Print Server Card

For Novell NetWare¨, AppleTalk, and TCP/IP Networks

Owner's Manual
Ethernet Models

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

- Automatic selection of 10Base2 (Thinnet), or, automatic selection of 100BaseT Fast Ethernet connection or 10BaseT Ethernet connection (for Ethernet cards with both type of connections).

- Fully transparent AppleTalk printing support for the Macintosh, including support for binary PostScript printing.

- Peer-to-Peer (serverless) discovery and printing from Windows 95/98 or Windows NT (4.0 or higher) workstations, without a Novell file server present and without using IP.

- Novell NetWare PSERVER on both bindery based and Novell Directory Services (NDS).

- lpr/lpd over TCP/IP for UNIX platforms and Microsoft Windows.

- 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 MIBs on compatible printers.

- Integral HTTP Server to allow monitoring and management of your Print Server Card from a standard IP Web Browser program.

- Management Access Program (MAP) to allow Windows-based HTML viewing for monitoring and management of your Print Server Card.

- FTP printing to allow users to print directly from their IP browser or other FTP client.

- FTP download allow users in the TCP/IP environment the ability of flash upgrading their Print Server Card.

- Flash memory to allow field upgrades, with capability for either Novell IPX/SPX or TCP/IP (FTP) download of executable code.

1.1   What's in Your Package

The Print Server contains the following:

- Print Server Card
- Quick Install Guide booklet for the Network Interface Card
- 1 CD-ROM that contains the following
    - This Manual
    - Quick Install Guide for the Network Interface Card
    - Management Access Program (MAP)
    - IPX Peer-to-Peer Windows Redirector
    - IP Peer-to-Peer Windows Redirector
    - UNIX TCP/IP Utility

The SNMP directory 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.

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

Note: Each print server has a unique serial number prefixed by three letters. The screen examples in this manual show serial numbers with the prefix "SHA", such as"SHA_991354". The serial number prefix for your print server may be different (for example: "NPS" or "PSI".)

1.2 Hardware/NOS Requirements

The Print Server Card hardware and software require the following:

Version of Protocol or Network Operating System	Novell NetWare Version 3.x or 4.x.
	Macintosh System 7.
	UNIX, Windows, or LAN Server systems supporting lpr over TCP/IP.
Software	The IP Peer-to-Peer utility requires Windows NT 4.0 or later; Windows 95/98
	The IPX Peer-to-Peer utility requires Windows NT 4.0 or later; Windows 95/98
	The MAP utility requires Windows NT 4.0 or later; Windows 95/98. MAP also requires a browser such as Microsoft Internet Explorer or Netscape.
	AppleTalk printing requires printer PPD appropriate to the printer. AppleTalk MAP Utility is provided for setup and maintenance.
	TCP/IP setup and maintenance may be done with Telnet. Monitoring and maintenance with HTTP requires a suitable internet Web Browser program supporting HTML.
Hardware	Support for 10 megabit Ethernet networks: either 10Base2 (also known as ThinWire or Thinnet) or 10BaseT (twisted pair) cables and hardware.
	Support for 100 megabit Ethernet networks: 100BaseT (twisted pair) cables and hardware
	CD-ROM drive on the workstation to accept Windows or UNIX utilities.

2
Installing the Print Server Card

2.1 Preparing the Printer

If the printer can generate a test or status page, you should generate one before you begin. This will give you detailed information on the identification and configuration of your printer, as well as ensuring that the printer is properly set up and operating.

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 Print Server Card in the option port, according to the printer manufacturer instructions.

Note: **Handling Precautions for Static Sensitive Devices:** The Print Server 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.

2.2   Connect the Network to Print Server Card: Ethernet

You can connect your **Ethernet** network in one of two ways:

1. **Using the 10BaseT or 100BaseT Ethernet interface**. This network connection uses a 4-wire RJ cable to plug into the RJ45 network connector on the Print Server Card.

Note: The Print Server Card automatically determines which type of network connection you are making; 100BaseT,10BaseT, or 10Base2. However, some older 10BaseT hubs may not support auto-detection of 10BaseT versus 10Base2. If this occurs, you may be required to change a jumper from automatic to manual selection. See **Appendix A** for details.

2. **Using a Thinnet Ethernet interface**. Your Print Server Card may include a BNC connector for 10Base2 or Thinnet connection. The Thinnet Ethernet wire uses a BNC T-connector to plug into the BNC port on the Print Server Card (marked **Thinnet** on the bracket). This Ethernet cable is 1/4-inch coaxial cable (usually RG-58/U) that uses the cylindrical BNC T-connector to attach to the BNC port.

Once you make the connection, continue to *2.3 Powering Up the Printer,*

2.3 Powering Up the Printer

Use the following procedures to power up the printer. Do this before the printer is attached to the network to verify the physical installation of the Print Server Card.

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 Print Server Card then provides a print job to the printer which contains the Print Server Card status information. Refer to *8.2 Status Report,* for more information.
3. Check the Print Server Card status report. Record the serial number and the Network address or save the status report. This information will be needed when configuring the printer for your network.

Refer to one or more of the following chapters for instructions on configuring the network for the Print Server Card.

- Chapter 4: Novell NetWare Configuration
- Chapter 5: Windows Peer-To-Peer Configuration
- Chapter 6: AppleTalk Configuration
- Chapter 7: TCP/IP Configuration

3
Using the Management Access Program or a
Standard Web Browser

The Management Access Program (MAP) uses a Windows-based HTML viewer program linked with a proprietary bi-directional IPX/IP channel program to allow access to the Print Server Card's HTML-based monitoring and maintenance capabilities. An IP Web Browser also provides access to this capability directly. Either program allows you to:

• Configure your network protocols for the Print Server Card.

• Reset the Print Server Card remotely to either clear an error condition, or return the print server to its factory default settings.

• Troubleshoot problems in the Print Server Card.

• Enable or disable the status sheet printout.

• Access a context-sensitive help menu that fully explains how to use each Management Access Program feature.

MAP has the following requirements:

• A web browser must be installed on this PC. Both Netscape Navigator and Internet Explorer are supported.

• Microsoft TCP/IP or IPX/SPX network protocol support must be installed and running on the workstation.

Note: To be able to change parameter values with the Management Access Program or the Web Browser, you must know the Print Server Card management password. The factory default password is "**sysadm**".

3.1   Where to Place the MAP Utility
The utility can be installed on any workstation hard drive or network drive.

3.2   How to Install MAP in Windows
The MAP utility can be installed using the self-running CD or it can be installed manually.

3.2.1 AutoInstall
1.   Start Windows on workstation.

2. Insert CD supplied with the Print Server Card into the CD ROM drive.

3. Once the CD's self-running program has started, follow the directions on the screen.

4. When the installation is complete, remove the CD from the CD drive.

3.2.2 Manual Install

1. Insert CD supplied in the Print Server card into the CD ROM drive.

2. Select **RUN** from the **Start** menu.

3. At RUN, type **<CD_Drive>:\MAP\SETUP.EXE** and click on the **OK** button.

4. Follow the instructions provided in the installation program screens.

5. When the installation is complete, remove the CD from the CD drive.

3.3   Using the MAP Program

When you start the MAP program, the program will prompt you with a list of IPX print servers listed by their SAP identification and IP print servers by their IP address. Select the print server you want to access. The program will setup a link to the print server and display its configuration menu.

3.4   Web IP Browser

Once you have assigned an IP address to your Print Server Card, you may use a web IP browser, such as Netscape, to access the print server's configuration menus. To access the print server using a web browser,do the following:

1. Open up your browser.

2. For the URL, type in the IP address of the Print Server Card. The printer server's configuration menu should appear.
   If you have problems, check to make sure you are using the correct IP address.

4
NetWare Configuration

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

- **Configuring NetWare 3.x** describes how to configure the Print Server Card for use with Version 3.x. Use PCONSOLE to set up the print server function.

- **Configuring NetWare 4.0x in Bindery Emulation** describes how to configure the Print Server Card for use with Version 4.x Bindery Services. Use PCONSOLE to set up the print server function.

- **Configuring NetWare Directory Services** describes how to configure the Print Server Card for use with Version 4.x Directory Services. Use NWADMIN to set up the print server function.

- **Print Server Card Setup Parameters** describes the parameters accessible via MAP or an IP Browser used to configure the Print Server for NetWare.

- **Using NetWare PCONSOLE Utility** explains how to use the PCONSOLE utility to make changes to the configuration of the Print Server function.

4.1 Configuring NetWare 3.x

Before configuring NetWare, you must determine if the Print Server Card has its desired name. You may use MAP or IP browser to do this.

Before you begin:

- Verify that you have supervisor privileges on the file servers on which the Print Server Card print server is to be entered.

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

When you are finished turn the printer off and on again. The printer creates a status report that indicates the file server(s) to which the unit is attached and the queues which it services.

4.1.1 Start PCONSOLE and Select File Server

Follow these steps to start PCONSOLE:

1. Log in to the network, type **PCONSOLE** and press the return key.

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 the return key. If the name of the file server you want is not displayed, press the **Insert** key to get a list of file servers.

4. Log in to the file server.

5. Press the **Escape** key to return to the Available Options menu.

4.1.2 Create Print Queues

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

• If the print queue that you want the print server card to service already exists, and you know the name of this queue, go to *4.1.3 Enter the Print Server Name*.

• 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 the **Return** key. A list of existing queues is displayed.

2. To create a new queue, press **INSERT**. Enter the name of the queue and press the **Return** key.

3. Press the **ESC** key to return to the **Available Options** menu.

4.1.3 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 the **Return** key. A list of existing print servers is displayed.

2. Press the **INSERT** key. The New Print Server Name box is displayed.
    Type the name of the print server into the entry box. The Novell print server name is printed under Novell NetWare information on the status sheet.

Note: If desired, this name can be changed using MAP or Web Browser utilities. The screen example shows how to enter the print server name for a print server with a serial number of SHA_991354.

```
      Print Servers
 ┌───────────────────────┐
 │ OTS_180100            ││  vailable Options
 │ OTS_180101            ││
 │ OTS_180102            ││  ge Current File Server
 │ OTS_180103            ││  t Queue Information
 │ OTS_180109            ││
 │ OTS_180099            │┌──────────────────────────────┐
 │ OTS_180106            ││New Print Server Name:   SHA_991354 │
 │ OTS_189999            │└──────────────────────────────┘
 │ OTS_181327            ││
 │ OTS_180408            ││
 │ OTS_181357            ││
 │ OTS_181234            ││
 │ OTS_181367            ││
 │▼                      ││
 └───────────────────────┘
```
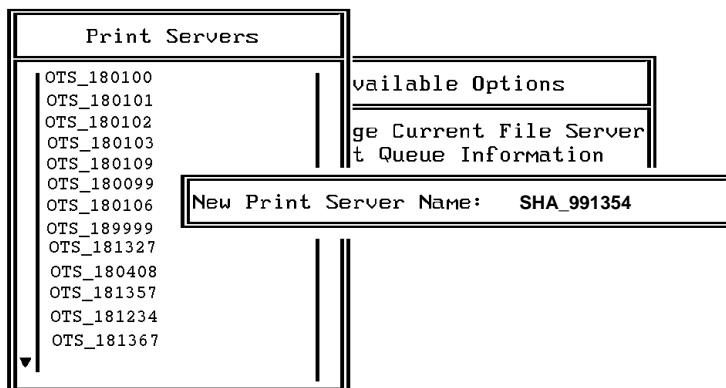
3. Press the **RETURN** key to add the print server name to the Print Servers list.

4.1.4 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 the **Return** key. The **Print Server** Information menu appears.

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

3. Choose **Printer Configuration** from the menu and press the **Return** key. 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 the **Return** key. The **Printer 0 Configuration** screen appears with a title of Printer 0.

5. If you choose to, change default printer name to something that helps you identify the printer, for example, SHARP_PRINTER, enter a name, and then press the **Return** key. The Printer Server uses this name in its message back to the users on the Notify list.

6. Select **Type** and press the **Return** key. A list of printer types is displayed. Choose **Remote Other/Unknown** and press the **Return** key. 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.

4.1.5 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 the **RETURN** key to display the **Available Queue**s list for the printer.

4. Select the queue you want and then assign a priority level from 1 to 10. It is recommended that you accept the default priority level. Press the **RETURN** key. The queue appears on the list for the printer.
    Press the **RETURN** 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 *Section. 4.1.6*. If you are finished, continue to press the **ESC** key and then save your changes.

4.1.6 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 the **RETURN** key to view a list of **Notify Candidates**.

3. Select the user or group from the list.

4. Set the **First** and **Next** intervals in the **Notify Intervals** screen. 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 the **RETURN** key.

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.

4.1.7 Installing the Print Server on Multiple File Servers

To install the print server on more than one file server, perform the procedures described in Sections 4.1.1 through 4.1.6 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 Print Server Card using the MAP program (refer to *4.3 Configuring the Print Server Card in NetWare Directory Services*). 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.

When the Print Server Card 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).

4.1.8 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 if each file server to be serviced and press the **Return** key 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 Print Server Card on each of the primary file servers.

4.1.9 Preferred File Servers

The MAP or Web Browser utilities allow you to identify a preferred file server, to be identified within the Print Server Card itself. If a preferred file server is listed, the Print Server Card will attach to this identified file server instead of 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 Print Server Card will connect directly to these file servers.

Note: The Preferred File Server is only applicable to bindery-based queues. Entering it has no affect on NDS queues.

4.2   Configuring NetWare 4.x Bindery Emulation

Novell's NetWare 4.0x can operate in two modes NetWare Directory Services (NDS) and Bindery Services Emulation. For Directory Services, see *4.3 Configuring the Print Server Card in NetWare Directory Services*. These services run simultaneously and transparently to each other. The Print Server Card may be configured to operate with Bindery Services mode only (this section), or to operate under NDS (*4.3 Configuring the Print Server Card in NetWare Directory Services*). When configured under NDS, the print Server Card will also service older file servers operating in bindery mode.

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

4.2.1   Confirm Bindery Context

Before installing the Print Server Card 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 Print Server Card 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.x server and at the system console type: **config**

2.   Press **Return** to continue the list.

3.   If the server has Bindery Context the last entry in the list will display.
      Bindery Context(s): and the name of the context.

4.   If this is not displayed at the end of the config list consult the Novell NetWare manuals for instructions on how to set the Bindery Context.

4.2.2   Configure in Bindery Mode with PCONSOLE

Once you confirm the server has Bindery Context, use the following procedures to configure the Print Server Card.

1.   Log into the network as ADMIN.
2.   Type **PCONSOLE** and press the **Return** key. 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 to switch to 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 *4.2.1 Confirm Bindery Context* or log onto a server with Bindery Services enabled.

---

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

Note: The print server name is printed under the Novell Network Information on the Status and Configuration report. The factory default name consists of three letter identifier, an underscore, and the serial number of the unit.

---

7. Select **New Printer** and press the **F3** key to modify the entry. Enter a name for the printer then press the **Return** key.
8. Select **New print queue** and press the **F3** key to modify the entry. Enter a name and press the **Return** key.
9. Select **Printer type** and press the **F3** key to modify the entry. From the list of printer types, select **Other/Unknown** and press the **Return** key.
10. Press the **Esc** key, select **Yes**, and press the **RETURN** key to save the configuration. Repeat steps 5 through 10 for each file server that the printer server services.

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.

4.3 Configuring the Print Server Card 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 on individually defined physical sites. The result is greatly improved print server setup and management.

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. Section 4.3 describes Print Server Operation with a 4.x NetWare system in 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.

You may use NWADMIN to configure the printer in NDS. Prior to printing, NDS must be set up as follows and the Print Server Card must be set up with NDS Context and Tree. See Section 4.4. The steps below describe the use of NWADMIN configuration to 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, under NetWare 4.*x* you can set a bindery context using the SET statement in your **AUTOEXEC.NCF** file.

For those who prefer, NetWare does offer PCONSOLE as an alternative to NWAD-MIN. 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.

4.3.1 Create Printer Object

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

2. Highlight the Organizational Unit or Organization where you want to create the print service in the Directory Tree, select the **Object** item from the main menu and choose **Create.**
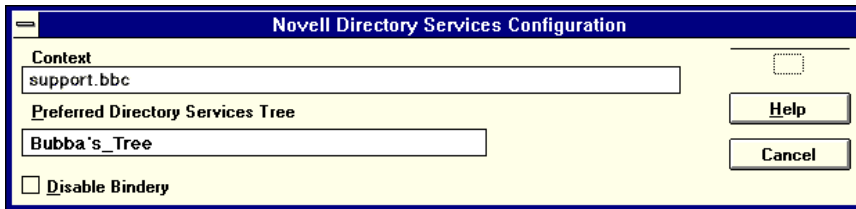
Note: If you wish, you can create objects another way in NWADMIN by: selecting an Organizational Unit, clicking on the *right* mouse button (which produces a pop-up menu), and clicking on **Create...** use the *left* mouse button to bring up the **New Object** window). From this point, the procedure continues as described.

3. When the **New Object** window appears, scroll down the **Class of New Object** icon list, select the Printer icon and click on the **OK** button.

New Object

Parent:

NEW

Class of New Object:

- NetWare Server
- Organizational Role
- Organizational Unit
- Print Queue
- Print Server
- **Printer**
- Profile
- User
- Volume

[OK] [Cancel] [Context] [Help]
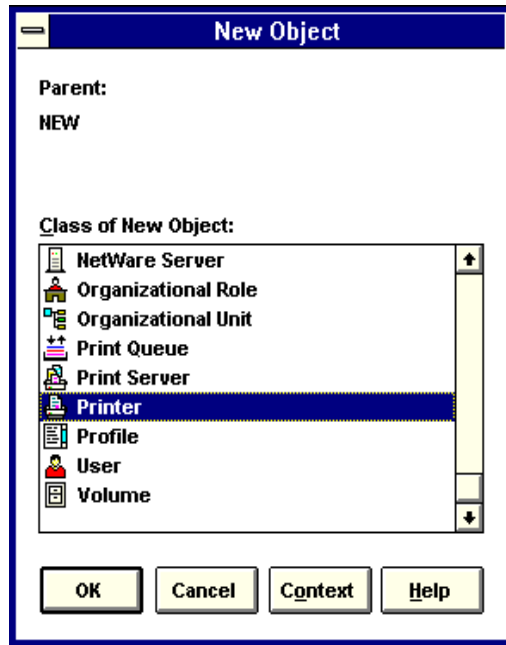
4. When the **Create Printer** window appears, type a value in the **Printer Name** field and click on the **Create** button.

4.3.2 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.

4.3.3 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.

4. 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.

Create Print Queue

◉ Directory **S**ervice Queue
○ **R**eference a Bindery Queue

Print Queue Name:

larry_queue

Print Queue Volume:

LEFT_SYS.QUALITY

☐ **D**efine Additional Properties

☐ Create **A**nother Print Queue

Create   Cancel   **H**elp
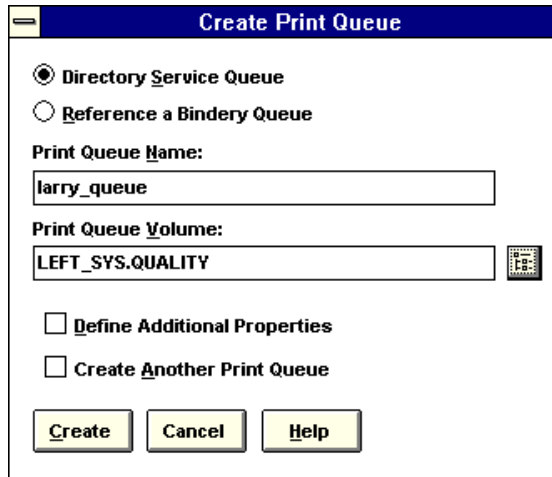
4.3.4 Assign Printer Object

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 <u>A</u>dd button.
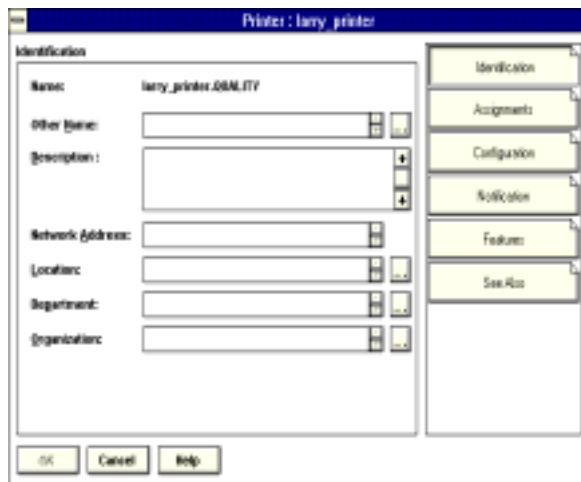
2. When the **Select Object** window appears, find the print queue object just created among the choices listed in the **Objects** box and select it.
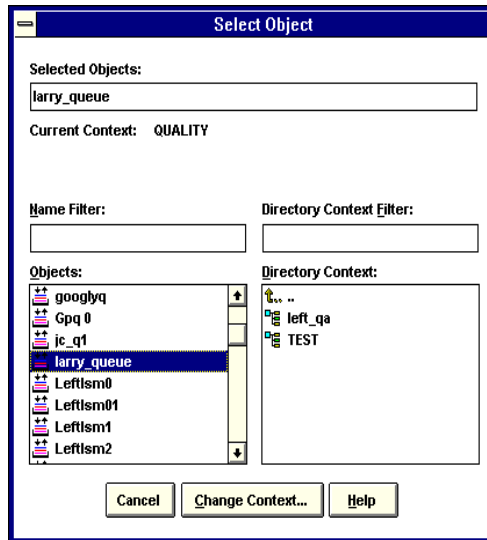
Click on the **OK** button and the print queue just created is added to the **Print Queues:** box in the **Printer:** window. Click on the **OK** button again.

4.3.5 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.
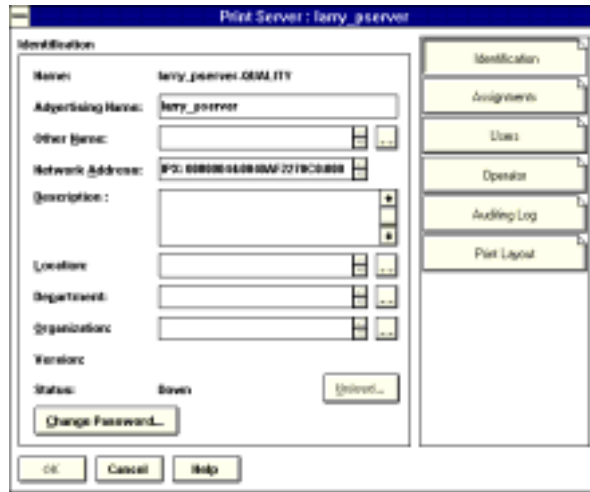
    2. At the **Print Server:** window, click on the **Assignments** button and **Add** button to bring up the **Select Object** window. Select the printer object just created from the **Objects:** box and click on the **OK** button. Now the printer (with its context) appears in the **Printers:** box of the **Print Server** window. Click on the **OK** button.
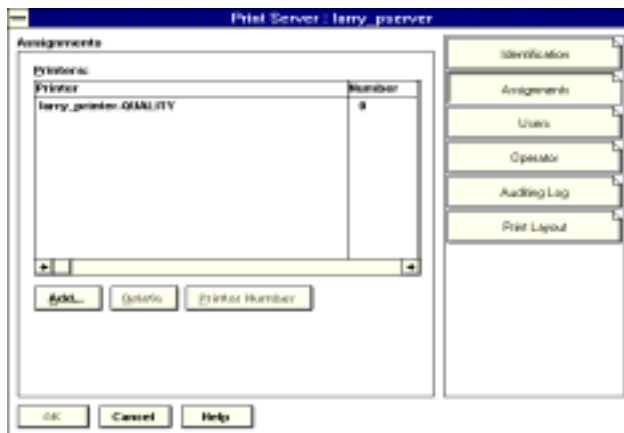
4.3.6 Check Assignments

At the **Directory Tree**, double click on the **Print Queue** object you just created. At the **Print Queue** window, click on the **Assignments** button.
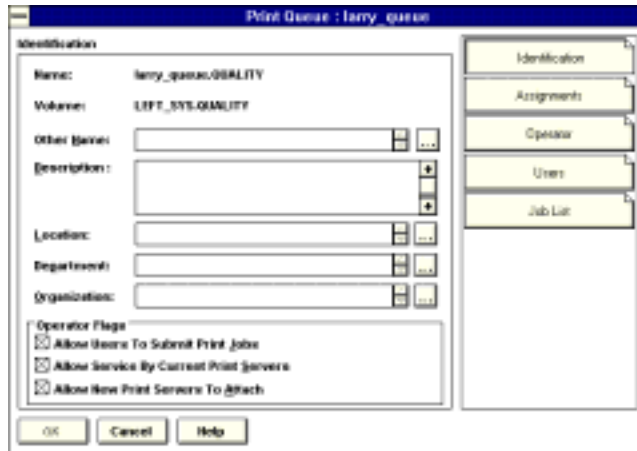
If you configured the print queue and printer correctly they will appear in the proper boxes on the **Print Queue** window. Press the **Cancel** button.
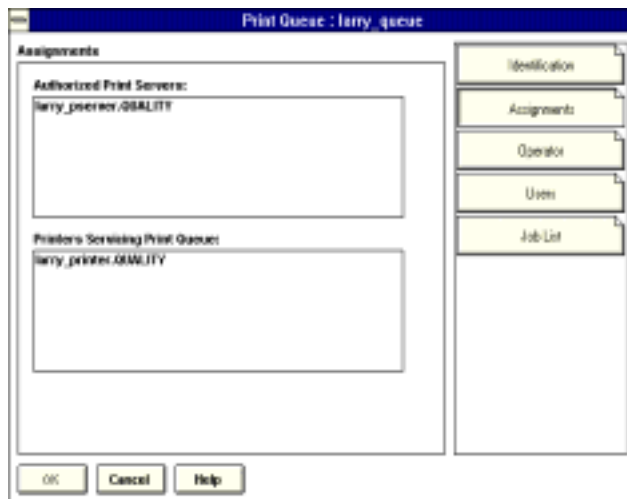
4.3.7 Set Up and Reset the Printer

NWADMIN configuration is complete. Before you can begin printing, though, be sure to set up and reset (power cycle) the printer.

4.4 Print Server Card Configuration

The MAP utility or an IP Web Browser must used to define the context and tree of the Print Server. It is also used to change the Print Server name, set a password, modify scan and frame search parameters, and set up bindery-mode specific values.

Use the MAP utility or IP Web Browser (refer to Chapter 3) to access the print server's configuration pages.

1. In the Network Administration menu, select **Setup NetWare**.

2. Select **Enable NetWare**. If it is not selected, the NetWare protocols will not come up, the Print Server card will not appear as an advertised device, and the NIC will not be accessible using IPX SNMP.

3. The default name for the NetWare Print Server is SHA_123456, where *SHA* is a three character sequence identifying the manufacturer, and *123456* is the serial number of the Print Server Card. This is also the default name of the printer in peer-to-peer mode. If you want to change the default Print Server name, type the new name in the **Print Server Name** field. Leave the space blank if the default name is to be used.

4. If you want the Print Server Card to login with a password, this password may be entered in the **Print Server Password** field, and again in the **Password Retype** field. If a password is used, this password must be the same password for all bindery-based and NDS-based Print Server entries.

5. Enter the name of a preferred bindery-based file server in the **Preferred File Server** field. The Preferred File Server entry is significant only for bindery or bindery emulation based operations. Refer to *4.1.9 Preferred File Servers* for the significance of a Preferred File Server. The Print Server must be configures on the preferred file server. Incorrect setup of a Preferred File Server can interfere with NetWare printing.

6. If the Print Server is to be operated under Novell Directory Services, type in a **Context** entry and **Preferred NDS Tree** entry in the appropriate fields. Be sure to give the *whole* context, whether *typed* or *typeless*, and do not begin your context path with a trailing period (**.**). 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

7. In the default mode, the Print Server scans each queue which it is to service once per second. If you prefer a longer scan rate, you may enter the time between scans in seconds in the **Print Queue Scan Rate** field.

8. The Print Server Card will normally monitor the network to determine which frame type is being used for Novell. When it recognizes a type, it will assume the same frame type. Once it selects a frame type, the Print Server Card will only operate over that Novell frame type. Monitoring normally starts looking for IEEE 802.3, then Ethernet II, then 802.3 SNAP, etc. If your network is using multiple frame types for Novell, you should bias the frame search to the desired type by setting the button next to the designation under **Ethernet Frame Type**.

9. You can **Disable Bindery** mode on the Print Server if are operating in NDS mode only. To do so, click on that box. If you disable Bindery, the Print Server Card will not support Print Servers on a Bindery file server.

10. Once all appropriate settings and NetWare information has been entered, if necessary, enter the Print Server Card Management Password, then click on **Accept Settings**. Selecting Accept Settings will store the setting in the Print Server Card's NVRAM.

11. The values just entered will not take effect until the Print Server Card is reset or power cycled. To reset the Print Server Card from MAP or the Web Browser, return to the Network Administration page, then click on **Reset** under **System**. Alternatively, you may power cycle the printer. The new NetWare values should now be in effect.

4.5   Using the Novell PCONSOLE Utility

This section explains how to use the PCONSOLE utility to perform the following tasks on a 4.x Novell NetWare server in Bindery Mode:

- 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 additional information on this utility.

Note: You must have Administrator level privileges to perform many PCONSOLE operations.

4.5.1   Changing the File Server

Use the following procedures to change the current file server or attach to additional file servers:

1.   Start the PCONSOLE utility.

2.   Select **Change NetWare 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 the **Return** key.

5.   Enter your username and press the **Return** key. If the username requires a password, the **Password** screen is displayed. Enter the password and press the **Return** key.

6.   Repeat steps 3 to 5 to attach to additional servers.

4.5.2   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 Servers** from the **Available Options** menu.

3.   Select the print server from the Print Servers list.

4.   Select Printers from **Print Server Information** menu.

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

6. Select **Print Queues Assigned**.

7. Press **Return** key to display a list of currently assigned print queues.

8. Press the **Insert** key to display a list of available print queues.

9. Select a queue from the list and press the **Return** key.

10. The highest priority queue is 1; 10 is the last. To change the priority of a queue, type in the new value (1 to 10), then press the **Return** key. at the **File Server/ Queue/Priority** screen to display the **Priority** setting screen.

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

When finished assigning queues, press the **ESC** key to return to the **Available Options** menu.

4.5.3 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 Servers** from the **Available Options** menu.

3. Select the print server from the Print Servers list.

4. Select **Printers** from the **Print Server Information** menu.

5. Select the printer from the **Defined Printers** menu.

6. Select **Notification**. The current notification list is displayed.

7. Press the **Insert** key. The **Notify Candidate**s screen appears.

8. Select the user or user group from the **Notify Candidates** screen, and press the **Return** key. The **Notify Intervals** screen is displayed.

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 job problem. The **Next** interval specifies how often in seconds users are notified.

10. Press the **Esc** key and save changes.

11. Repeat steps 7, 8, and 9 to add more users or groups to the notify list.

12. When finished, press the **ESC** key to return to the **Available Option** menu.

13. Press **Esc** key once more to exit **PCONSOLE**.

5.1 Windows IPX Peer-to-Peer Printing

Windows Peer-to-Peer printing allows Windows 95/98 workstations and Windows NT 4.0 workstations and servers to print to Print Server Card printers without an intervening server and without using IP. The main features of the Windows IPX Peer-to-Peer printing are as follows:

- Runs on Windows-95 workstations and on Windows NT 4.0 workstations or servers "out of the box".

- Runs on networks which do not have a NetWare file server, as well as those that do.

- Implements IPX peer-to-peer bi-directional printing between Windows workstations and Print Server Card printers.

5.1.1 Introduction and Preparation

The Peer-to-Peer implementation uses the IPX/SPX stacks that are provided with Windows 95/98 or Windows NT 4.0. The redirector software provided will establish a connection with the printers supporting IPX Peer-to-Peer, without using an intermediate file server, whether or not your network uses Novell NetWare.

When configuring the network capabilities for the Windows computer, you must include the "**IPX/SPX Compatible Protocol**". If you are not using NetWare, you do not need to activate any NetWare Client application.

This inclusion of IPX/SPX can also be done after initial Windows installation by going to the Network setup function under Control Panel. To complete the installation, you will need the Windows CD.

Note: Because Peer-to-Peer uses the IPX/SPX Protocol, Novell operation must remain enabled on the Print Server Card, even if traditional Novell printing facilities are not being used. The name of the Peer-to-Peer printer, as it appears in the Windows Port List, is the same as the Novell Print Server name, and may be changed by changing the Novell Print Server name using the MAP utility or IP browser.

If a NIC is being moved from a site that had active Novell to a site that does not, the unit should be reset to factory default to clear the frame type and network number information. Refer to the printer's Owner Manual for instructions on how to do this.

5.1.2 Installation and Operation

The IPX Peer-to-Peer redirector can be installed using the self running CD or it can be installed manually.

5.1.2.1 Auto-Install

1.Start Windows on workstation.

2.Insert CD supplied in Print Server card into the CD ROM drive.

3. Once, the CD's self running program has started, follow the directions on the screen.

4.When the installation is complete, remove the CD from the CD drive.

5.1.2.2 Manual-Install

1. Insert CD supplied in Print Server card into the CD ROM drive.

2. Select **Run** from the Windows Start menu.

3. At Run, type **<CDROM drive>:\IPX-P2P\SETUP.EXE** and click on the **OK button.**

4. Follow the instructions provided in the installation program screens.

5. When the installation is complete, remove the CD from the CD drive.

Note: If setup detected a previous installation of the IPX Peer-to-Peer Redirector, it will prompt you to have Setup delete the old driver and continue the installation procedure. Click on **Yes**.

Once the redirector is installed, each printer on the network that supports this peer-to-peer capability will appear as a **Port** under Printer Properties.

To use the Peer-to-Peer connection, create a logical printer using the **Add Printer Wizard** according to the instructions for your printer. Set up the printer as a **LOCAL** printer. Use the driver that came with your printer.

When the Add Printer Wizard asks you to choose the Port, select the name of the Peer-to-Peer printer you wish to print to. When you complete the installation, select the **Print Test Page** option.

5.2 Windows IP Peer-to-Peer Printing

For more detailed information on TCP/IP setup and printing, see *Chapter 7*.

Windows IP Peer-to-Peer printing allows Windows 95/98 workstations and Windows NT 4.0 workstations and servers to print to Print Server Card printers without an intervening server and without using IPX. The main features of the Windows IP Peer-to-Peer printing are as follows:

• Runs on Windows 95/98 workstations and on Windows NT 4.0 workstations or servers "out of the box".

• Implements IP peer-to-peer bi-directional printing between Windows workstations and Print Server Card printers.

5.2.1 Introduction and Preparation

The Peer-to-Peer implementation uses the TCP/IP stacks that are provided with Windows 95/98 or Windows NT 4.0. The redirector software provided will establish a connection with the printers supporting Peer-to-Peer, using a direct IP connection over the network.

When configuring the network capabilities for the Windows computer, you must include the "**TCP/IP Protocol**". You do not need to activate any TCI/IP Client applications.

This inclusion of TCP/IP can also be done after initial Windows installation by going to the Network setup function under Control Panel. To do this, you will need the Windows CD.

Note: Because Peer-to-Peer uses the TCP/IP Protocol, TCP/IP operation must remain enabled on the Print Server Card, and the Print Server Card must be assigned a valid IP address. The name of the Peer-to-Peer printer, as it appears in the Windows Port List, is the same as the IP Address assigned to the Print Server Card. The IP Address may be changed by using the MAP utility or IP browser.

If a NIC is being moved from a site that had active TCP/IP to a site that does not, the unit should be reset to factory default to clear the IP Address and other network information. Refer to the printer's Owners Manual for instructions on how to do this.

5.2.2 Installation and Operation

The following instructions are for installing directly from the CD. The IP Peer-to-Peer redirector can also be installed by following the instructions on the self running CD.

1. Insert the CD supplied in the Print Server Card package into the CD ROM drive.

2. Once the self running CD has started, select **Exit**.

3. Select **RUN** from the Windows Start menu.

4. From Run, type **<CD ROM drive>:\IP-P2P\SETUP.EXE**.

5. At Run, type **<CD drive>:\IP-P2P\SETUP.EXE** and click on **OK** button.

6. Follow the instructions provided in the installation program screens.

Note: If setup detected a previous installation of the IP Peer-to-Peer Redirector, it will prompt you to have Setup delete the old driver and continue the installation procedure. Click on **Yes**.

Once the redirector is installed, each printer on the network that supports this peer-to-peer capability will appear as a **Port** under Printer Properties.

To use the Peer-to-Peer connection, create a logical printer using the **Add Printer Wizard** according to the instructions for your printer. Set up the printer as a **LOCAL** printer. Use the driver that came with your printer.

When the Add Printer Wizard asks you to choose the Port, select the name of the Peer-to-Peer printer you wish to print to. When you complete the installation, select the **Print Test Page** option.

6
AppleTalk Configuration

Use this chapter if you will be printing from a Macintosh. This chapter explains how to configure the Print Server Card using AppleTalk.

6.1 Choosing a 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. Click on the Apple icon in the menu bar, then select AppleTalk.
3. Select **Control Panel**.
4. Click on **Networks**.
5. Choose **AppleTalk** as the Network connection.
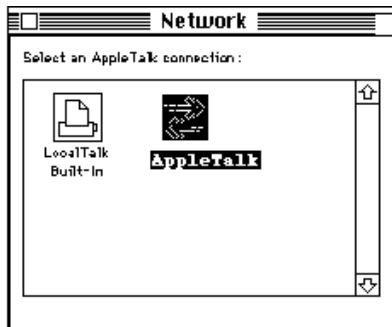
6. Close the Network screen.
7. Click on the Apple icon.
8. Select **Chooser** to display the Chooser screen.
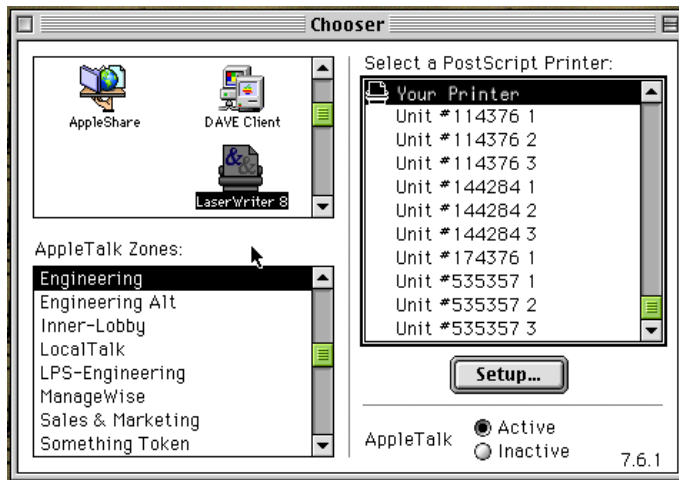
Note: The screen shown above will only appear if your network does has more than one zone.

---

9. Select the AppleTalk Zone containing the printer from the list at the lower left of the screen. Select the device driver type corresponding to your printer from those at the upper left of the screen. A list of printers will appear at the right of the screen.

10. From the list of printers, choose the name of your printer. The AppleTalk printer name is displayed on the Status and Configuration report under AppleTalk Connection Information.

11. The options available at this point depend on your printer driver. With a typical driver, you may 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.

6.2   Using the NIManage Utility Program

The AppleTalk NIManage utility program has the following functions:

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

- Enable or disable the printing of Status/Configuration report.

- View the error log.

- Enable or disable protocols.

- View or modify the TCP/IP address, subnet mask, and default gateway address.

6.2.1 Installation

1. Insert CD supplied in the Print Server card into your Macintosh's CD ROM drive.

2. Drag the NIManage icon from the APPLTLK folder on the CD to the desktop.

3. Remove the CD from CD drive.

6.2.2 Loading NIManage Utility

1. Locate the NIManage program icon and double-click on the icon.

2. For each zone, the Device list shows the available Print Server Cards. If your net-
   work has only one zone, the screen shows only the Device display panel.
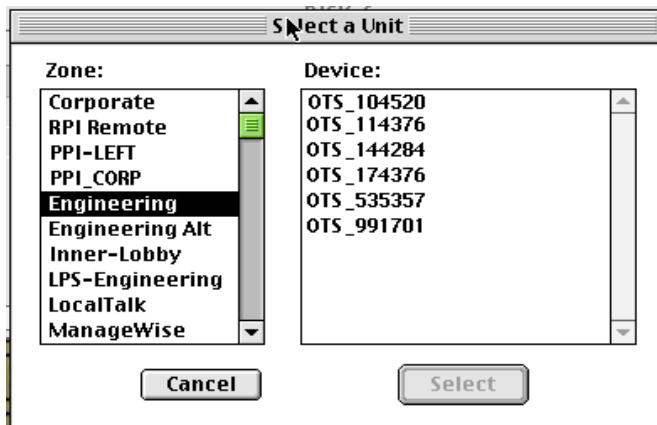
3. Select the name of your network zone.

4. From the Device list, select the Print Server Card. After you select the device, a
   menu of options is added to the menu bar at the top of your screen.

Note: The NIManage Utility Program can also be copied to and run from a folder located
on your local hard drive.

6.3   Configuring the Print Server Card

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.

6.3.1 AppleTalk Configuration

Use the Configuration function to change the name of the device and AppleTalk Zone. These changes are stored only in the print server and are not passed on to the Post-Script interpreter. When you choose this function, the following screen is displayed:
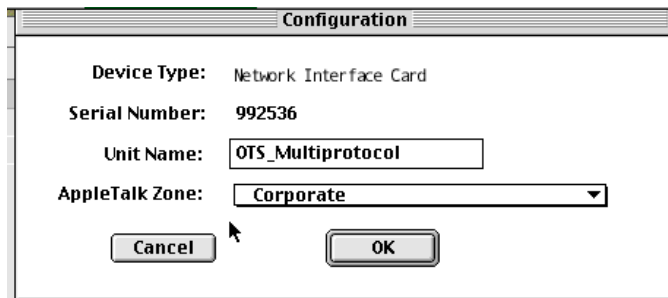
1. To change the print server device name, click on the name displayed and then enter the new name. Be careful when you do this. Many printers maintain the printer name in the printer controller where it can be changed using a Macintosh utility. If you change the name in the Print Server Card, you may make the network interface and the printer become "out of sync".

2. To change the AppleTalk Zone, click on the zone displayed. A drop-down menu displays all available zones. Select the new zone from the list.

3. Click on **OK** when you have finished making changes.

4. Turn off the printer and then turn it on again to store these changes in the printer's NVRAM. The status sheet will display the new printer name and zone that was entered.

6.3.2 Error Log

The Error Log function is used to view a log of events that the Print Server Card has registered. The log contains information as well as errors. Customer Support may need the information in this log if your Print Server Card encounters problems.

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

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

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

Note: The data is cleared each time the printer is power cycled.

6.3.3 Protocol Setup

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

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

---

1. Select ON for the protocols that you want to be active. Select OFF for the protocols you will not be using. The utility will not let you make active any protocol that the Print Server Card 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 it applies to your network.

3. Click on **OK** when you are finished.

4. Turn off the printer and then turn it on again to store these changes in the printer's NVRAM.

6.3.4 Options

Select **Status Sheets: Enable** to send a status report to the printer each time you power it on. Select on **Disable to** disable this option. Click on **OK**. These change take effect the next time you power on the printer.
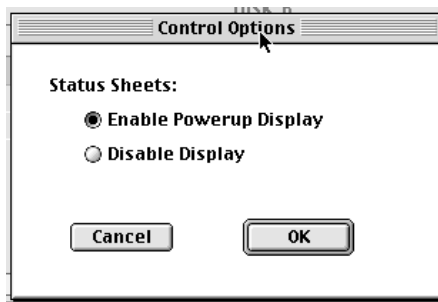
This chapter explains how to configure the Print Server Card and your network for use with TCP/IP communication in various environments. Independent setup and installation procedures are provided for Windows systems and for most popular UNIX systems. The Print Server Card TCP/IP capability will also operate with *lpr* spoolers on other systems, and with spooler/supervisor capabilities that communicate raw print jobs to the Print Server TCP/IP Port. The IP Peer-to-Peer redirector for Windows 95/98 and Windows NT systems, provided with the Print Server Card, uses this TCP/IP port. The default port number is 10001, but may be changed to any desired number using the *Telnet* utility, SNMP, or the HTML pages accessible via MAP or a Web Browser. Section *7.5 Running Telnet,* 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. The use of MAP or a Web Browser to access HTML management pages in the Print Server Card is described in Chapter 3.

7.1   Installation in a Windows Environment

The several versions and variations of Microsoft Windows may be used on a NetWare and/or TCP/IP network, as well as in a native Microsoft Windows network. This flexibility allows various options for setting up the network printing system even though this Print Server Card 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. Windows 95/98 and Windows NT 4.0 users can also use the Print Server Card Peer-to-Peer capability as described in Chapter 5. The following sections describe installation using TCP/IP under Windows 95/98, Windows NT, and UNIX.

7.1.1   Window 95/98

The Print Server Card must be given IP address and routing information to be used with TCP/IP. 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. The following sections explain how to assign an IP Address and how to set up lpr on a workstation. See the Windows documentation about sharing printers.

7.1.1.1 Assigning an IP Address Using DHCP

DHCP is a service much like BootP that provides a method for assignment and maintenance of IP addresses.

- If DHCP is not enabled, the Print Server Card will make no DHCP requests.

- If DHCP is enabled, the Print Server Card will make DHCP requests when the Print Server Card is reset or on power up, provided that the Print Server Card does not have an IP address stored, or that "IP in NVRAM" is OFF.

- If DHCP is enabled, and the Print Server Card had an IP address in NVRAM, and "IP in NVRAM" is ON, then the Print Server Card will use the IP information from NVRAM and there will be no DHCP activity on the part of the Print Server Card.

Using Map Utility

When you click on the MAP icon in the Windows Start menu to start the program, the program will prompt you with a list of IPX print servers listed by their SAP identification and IP print servers by their IP address.

1. Select the print server you want to access.
2. Select **Network Configuration**, then **Setup TCP/IP**
3. On the TCP/IP Configuration page, enter the appropriate IP Settings
4. If necessary, enter the Print Server Card Management Password, then click on **Accept Settings**.

The values just entered will not take effect until the Print Server Card is reset or printer is powercycled. To reset the Print Server Card from Map or the Web Browser, return to the Network Administration page, then click on Reset under System. Alternatively, you may power cycle the printer. The new TCP/IP values should now be in effect.

Using Printer Front Panel

If the printer is equipped with a front panel display it may be possible to that display to assign an IP address and routing information. Refer to the printer's Owner's Manual for instruction on assigning an IP Address via the printer's front panel.

Using ARP

The Print Server Card 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. From Windows, enter the MS-DOS Prompt window.
2. At the command prompt enter:
    arp -s [IP address of Print Server Card] [MAC Address of Print Server Card].

    The entry should be accepted.
    ping [IP address of the Print Server Card]. Request should time out.
3. Power cycle the printer. The Print Server Card will produce a status page that
should include the new IP address.
4. When the Print Server Card is up again, at the command prompt, enter:
    ping [IP address of Print Server Card]

Note: This only enters the IP address. The other IP parameters must still be entered.

7.1.1.2 Setting Up LPR on the Workstation

An lpr spooler should be installed and working on the workstation.

1. Double click on the spooler icon.
2. Click on **setup**, define new queue.
3. At the Remote Host Name prompt enter the Print Server Card'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.

7.1.2 Windows NT 4.0

The Print Server Card must be given IP address and routing information to be used with
TCP/IP. Windows NT (version 3.5 or higher) comes with TCP/IP and *lpr* capabilities,
although these must be installed when the unit is configured. Prior to entering the net-
work printer on the workstation the TCP/IP Protocol, Simple TCP/IP Services, and
Microsoft TCP/IP Printing must be installed.

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.

7.1.2.1 Assigning an IP Address
Using DHCP
DHCP is a service much like BootP that provides a method for assignment and maintenance of IP addresses.

•If DHCP is not enabled, the Print Server Card will make no DHCP requests.

•If DHCP is enabled, the Print Server Card will make DHCP requests when the Print Server Card is reset or on power up, provided that the Print Server Card does not have an IP address stored, or that "IP in NVRAM" is OFF.

•If DHCP is enabled, and the Print Server Card had an IP address in NVRAM, and "IP in NVRAM" is ON, then the Print Server Card will use the IP information from NVRAM and there will be no DHCP activity on the part of the Print Server Card.

Using Map Utility
When you click on the MAP icon in the Windows Start menu to start the program, the program will prompt you with a list of IPX print servers listed by their SAP identification and IP print servers by their IP address.

1. Select the print server you want to access.
2. Select **Network Configuration**, then **Setup TCP/IP**
3. On the TCP/IP Configuration page, enter the appropriate IP Settings
4. If necessary, enter the Print Server Card Management Password, then click on
    Accept Settings.

The values just entered will not take effect until the Print Server Card is reset or printer is powercycled. To reset the Print Server Card from Map or the Web Browser, return to the Network Administration page, then click on Reset under System. Alternatively, you may power cycle the printer. The new TCP/IP values should now be in effect.

Using Printer Front Panel
If the printer is equipped with a front panel display it may be possible to that display to assign an IP address and routing information. Refer to the printer's Owner's Manual for instruction on assigning an IP Address via the printer's front panel.

Using ARP
The Print Server Card 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. From Windows, enter the MS-DOS Prompt window.
2. At the command prompt enter:
   arp -s [IP address of Print Server Card] [MAC Address of Print Server Card].

   The entry should be accepted.
   ping [IP address of the Print Server Card]. Request should time out.
3. Power cycle the printer. The Print Server Card will produce a status page that should include the new IP address.
4. When the Print Server Card is up again, at the command prompt, enter:
   ping [IP address of Print Server Card]

Note: This only enters the IP address. The other IP parameters must still be entered.

7.1.2.2 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.
```
Line 1: Address of host providing lpd (Print server);
enter IP address.
Line 2: Name of printer on that machine - enter PORT1
(the word PORT MUST be in uppercase).
```
10. Choose **OK** to exit.

Your Print Server Card is now configured to operate Windows NT. Printing can now be done from any application by the following the normal print instructions for that application.

7.2 Dynamic Host Configuration Protocol

DHCP provides a method for assignment and maintenance of IP addresses. The Print Server Card is able to obtain IP information from this service.

There are two user settable variables related to the DHCP function. These are accessible in the TCP section of Network Administration, in the HTML pages.

•DHCP enable; and

•IP in NVRAM

If DHCP is not enabled, the Print Server Card will make no DHCP requests under any circumstances. If the Print Server Card does not have an IP address stored, or if "IP in NVRAM" is OFF, the Print Server Card will issue BOOTP requests.

If DHCP is enabled, the Print Server Card will make DHCP requests when the Print Server Card is reset or on power up, provided that the Print Server Card does not have an IP address stored, or that "IP in NVRAM" is OFF. These DHCP requests will be in addition to BOOTP requests.

If DHCP is enabled, and the Print Server Card had an IP address in NVRAM, and "IP in NVRAM" is ON, then the Print Server Card will use the IP information from NVRAM and there will be no DHCP activity on the part of the Print Server Card.

The factory default is with both DHCP enable ON and IP in NVRAM ON. In this case, the Print Server Card will issue DHCP requests if it does not already have IP identification information stored in its NV RAM.

Important: If DHCP and the Print Server Card is in the default mode, you must establish a permanent lease or reservation for the Print Server Card in the DHCP server. Failure to do this may cause the same address to be given out to another host.

7.3 IP Discovery and Peer to Peer Printing

This section explains how to setup and use the following two IP functions:

• IP Printer Discovery, which allows you to find print servers on your network.

• IP Peer-to-Peer Printing, which allows you to set up your print server ports for peer to peer printing for IP on Windows NT 4.0 and Windows 95/98.

Note: All features of IP Discovery are now included as part of MAP versions 3.02 and higher.

7.3.1 How to Install

The IP Discovery program can be installed using the self running CD or it can be installed manually.

7.3.1.1 Auto-Install

1. Start Windows on workstation

2. Insert CD supplied in Print Server card into the CD ROM drive.

3. Once, the CD's self running program has started, follow the directions on the-screen.

4. When the installation is complete, remove the CD from the CD drive.

7.3.1.2 Manual Install

1. Insert CD supplied in Print Server card into the CD ROM drive.

2. Select RUN from the Windows Start menu.

3. At RUN, type <CD_Drive>:\IP-DISC\SETUP.EXE and click on the OK button.

4. Follow the instructions provided in the installation program screens.

5. When the installation is complete, remove the CD from the CD drive.

7.3.2 Configure IP Discovery

Once you install the program, you can Configure IP Unit Discovery with the hop count. The default hop count is 2.

The hop count number determines how many subnetworks the program will search to find units. An entry of 0 on the screen searches only the current subnet. An entry of 2 would search the wire directly connected to the workstation, and, all networks accessible through two routers. Entries of 15 or higher will automatically search every connected network (this number is not recommended due to the amount of traffic it will generate).

Once a hop count is entered, click on OK.

7.3.3 IP Unit Discovery

Select IP Unit Discovery to search your network for all compatible print servers available.

The response is provided through the default Web Browser on your workstation.

Once a list of units appears, you can select the print server unit you want to configure or reconfigure by clicking on the URL of the unit (which is http:// followed by the IP address).

Once you click on the URL of the unit you want to configure, the program automatically enters Microsoft Internet Explorer, Netscape Navigator, or your default browser to access the units HTTP Server. Once the HTTP Server home page appears, you can configure or reconfigure your unit.

7.3.4 IP Peer-to-Peer Setup

IP Peer-to-peer printing allows you to print to a network printer for networks without a file server or for networks where you do not want to use the server for printing. Use peer-to-peer printing on Windows NT 4.0 and Windows 95/98 systems. Click on the IP-P2P menu item in Windows to bring up the peer-to-peer printing setup screen. An explanation for each field on the screen is described below.

• Max Hops for Search. Once you install the program, you can setup IP Peer-To-Peer with the hop count. The default hop count is 2. The hop count number determines how many networks the program will search to find units. An entry of 0 on the screen searches only the network wire directly connected to the workstation. An entry of 2 would search the wire directly connected to the workstation, and, all networks accessible through two routers. Entries of 15 or higher will automatically search every connected network (this number is not recommended due to the network traffic it would generate).

• **IP Port Base:** The starting port number for the printserver. The default is 10000 (corresponding to a TCP/IP port of 10001) but you can change it if you need to.

• **Printer Names:** Lets you select how you can view the printer names in the Windows port list.

• **Based on Serial Number:** Uses the printer server serial number to identify the printer names. For example, if SN991354 is the serial number of the unit, SN991354 1 would be the printer port.

- **Based on IP Address:** Use the IP address to identify the printer names For example, if 199.99.92.99 is the IP address for the unit, 199.99.92.99 1 would be the printer port.

- **Based on DNS (Domain Name Server:** Uses the DNS name to identify the printer name. For example, <PTR-MKTG.DOMAIN.COM>.

- **Based on Unit Name:** Uses the NIC Peer-to-Peer name set in the Novell section of the print server setup. This was the name used to identify the printer. This defaults to xxx123456 where the xxx stands for the three letter identifier of the manufacturer and the digits represent the serial number of the NIC.

7.3.5 Add Printers for IP Peer To Peer Printing

You can add printers manually whenever you cannot find printers automatically because of router setup or the hop count setting. In general, this should not be necessary.

7.3.5.1 Use IP-P2P to Add Printers

1. Click on the IP-P2P menu item in Windows. The IP Peer-to-Peer Setup screen appears.

2. Press the **Printer...** button; a new form screen appears.

3. Enter information for the printer in all the fields described on the form.

Field: Description

IP Address: Enter the IP address of the printer you want to add.

Name: Assign a name to the printer. You can enter any name which you feel identifies the printer.

Port Number: The port number of the printer. The default is 10001.

Description: Use this field to describe the printer location or the users who will access the printer.

4.   When you have entered all the information, click on the Add button. The printer is listed in the Available Printers field at the bottom of the screen.

5.   Click OK when you have finished adding all the printers you want to add.

7.3.5.2 Use the Add Printers option in Windows

1.   Click on the Add Printer button.

2.   Select Local Printer from the menu.

3.   Select the make and model of the printer you want to use. A list of printer ports appears. IP peer-to-peer printers will appear in this list.

4. Select the IP printer you want to use.

5. Complete the remainder of the printer setup procedure as you would normally.

7.4   UNIX Printing

The Print Server Card 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 Print Server Card 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 Print Server Card has its IP information. Some UNIX System V systems have restrictions on support of remote *lpr/lpd* printers, requiring that the host-based *lpr/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 Print Server Card will also operate with other host-resident print supervisor/ spooler programs that present a print image to the printer over a TCP/IP port. The base TCP/IP port number can be changed via Telnet, or the Print Server Card HTML setup pages accessed by MAP or a Web Browser. Remember, the actual port is always one higher than the base port number. The Status and Configuration page indicates the actual port number.

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

- All UNIX systems that support *lpd/lpr*

- 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.

7.4.1 Configuring the IP Address on the Print Server Card

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

- Use MAP Utility, as described in Chapter 3.

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

- Use arp and ping capability.

For each method, you will need to provide the Ethernet address of the Print Server Card. The Ethernet address is the 12-character code that is printed under Network Address on the configuration status report each time the printer is turned on.

You can use the 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, the AppleTalk NIManage utility for the Macintosh, or the Print Server Card HTML management pages accessed through the MAP utility or a Web Browser to change an IP address, Subnet Mask and Default Gateway.

7.4.1.1 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 work-station 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. Recon-nect the print server anywhere on the network, and then use the *Telnet* or the HTML pages accessed by MAP or a Web Browser to adjust the IP parameters for the subnet on which the Print Server Card is to operate.

3. Find the Ethernet address of the Print Server Card. The address is printed on the configuration status report when you power on the printer.

4. Edit the *hosts* file (usually */etc/hosts*) or use NIS or DIS to add the IP Address and Print Server Card'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 Print Server Card should then reset itself.

9. After the Print Server Card 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.

7.4.1.2 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* or the HTML pages accessed by MAP or a Web Browser utility to change the IP address. See *7.5 Running Telnet,* for instructions on using *Telnet*.

3. Find the Ethernet address of the Print Server Card. The address is printed on the configuration status report each time you turn the printer on.

4. Edit the *hosts* file (usually */etc/hosts*) or use NIS or DIS to add the IP address and [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 Print Server Card to verify it is running on the network. For example:

```
ping 192.9.200.200 or
ping printfast
```

The Print Server Card 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
```

7.4.2 *lpd/lpr* Configuration

lpd/lpr 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 Print Server Card. 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/lpr* 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.

Print Server Card *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 Print Server Card *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* or the HTML pages accessed by MAP or a Web Browser utility.

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

7.4.2.1 Setting Up a BSD Remote Printer to Use *lpd/lpr*

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

1. Open the /etc/printcap file. Make an entry naming the Print Server Card 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 Print Server Card 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.

7.4.2.2 Setting Up an AIX Version 2.5 Remote Printer to Use *lpd/lpr*

Set up a remote printer on the host that sends jobs to the Print Server Card using the Print Server Card'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 Print Server Card. The values displayed are default values. You must replace the short and long form filter values with the values shown below.

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

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

    You can now print.

7.4.2.3 Setting Up an AIX 4.0 System

Use the following procedures to install a Print Server Card 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 Print Server Card 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>
> ```

7.4.2.4 Setting Up an HP/UX Remote Printer to Use *lpd*

Set up a remote printer on the host that sends jobs to a Print Server Card using the Print Server Card *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 Print Server Card. See the following example.

Input Requested	Example	Description of Inputted Data
Printer Name	myprinter	name to be used in lp command
Remote System Name	fastprint	Print Server Card hostname as in */etc/hosts*
Remote printer Name	PORT1	lpd queue name

7. At the bottom of the screen, select **Remote Printer is on BSD system** from the three choices available.

8. Click on the **OK** button.

9. Ping the unit to test communications. Type:
   ```
   ping  <Print Server Card IP address>
   ```

10. Ping should confirm your IP address with the message:
    ```
    <     Print Server Card IP address> is alive
    ```

11. If the connection is confirmed, you can now print.

7.4.2.5 Setting Up an AS/400 Systems to Use *lpd/lpr*

When working with the output queue description (WORKOUTQD), there are several

fields that must be defined for the Print Server Card 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**.

3. Connection type *must* be **IP**.

4. Internet address *must* be the IP address of the Print Server Card 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.

7.4.2.6 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 Print Server Card.

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 **[Enter]**.

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]**. See the following example.

Printer #7 Symbol	Type	Representative Value
lp (line printer)	STR	
rm (remote host)	STR	Printer Server Card_host
rp (remote printer)	STR	PORT1
sd (spooler directory)	STR	*/usr/spool/lpd7*

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

      Dick's printer down the hall **[Enter]**

13. Select **exit** to save your configuration and press **[Enter]**.

You are now prepared to print.

7.4.2.7 Setting Up a SCO UNIX Remote Printer to Use *lpd/lpr*

Set up a remote printer on the host that sends jobs to a Print Server Card 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 Print Server Card. 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)
```

7.4.2.8 Setting Up System V Release 4 and Solaris 2.X to Use *lpd/lpr*

If your system recognizes the LPSYSTEM command, you can use *lpd/lpr*. 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** <IP_address_of_Print Server Card>

   ```
   Enter Print Server Card 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 addre*ss>**!PORT1**

Note: There is no space after the remote host name.

---

3. Enable *<local printername>*

4. Accept *<local printername>*

7.4.3 Installing TCP/IP for Print Server Card If Not Running *lpd/lpr*

The CD's UNIX directory includes install scripts for various UNIX systems. This section describes how to install TCP/IP printing to the Print Server Card 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 Print Server Card 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.

7.4.3.1 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 Print Server Card 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:

UNIX Version	Example
BSD/ULTRIX/AIX/ SCO	tar -xvf/dev/rfd0
System V	tar -xvf/dev/rdsk/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.

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

7.4.3.2 Script Selection of Filters

There will be certain options in executing the script for various systems.

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.

7.5.3.3 Manual Selection of Filters

The Print Server Card 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>  |  Print Server Card printer:\
:lp=/dev/nic/<printer_name>:\
:if=/usr/nic/psfilter:\
:of=/usr/nic/psbanner:\
:sd=/usr/spool/<printer_name>:
```

7.4.3.4 Installing and Printing on Ver. 1 Solaris and OSF1 Systems

1. Run the Installation script by typing: nicinst.

    ```
    The script automatically downloads the correct Print
    Server Card 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 exam-
    ple:  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 Print Server Card: 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 dis-
    plays 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 **e**. 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 Print
    Server Card 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> | Print Server Card 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/lpr* processes.

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

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

10. Restart the daemon.

Type: **/usr/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 Print Server Card to test communications.

7.4.3.5 Installing & Printing on an DEC ULTRIX 4.3 System

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

The script automatically downloads the correct Print Server Card 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 **e**.

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

```
Node name of the Print Server Card:   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> | Print Server Card 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 Print Server Card 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.

7.4.3.6 Installing and Printing on the HP/UX System

1. Run the Installation script by typing: **nicinst**.
   ```
   The script automatically downloads the correct Print
   Server Card 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]**.
   Your screen will now display the information you   provided to the install script. For example:
   ```
   Node name of the Print Server Card:    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]**.

4. 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 Print Server Card 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.

7.4.3.7 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. To load the software, create a /usr/nic directory and tar the TCP/IP diskette to it.

1. Go to the /usr/nic directory by entering the following:

        cd /usr/nic

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

Once the operating system has been identified, the script downloads the files for your particular system, to the /usr/nic directory, and prompts you for information as needed.

3. Type *cd /usr/spool/lp/model/standard/usr/nic/port1_interface*

Note: Use of this default interface in most cases will suffice for generic or routine printing of most PostScript, PCL, and ASCII files. In order to utilize a printer specific interface other than the default interface script (named standard), you must have a copy of that printer interface edited and installed in the /usr/nic directory.

Next, you will need to edit the printer interface program you created in step 3.

4. Type: *cd /usr/nic* and using your favorite editor, open and edit the port1_interface file.

5. Search on FILTER=0 and insert the following line above or below the # FILTER=0${LPCAT} section of the file. Remark out (using the # sign) any other FILTER entries present in this section of the file.
    ```
    FILTER="/usr/nic/infilter| /usr/nic/nicfilter printer
    server name 10001"
    ```

Note: The <print server name> must be the same as the one present in the */etc/hosts* file. Optional arguments to be inserted after the 10001 entry and before the trailing 0 are ${banner}, ${user_name}, ${request_ID}, and ${files}. For further explanation of these and the statement above, refer to the *System 5 Release 4 System Administration Manual.*

---

6. Save the file and close the editor.
    ```
    You need to configure the host-side printer using
    lpadmin.
    ```

7. Type the following:
    ```
    lpadmin -p <printer name> -v /dev/null -i /usr/nic/
    port1_interface
    ```

Note: lpadmin configures the printer name and associates it with a given device and printer interface program. There is no /etc/printcap file involved with this method of configuration.

```
Next, you need to initialize the printer
```

8. Type the following commands:
    ```
    accept <printer name> and press e.
    enable <printer name> and press e.
    ```

Note: After each entry, lpadmin should provide an acknowledgment of the command
        invoked.

---

9. Type the command:
    ```
    lp -d <printer name> /etc/hosts, and press e.
    ```

10. Check for output, or type the following:
    ```
    lpstat <printer name> or -t.
    ```

7.4.3.8 Installing & Printing on a SCO UNIX System

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

After completing software download in Section *7.4.3.1 Loading the Software,* 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 Print
    Server Card 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 e.
    ```

3. What is the node name of the Print Server Card?
    Type the name assigned in the */etc/hosts* file and press **[Enter]**. For example,
    printfast

4. What is the printer name for this Print Server Card-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 Print Server Card: printfast
Printer name to be used: <printer_name>
The printer is attached on: PORT 1
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
```

Note: Your host may require you to specify the model by using the -i command.

```
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 Print Server Card 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.

7.4.3.9 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 Print Server Card 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 Print Server Card printer must be a named pipe used by the print daemon to route data to Print Server Card. 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 Print
    Server Card 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 Print Server Card:    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 Print Server Card 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.

7.4.3.9.1 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 Print Server Card. Before you edit the files above, be sure that the following daemon is running:

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

7.4.3.9.2 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>
```

7.5   Running *Telnet*

The *Telnet* utility uses the standard remote terminal protocol to configure the IP address, *lpd/lpr* printers, and other parameters on your system. Use the following guidelines to run *Telnet*. You have the same functionality with the HTML pages accessed by MAP or a Web Browser, as described ion Chapter 3.

• 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.

7.5.1   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 **e**.

3. The main menu is displayed. This utility lets you change the IP Parameters, *lpd/lpr* printers, protocols, restore to factory defaults, and change password. Press the number for the parameter you wish to check or change and press **e**.

```
The Configuration Utility
Unit Serial no. 221963 V4.10

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 **e**.

Note: Press ? to access the *Telnet* help utility.

7.5.2 Configure IP Parameters

Although the Print Server Card 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 Print Server Card 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	255.255.255.0
3. Default Gateway	199.92.187.254

3. Enter a new **IP Address** and press **ENTER**. Repeat the previous steps to change **Subnet Mask** and **Default Gateways**.

4. 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**.

7.5.3 Select Printer Languages

Selection **2** in the Main Menu allows you to designate which emulations (printer inter-preter languages) the printer supports. This is to allow the resident *lpd/lpr* 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/lpr* 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:

Print Server Setup	Job Detected to be	Action
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

1. 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

2. 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	

3. 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.

4. From the LPD Printers menu, press **2** to toggle Banners between Enabled/Disabled.

7.5.4 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 OSs are enabled by default. For example, to disable Appletalk, type 2 and press ENTER.

7.5.5 Restore Factory Defaults

When it is necessary to restore factory defaults on your print server, choose 4 on the Main Menu and press ENTER. All NVRAM stored parameters will be returned to their factory default values. The factory default values will not take effect until the Telnet program is exited, or, the unit is powered cycled.

7.5.6 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.

Note: There is a single maintenance access password to the Print Server Card. This password is used for both Telnet and HTML maintenance programs. This password may be changed from Telnet or from HTML (accessed either via MAP or Web Browser utility.

7.5.7 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. Save Changes and Reset
> 3. Exit Without Saving Changes

2. Choose your option and press **ENTER**. For example, type **2** and press **ENTER**. The program will save your changes and reset the print server so that the changes will take effect.

This chapter describes normal operation of the Print Server Card in the printer, and also provides information on how to troubleshoot any problems you might have with the Print Server Card.

8.1   LED Status Indicator

The Print Server Card 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 Print Server Card; it is off when no activity is occurring.

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

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 check-sum 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 interface error.	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

8.2   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 on the next page shows the configuration of the print server 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.

```
Unit Serial No: 990007                        Version: 04.23
Network Address: 00:40:af:78:d9:b8
Network Topology:Ethernet                     Connector: 10 Base T
Network Speed: 10 Mega Bits
Novell Network Information                    enabled
   Print Server Name: SHA_260121
   Password Defined: no
   Preferred File Server not defined
   Directory Services Context not defined
   Frame Type: Novell 802.3
Peer-to-Peer Information                      enabled
   Frame Type: Novell 802.3
   Network ID: 68
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
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: *
-------------------------------------------------------------------------
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
      Notify (Job Owner)                      First: 60 Repeat: 60
Peer-to-Peer Connection Information
      Printer Name: OTS_260121
AppleTalk Connection Information
      AppleTalk Printer Name: OTS_260121
TCP/IP Connection Information
      Port Number : 10001
-------------------------------------------------------------------------
```

8.3   Resetting the Print Server to Factory Default

You can cause the Print Server Card to restore all parameters to factory default values, so the Print Server Card appears just as it came from the factory. You may choose to do this when the Print Server Card is moved to a new location where the environment (AppleTalk network zones, NetWare file servers, IP subnets, and so on) is different.

This process is called "Reset to Factory". It can be done with the standard Telnet or HTML (accessed via MAP or a Web Browser) utility. However, if network access is not possible, the following method may be used.

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 MAC (Ethernet hardware) address.

To reset the print server card:
1. Power off the printer and remove the Print Server Card from the printer. The removal process is the reverse of the installation process in Chapter 2.
2. Locate the Reset Jumper. It is labeled **OP2**. See diagram in Appendix A.
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 Print Server Card as shown in Chapter 2. Do not connect the printer to the network.
5. Power on the printer. The Print Server Card performs its diagnostic self tests Ñ 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 Print Server Card 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 Print Server Card according to Chapter 2.

8.4   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? 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 Print Server Card 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.

Note: The start-up Configuration and Status Page from the print Server Card may be disabled via the maintenance access provisions.

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2. Check the Print Server Card's LED status indicator to ensure that there is no error condition. See *8.1 LED Status Indicator,* 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 Print Server Card. See *8.2 Status Report,* 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.
7. When you have determined the nature of the problem, use the checklists in the next section.

8.5   Troubleshooting Checklists

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

8.5.1   Troubleshooting Network Hardware Connections

Be sure that the Print Server Card 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 Print Server Card. If the printer is at the end of a run, ensure that a 50-ohm terminator is installed.

- For 100BaseT or 10BaseT, check that the network connector is plugged into the RJ connector on the Print Server Card.

- Try another cable to make sure you do not have a bad cable.

If you are using a 100BaseT or 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. Refer to *Appendix A*.

8.5.2   Troubleshooting NetWare Protocol

It is recommended you use MAP to get the NetWare setup and parameter values. If you have not resolved the problem after running MAP, go through the checklists in this section.

8.5.2.1 NetWare Checklist

- Is the print server name entered correctly? The factory-default name is *XXX_serial number*, where *XXX* is a three-letter designation for the manufacturer. 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 Print Server Card-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.

8.5.2.2 File Server Checklists

- 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 COM-CHECK utility from any network workstation to check this.

- Are there enough user positions on the File Server? The Print Server function logs on as a user.

8.5.2.3 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 Print Server Card-connected printer also assigned to another network printer? If they are, the print jobs may be going to that printer.

- From PCONSOLE, enter a sample print job directly into an assigned queue. Does the job become Active? Is job printed?

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

8.5.2.4 Print Server Card Configuration Checklist

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

- Use MAP to check the status of the print server. 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 Print Server Card's name has been entered correctly. If you

changed the name in MAP, you must also change the name in PCONSOLE before you can print.

- Use PCONSOLE to check the Printer Status. Make sure it is not stopped or paused.

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

8.5.2.5 Printer Server/File Server/Printer Checklist

Check the following to see if:

- The Print Server Card can not log into the file server, or cannot service jobs from a File Server.

- The Print Server name is listed on that File Server, or cannot service jobs from a File Server.

- The password assigned to the Print Server Card through PCONSOLE matches the password assigned through MAP. Use MAP to update the password stored in the network Print Server's memory.

- The print job is in the print queue and waiting to be printed. Use PCONSOLE to check if the print jobs are being sent to the printer.

8.5.2.6 Workstation to Print Server Card Connection Checklist

To make sure the workstation is communicating with the Print Server Card, check the following:

- Print a file from the workstation and make sure the print job gets to the print queue using PCONSOLE. If the print job does get to the queue, the problem is not with the workstation/print server connection.

- Use CAPTURE to send data to the printer from a workstation software application. See your NetWare print server manual for information.

- Make sure another printer is not taking the print jobs from the queues BEFORE the Print Server Card can service the job. To do this, disable the other printer until you can verify the Print Server Card-connected printer setup.

8.5.2.7 Print Server Card Loses Its File Server Connection

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

8.5.2.8 Unable to Print from a Different Context

The Print Server Card 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.

8.5.3 Troubleshooting AppleTalk Protocol

- Is the Macintosh computer connected to the network through Ethernet, and, has the Macintosh AppleTalk driver been selected? Go to the Control Panel, then go to Networks to check.

- Did you select the correct Print Server Card and correct zone?

- Is AppleTalk enabled on the Macintosh? 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.

Note: Not all printers will communicate with the default Macintosh driver.

- If you renamed the printer in the AppleTalk NIManage for Macintosh Program, did you reselect the printer under its new name?

- If you placed the printer in a new zone, did you reselect the zone?

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

Jumper Settings

The Print Server Card 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.

HANDLING PRECAUTIONS
FOR
STATIC SENSITIVE DEVICES

The Print Server Card 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. Remove the Print Server Card according to the printer instructions.

A.1 Print Server Card and Jumper Locations

The illustration below shows the location of each of the jumpers on the 100BaseT/
10BaseT Print Server Card with an RJ45 connector only.

Note:The **bold** print indicates the default pin positions.
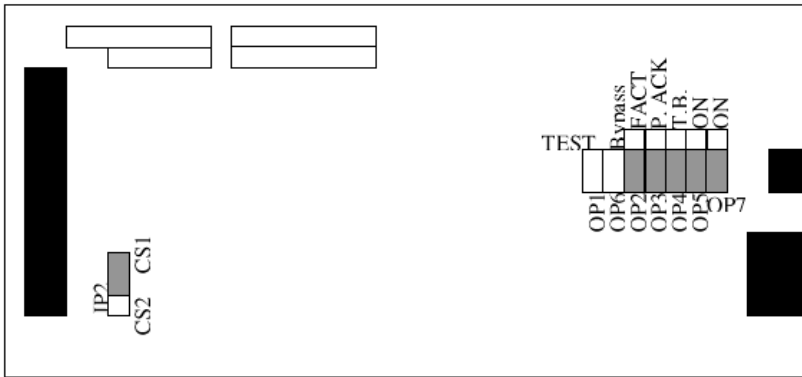
The illustration below shows the location of each of the jumpers on the small board
Print Server Card with both an RJ45 connector and a BNC connector for 10Base2
operation.

Note: The **bold** print indicates the default pin positions.
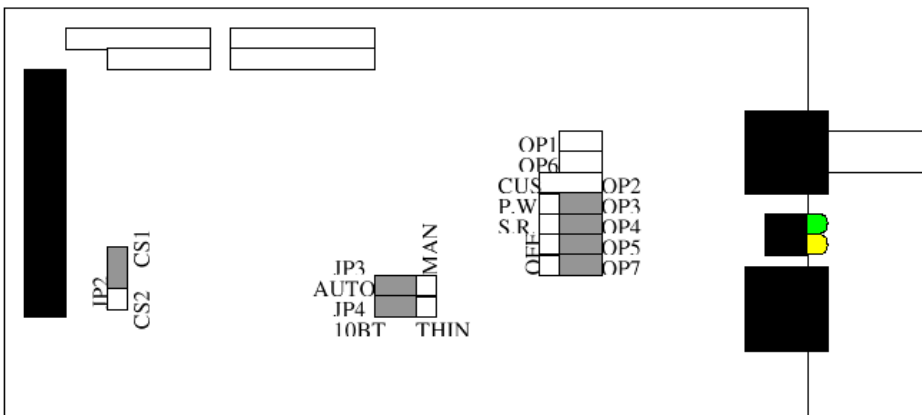
A.2   Reset to Factory

The Print Server Card 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-new* condition.

If the unit is powered up with a jumper in the **FACT** position on OP2, 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 (labeled **CUST** or **OP2**). The unit will operate normally when you turn the power on again.

A.3   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).

A.4   Ethernet-Specific Jumpers (10BaseT/10Base2 Only)

On a Print Server Card with both 10BaseT and 10Base2 capability there are two jumpers that affect Ethernet operations: Automatic/Manual (JP4) and Manual Selection (JP3).

A.4.1 Automatic/Manual Jumper

The **Automatic/Manual** jumper causes the Print Server Card to select Ethernet network type automatically when in the AUTO position. In the MA position, the selection is covered by the Manual Selection jumper.

A.4.2 Manual Select Jumper

The **Manual Select** jumper allows the user to force the Print Server Card 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.

Appendix B
Board Specifications

B.1 Print Server Card

The following table provides general specifications for the Print Server Card.

Print Server Card General Specifications (Small Board)

Size:	123.7 mm length x 95 mm height
Weight:	8 ounces
Environment:	0 to 50 degrees Centigrade, 5% to 80% humidity
Controls and Indicators:	One green LED and one amber LED
Configuration:	Stored in non-volatile memory
Connectors:	Ethernet: 8-wire RJ45 10/100BaseT or Ethernet: 8-wire RJ45 10BaseT & BNC 10Base2

B.2 10/100BaseT UTP Cables

Use the following universal Ethernet standard when configuring your 10/100BaseT/
UTP cables to connect to the RJ45 connector on the Print Server Card. The cable
should be Category/Type 3 or better (depending on length).

Pin Number	Color	Ethernet
8	blue/white	
7	blue	
6	orange/white	Receive -
5	green/white	
4	green	
3	orange	Receive +
2	brown/white	Transmit -
1	brown	Transmit +

C.1 FTP Printing Using Netscape

Connect to the port you wish to send the print job to on your print server. For example, to print your print server from Netscape (must be Netscape 2.0 or greater), do the following:

1. Type: **ftp://port1@<destination server IP address>**
2. Select **File**.
3. Select **Upload File**.

Note: FTP printing does *not* support selecting multiple file names.

The selected file is now sent to the printer.

C.2 Drag and Drop Method using Netscape

You can also use the "drag and drop" method of printing files from Netscape. For example, to print a file on your print server from Netscape (must be Netscape 2.0 or greater), do the following:

1. Type: **ftp://port1@<destination server IP address>**
2. Click and hold on the file that is on your system and drag it to your IP browsers window.
3. Click on **OK** to upload file.

The selected file is now sent to the printer.

Note: FTP printing does *not* support selecting multiple file names. Only **one** person can be logged on to a port at any particular time.

C.3 FTP Client

To print from a FTP Client, do the following:

1. Type**: ftp <destination server ID>**
2. Type: **port1** as the login
3. Type: **put <filename***>*

The selected file is now sent to the printer.

Numerics

A

B

C

D

E

F

H

I

J

L

M

R

S

T

U