mandatory
DESCRIPTION
"Total Number of ports."
 ::= { dpidiag 10 }
NIC value is '1'
numserialports OBJECT-TYPE
SYNTAX  INTEGER (0..65535)
ACCESS  read-only
STATUS  mandatory
DESCRIPTION
"Total Number of serial ports."
 ::= { dpidiag 11 }
NIC value is '0'
numparaports   OBJECT-TYPE
SYNTAX  INTEGER (0..65535)
ACCESS  read-only
STATUS  mandatory
DESCRIPTION
"Total Number of parallel ports."
 ::= { dpidiag 12 }
NIC value is '1'
dpicomcommunity OBJECT-TYPE
SYNTAX  DisplayString (SIZE(0..28))
ACCESS  read-write
STATUS  mandatory
DESCRIPTION
"This variable specifies the community name to be used for SETs. It defaults to 'private'.
When read with the 'public' community name, the value is scrambled"
 ::= { dpidiag 13 }
iptrapaddr     OBJECT-TYPE
SYNTAX  IpAddress
ACCESS  read-write
STATUS  mandatory
DESCRIPTION
"This variable specifies the internet address of the management station which should
receive TRAPs."
 ::= { dpidiag 14 }
NIC default is read back as 0.0.0.0
ipxtrapaddr    OBJECT-TYPE
SYNTAX  DisplayString (SIZE(0..22))
ACCESS  read-write
STATUS  mandatory
DESCRIPTION
"This variable specifies the IPX address of the management station which should receive
TRAPs. The format is:nnnnnnnnn:mmmmmmmmmmmm, where:
n = net address hex digit ,
m = MAC address hex digit."
 ::= { dpidiag 15 }
NIC default is all zeros
statusprint    OBJECT-TYPE

```

NIC MIB Definition

```
SYNTAX DisplayString (SIZE(0..10))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"Causes a status page to be printed or killed. Writable values are:
(K)ill (which will abort a status print is process)
(P)rint (which will initiate a status print)
The amount of time to wait is controlled by printerwait below which also controls
porttestpage in the termcap table. Readable values are:
AVAILABLE, PRINTING"
 ::= { dpidiag 16 }
printerwait OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"Number of seconds to wait while trying to initiate a status page or test page print. Print
job is abandoned if printer does not accept job in indicated period."
 ::= { dpidiag 17 }
NIC default is 10
The Port Capability Group
portcapTable OBJECT-TYPE
SYNTAX SEQUENCE OF PortcapEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"This table contains information and control for printer ports on the unit."
 ::= { dpidiag 18 }
In the NIC module, aside from the index value which is set to '1', all objects in this
table read back as N/A, reflecting the fact that they are not applicable to the NIC module
portcapEntry OBJECT-TYPE
SYNTAX PortcapEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
" "
INDEX { portindex }
 ::= { portcapTable 1 }
PortcapEntry ::=
SEQUENCE {
portindex INTEGER,
porttype DisplayString,
portsubtype DisplayString,
porttestpage DisplayString,
portsoj DisplayString,
portsojdelay DisplayString,
porteoj DisplayString,
porteojdelay DisplayString,
portstrobe DisplayString,
mioblocksize DisplayString,
portbaud DisplayString,
portparity DisplayString,
```

```

portstopbits DisplayString,
portdatabits DisplayString,
portreadybusy DisplayString,
portxonxoff DisplayString
}
portindex          OBJECT-TYPE
SYNTAX  INTEGER (0..65535)
ACCESS  read-only
STATUS  mandatory
DESCRIPTION
"This variable specifies the physical port number."
 ::= { portcapEntry 1 }
NIC has only one port, value = 1
porttype           OBJECT-TYPE
SYNTAX  DisplayString (SIZE(1..5))
ACCESS  read-only
STATUS  mandatory
DESCRIPTION
"This variable specifies the type of port. Currently there are two types defined: parallel,
serial."
 ::= { portcapEntry 2 }
NIC response is N/A
portsubtype        OBJECT-TYPE
SYNTAX  DisplayString (SIZE(1..5))
ACCESS  read-only
STATUS  mandatory
DESCRIPTION
"This variable further defines the port. If the port is for an internal card this variable
is set to NIC."
 ::= { portcapEntry 3 }
NIC response is N/A
porttestpage       OBJECT-TYPE
SYNTAX  DisplayString (SIZE(1..1))
ACCESS  read-write
STATUS  mandatory
DESCRIPTION
"Causes a test sheet to be printed or killed. Writable values are:
(K)ill
(A)scii
(P)ostscript.
The amount of time to wait is controlled by printerwait above which also controls
statusprint. Readable values are:
AVAILABLE
time in seconds as it is clocked down."
 ::= { portcapEntry 4 }
NIC response is N/A
portsoj            OBJECT-TYPE
SYNTAX  DisplayString (SIZE(1..64))
ACCESS  read-write
STATUS  mandatory
DESCRIPTION
"This variable contains the start of job string for the port specified by portindex."

```

NIC MIB Definition

```
::= { portcapEntry 5 }
NIC response is N/A
portsojdelay OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..5))
ACCESS read-write
STATUS mandatory
DESCRIPTION
This variable specifies the start of job delay in seconds for the port specified by
portindex."
::= { portcapEntry 6 }
NIC response is N/A
porteoj OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..64))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the end of job string for the port specified by portindex."
::= { portcapEntry 7 }
NIC response is N/A
porteojdelay OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..5))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the delay between the end of job and the end of job string for the
port specified by portindex."
::= { portcapEntry 8 }
NIC response is N/A
portstrobe OBJECT-TYPE
SYNTAX DisplayString (SIZE(2..3))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the amount of time in microseconds the strobe is kept active for
each character. The string is translated into a value understood by the firmware. The valid
strings are: "
::= { portcapEntry 9 }
NIC response is N/A
mioblocksize OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..5))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the data transfer block size used by MIO interface cards."
::= { portcapEntry 10 }
NIC response is N/A
portbaud OBJECT-TYPE
SYNTAX DisplayString (SIZE(3..6))
ACCESS read-write
STATUS mandatory
DESCRIPTION
```

"This variable specifies the baud rate for the port specified by portindex. The port must be a serial port for this variable to apply."

::= { portcapEntry 11 }

NIC response is N/A

portparity OBJECT-TYPE

SYNTAX DisplayString (SIZE(3..3))

ACCESS read-write

STATUS mandatory

DESCRIPTION

"This variable specifies the parity used by the port specified by portindex. The port must be a serial port for this variable to apply."

::= { portcapEntry 12 }

NIC response is N/A

portstopbits OBJECT-TYPE

SYNTAX DisplayString (SIZE(1..3))

ACCESS read-write

STATUS mandatory

DESCRIPTION

"This variable specifies the number of stop bits used by the port specified by portindex. The port must be a serial port for this variable to apply."

::= { portcapEntry 13 }

NIC response is N/A

portdatabits OBJECT-TYPE

SYNTAX DisplayString (SIZE(1..1))

ACCESS read-write

STATUS mandatory

DESCRIPTION

"This variable specifies the number of data bits used by the port specified by portindex. The port must be a serial port for this variable to apply."

::= { portcapEntry 14 }

NIC response is N/A

portreadybusy OBJECT-TYPE

SYNTAX DisplayString (SIZE(1..8))

ACCESS read-write

STATUS mandatory

DESCRIPTION

"This variable is used to ENABLED/DISABLE the hardware flow control capability of the port specified by portindex. The port must be a serial port for this variable to apply."

::= { portcapEntry 15 }

NIC response is N/A

portxonxoff OBJECT-TYPE

SYNTAX DisplayString (SIZE(1..8))

ACCESS read-write

STATUS mandatory

DESCRIPTION

"This variable is used to ENABLED/DISABLE the software XON/XOFF flow control mechanism for the port specified by port index. The port must be a serial port for this variable to apply."

::= { portcapEntry 16 }

NIC response is N/A

messageTable OBJECT-TYPE

SYNTAX SEQUENCE OF MessageEntry

NIC MIB Definition

```
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"This table contains error messages generated by the unit."
 ::= { dpidiag 19 }
Messages are intended for administrator
messageEntry OBJECT-TYPE
SYNTAX MessageEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
" "
INDEX { messageindex }
 ::= { messageTable 1 }
MessageEntry ::=
SEQUENCE {
messageindex INTEGER,
errormessage DisplayString
}
messageindex OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"A number representing the index of the error message."
 ::= { messageEntry 1 }
errormessage OBJECT-TYPE
SYNTAX DisplayString (SIZE (0..255))
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Error message retained by server."
 ::= { messageEntry 2 }
The DPI NetWare Group
enablenetware OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies whether or not the Novell Netware protocol is enabled. Changes
occur at the next reset or power cycle. Writable Values are:
enable
disable
or any truncation of these terms, in upper case or lower case. Stored values are:
ENABLED
DISABLED
"
 ::= { dpinetware 1 }
netwareloginname OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..47))
ACCESS read-write
STATUS mandatory
```



```

DESCRIPTION
"A textual string containing the login name for the Novell print server."
 ::= { dpineware 2 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
However, actual default value is NIC_<serial no>
networkpasswd OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..31))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"A textual string containing the password for the Novell print server."
 ::= { dpineware 3 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
preferredsvr OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..47))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"Specifies the preferred file server that the unit is to login to first."
 ::= { dpineware 4 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
scanrate OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"Specifies the interval in seconds that the unit is to check the print queues for jobs to
print."
 ::= { dpineware 5 }
NIC default is 1
frametype OBJECT-TYPE
SYNTAX INTEGER (1..5)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the appropriate network frametype to use.
1 -- Auto-Sense
2 -- 802.3
3 -- Ethernet II
4 -- 802.3 SNAP
5 -- 802.2
"
 ::= { dpineware 6 }
NIC default is 1
context OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..127))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the Directory services context."
 ::= { dpineware 7 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM

```

NIC MIB Definition

```
tree OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..47))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the Directory services tree."
 ::= { dpinetwork 8 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
disablebindery OBJECT-TYPE
SYNTAX INTEGER (0..1)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable allows bindery mode to be turned off and on.
'0' means not disabled
'1' means disabled"
 ::= { dpinetwork 9 }
NIC default is 0, not disabled
netwareportTable OBJECT-TYPE
SYNTAX SEQUENCE OF NetwareportEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"NetWare information about the ports currently being serviced."
 ::= { dpinetwork 10 }
NIC has but one port, so that this table is not applicable to NIC configurations
NIC reports N/A for all objects in this table
netwareportEntry OBJECT-TYPE
SYNTAX NetwareportEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
" "
INDEX { netwarePort }
 ::= { netwareportTable 1 }
NetwareportEntry ::= SEQUENCE {
netwarePort INTEGER,
netwareportenable DisplayString
}
netwarePort OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Port index"
 ::= { netwareportEntry 1 }
NIC response is N/A
netwareportenable OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
ACCESS read-write
STATUS mandatory
DESCRIPTION
```

```

"Specifies whether or not the port is enabled."
 ::= { netwareportEntry 2 }
NIC response is N/A
filesvrTable OBJECT-TYPE
SYNTAX SEQUENCE OF FilesvrEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"A table of the file servers currently being serviced by the unit."
 ::= { dpinetwork 11 }
filesvrEntry OBJECT-TYPE
SYNTAX FilesvrEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"This entry contains information about all file servers being serviced by the unit."
INDEX { fsPort, fsPortindex }
 ::= { filesvrTable 1 }
FilesvrEntry ::= SEQUENCE {
fsPort      INTEGER,
fsPortindex INTEGER,
filesvrname  DisplayString,
filesvrstate INTEGER
}
fsPort      OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Refers to print server port"
 ::= { filesvrEntry 1 }
NIC has but one port, index 1.
fsPortindex OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
" The is one index value for each file server to which the printserver is attached. "
 ::= { filesvrEntry 2 }
filesvrname OBJECT-TYPE
SYNTAX DisplayString (SIZE (0..47))
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The name of a file server referenced by the fsPortIndex"
 ::= { filesvrEntry 3 }
filesvrstate OBJECT-TYPE
SYNTAX INTEGER { not-active (1), active (2) }
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Specifies whether or not the file server is actively

```

NIC MIB Definition

```
being serviced."
 ::= { filesvrEntry 4 }
queueTable OBJECT-TYPE
SYNTAX SEQUENCE OF QueueEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"Information about the NetWare print queues currently being serviced."
 ::= { dpinetwork 12 }
queueEntry OBJECT-TYPE
SYNTAX QueueEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
" "
INDEX { queuePort, queueindex }
 ::= { queueTable 1 }
QueueEntry ::= SEQUENCE {
    queuePort      INTEGER,
    queueindex     INTEGER,
    queueName      DisplayString,
    qfilesvrName   DisplayString,
    queuePortType  INTEGER,
    eueState       DisplayString,
    qpriority      INTEGER
}
queuePort OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Specifies the print server port being considered."
 ::= { queueEntry 1 }
NIC value is always 1
queueindex OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Specifies the index of the queue. Each queue on a given fileserver has a unique index value"
 ::= { queueEntry 2 }
    queueName OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..47))
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The name of a print queue corresponding to the queueIndex."
 ::= { queueEntry 3 }
qfilesvrName OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..47))
ACCESS read-only
```

```

STATUS mandatory
DESCRIPTION
"The name of the file server owning this queue."
 ::= { queueEntry 4 }
queueporttype OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Specifies the type of port."
 ::= { queueEntry 5 }
NIC value is "31"
queuestate OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Specifies whether the queue is active or not. ACTIVE is returned for active.
INACTIVE is returned for not active. In this context, active indicate that there is a file
in the queue."
 ::= { queueEntry 6 }
qppriority OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The NetWare priority assigned to the queue."
 ::= { queueEntry 7 }
The DPI TCP/IP Group
enabletcp OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies whether or not the TCP/IP protocol is enabled. Changes occur at
the next reset or power cycle. Writable Values are:
enable
disable
or any truncation of these terms, in upper case or lower case. Stored values are:
ENABLED
DISABLED
"
 ::= { dpitcp 1 }
ipaddr OBJECT-TYPE
SYNTAX IpAddress
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the unit's internet address."
 ::= { dpitcp 2 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
subnet OBJECT-TYPE

```

NIC MIB Definition

```
SYNTAX IpAddress
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the unit's subnet mask."
 ::= { dpitcp 3 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
defaultgateway OBJECT-TYPE
SYNTAX IpAddress
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the unit's default gateway address."
 ::= { dpitcp 4 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
defaulthostport OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies the base TCP port number of the host printing solution. The
default base port number is 10000."
 ::= { dpitcp 5 }
lpdportTable OBJECT-TYPE
SYNTAX SEQUENCE OF LpdportEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"This table contains the LPD filter settings for each printer port."
 ::= { dpitcp 6 }
lpdportEntry OBJECT-TYPE
SYNTAX LpdportEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"LPD filter settings per LPD port."
INDEX { lpdPort }
 ::= { lpdportTable 1 }
LpdportEntry ::= SEQUENCE {
  lpdPort          INTEGER,
  filtertype       INTEGER,
  ffenable         DisplayString,
  bannerenable    DisplayString
}
lpdPort OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"Port Index"
 ::= { lpdportEntry 1 }
There is only on eport in NIC. Index is 1.
```

```

filtertype OBJECT-TYPE
SYNTAX INTEGER (0..65535) { pcl (1), postscript (2), ascii (4),
other (8), }
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The filter type options set for the port specified by lpdPort. The values can be OR'ed
together to enable a combination of filters."
 ::= { lpdportEntry 2 }
NIC default is decimal 11, corresponding to plc, postscript and other. This corresponds to
filtering of ASCII diles to add cr/lf sequences
ffenable OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..8))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This allows form feeds to be enabled or disabled on the port specified by portindex.
Writable Values are:
enable
disable
or any truncation of these terms, in upper case or lower case. Stored
values are:
ENABLED
DISABLED
 ::{ lpdportEntry 3 }
There should be no use for this option on the NIC modules; response is N/A
bannerenable OBJECT-TYPE
SYNTAX DisplayString (SIZE(1..8))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This allows banner pages to be enabled or disabled on the port specified by portindex..
Writable Values are:
enable
disable
or any truncation of these terms, in upper case or lower case. Stored
values are:
ENABLED
DISABLED
"
 ::= { lpdportEntry 4 }
DPI Banyan Group
None of this group is applicable to NIC NBovell/TCP/AppleTalk cards Response is N/A
enablevines OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies whether or not the Banyan VINES protocol is enabled. Changes occur
at the next reset or power cycle."
 ::= { dpivines 1 }
vinesloginname OBJECT-TYPE

```

NIC MIB Definition

```
SYNTAX DisplayString (SIZE (0..64))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable holds the Banyan Street Talk login name for DPI Banyan print server."
 ::= { dpivines 2 }
vinespasswd OBJECT-TYPE
SYNTAX DisplayString (SIZE (0..16))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable holds the Street Talk pass word for the DPI Banyan print server."
 ::= { dpivines 3 }
DPI Apple Group
enableapple OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies whether or not the AppleTalk protocol is enabled. Changes occur at
the next reset or power cycle. Changes occur at the next reset or power cycle. Writable
Values are:
enable
disable
or any truncation of these terms, in upper case or lower case. Stored
values are:
ENABLED
DISABLED
"
 ::= { dpiappletalk 1 }
applelevel OBJECT-TYPE
    SYNTAX INTEGER (0..65535)
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
"Structure level of NVRAM"
    ::= { dpiappletalk 2 }
NIC value is 0
applenetrangelow OBJECT-TYPE
    SYNTAX INTEGER (0..65535)
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
" "
    ::= { dpiappletalk 3 }
NIC value is 6
applenetrangehigh OBJECT-TYPE
    SYNTAX INTEGER (0..65535)
    ACCESS read-only
    STATUS mandatory
    DESCRIPTION
". "
```



```

 ::= { dpiappletalk 4 }
NIC value is 10
appledevicename OBJECT-TYPE
    SYNTAX    DisplayString (SIZE(0..32))
    ACCESS    read-only
    STATUS    mandatory
    DESCRIPTION
"Refers to device name used for maintenance access name is NetPrint."
 ::= { dpiappletalk 5 }
appledevicetype OBJECT-TYPE
    SYNTAX    DisplayString (SIZE(0..32))
    ACCESS    read-only
    STATUS    mandatory
    DESCRIPTION
"Device type Fixed at Laserwriter"
 ::= { dpiappletalk 6 }
appledesiredzone OBJECT-TYPE
    SYNTAX    DisplayString (SIZE(0..32))
    ACCESS    read-write
    STATUS    mandatory
    DESCRIPTION
"This variable specifies the target network zone."
 ::= { dpiappletalk 7 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
appleinput OBJECT-TYPE
    SYNTAX    INTEGER ( 0..65535)
    ACCESS    read-only
    STATUS    mandatory
    DESCRIPTION
"Unused."
 ::= { dpiappletalk 8 }
NIC reads back as 0
applenumberofprinters OBJECT-TYPE
    SYNTAX    INTEGER (0..65535)
    ACCESS    read-only
    STATUS    mandatory
    DESCRIPTION
"Actual number of printers recognized by the Appletalk print server."
 ::= { dpiappletalk 9 }
Value is 1 on NIC
appleprinterTable OBJECT-TYPE
SYNTAX SEQUENCE OF AppleprinterEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"This table contains information for apple printer ports on the unit."
 ::= { dpiappletalk 10 }
appleprinterEntry OBJECT-TYPE
SYNTAX AppleprinterEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION

```

NIC MIB Definition

```
" "
```

```
INDEX { appleprinterindex }
 ::= { appleprinterTable 1 }
AppleprinterEntry ::=
SEQUENCE {
appleprinterindex INTEGER,
appleprintername DisplayString,
appleprinterenable DisplayString,
appleprintertype INTEGER,
appleprinterbidirectional DisplayString
}
appleprinterindex          OBJECT-TYPE
SYNTAX  INTEGER (0..65535)
ACCESS  read-only
STATUS  mandatory
DESCRIPTION
"index of printer serviced "
 ::= { appleprinterEntry 1 }
value is fixed to 1 on NIC
appleprintername          OBJECT-TYPE
SYNTAX  DisplayString (SIZE(0..32))
ACCESS  read-write
STATUS  mandatory
DESCRIPTION
"Name assigned to printer for Apple use."
 ::= { appleprinterEntry 2 }
Default value reported on NIC is no value, indicating that there is no value in NVRAM
However, unit will assume default value of 'NIC Multiprotocol'
appleprinterenable       OBJECT-TYPE
SYNTAX  DisplayString (SIZE(0..8))
ACCESS  read-write
STATUS  mandatory
DESCRIPTION
"(E)nabled or (D)isabled."
 ::= { appleprinterEntry 3 }
Not Applicable to NIC, since enable/disbale is on basis of AppleTalk protocol. Response is
N/A
appleprintertype         OBJECT-TYPE
SYNTAX  INTEGER (0..65535)
ACCESS  read-write
STATUS  mandatory
DESCRIPTION
"Unused"
 ::= { appleprinterEntry 4 }
NIC response is '0'
appleprinterbidirectional OBJECT-TYPE
SYNTAX  DisplayString (SIZE(0..3))
ACCESS  read-only
STATUS  mandatory
DESCRIPTION
"This variable specifies the bidirectional capabilities of of the Appletalk printer. YES if
printer is bidirectional, NO if not."
```

```
::= { appleprinterEntry 5 }
NIC response is YES
DPI LAT Group
enablelat OBJECT-TYPE
SYNTAX DisplayString (SIZE(0..8))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This variable specifies whether or not the DEC LAT protocol is enabled. Changes occur at
the next reset or power cycle."
::= { dpilat 1 }
NIC response is N/A.
END
```



Appendix D

Environmental Specifications

The Xerox Commitment to Environmental Quality

Xerox Corporation is committed to an international program to safeguard our environment by diverting certain products and materials from the solid waste stream. We do this by reusing serviceable components and remanufacturing selected products.

To support this effort, we have made it easy for you to return selected printer equipment and empty print cartridges to Xerox. We recondition the print cartridges and refill them with Xerox toner and developer. All products we manufacture meet our stringent performance standards.

The worldwide effort to remanufacture printer equipment and recall EP (print) cartridges benefits the environment and conserves our natural resources by reducing waste going into our landfills. Besides, it makes good business sense for Xerox and Xerox customers. Please join us in this effort.

Acoustic Noise Figures

On Standby (ROS Pause): 44 dB(A)

Under Operation:

Continuous Sound: 52 dB(A)

FCC Compliance Statement for United States Users

Class A:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Shielded cables must be used with this equipment to maintain compliance with FCC regulations.

Caution: Changes or modifications not expressly approved by Xerox Corporation could void the user's authority to operate the equipment.

Compliance Statement for International Users

Canadian EME Regulations:

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

Cet appareil numérique est conforme aux limites d'émission de bruits radioélectriques pour les appareils de Classe A stipulées dans le Règlement sur le brouillage radioélectrique du Ministère des Communications du Canada.

European EME Regulations:

This Network Interface Card meets the requirements of EN55022 Class A.

"The CE marking applied to this product symbolizes Rank Xerox Declaration of Conformity with the following applicable Directives of the European Union as of the dates indicated:

January 1, 1995: - Council Directive 73/23/EEC amended by Council Directive 93/68/EEC, approximation of the laws of the member states related to low voltage equipment.

January 1, 1996: - Council Directive 89/336/EEC, approximation of the laws of the member states related to electromagnetic compatibility.

A full declaration, defining the relevant Directives and referenced standards can be obtained from your Rank Xerox representative."

Operational Safety

Your Xerox equipment and supplies were designed and tested to meet strict safety requirements. These include safety agency examination, approval, and compliance with established environmental standards.

Attention to the following notes ensures the continued safe operation of your equipment.

Always connect the equipment to a properly grounded power source receptacle. If in doubt, have the receptacle checked by a qualified electrician.

WARNING: Improper connection of the equipment grounding conductor can result in electrical shock.

Always follow all warnings and instructions marked on, or supplied with, the equipment.

Always locate the equipment on a solid support surface with adequate strength for the weight of the machine.

Always exercise care in moving or relocating the equipment.

Always place the equipment in an area which provides adequate room area for ventilation and servicing.

Always use the materials and supplies specifically designed for your Xerox equipment. Use of unsuitable materials may result in poor performance and, possibly, a hazardous situation.

Never use a ground adaptor plug to connect the equipment to a power source receptacle that lacks a ground connection terminal.

Never attempt any maintenance function that is not specifically described in this documentation.

Never obstruct ventilation openings. These are provided to prevent overheating.

Never install the equipment near a radiator or any other heat source.

Never override or "cheat" electrical or mechanical interlock devices.

Never push objects of any kind into the ventilation openings.

Never operate the equipment if you notice unusual noises or odors. Disconnect the power cord from the power source receptacle and contact your dealer or Xerox / Rank Xerox to correct the problem.

If you need any additional safety information concerning the equipment or materials, contact your dealer or Xerox / Rank Xerox.

WARNING: Use of controls, adjustments, or performance of procedures other than those specified herein may result in a hazardous radiation exposure.

This product will produce less than 0.1 ppm ozone during normal operation. The ozone produced is dependent on copy volume and is heavier than air. Providing the proper environmental parameters as specified by Xerox will ensure that concentration levels meet safe limits.

If additional information concerning ozone is needed, request the Xerox publication (600P83222), "Ozone," by calling in the USA 1-800-828-6571.

Laser Safety

WARNING: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous light exposure.

This equipment complies with appropriate safety standards.

With specific regard to lasers, the equipment complies with laser product performance standards set by governmental, national, and international agencies as a Class 1 laser product. It does not emit hazardous light as the beam is totally enclosed during all phases of customer operation and maintenance.

When you perform various operator functions, laser danger labels may be visible. These labels are for your dealer or service technician and are placed on or near panels, or shields, which require a tool for removal. **THESE PANELS ARE NOT TO BE REMOVED BY USERS OF THE PRINTER. THERE ARE NO USER SERVICEABLE AREAS INSIDE THESE COVERS.**

Laser Safety Warning for Finland and Sweden

Luokitus on tehty standardin EN 60825 mukaisesti
Klassningen är gjord i enlighet med standarden EN 60 825

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

VAROITUS!

Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

WARNING!

Om apparaten används på annat sätt än i denna bruksansvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.



Index

Numerics

10BaseT Cables B-2

A

Address Select A-7

AIX Print Commands 5-46

AIX RISC System/6000

 Install and Print 5-43

Assign Print Object 3-24

Assign Print Server Object 3-25

Assign Printer Object 3-22

Assigning IP Address with ARP 5-4, 5-9, 5-13

Assigning IP Address with Bootp Lite 5-5

Assigning IP Address with NTBootp 5-10, 5-14

Assigning Print Queues to Printer 3-8

Assignments

 Check 3-26

AUTOEXEC.NCF 3-13

B

Bindery Context 3-13

Bindery Emulation 3-13

 Configuring 3-13

C

Bindery Services 3-13

Bootp 5-19

Bootp Lite

 Assigning IP Address 5-5

BUS Handshake A-7

C

Cables

 10BaseT B-2

Change Password 5-52

Changing Password 5-51

Changing Print Queues 3-34

Changing the File Server 3-33

Choosing the Printer 4-3

Commands

 AIX Print 5-46

 Virtual Printer 5-45

Configuration

 EtherTalk 4-1

 NetWare 3-19

 Print Server 3-7

 TCP/IP 5-1

Configure in Bindery Mode

 Configuration

 Bindery mode 3-14

Configure Printer in NIManage 3-19

Configure the Print Server 3-7

Configuring Bindery Emulation 3-13

Configuring Directory Services 3-13

Configuring IP Address 5-18

Configuring IP Parameters 5-48

Configuring NetWare 2.15 and 3.1x 3-4

Configuring NetWare 4.0x 3-13

Configuring Network Interface Card 4-7

Configuring Network Interface Card in NetWare Directory Services 3-17

Confirm Bindery Context 3-13

Connector

 RJ45 B-2

C

- Context
 - Confirm Bindery 3-13
- Create a Print Queue Object 3-22
- Create a Print Server Object 3-22
- Create Print Queues 3-5
- Creating an LPR Queue on the Workstation 5-7

D

- Diagnosing Problems 6-7
- DIB 3-17
- Differences
 - DIB and the Bindery 3-17
- Directory Information Base (DIB) 3-17
- Directory Services
 - Configuring 3-13

E

- Emulation
 - Bindery 3-13
- Enable/Disable Network Protocols 5-51
- Error Log 4-8
- Ethernet Jumpers A-4
- EtherTalk Configuration 4-1
- EtherTalk Protocol Troubleshooting 6-13

F

- Factory Default
 - Reset A-7
- Factory Defaults
 - Restoring 5-51
- File Server
 - Changing 3-33
 - Installing the Print Primary 3-11
 - Preferred 3-11
 - Primary 3-11
- Filters 5-34

H

- Handshake
 - BUS A-7

/

HP/UX

Install and Print 5-38

I

Indicator

LED Status 6-3

Install Print Server on Multiple File Servers 3-11

Install Script

TCP/IP 5-32

Installation

Windows 95 5-8

Windows Environment 5-3

Windows for Workgroups 5-3

Installing TCP/IP 5-4

Installing TCP/IP by Script 5-32

Installing the Network Interface Card 2-1

Installing the Print Primary File Server 3-11

Installing Windows NT 5-12

IP Address

Configuring 5-18

IP Parameters

Setting Up 5-15

IP Parameters Set Up 5-11

J

Jumper Locations A-3

Jumper Settings A-1

Jumpers

Ethernet A-4

L

LED Status Indicator 6-3

Loading NIManage for AppleTalk Program 4-5

Loading the LPR Spooler 5-4, 5-8

lpd printing 5-24

LPR Parameters

Set Up 5-7

Setting Up 5-15

LPR Parameters Set Up 5-11

- LPR Queue
 - Creating 5-7
- LPR Spooler
 - Loading 5-4, 5-8

M

- Microsoft Windows 95 Installation 5-8
- Multiple Print Servers 3-11

N

- NCF Files 3-13
- NDS 3-13, 3-17
- NetWare
 - Configuring for 2.15 and 3.1x 3-4
 - NetWare 4.0x
 - Configuring 3-13
 - NetWare Configuration 3-1, 3-19
 - NetWare Directory 3-13
 - NetWare Directory Services 3-13
 - Configuring Network Interface Card 3-17
 - NetWare Protocol Troubleshooting 6-10
- Network Interface Card **B-2**
 - Configuring 4-7
 - Installing 2-1
 - Resetting to Factory Default, Resetting Network Interface Card 6-6
 - Set Up 5-12
 - Setting Up 5-4
- Network Interface Card, Set Up 5-8
- Network Protocols
 - Enable/Disable 5-51
- NIC MIB Definition C-1
- NIManage
 - Loading for AppleTalk Program 4-5
 - Printer Configuration 3-19
- Novell PCONSOLE Utility 3-33
- NSDOCTOR 3-19
- NTBootp
 - Assigning IP Address 5-10, 5-14
- NWADMIN 3-19
 - Printer Configuration 3-20

O

OSF1

Install and Print 5-35

OSF1/Alpha Remote Printer 5-28

P

Parameters

IP and LPR 5-7

Password

Changing 5-51, 5-52

PCONSOLE 3-5, 3-14

PCONSOLE configuration process

setting up notify options 3-9

PCONSOLE Utility 3-33

ping 5-22

Power Cycle the Printer 3-27

Power up

Printer 2-3

Preparing the Printer 2-2

Primary and Preferred File Servers 3-11

Print Object

Assigning 3-24

Print Primary File Server 3-11

Print Queue Object

Create 3-22

Print Queues

Changing 3-34

Create 3-5

Print Server Configuration 3-7

Print Server Name 3-6

Print Server Object

Assigning 3-25

Create 3-22

Printer

Assigning Print Queues 3-8

Choosing the 4-3

Power Cycle 3-27

Preparing 2-2

Set Up Notify Options 3-9

Printer Notify Options 3-9

- Printer Object
 - Assigning 3-22
- Printer Power Up 2-3
- Printer server/file server/printer checklist 6-12
- Problems
 - Diagnosing 6-7
- Procedures
 - Print Server Name 3-6
- Protocol Setup 4-9
- PSBanner 5-34

R

- rarp 5-21
- Report
 - Status/Configuration 6-4
- Reset to Factory Default A-7
- Restoring Factory Defaults 5-51
- RFC 951 5-20
- RJ45 Connector B-2
- Running TELENET 5-47

S

- SCO UNIX 5-20
 - Install and Print 5-41
- Screen
 - Zone and Device 4-5
- Select File Server 3-5
- Select Printer Languages 5-50
- Selection
 - File Server 3-5
- Services
 - Bindery 3-13
- Set up 5-28
- Set Up BSD Remote Printer to Use lpd 5-24
- Set Up DEC Printer
 - ULTRIX 4.3 RISC OSF/ALPHA Printer 5-28
- Set Up DEC Remote Printer
 - OSF1/Alpha 5-28
 - ULTRIX 4.3 RISC 5-28

T

Set Up SCO UNIX Remote Printer 5-29

Setting Up

IP Parameters 5-11

LPR Parameters 5-11

Setting Up AIX Remote Printer for lpd 5-25

Setting Up HP/UX Remote Printer to use lpd 5-27

Setting Up IP and LPR Parameters

IP Parameters

Set Up 5-7

Setting Up IP Parameters 5-15

Setting up LPR on the Workstation 5-15

Setting Up LPR Parameters 5-15

Setting Up the Network Interface Card 5-4

Setting up the Network Interface Card 5-8, 5-12

Setup

Protocol 4-9

Solaris

Install and Print 5-35

Specifications B-2

Start PCONSOLE 3-5

Status Report 6-4

System V (Solaris Ver. 2)

Install and Print 5-39

System V Rel 4

Install and Print 5-39

T

TCP/IP

Installing 5-4

TCP/IP Configuration 5-1

Loading Software 5-33

TELENET 5-47

Telnet

Exit 5-52

Troubleshooting 6-9

- EtherTalk Protocol 6-13
- File Server Checklist 6-10
- NetWare Protocol 6-10
- Network Hardware Connections 6-9
- Network Interface Card Configuration Checklist 6-11
- Network Interface Card Loses File Server Connection 6-13
- Print Server/File Server/Printer Checklist 6-12
- Unable to Print from a Different Context 6-13
- Workstation Checklist 6-11

U

ULTRIX 4.3 RISC Remote Printer 5-28

Using Bootp 5-19

Using PCONSOLE Utility 3-33

Using ping 5-22

Using rarp 5-21

Using the NIManage Utility 3-28

Utility

NIManage 3-28

Novell PCONSOLE 3-33

V

Virtual Printer Commands 5-45

W

Windows Environment

Installation 5-3

Windows for Workgroups Installation 5-3

Windows NT

Installation 5-12

Z

Zone and Device Screen 4-5

