Installation and Reference for the Model PS104/PS105/ PS110/PS113 Print Server

NETGEAR

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M-PS100NA-4
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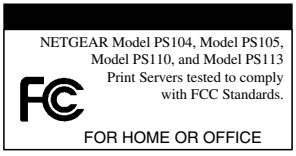
NETGEAR does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Federal Communications Commission (FCC) Compliance Notice: Radio Frequency Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.



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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

EN 55 022 Declaration of Conformance

This is to certify that the NETGEAR Model PS104 Print Server, Model PS105 Print Server, Model PS110 Print Server, and Model PS113 Print Server are shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class B (CISPR 22).

Bestätigung des Herstellers/Importeurs

Es wird hiermit bestätigt, daß das NETGEAR Model PS104 Print Server, Model PS105 Print Server, Model PS110 Print Server, und Model PS113 Print Server gemäß der im BMPT-AmtsblVfg 243/1991 und Vfg 46/1992 aufgeführten Bestimmungen entstört ist. Das vorschriftsmäßige Betreiben einiger Geräte (z.B. Testsender) kann jedoch gewissen Beschränkungen unterliegen. Lesen Sie dazu bitte die Anmerkungen in der Betriebsanleitung.

Das Bundesamt für Zulassungen in der Telekommunikation wurde davon unterrichtet, daß dieses Gerät auf den Markt gebracht wurde und es ist berechtigt, die Serie auf die Erfüllung der Vorschriften hin zu überprüfen.

Certificate of the Manufacturer/Importer

It is hereby certified that the Model PS104 Print Server, Model PS105 Print Server, Model PS110 Print Server, and Model PS113 Print Server have been suppressed in accordance with the conditions set out in the BMPT-AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

Federal Office for Telecommunications Approvals has been notified of the placing of this equipment on the market and has been granted the right to test the series for compliance with the regulations.

Compliance with the applicable regulations is dependent upon the use of shielded cables. It is the responsibility of the user to procure the appropriate cables.

Voluntary Control Council for Interference (VCCI-B) Statement

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

Customer Support

For assistance with installing and configuring your NETGEAR system or with post-installation questions or problems, contact your point-of-purchase representative.

To contact customer support or to purchase additional copies of this document and publications for other NETGEAR products, you can contact NETGEAR at the following numbers:

- **Australia:** 1800-142-046
- **Austria:** 00800-06384327 (008000-NETGEAR)
- **Canada:** 888-NETGEAR
- **France:** 0800-90-2078
- **Germany:** 00800-06384327 (008000-NETGEAR)
- **Japan:** 0120-66-5402
- **Korea:** 00308-11-0319
- **New Zealand:** 0800-444-626
- **Sweden:** 020-790086
- **Switzerland:** 00800-06384327 (008000-NETGEAR)
- **United Kingdom:** 0171-571-5120
- **United States:** 888-NETGEAR

Internet/World Wide Web

NETGEAR maintains a World Wide Web Home Page that you can access at the universal resource locator (URL) http://www.NETGEAR.com. A direct connection to the Internet and a Web browser such as Internet Explorer or Netscape are required.

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Preface

Congratulations on your purchase of the NETGEAR™ Model PS104 Print Server, Model PS105 Print Server, Model PS110 Print Server, or Model PS113 Print Server.

Supporting multiple protocols and operating systems, these print servers provide an effective solution for networked PCs to connect to the same printer, processing and trafficking printing requests to any parallel device. These print servers are fast and easy to set up with FirstGear™, a NETGEAR software configuration program.

Purpose

This guide describes how to set up the Model PS104 Print Server, Model PS105 Print Server, Model PS110 Print Server, and Model PS113 Print Server. If your network is operating in a Microsoft environment and you are using Microsoft® Windows® 95, Windows® 98, Windows NT®, or Windows® 2000, refer to the *Model PS104/PS105/PS110/PS113 Print Server Quick Installation Guide* (NETGEAR part number M1-PS100NA-1). However, this guide provides you with further reference information.

In this guide, the Model PS104 Print Server, the Model PS105 Print Server, the Model PS110 Print Server, and the Model PS113 Print Server are referred to collectively as the Model PS104/PS105/PS110/PS113 Series of print servers or just the print server. Each model is referred to specifically when features or functions are unique to that particular model.

Audience

To configure and install the print server, you should have the following background and experience:

- Working knowledge of basic network management concepts and terminology
- Working knowledge of tools and procedures to install and operate electronic equipment

Conventions

This section describes the conventions used in this guide.

Special Message Formats

This guide uses the following formats to highlight special messages:

	**Note:** This format is used to highlight information of importance or special interest.

	**Caution:** This format is used to highlight information that will help you prevent equipment failure or loss of data.

	**Warning:** This format is used to highlight material involving possibility of injury or equipment damage.

	**Danger:** This format is used to alert you that you may incur an electrical shock by mishandling equipment.

Use of Enter, Type, and Press

This guide uses “enter,” “type,” and “press” to describe the following actions:

- When you read “enter,” type the text and press the Enter key.
- When you read “type,” type the text, but do not press the Enter key.
- When you read “press,” press only the alphanumeric or named key.

Other Conventions

This guide uses the following additional conventions:

italics	Book titles and UNIX file, command, and directory names.
Initial Caps	Menu titles and window and button names.

Related Publication

If you are using Microsoft Windows 95, Windows 98, Windows NT, or Windows 2000 and have a network card installed with the NetBEUI protocol, refer to the *Model PS104/Model PS105/Model PS110/Model PS113 Print Server Installation Guide* (document part number M1-PS100NA-1). This guide provides instructions for installing the print servers by using the FirstGear Utility, a program developed by NETGEAR for fast and easy device configuration.

Chapter 1
Introduction

This chapter describes the features and the components of the Model PS104/PS105/PS110/PS113 print server.

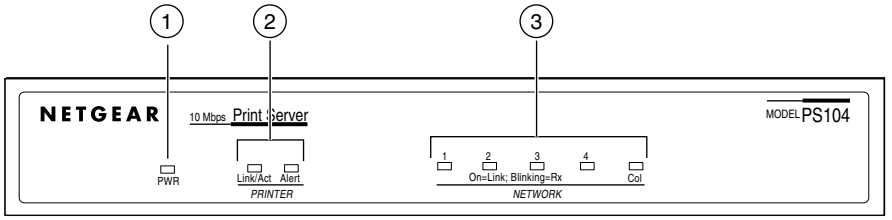
Features

The Model PS100 series of print servers offers:

- Support for multiple protocols (NetBEUI, TCP/IP, and IPX/SPX)
- Support for multiple operating systems (Windows 95, Windows 98, Windows NT, Windows 2000, Novell NetWare, and UNIX)
- Easy configuration of the device with FirstGear, NETGEAR configuration software that assures fast and easy setup for Windows 95, Windows 98, and Window NT users
- Support for 10BASE-T Ethernet connection with four 10BASE-T ports on the Model PS104 Print Server, four 10BASE-T ports and a BNC port on the Model PS105 Print Server, or 10/100BASE-T Ethernet connection on the Model PS110 and Model PS113 Print Server
- One IEEE 1284 bidirectional parallel port on the Model PS104 and Model PS105 Print Servers, two bidirectional parallel ports on the Model PS110 Print Server, and three bidirectional parallel ports on the Model PS113 Print Server
- Extensive LED indicators for at-a-glance status information
- Built-in repeater functionality (Model PS104 and Model PS105 Print Servers)
- Compact size to fit into limited space in a work area
- In a TCP/IP environment, configurability to allow others to print to one of your printers from anywhere on the Internet

Front Panel

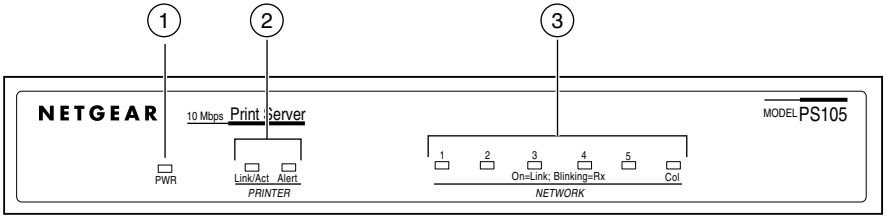
The LEDs that indicate the status of the server, ports, and printer are located on the front panels of the Model PS104 Print Server, the Model PS105 Print Server, the Model PS110 Print Server, and the Model PS113 Print Server as illustrated in Figure 1-1, Figure 1-2, Figure 1-3, and Figure 1-4, respectively.



8625EB

Key:
1 = PWR (power) LED
2 = PRINTER LEDs
3 = NETWORK LEDs

Figure 1-1. Front Panel of the Model PS104 Print Server



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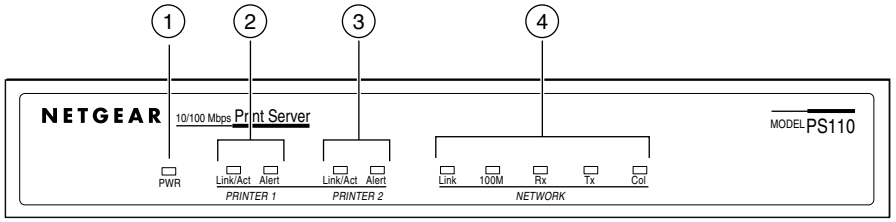
Key:
1 = PWR (power) LED
2 = PRINTER LEDs
3 = NETWORK LEDs

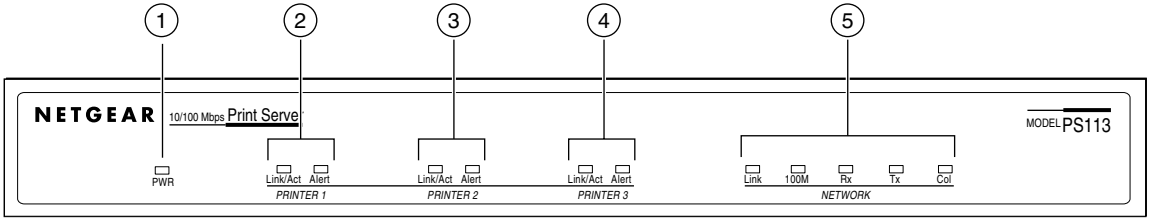
Figure 1-2. Front Panel of the Model PS105 Print Server



8626EB

Key:
1 = PWR (power) LED
2 = PRINTER 1 LEDs
3 = PRINTER 2 LEDs
4 = Network LEDs

Figure 1-3. Front Panel of the Model PS110 Print Server



9600EA

Key:
1 = PWR (power) LED
2 = PRINTER 1 LEDs
3 = PRINTER 2 LEDs
4 = PRINTER 3 LEDs
5 = Network LEDs

Figure 1-4. Front Panel of the Model PS113 Print Server

LEDs

There are 8 LEDs on the front panel of the Model PS104 Print Server, 9 LEDs on the front panel of the Model PS105 Print Server, 10 LEDs on the front panel of the Model PS110 Print Server, and 12 LEDs on the front panel of the Model PS113 Print Server. Table 1-1 describes the activity of each of the LEDs.

Table 1-1. LED Descriptions

Label	Color	Activity	Description
PWR (power)	Green	On	Power is supplied to the print server.
PRINTER, PRINTER 1, PRINTER 2, or PRINTER 3			
• Link/Act	Green	On	A printer is connected to the port.
		Off	No printer is connected to the port.
		Blinking	Data transmission is occurring on the port.
• Alert	Amber	On	The connected printer is offline, is out of paper, or has a paper jam.
		Off	The connection between the printer and print server is good.
NETWORK (Model PS104 and PS105)			
• Link/Rx	Green	Off	No link exists between the port and the network.
		On	The 10 Mbps half-duplex link between the print server and the network is good.
		Blinking	Incoming data is on the port.
• Col (collision)	Amber	Blinking	Data collision is occurring on the network. Note that occasional collisions are normal.

Table 1-1. LED Descriptions (continued)

Label	Color	Activity	Description
NETWORK (Model PS110 and PS113)			
• Link	Green	On	The link between the port and the network is good.
• 100M	Green	On	The link between the port and the network is a half-duplex 100 Mbps connection.
		Off	The link between the port and the network is a half-duplex 10 Mbps connection.
• Tx	Green	Blinking	The print server is sending data out of the port.
• Rx	Green	Blinking	The print server is receiving data on the port.
• Col (collision)	Amber	Blinking	Data collision is occurring on the network. Note that occasional collisions are normal.

Rear Panel

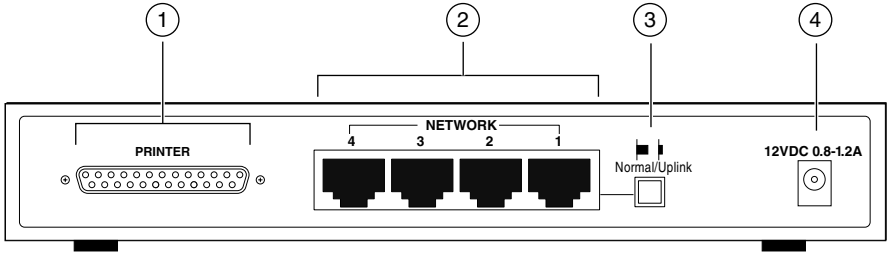
The rear panel of the Model PS104 Print Server and the Model PS105 Print Server has one parallel PRINTER port, the rear panel of the Model PS110 Print Server has two parallel ports for printers (PRINTER 1 and PRINTER 2), and the rear panel of the Model PS113 Print Server has three parallel ports for printers (PRINTER 1, PRINTER 2, and PRINTER 3). The ports on the first two print servers accept either a printer or another parallel device such as a plotter. The ports on the second two print servers accept two or three ports, therefore, two or three parallel devices can be connected and can operate simultaneously.

The Model PS104 Print Server has four 10BASE-T network ports. The Model PS105 Print Server has four 10BASE-T network ports and one BNC network port. The Model PS110 and Model PS113 Print Server each has one 10/100BASE-T network port. The 10/100BASE-T port is an autonegotiation port that operates in 100 Mbps and in half-duplex mode when connected to a Fast Ethernet network.

Normal/Uplink Push Button on the Model PS104/PS105 Print Server

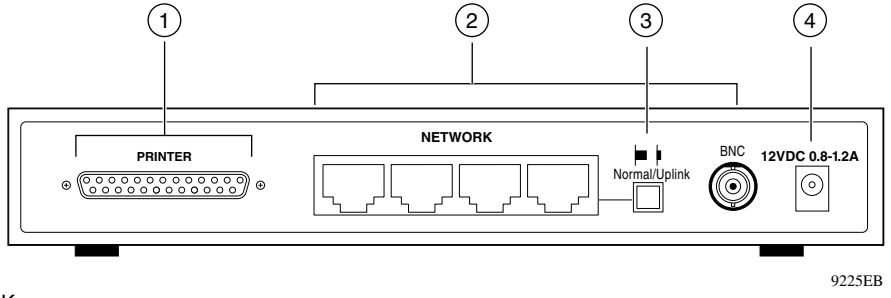
The Normal/Uplink push button on the Model PS104 Print Server and the Model PS105 Print Server allows you to select Normal (MDI-X) or Uplink (MDI) wiring for NETWORK port 1, eliminating the need to use a crossover cable. Ports 2 to 4 on the print server are permanently configured for Normal wiring.

As illustrated in Figure 1-5, Figure 1-6, Figure 1-7, and Figure 1-8 all the print servers have a power adapter receptacle that accepts a 12 V DC power adapter.



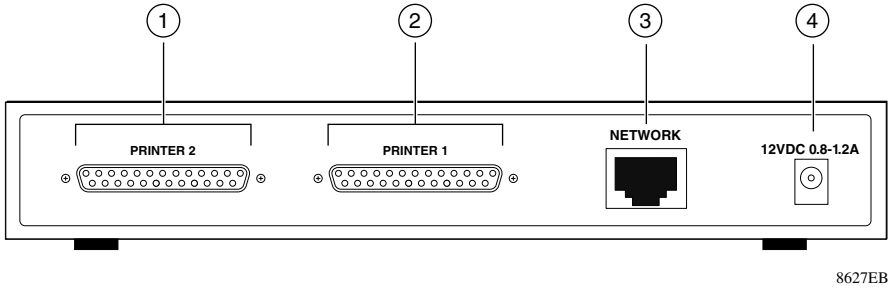
Key:
1 = PRINTER Port
2 = NETWORK port (10BASE-T connectors)
3 = Normal/Uplink push button
4 = Power adapter receptacle

Figure 1-5. Rear Panel of the Model PS104 Print Server



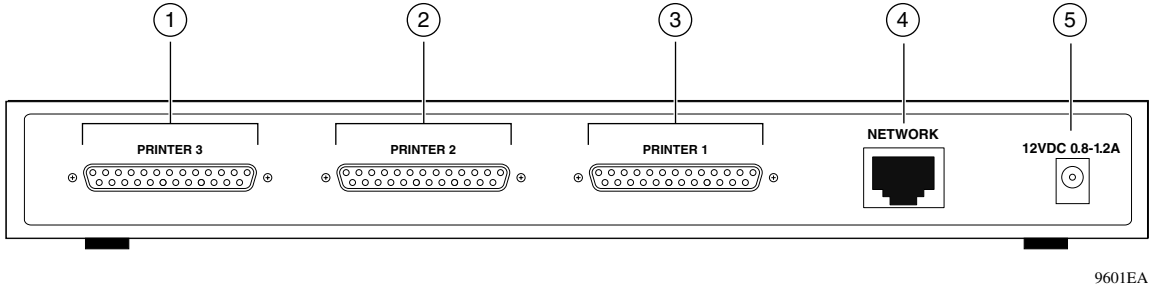
Key:
1 = PRINTER Port
2 = Network Port (Four 10BASE-T and One BNC Connector)
3 = Normal/Uplink push button
4 = Power adapter receptacle

Figure 1-6. Rear Panel of the Model PS105 Print Server



Key:
1 = PRINTER 2 (parallel) port
2 = PRINTER 1 (parallel) port
3 = NETWORK port (10/100BASE-T connector)
4 = Power adapter receptacle

Figure 1-7. Rear Panel of the Model PS110 Print Server



Key:
1 = PRINTER 3 (parallel) port
2 = PRINTER 2 (parallel) port
3 = PRINTER 1 (parallel) port
4 = NETWORK port (10/100BASE-T connector)
5 = Power adapter receptacle

Figure 1-8. Rear Panel of the Model PS113 Print Server

Chapter 2
Installation

This chapter describes the installation and setup of the NETGEAR Model PS104/PS105/PS110/ PS113 print server.

Preparing the Site

Before you begin installing the print server, prepare the installation site. Make sure the operating environment meets the physical requirements of the print server, as described in Appendix A, "Technical Specifications."

Verifying Package Contents

Your package should contain the following:

- Model PS104 Print Server, Model PS105 Print Server, Model PS110 Print Server, or Model PS113 Print Server
- Power adapter
- BNC terminator and T-connector (Model PS105 only)
- Model PS104/PS105/PS110/PS113 Print Server Resource CD
- Model PS104/PS105/PS110/PS113 Print Server Installation Guide
- Warranty & Owner Registration Card
- Customer Support Phone Card

Call your reseller or NETGEAR Customer Support in your area if there are any wrong, missing, or damaged parts. Refer to "Customer Support" on page iii for the location of customer support in your area.

Keep the carton, including the original packing materials. Use them to repack the print server if you need to return it for repair.

Connecting Devices to the Print Server

The Model PS104 Print Server has four 10BASE-T network ports. The Model PS105 Print Server has four 10BASE-T network ports and one BNC network port. The Model PS110 and Model PS113 Print Server each has one 10/100BASE-T network port that is autosensing and will support either 10 Mbps or 100 Mbps connections, depending on the connected device. The 10/100BASE-T network port operates in half-duplex mode.

Ports 2 through 4 on the Model PS104 Print Server are permanently configured for MDI-X wiring; port 1 can be set to MDI (Uplink) or MDI-X (Normal) by using the Normal/Uplink push button switch. The BNC port 1 on the Model PS105 Print Server is for network connections with BNC cabling. The BNC-T connection included in the package contents must be used with the coaxial cable for a 10BASE 2 connection to other network devices that have a BNC port. To terminate the connection on the last device in the network segment, you must use the BNC terminator, which is included in the package contents. The one network port on the Model PS110 and Model PS113 Print Server is permanently configured for Uplink wiring.

Refer to Table 2-1 for setting the Normal/Uplink push button switch and for selecting either a crossover or straight-through cable when connecting your print server to other devices.

Table 2-1. Cable Selection and Normal/Uplink Push Button Settings

Connecting Network Port	Connecting Device	Cable Used
Model PS104 Print Server		
Port 1 set to Uplink	Hub or switch	Straight-through cable
Port 1 set to Normal	PC or router	Straight-through cable
Ports 2 through 4	PC	Straight-through cable
Model PS105 Print Server		
Port 1	PC	BNC cable with 50 ohm terminator
Port 2 set to Uplink	Hub or switch	Straight-through cable
Ports 3 through 5	PC	Straight-through cable
Model PS110 and Model PS113 Print Server	Hub or switch	Straight-through cable
	PC	Crossover cable

Note: Ethernet specifications limit the twisted pair cable (called a twisted pair segment) extended from a network port to 100 meters in length.

Verifying Power

To complete the installation, connect the power adapter first to the power adapter receptacle on the print server rear panel and then to the power outlet on the wall. When power has been applied to the print server:

- The green PWR (power) LED on the front panel is on.
- On the Model PS104 Print Server and the Model PS105 Print Server, the green Link/Rx LED on each connected network port is on.
- On the Model PS110 and the Model PS113 Print Sever, the green Link LED on each connected printer port is on.
- The green Link/Act LED on the connected PRINTER, PRINTER 1, PRINTER 2, or PRINTER 3 port is on.

Make sure the network interface cards installed in the workstations are in working condition and the software driver has been installed on the cards.

If required, verify the integrity of the print server by resetting it. Turn power to the print server off and then back on. If the problem continues and you have completed all the preceding diagnoses, contact NETGEAR Customer Support. For the telephone number of the representative in your area, refer to “Customer Support” on page iii.

Chapter 3
Microsoft Windows 95 and Windows 98 Printing

This chapter describes how to configure and use the NETGEAR Model PS104/PS105/PS110/ PS113 print server in a Microsoft Windows networking environment.

To correctly configure your hardware and software for the Microsoft Windows platform, you must:

- Install FirstGear for Print Server software.
- Run Setup.
- Configure the user PC to print to the NETGEAR print server.

FirstGear for Print Server

This section describes how to install and set up the print server with the FirstGear for Print Server Program in Windows 95, Windows 98, or Windows 2000. There are several options to choose from:

- User Installation—used through the NetBEUI protocol, this option is geared toward the user who is already connected to the LAN and needs to set up a PC to the NETGEAR print server.
- Admin Installation—this option is geared toward the user who is connected to the LAN and also manages the print server.
- User Installation with diskette—this option generates an installation floppy disk for the user without a CD-ROM drive.

To install and set up your network and your print server for the NETGEAR print server, you must be using a PC with a Windows 95, Windows 98, Windows NT 3.51, or later operating system and with either the TCP/IP protocol or the NetBEUI protocol enabled.

	**Note:** Before proceeding with these instructions, be sure to assign a name to your workgroup on your PC. NETGEAR strongly recommends that you exit all Windows programs before running the Setup program. It is also necessary to install the FirstGear software on every PC in the network that will use the printers attached to the Model PS104/PS105/PS110/PS113 print server.

Installing and Setting Up FirstGear—User Installation

To install the NETGEAR print server software for user installation:

1. **Turn on the power to your PC.**
2. **Insert the NETGEAR Resource CD-ROM.**

   The NETGEAR window briefly opens, and the FirstGear introductory window, as illustrated in Figure 3-1, opens.

   If it does not, click on Start > Run and then type in “Install.exe” at the prompt (for example, “D:Install.exe”) to start the installation process.

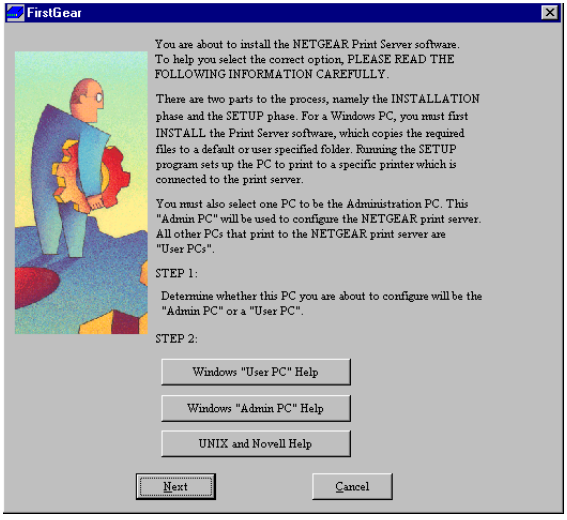


Figure 3-1. FirstGear Introductory Window

3. Click on Next.

Another FirstGear window, as illustrated in Figure 3-2, opens.

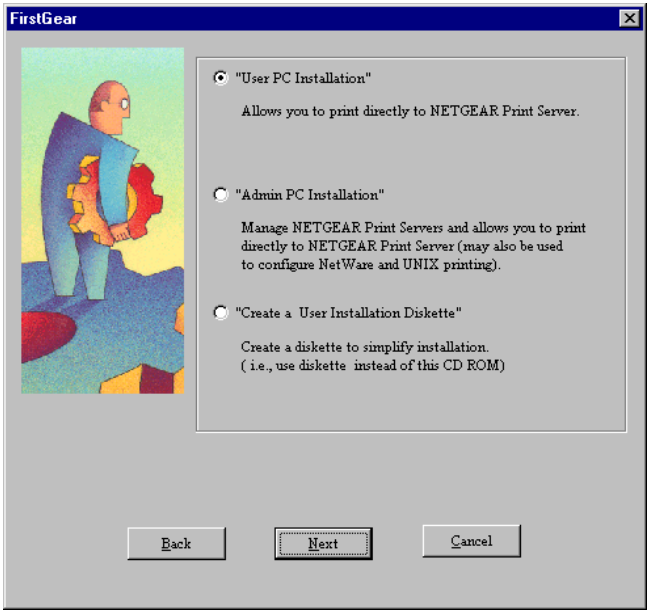


Figure 3-2. User Installation Option Window

4. Choose "User PC Installation" and click on Next.

The NETGEAR Print Server Software Installation window, as illustrated in Figure 3-3, opens.

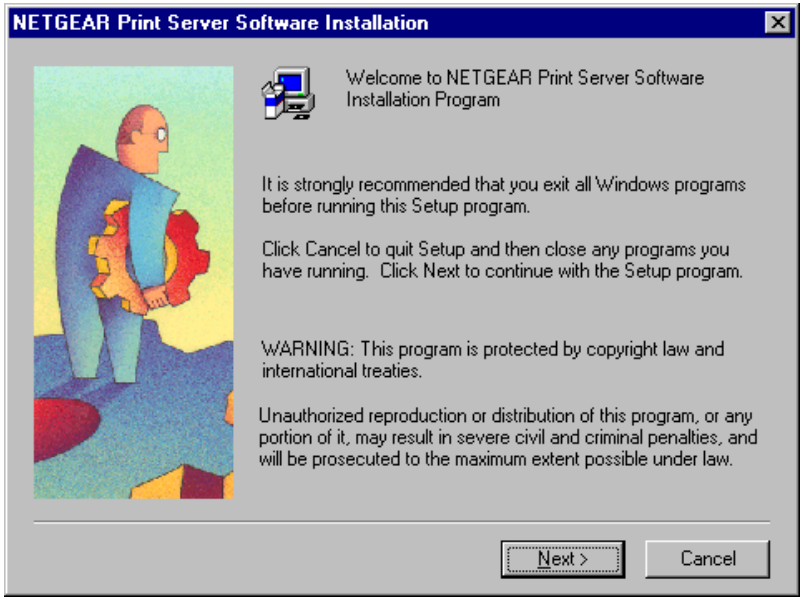


Figure 3-3. NETGEAR Print Server Software Installation Window

5. Click on Next.

The Choose Destination Location window, as illustrated in Figure 3-4, opens.

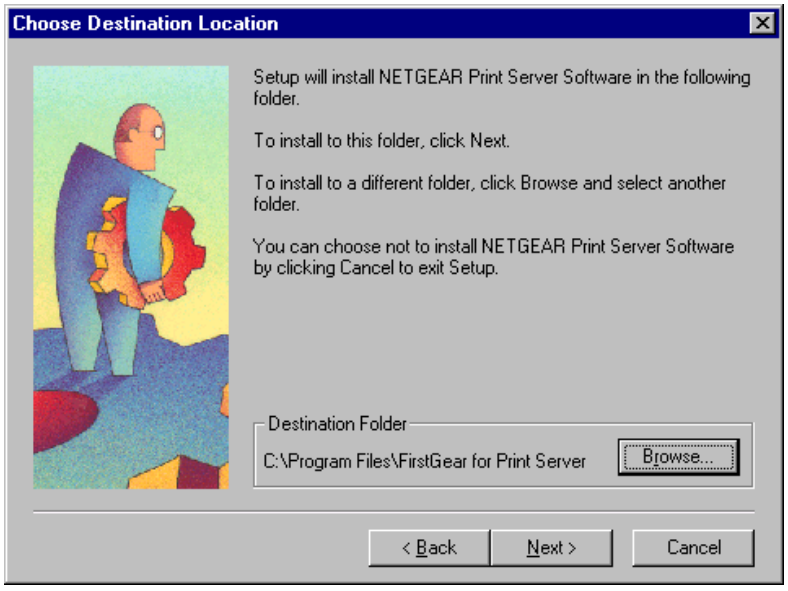


Figure 3-4. Choose Destination Location Window

6. Click on Next.

The Select Program Folder window, as illustrated in Figure 3-5, opens.

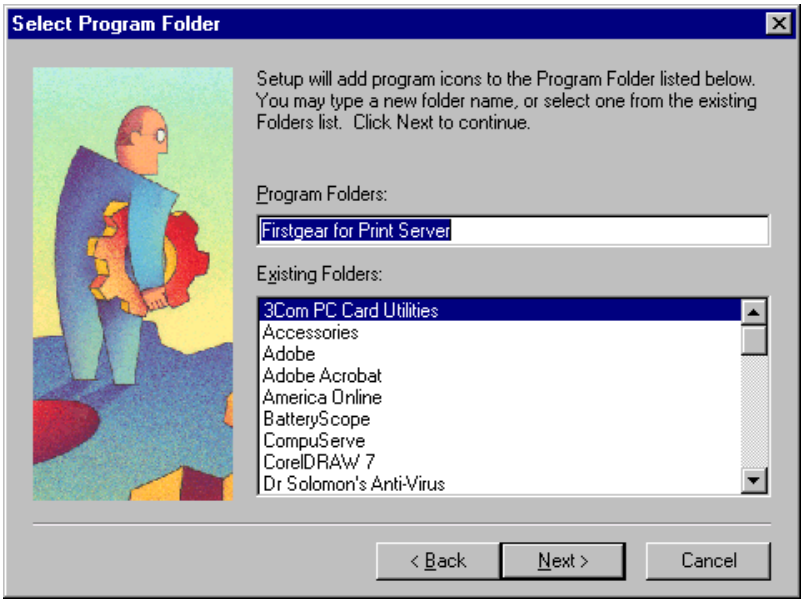


Figure 3-5. Select Program Folder Window

7. **Type Firstgear for Print Server in the Program Folders entry field (default) or select a folder from the Existing Folders list.**

   Or

   You can type in a unique name you have chosen for the program folder at the “Program Folders” prompt or click on a selection in the Existing Folder field to title the folder with another name. The name will automatically display in the Program Folders entry field.

8. **Click on Next.**

   The Setup Complete window, as illustrated in Figure 3-6, opens.

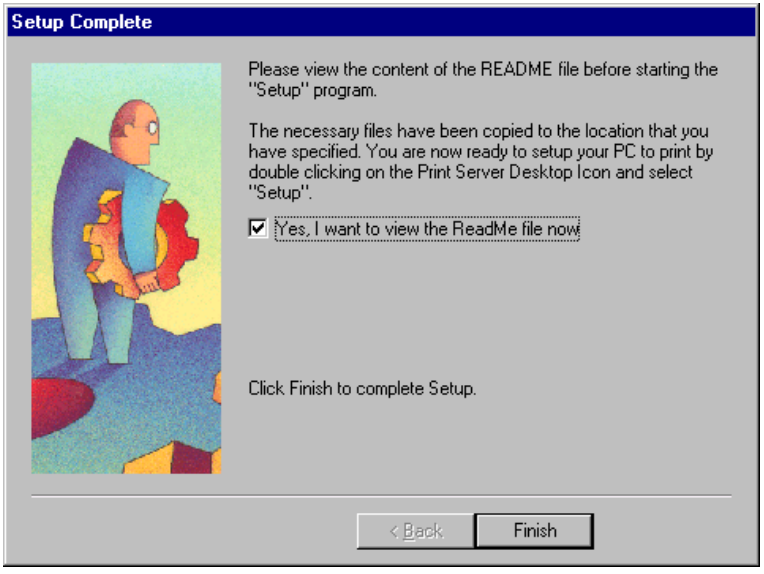


Figure 3-6. Setup Complete Window

9. **Click on Finish.**

   The FirstGear Print Server Program is now installed on your PC.

   You must now set up your PC to recognize the print server.

Setting Up Your PC to Recognize the Print Server

You must set up each PC that will print to the print server. Before proceeding, verify that:

- The print cable is connected to the printer port.
- The AC adapter is plugged into the wall socket.
- The Ethernet cable is plugged into the LAN.

To set up each PC:

1. **Double-click on the desktop icon, as illustrated in Figure 3-7, that you named in step 7 in the previous section, "Installing and Setting Up FirstGear—User Installation."**

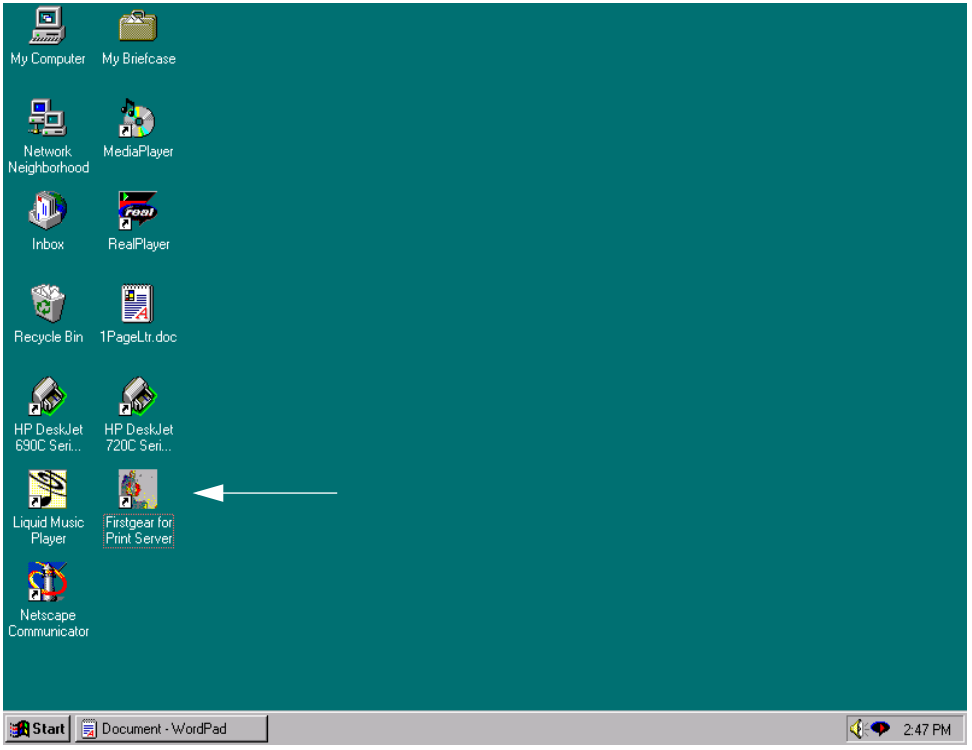


Figure 3-7. Firstgear for Print Server Icon

The Firstgear for Print Server window, as illustrated in Figure 3-8, opens.

Figure 3-8. Setup Icon

2. **Double-click on Setup in the Firstgear for Print Server window.**

   The Setup window opens, as illustrated in Figure 3-9.

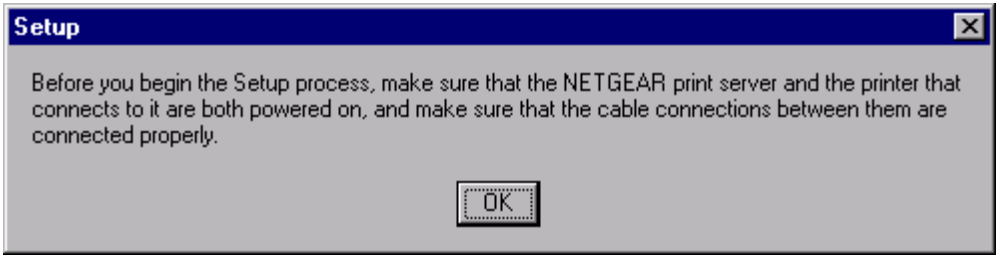


Figure 3-9. Setup Window

3. **Make sure that the NETGEAR print server and the printer that connects to it are both powered on.**
4. **Make sure that the cable connections between them are properly connected.**

5. Click on OK.

The Printer Select window, as illustrated in Figure 3-10, opens.

The Printer Select window will stay in the background while you work through subsequent setup windows because you will use this window to complete the setup process.

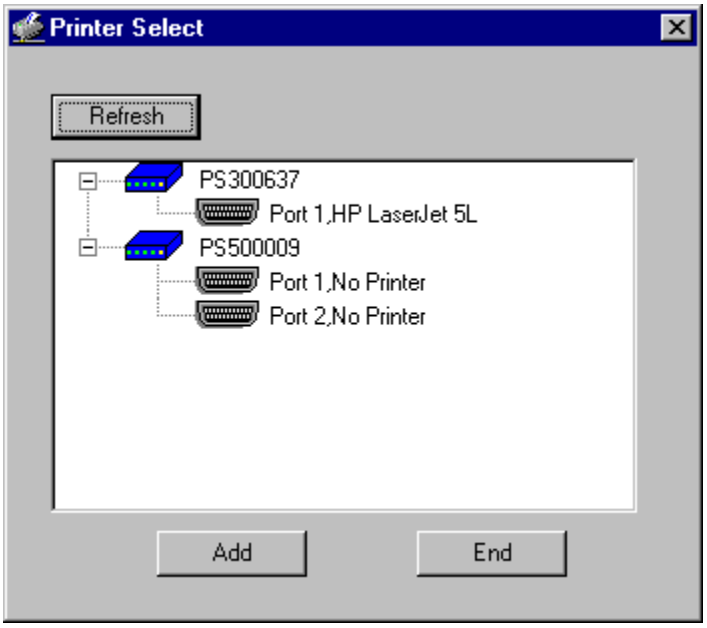


Figure 3-10. Printer Select Window (Add Port)

Note: If the cables are not properly connected, your PC screen will appear empty when the Printer Select window opens. If so, check the cable connections and click on the Refresh button, which will initiate the PC to browse again for a port.

6. **Click on the printer port you want to use with the print server, and click on Add.**

   The ADDPORT window for Epson print connection, as illustrated in Figure 3-11, opens.

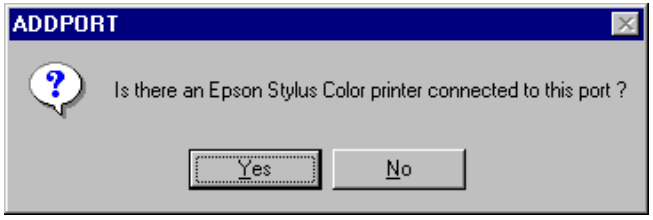


Figure 3-11. ADDPORT Window (Epson Connection)

7. **Click on No if you do not have an Epson Stylus Color printer attached to the port, and continue to step 8.**

   Or

   Click on Yes if you do have an Epson Stylus Color printer (or plan to install one). You must disable the Epson printer.

   To disable:

   a. **Click on the Program Files folder on your hard drive.**

   b. **Start the Epson Spool Manager.**

      The Queue Setup window opens, as illustrated in Figure 3-12.

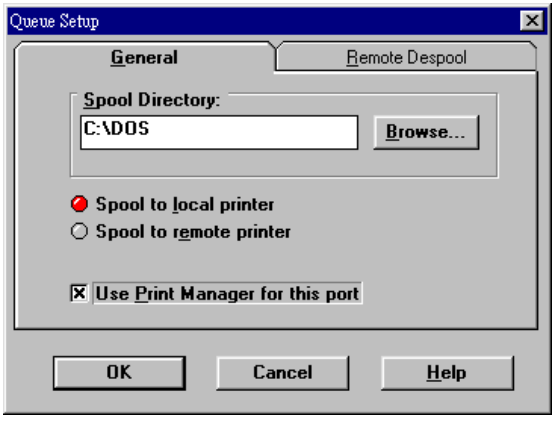


Figure 3-12. Epson Spool Manager Queue Setup Window

c. Select Queue Setup, and click on Use Print Manager for this port.

d. Click on OK to exit the Queue Setup window.

The ADDPORT window, as illustrated in Figure 3-13, opens. This window informs you that you have successfully added the port.

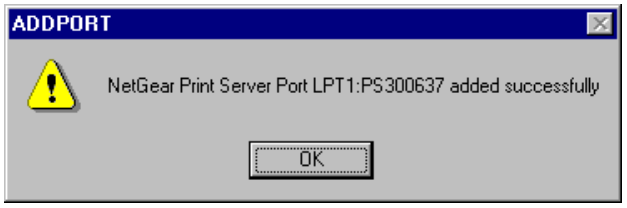


Figure 3-13. ADDPORT Window

8. Click on OK.

The Add Printer Wizard window, as illustrated in Figure 3-14, opens.

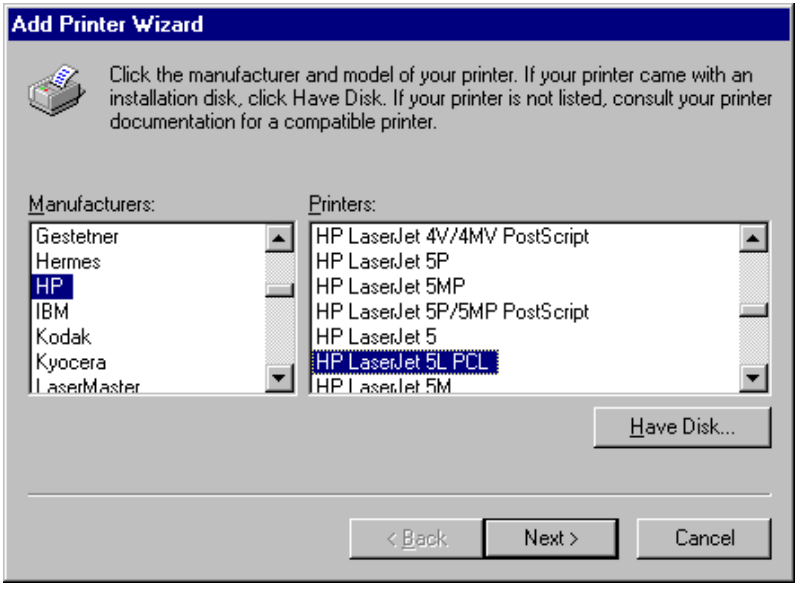


Figure 3-14. Add Printer Wizard Window (Manufacturer and Model of Printer)

9. Click on Next after clicking on the names of the manufacturer and printer model you are adding.

If your printer is not listed, click on Have Disk and insert the driver disk that you received from the printer manufacturer. Install the driver, proceeding as instructed until the Add Printer Wizard window, as illustrated in Figure 3-15, opens.

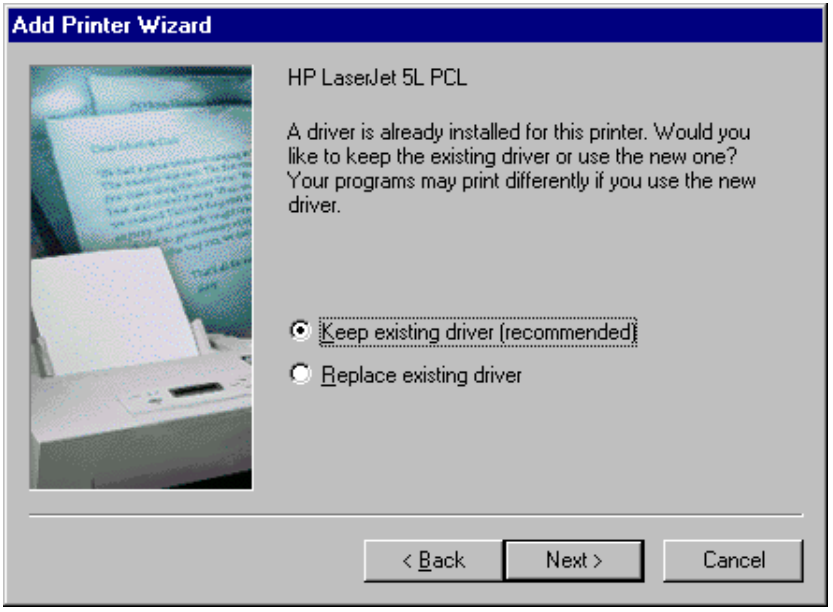


Figure 3-15. Add Printer Wizard Window (Driver Installation)

10. **If you have already installed the printer driver, select Keep existing driver (recommended), and click on Next. If you have not installed the driver, do so now as prompted by the screen, as illustrated in Figure 3-15.**

    The Add Printer Wizard window for naming your printer, as illustrated in Figure 3-16, opens.

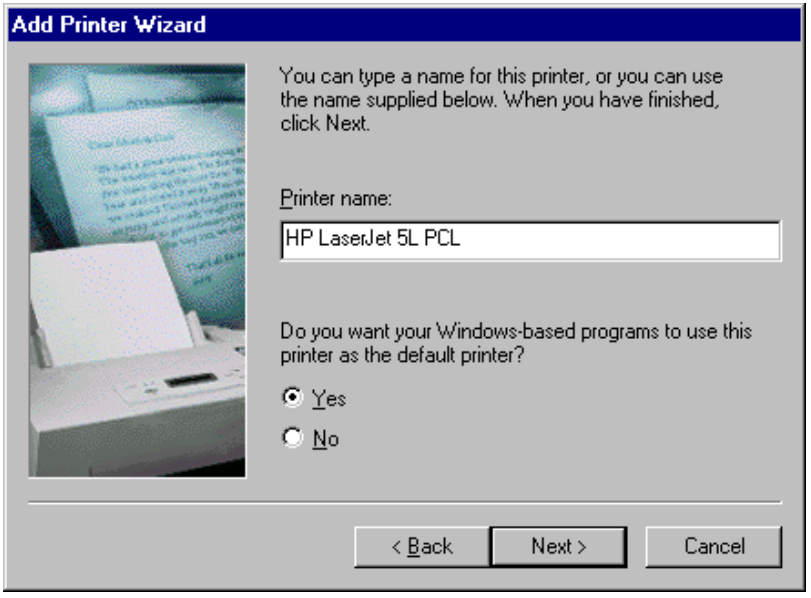


Figure 3-16. Add Printer Wizard Window (Printer Name)

11. Type a name for the printer (if you want it to have a unique name) and decide if you want this printer to be your default printer; then click on Next.

The Add Printer Wizard window for printing a test page, as illustrated in Figure 3-17, opens.

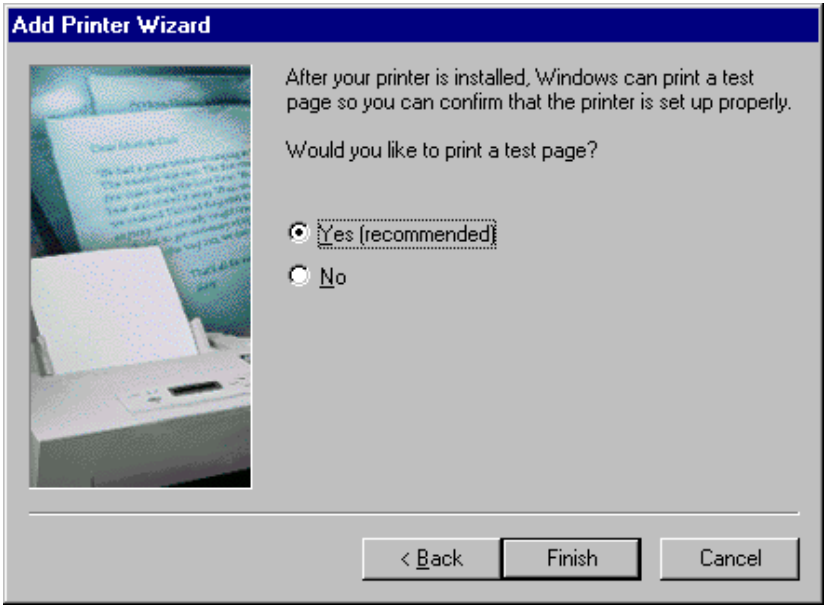


Figure 3-17. Add Printer Wizard Window (Print Test Page)

12. Select Yes when asked to print a test page, and click on Finish.

The Add Printer window closes and the Printer Select window, as illustrated in Figure 3-18, comes back into view.

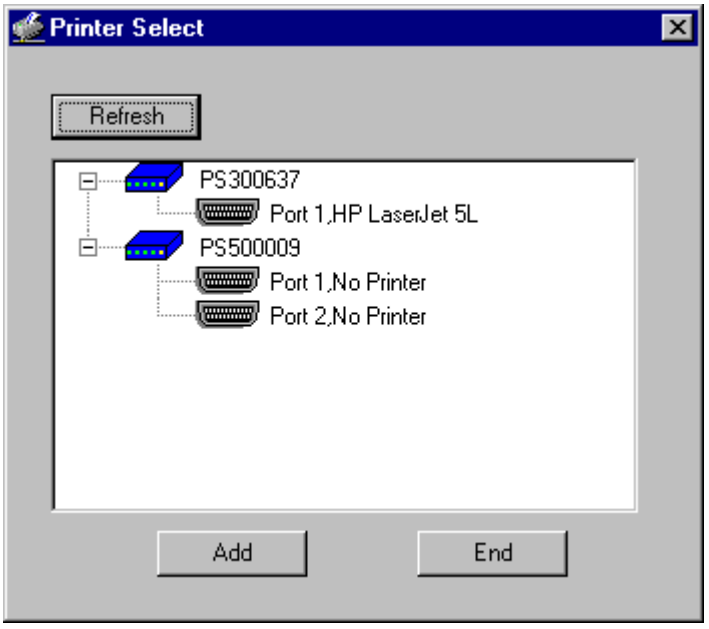


Figure 3-18. Add Port Window (Setup Complete)

13. Click on End to complete the setup process.

You are now ready to use the printer attached to your print server.

Installing and Setting Up FirstGear—Admin Installation

Choose this option if you are using Windows 95 or Windows 98 to install, print, and manage the NETGEAR print server.

Note: It is necessary to install the FirstGear software on every PC in the network that will use the printers attached to the Model PS104/PS105/PS110/PS113 print server.

To install the NETGEAR print server software for admin installation:

1. **Turn on the power to your PC.**
2. **Insert the NETGEAR Resource CD-ROM.**

   The NETGEAR window briefly opens, and the FirstGear Introductory window, as illustrated in Figure 3-19, opens.

   If it does not, click on Start > Run > and then type in “Install.exe” at the prompt (for example, “D:Install.exe”) to start the installation process.

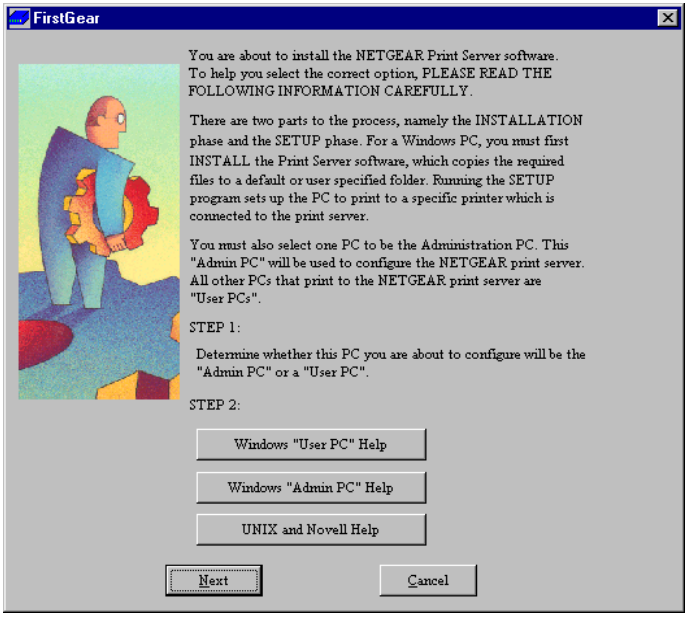


Figure 3-19. FirstGear Introductory Window

3. Click on Next.

Another FirstGear window, as illustrated in Figure 3-20, opens.

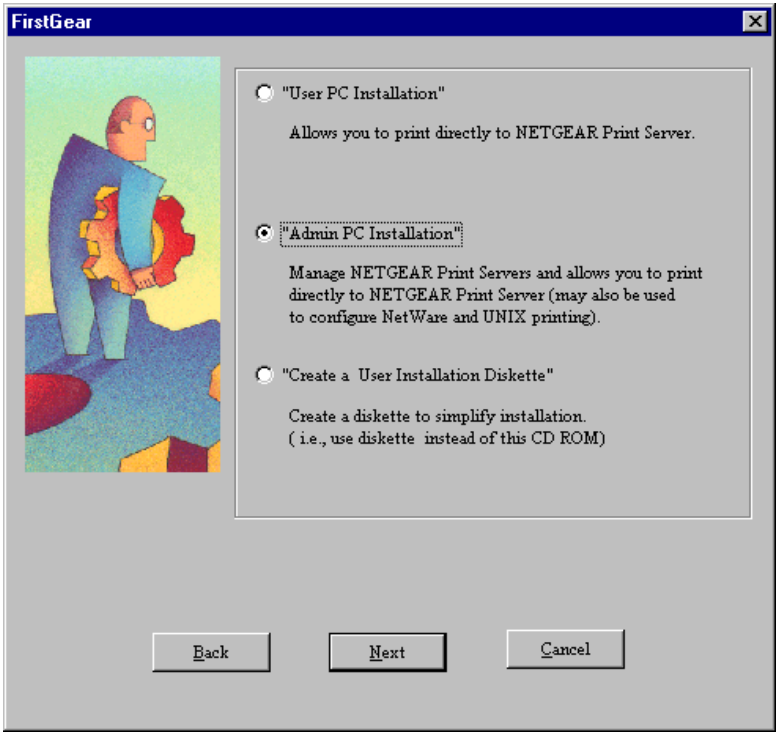


Figure 3-20. "Admin Installation" Option Window

4. Choose "Admin PC Installation" and click on Next.

The NETGEAR Print Server Software Installation window, as illustrated in Figure 3-21, opens.

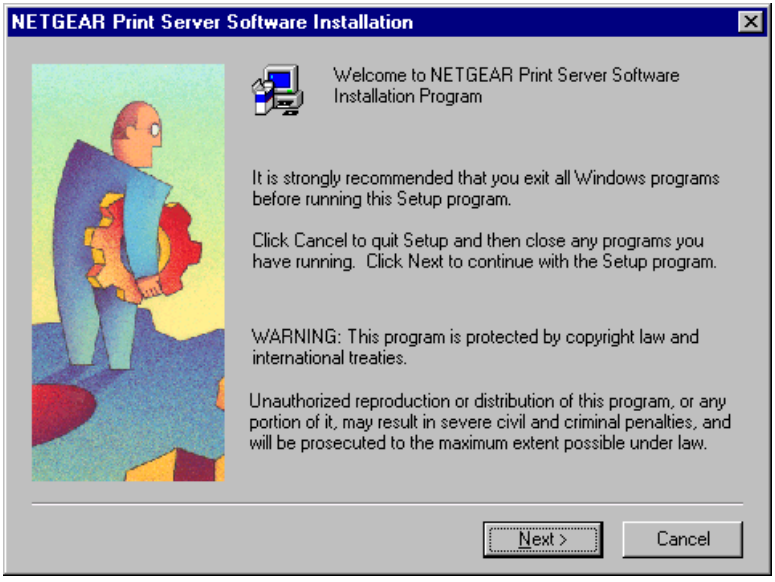


Figure 3-21. NETGEAR Print Server Software Installation Window

5. Click on Next.

The Choose Destination Location window, as illustrated in Figure 3-22, opens.

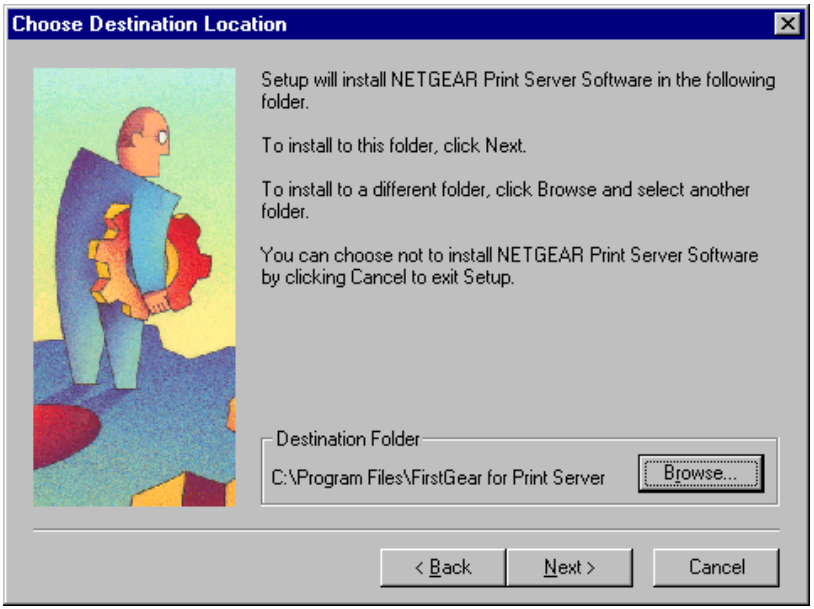


Figure 3-22. Choose Destination Location Window

6. **Click on Next to install the NETGEAR print server program in the Program Files folder. If you want to have the program installed elsewhere, click on Browse to find an alternate location for the software.**

   The Select Program Folder window, as illustrated in Figure 3-23, opens.

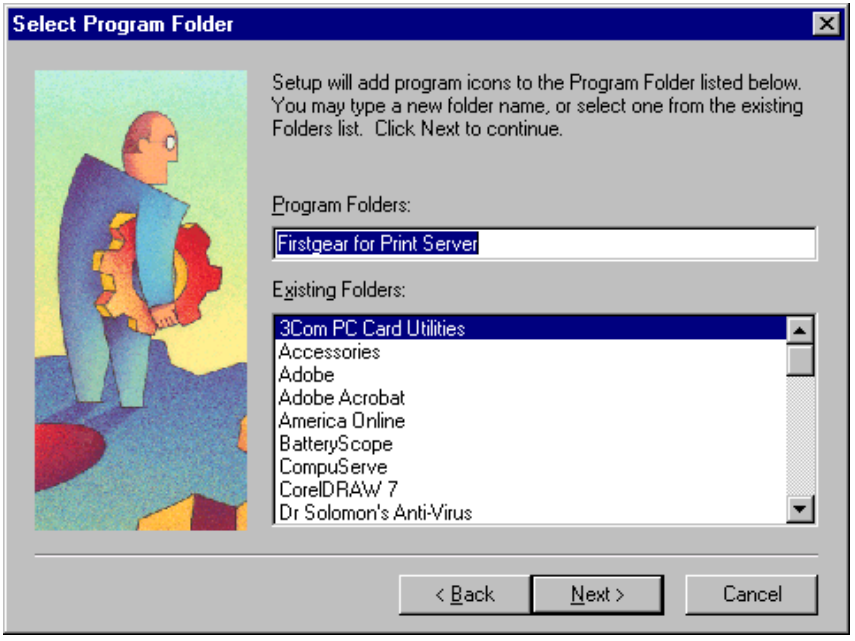


Figure 3-23. Select Program Folder Window

7. **Type Firstgear for Print Server in the Program Folders entry field (default) or select a folder from the Existing Folders list.**

   Or

   You can type in a unique name you have chosen for the program folder at the “Program Folders” prompt or click on a selection in the Existing Folders field to title the folder with another name. The name automatically displays in the Program Folders entry field.

8. **Click on Next.**

   The Information window opens. This window displays the folder where the FirstGear software is saved, the space required for the software, and the space remaining on your hard drive.

9. **Click on Next.**

   The software is copied to the program folder you requested in step 7.

   A window opens, asking you if you want to install Adobe Acrobat (a software program that will allow you to view the manual on line).

10. **Click on Yes if you want Adobe Acrobat to be installed. If you already have Adobe Acrobat installed in your PC, clicking on Yes will override the version you currently have installed.**

    Skip to step 12 if you do not want to install Adobe Acrobat.

11. **Click on Next when the Adobe Acrobat Setup window opens.**

    Follow the screen prompts to install Adobe Acrobat.

    The Setup Complete window, as illustrated in Figure 3-24, opens.

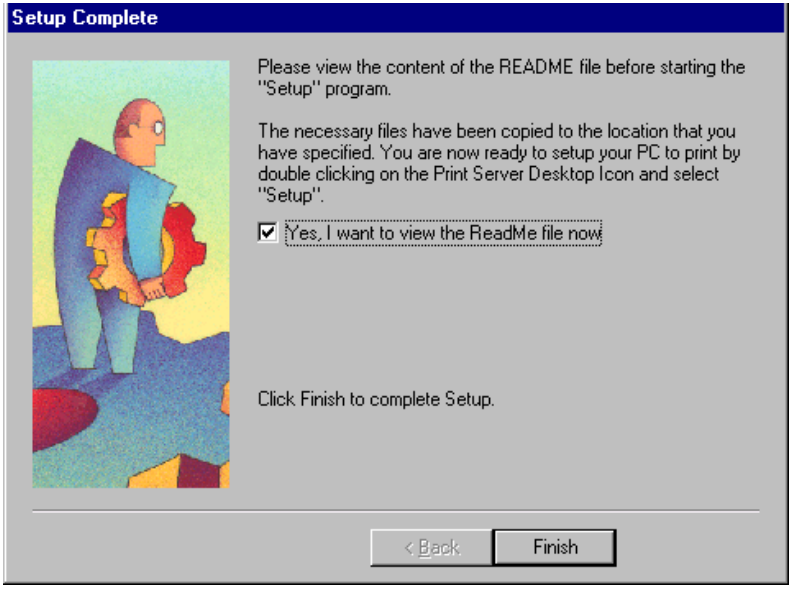


Figure 3-24. Setup Complete Window

12. **Click on Finish.**

The FirstGear Print Server program is now installed on your PC.

You must now set up your PC to print to the print server. Proceed to "Setting Up Your PC to Recognize the Print Server."

Setting Up Your PC to Recognize the Print Server

Refer to "Setting Up Your PC to Recognize the Print Server" on page 3-8 for instructions.

Installing and Setting Up FirstGear—Diskette Option

Use this option if your system does not have a CD-ROM drive.

To install the FirstGear software with a diskette:

1. **Insert a blank diskette into Drive A, and click on OK, as illustrated in Figure 3-25.**

   The diskette installation will not work in any other drive but drive A, and you must also use a high-density disk.

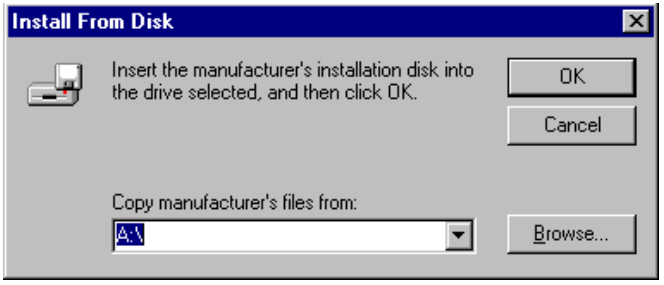


Figure 3-25. Install From Disk Window

2. Refer to "Installing and Setting Up FirstGear—User Installation" on page 3-2 or "Installing and Setting Up FirstGear—Admin Installation on page 3-17 to continue with the installation and setup process.

For more information about the advanced setup features for the NETGEAR print server, refer to Chapter 7, "Using Advanced Management Tools."

Setting up the Print Server Using NetBEUI and TCP/IP

Configuring the Print Server Using NetBEUI

No additional print server configuration is necessary after you have followed the steps outlined in "Setting Up Your PC to Recognize the Print Server" starting on page 3-8.

Configuring the Print Server Using TCP/IP

To configure the print server using TCP/IP:

1. **Double-click on the Firstgear for Print Server icon, as illustrated in Figure 3-27, on your desktop.**

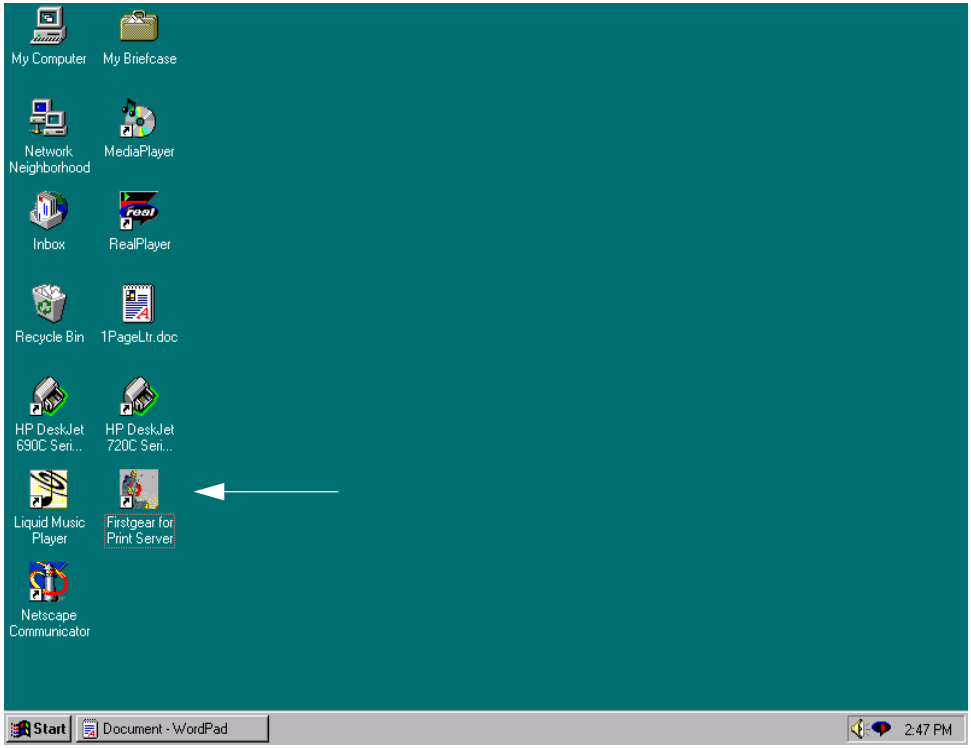


Figure 3-26. Firstgear for Print Server Icon

The Firstgear for Print Server window, as illustrated in Figure 3-27, opens.

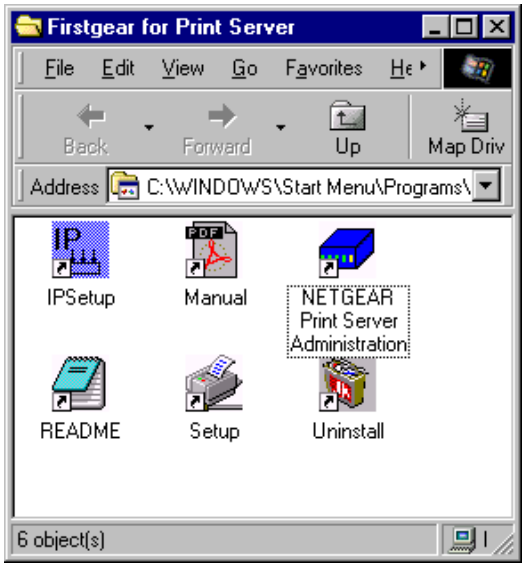


Figure 3-27. Firstgear for Print Server Window

2. **Double-click on the NETGEAR Print Server Administration icon.**

   The NETGEAR Print Server Administration Program window, as illustrated in Figure 3-28, opens.

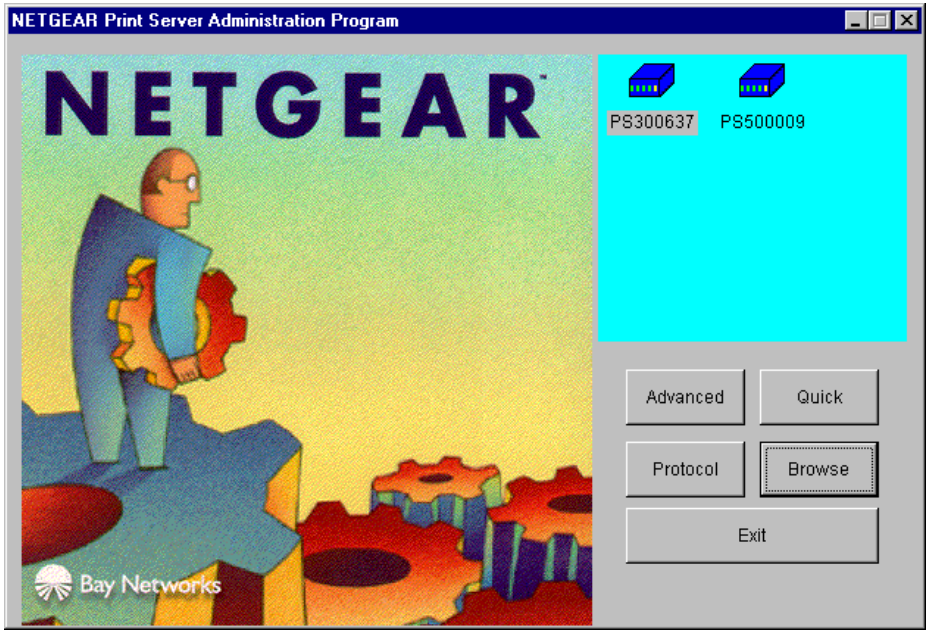


Figure 3-28. NETGEAR Print Server Administration Program Window

3. **Click on the Advanced button, as illustrated in Figure 3-28.**

   The TCP/IP menu opens, as illustrated in Figure 3-29.

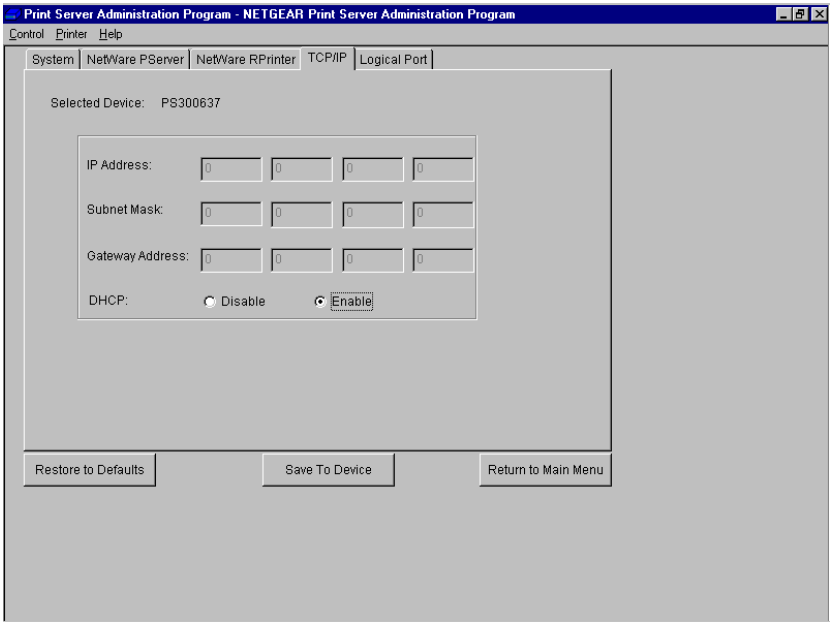


Figure 3-29. TCP/IP Menu

4. **Click on the TCP/IP menu tab, which is located at the top of the window, as illustrated in Figure 3-29.**

   Refer to Table 3-1 on page page 3-28 for a description of each field in the TCP/IP menu.

5. **Select Enable or Disable to enable or disable DHCP.**

   If DHCP is enabled, the print server can be set up to obtain its IP address from a DHCP (Dynamic Host Configuration Protocol) server or can be manually assigned an IP address at this menu tab.

   If DHCP is disabled, be sure that the IP address assigned to the device is not already in use when assigning the IP address manually.

   For a private TCP/IP network, you can use the IETP-designated private addresses (for example, 192.168.X.X or 10.X.X.X). For more information about IP addresses, refer to Appendix B, "Understanding IP Addresses."

6. **Type the subnet mask and gateway address (if DHCP is disabled) or proceed to step 7.**
7. **Click on the Save To Device button to download the new print server configuration.**
8. **Click on Return to Main Menu to exit the Advanced Configuration window.**
9. **Click on Exit on the main menu.**

Table 3-1. Fields and Descriptions for TCP/IP Configuration

Field	Description
DHCP	This option allows you to enable or disable the print server's ability to get its IP address from a DHCP (Dynamic Host Configuration Protocol) server. When disabled, you can provide a fixed IP address in the IP address, Gateway address, and Subnet Mask fields (listed in this table).
IP Address	This IP address is assigned to the print server. If you have a private LAN and do not plan to connect to the TCP/IP-based Internet, NETGEAR recommends that you use an address from the IETP-designated private addresses (for example, 192.168.x.x or 10.x.x.x).
Gateway Address	This IP address is what the print server uses for stations with IP addresses not reachable on your local LAN.
Subnet Mask	This subnet mask defines the range of addresses that are reachable on your local LAN.

Your print server is now set up to use the TCP/IP protocol for networking. If you enable DHCP, you must prepare the DHCP server to receive a DHCP query from the print server. Then reset the print server so it can then obtain an IP address from the DHCP server.

If you run into any difficulty with the static IP Setup, there is the possibility that you inadvertently disabled the DHCP protocol and/or assigned a wrong subnet IP address. Proceed to Appendix E, "IP Setup," for more information to help you force a static IP address to the print server.

Chapter 4
Microsoft Windows NT and Windows 2000 Printing

This chapter describes how to configure and use the NETGEAR Model PS104/PS105/PS110/ PS113 print server in a Microsoft Windows NT and Windows 2000 networking environment.

To correctly configure your hardware and software for the Microsoft Windows platform, you must:

- Install FirstGear for Print Server software.
- Run Setup
- Configure the user PC to print to the NETGEAR print server.

FirstGear for Print Server

This section describes how to install and set up the print server with the FirstGear for Print Server Program in Windows NT. There are several options to choose from:

- User Installation—used through the NetBEUI protocol, this option is geared toward the user who is already connected to the LAN and needs to set up a PC to the NETGEAR print server.
- Admin Installation—this option is geared toward the user who is connected to the LAN and also manages the print server.
- User Installation with diskette—this option generates an installation floppy disk for the user without a CD-ROM drive.

To install and set up your network and your print server for the NETGEAR print server, you must be using a PC with Windows NT 3.51 and later operating system and with either the TCP/IP protocol or the NetBEUI protocol enabled.

Choose this option, User Installation, to be able to print to the print server.

	**Note:** Before proceeding with these instructions, be sure to assign a name to your workgroup on your PC. Installation and setup of the NETGEAR software is required on each PC needing access to the printers that will be attached to the print server. NETGEAR strongly recommends that you exit all Windows programs before running the Setup program.

Installing and Setting Up FirstGear—User Installation

To install the NETGEAR print server software for user installation:

1. **Turn on the power to your PC.**
2. **Insert the NETGEAR Resource CD-ROM.**

   The NETGEAR window briefly opens and the FirstGear Introductory window, as illustrated in Figure 4-1, opens.

   If it does not, click on Start > Run and then type in “Install.exe” at the prompt (for example, “D:Install.exe”) to start the installation process.

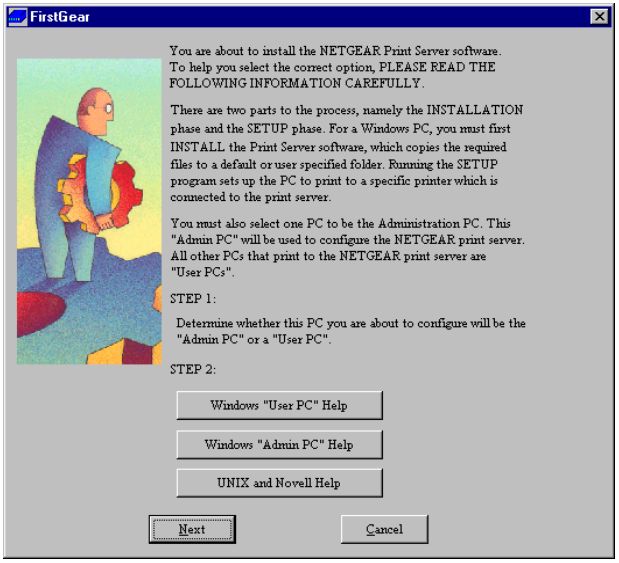


Figure 4-1. FirstGear Introductory Window

3. Click on Next.

Another FirstGear window, as illustrated in Figure 4-2, opens.

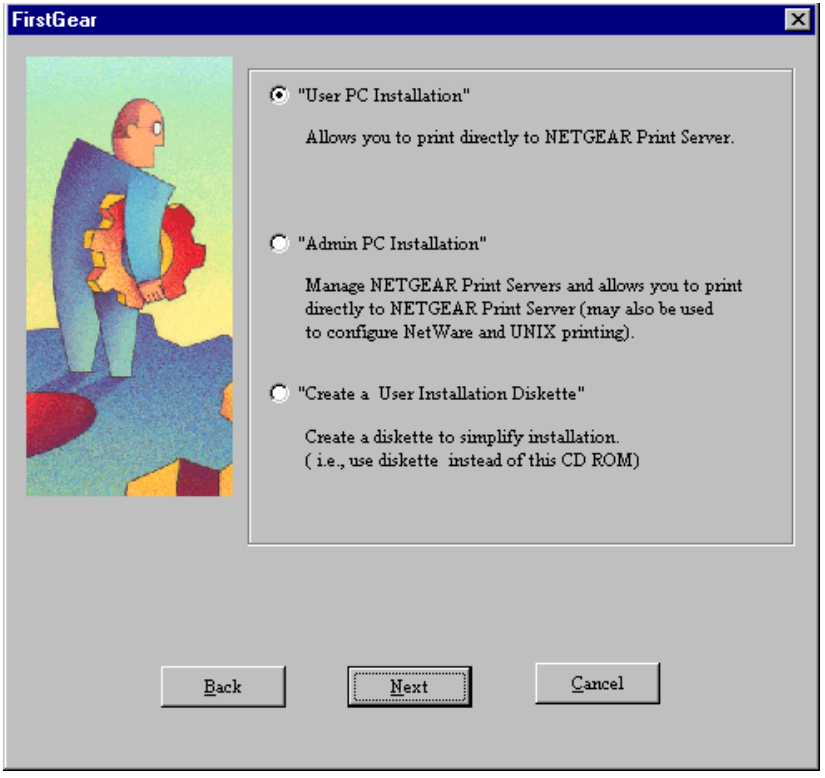


Figure 4-2. User PC Installation Option Window

4. Choose "User PC Installation" and click on Next.

The NETGEAR Print Server Software Installation window, as illustrated in Figure 4-3, opens.

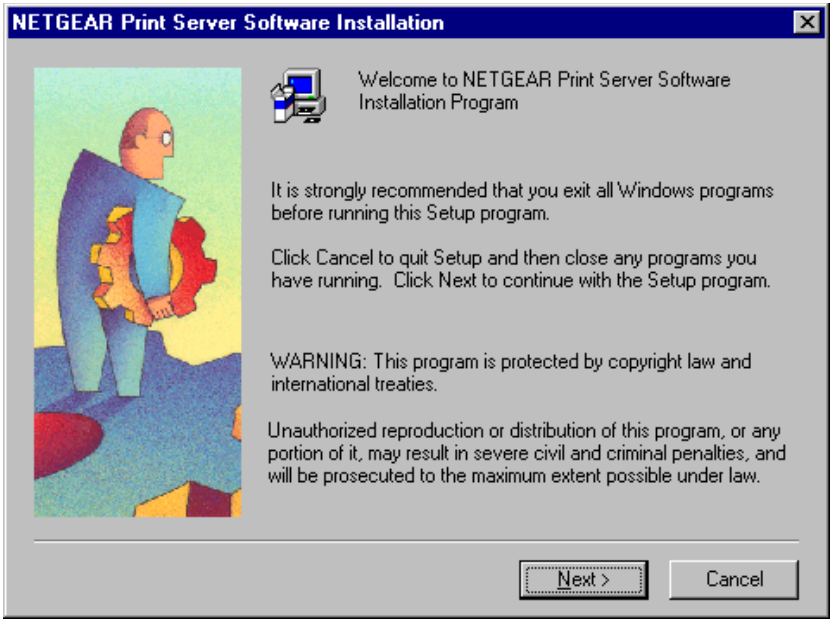


Figure 4-3. NETGEAR Print Server Software Installation Window

5. Click on Next.

The Choose Destination Location window, as illustrated in Figure 4-4, opens.

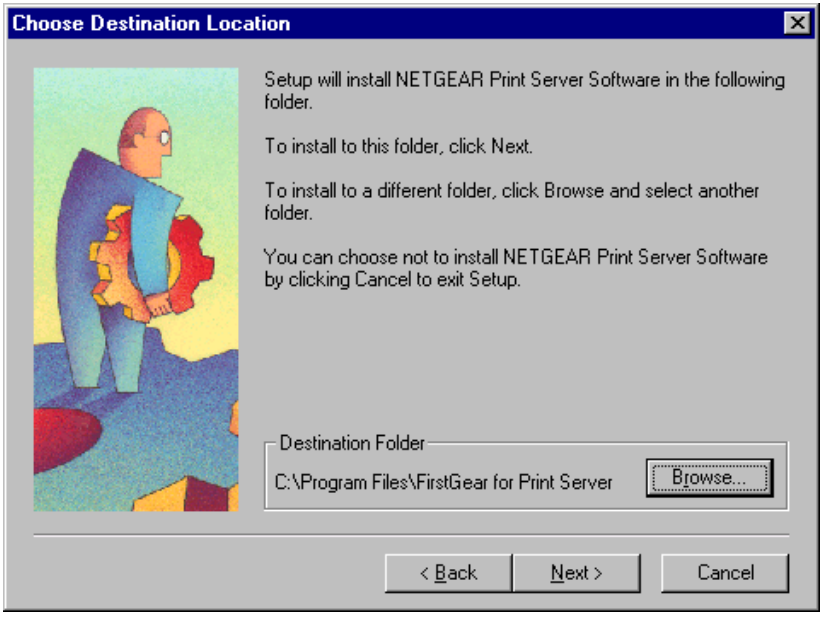


Figure 4-4. Choose Destination Location Window

6. **Click on Next to install the NETGEAR Print Server program in the Program Files folder. If you want to have the program placed elsewhere, click on Browse to find an alternate location for the software.**

   The Select Program Folder window, as illustrated in Figure 4-5, opens.

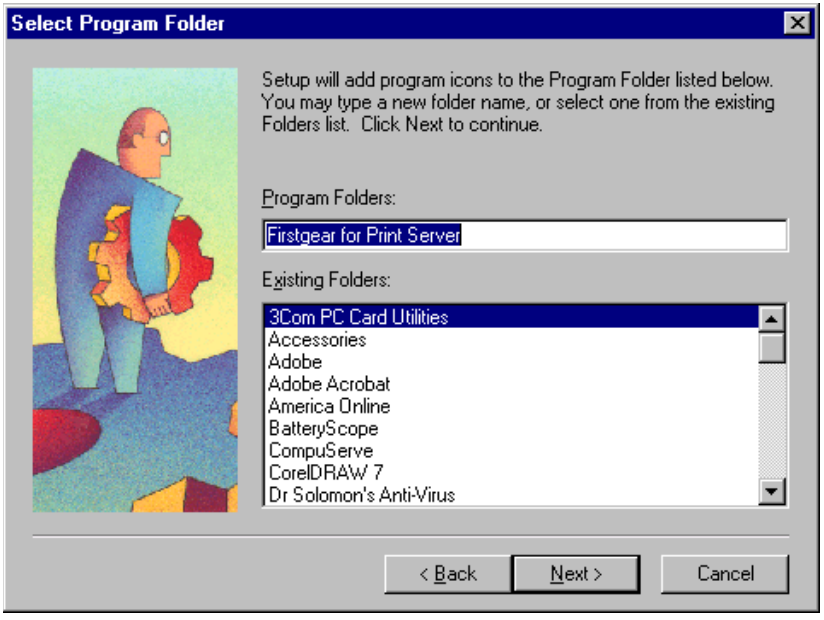


Figure 4-5. Select Program Folder Window

7. **Type Firstgear for Print Server in the Program Folders entry field (default), or select a folder from the Existing Folders list.**

   Or

   You can also type in a unique name for the print server folder. Verify that the information on the screen is correct.

8. Click on Next.

The Setup Complete window, as illustrated in Figure 4-6, opens.

Figure 4-6. Setup Complete Window

9. Click on Finish.

The FirstGear Print Server Program is now installed on your PC. You must now set up your PC to recognize the print server.

Setting Up Your PC to Recognize the Print Server

You must set up each PC that will print to the print server. Before proceeding, verify that:

- The print cable is connected to the printer port.
- The AC adapter is plugged into the wall socket.
- The Ethernet cable is plugged into the LAN.

To set up each PC:

1. **Double-click on the desktop icon, as illustrated in Figure 4-7, that you named in step 7 of the previous section, "Installing and Setting Up FirstGear—User Installation."**

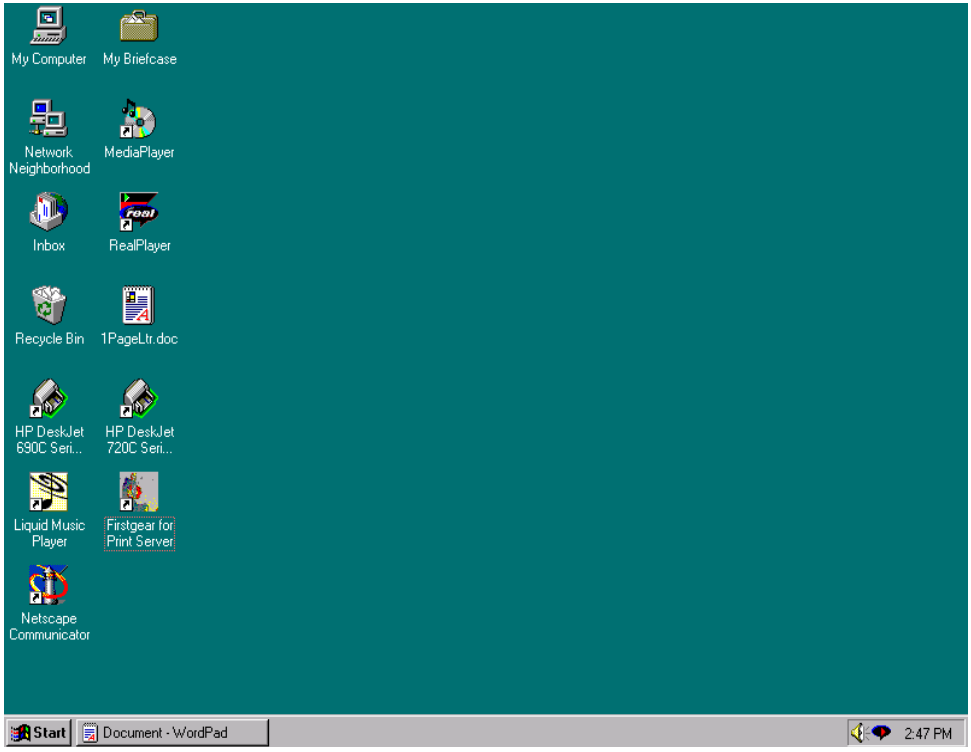


Figure 4-7. Firstgear for Print Server Icon

The Firstgear for Print Server window, as illustrated in Figure 4-8, opens.

Figure 4-8. Firstgear for Print Server Setup Icon

2. **Click on Setup.**

   The Setup window, as illustrated in Figure 4-9, opens.

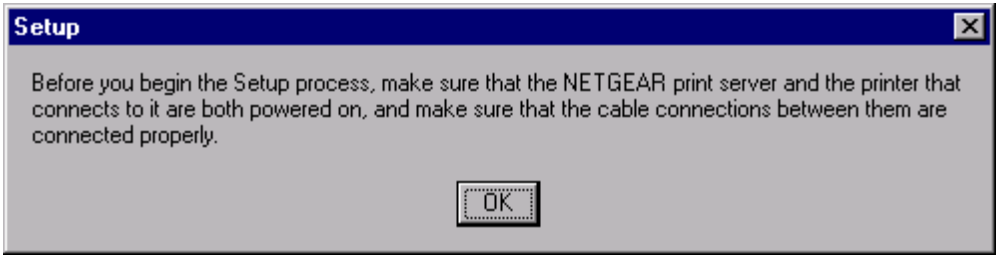


Figure 4-9. Setup Window

3. **Make sure the NETGEAR print server and the printer that connects to it are both powered on.**
4. **Make sure the cable connections between them are properly connected.**

5. **Click on OK.**

   The Printer Select window, as illustrated in Figure 4-10, opens.

   The Printer Select window will stay in the background while you work through subsequent setup windows because you will use this window to complete the setup process.

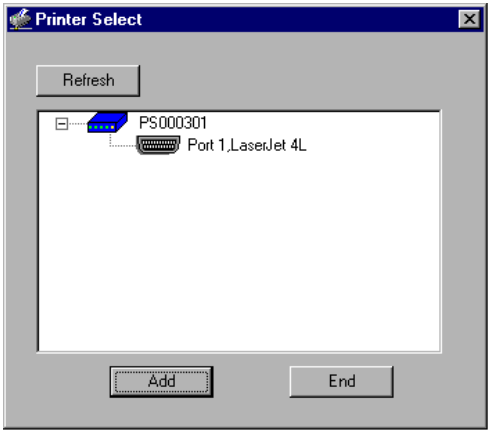


Figure 4-10. Printer Select Window (Add Port)

Note: If the cables are not properly connected, your PC screen will appear empty when the Printer Select window opens. If so, check the cable connections and click on the Refresh button, which will initiate the PC to browse again for a port.

6. **Click on the printer port you want to use with the print server and click on Add.**

   The ADDPORT window for Epson printer connection, as illustrated in Figure 4-11, opens.

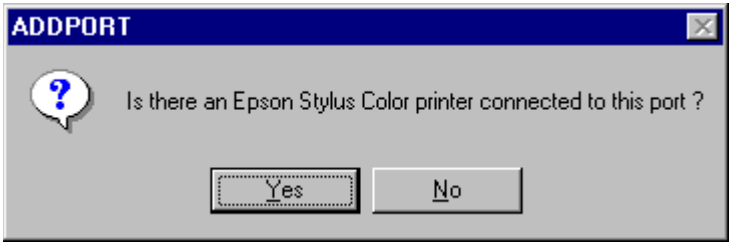


Figure 4-11. ADDPORT Window (Epson Connection)

7. **Click on Yes if you have an Epson Stylus Color printer attached to the port, otherwise Click on No.**

   The ADDPORT window, as illustrated in Figure 4-12, opens. This window informs you that you have successfully added the port.

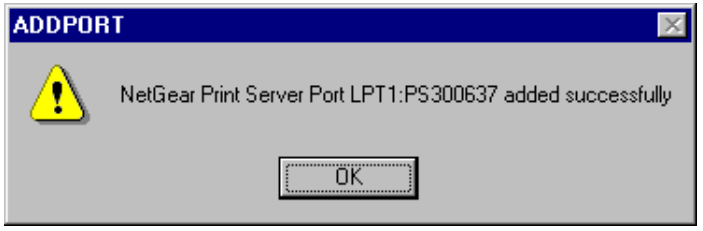


Figure 4-12. Add Port Window (Added port successfully)

8. **Click on OK.**

   The Add Printer Wizard, as illustrated in Figure 4-13, opens.

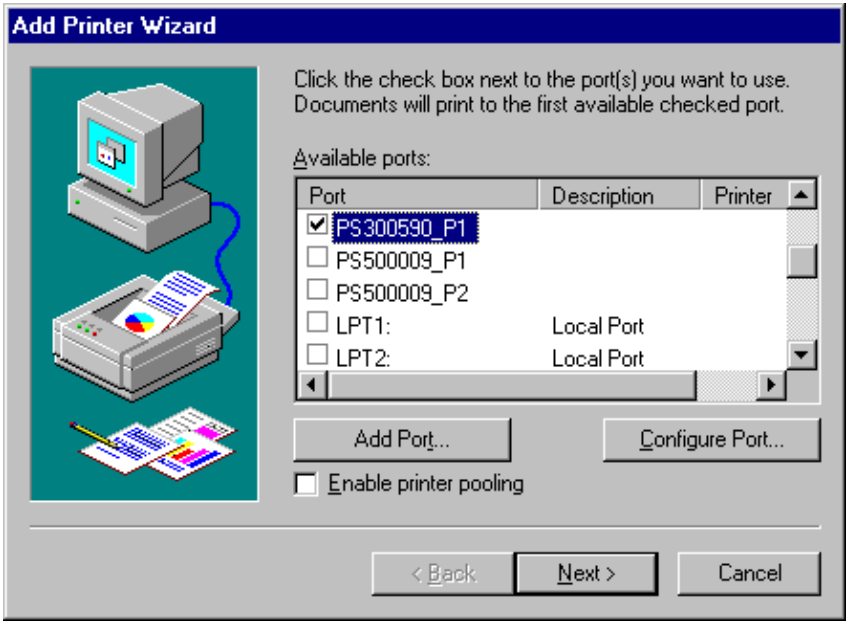


Figure 4-13. Add Printer Wizard Window (Add Ports)

9. **Select the port you added in the previous step. Do *not* click on Add Port.**
10. **Click on Next.**

    The Add Printer Wizard window, as illustrated in Figure 4-14, opens.

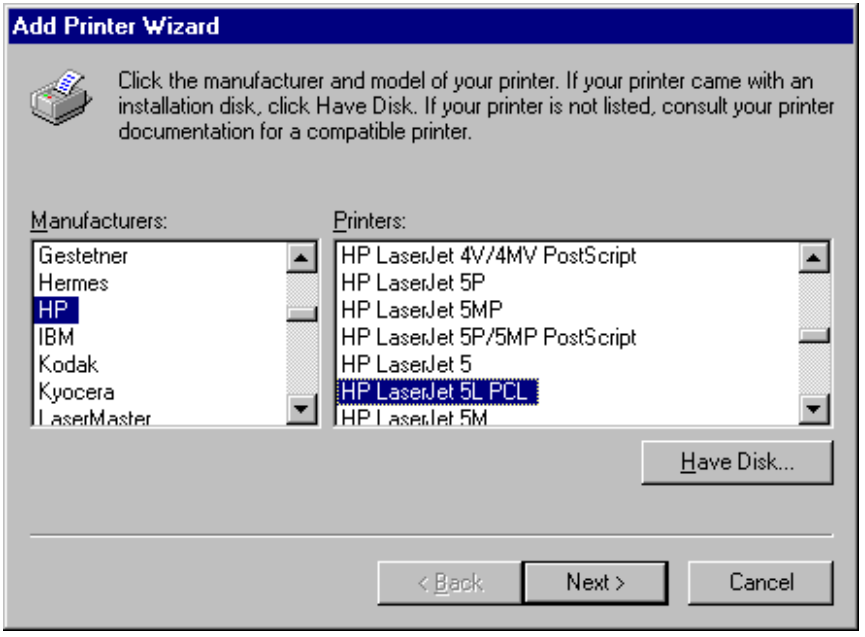


Figure 4-14. Add Printer Wizard Window (Manufacturer and Model of Printer)

11. Click on Next after clicking on the names of the manufacturer and printer model you are adding in the Add Printer Wizard window.

If your printer is not listed, click on Have Disk and insert the driver disk that you received from the printer manufacturer. Install the driver, proceeding as instructed.

The Add Printer Wizard window, as illustrated in Figure 4-15, opens.

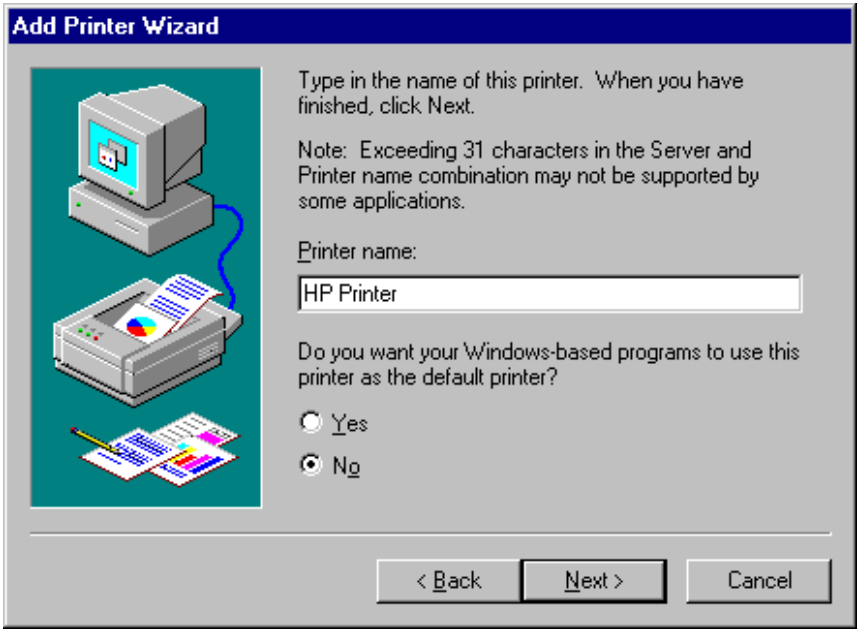


Figure 4-15. Add Printer Wizard Window (Printer Name)

12. Type a name for the printer (if you want it to have a unique name) and decide if you want this printer to be your default printer; then click on Next.

Another Add Printer Wizard screen, as illustrated in Figure 4-16, opens. With this screen, you can choose to either share or not share the print server with other users in the network. If you do want to share the print server, you must click on all of the operating systems that will be sharing the print server.

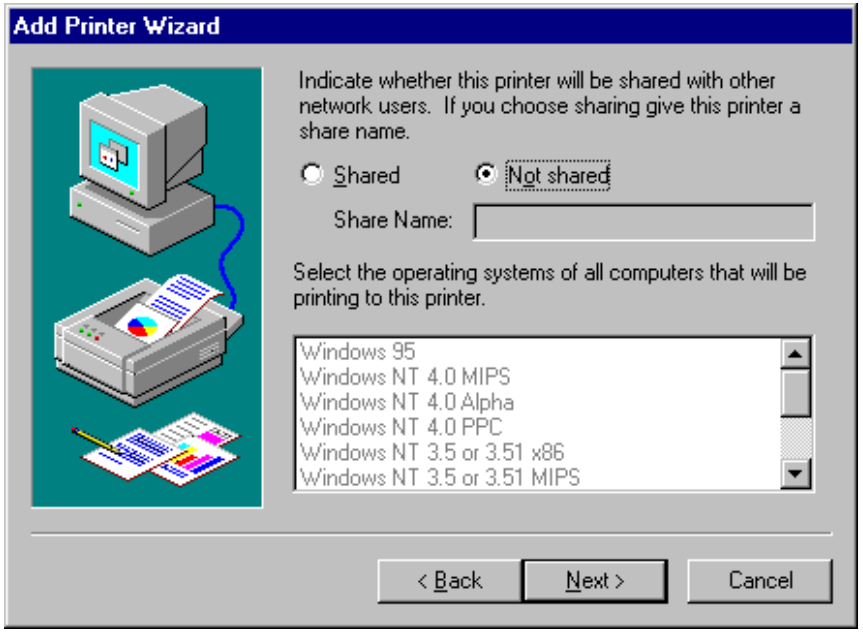


Figure 4-16. Add Printer Wizard Window (Sharing Ports Screen)

13. Click on Next.

Another Add Printer Wizard window, as illustrated in Figure 4-17, opens.

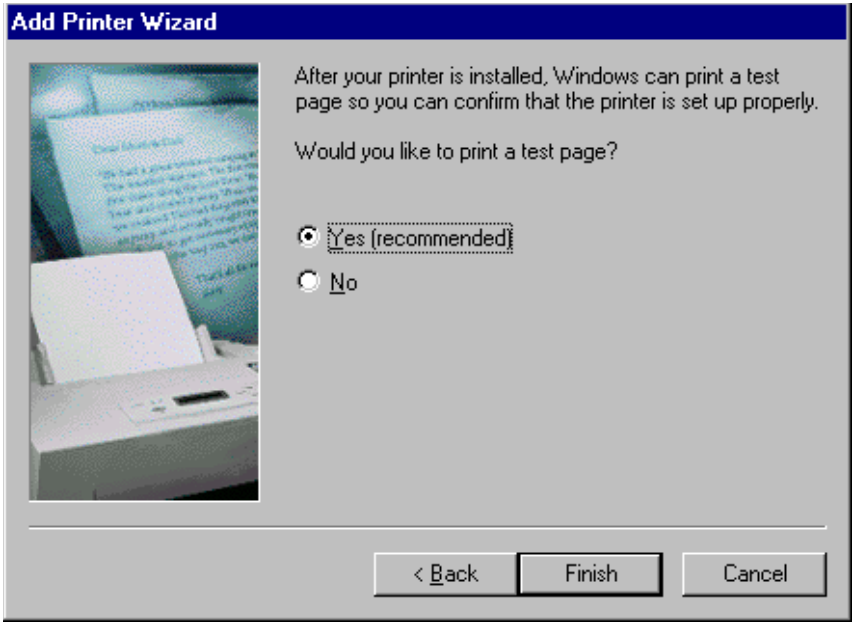


Figure 4-17. Add Printer Wizard Window (Print Test Page)

14. Click on Finish.

The Add Printer Wizard window closes and the Printer Select window, as illustrated in Figure 4-18, comes back into view.

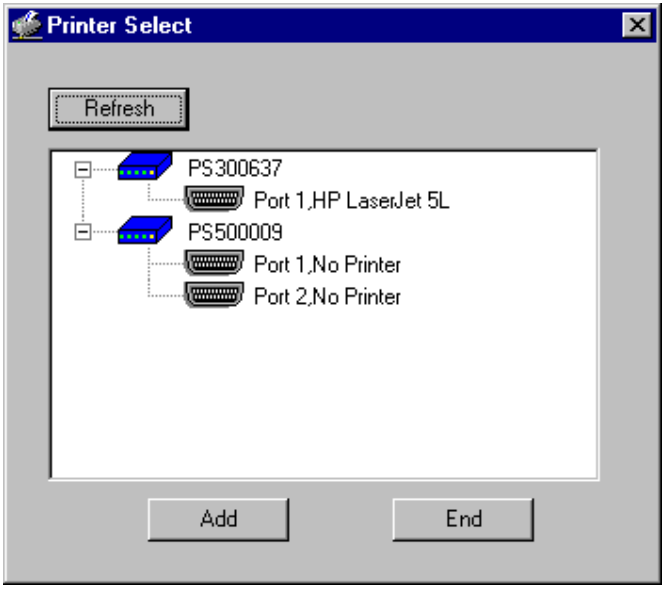


Figure 4-18. Printer Select Window (End Setup)

15. Click on End.

You are now ready to use the printer attached to your print server.

Installing and Setting Up FirstGear—Admin Installation

Choose this option to install, print, and manage the NETGEAR print server.

Note: It is necessary to install the FirstGear software on every PC in the network that will use the printers attached to the Model PS104/PS105/PS110/PS113 print server.

1. **Turn on the power to your PC.**
2. **Insert the NETGEAR Resource CD-ROM.**

   The NETGEAR window briefly opens, and the Firstgear Introductory window, as illustrated in Figure 4-19, opens.

   If it does not, click on Start > Run and then type in “Install.exe” at the prompt (for example, “D:Install.exe”) to start the installation process.

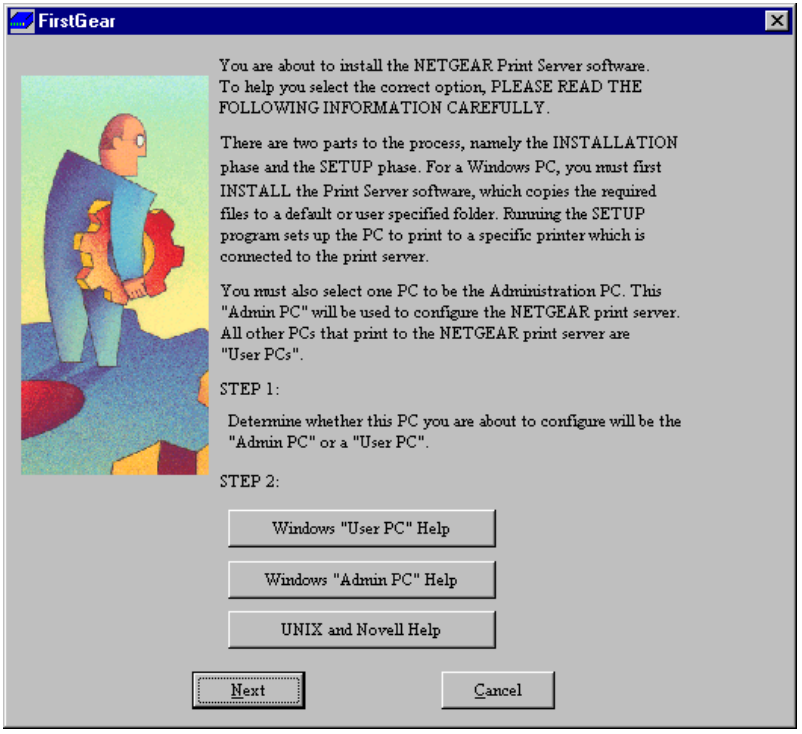


Figure 4-19. FirstGear Introductory Window

3. Click on Next.

Another FirstGear window, as illustrated in Figure 4-20, opens.

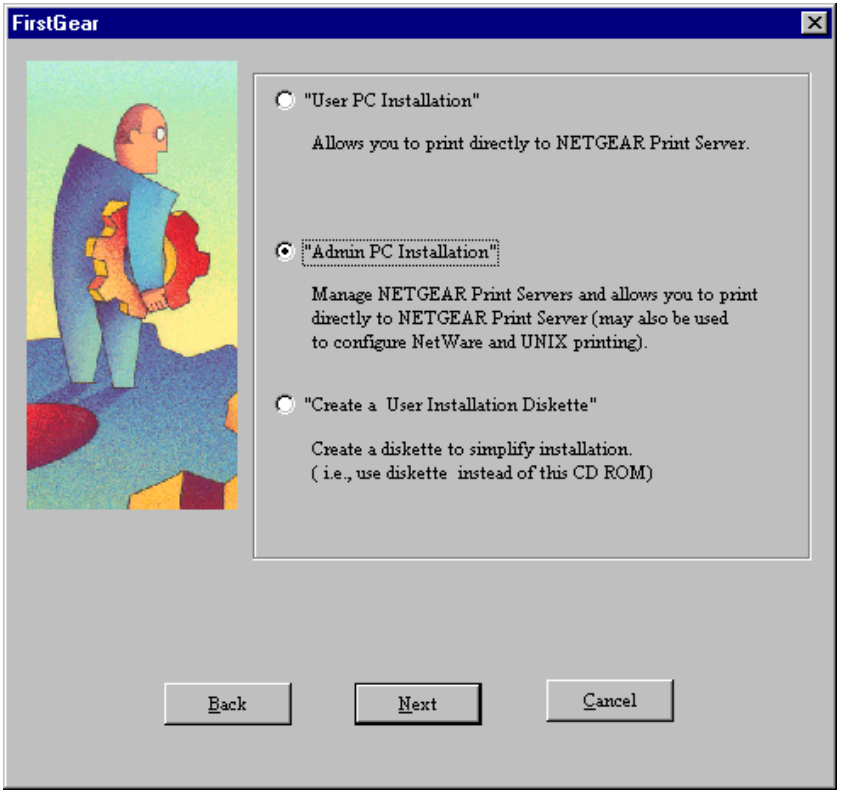


Figure 4-20. Admin Installation Option Window

4. Select "Admin PC Installation" and click on Next.

The NETGEAR Print Server Software Installation window, as illustrated in Figure 4-21, opens.

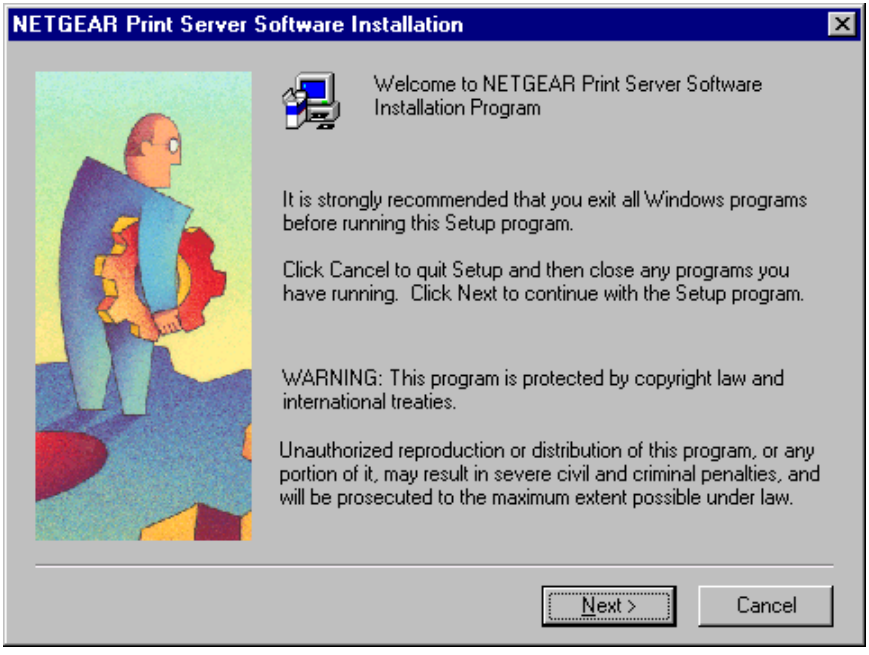


Figure 4-21. NETGEAR Print Server Software Installation Window

5. Click on Next.

The Choose Destination Location window, as illustrated in Figure 4-22, opens.

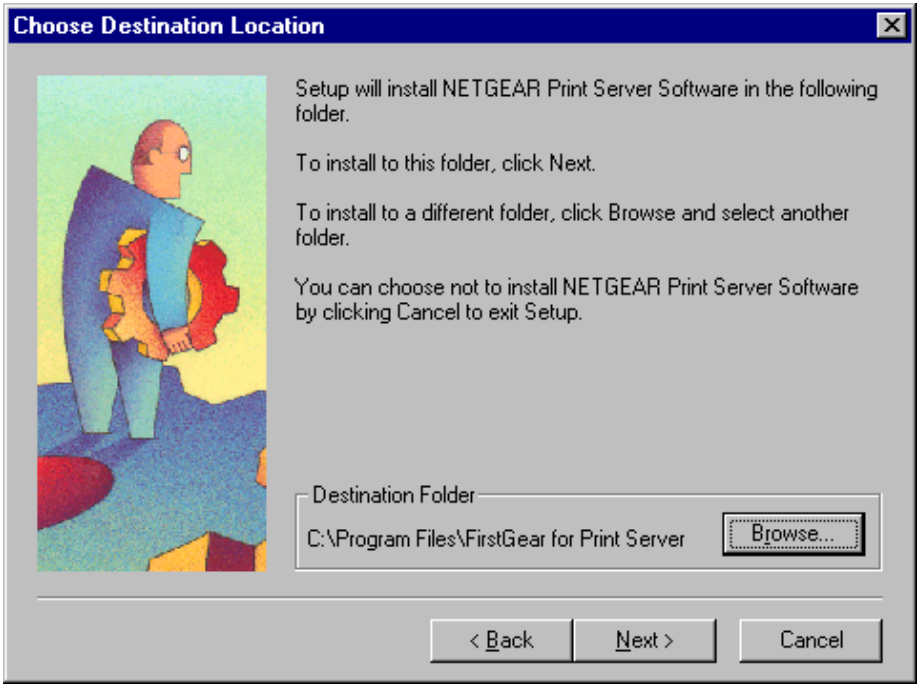


Figure 4-22. Choose Destination Location Window

6. **Click on Next to install the NETGEAR Print Server program in the Program Files folder. If you want to have the program placed elsewhere, click on Browse to find an alternate location for the software.**

   The Select Program Folder, as illustrated in Figure 4-23, opens.

.

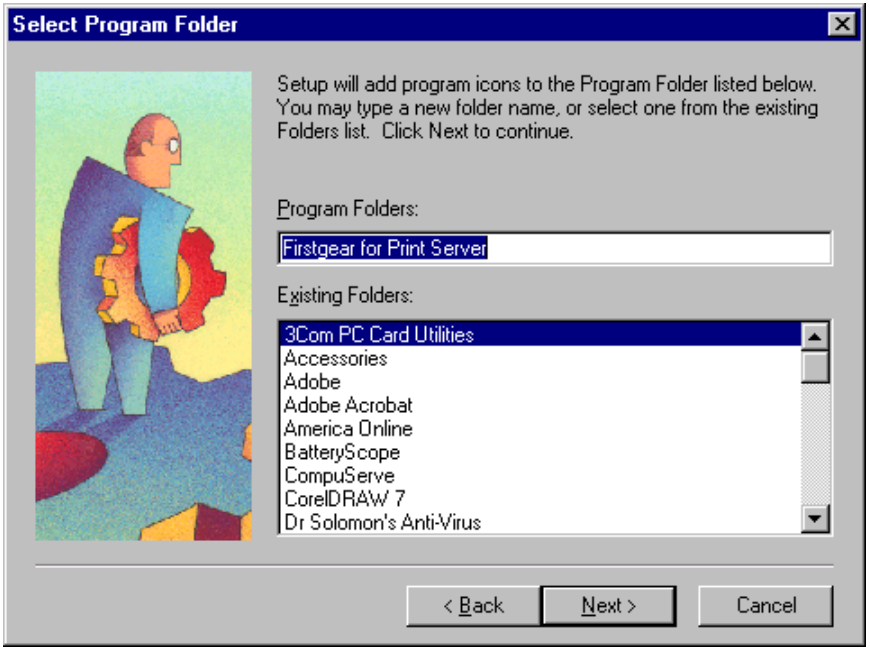


Figure 4-23. Select Program Folder Window

7. **Type Firstgear for Print Server in the Program Folders entry field (default) or select a folder from the Existing Folders list.**

   Or

   You can type in a unique name you have chosen for the program folder at the “Program Folders” prompt or click on a selection in the Existing Folders field to title the folder with another name. The name automatically displays in the Program Folders entry field.

8. **Click on Next.**

   The Information window opens. This window displays the folder where the FirstGear software is saved, the space required for the software, and the space remaining on your hard drive.

9. **Click on Next.**

   The software will be copied to the program folder you requested in step 7.

   A window opens, asking you if you want to install Adobe Acrobat (a software program that will allow you to view the manual on line).

10. **Click on Yes if you want Adobe Acrobat to be installed. If you already have Adobe Acrobat installed in your PC, clicking on Yes will override the version you currently have installed.**

    Skip to step 12 if you do not want to install Adobe Acrobat.

11. **Click on Next when the Adobe Acrobat Setup window opens.**

    Follow the screen prompts to install Adobe Acrobat.

    The Setup Complete window, as illustrated in Figure 4-24, opens.

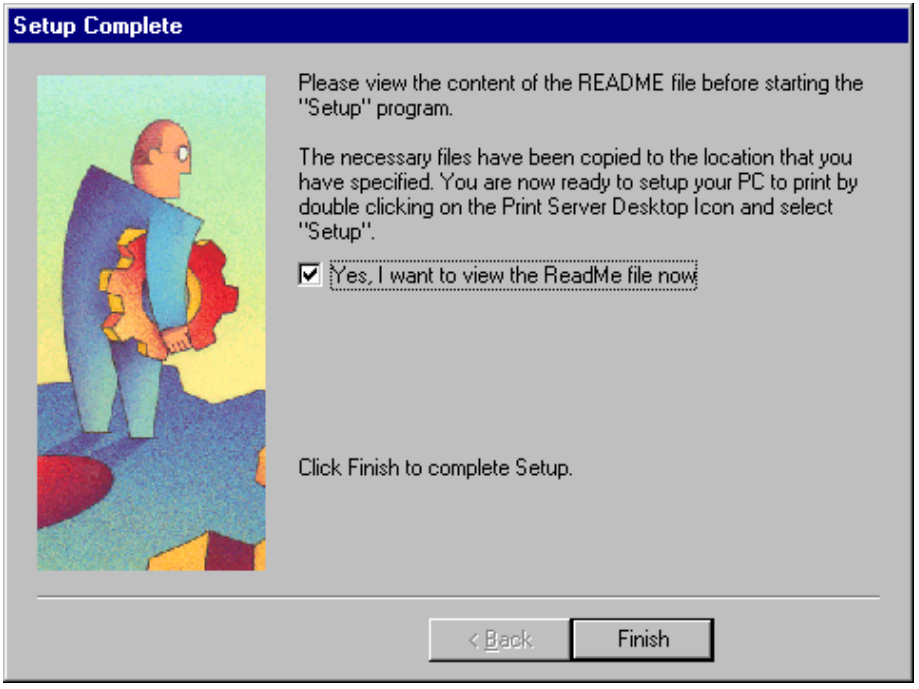


Figure 4-24. Setup Complete Window

12. **Click on Finish.**

    The FirstGear Print Server Program is now installed on your PC.

    You must now set up your PC to print to the print server. Proceed to "Setting Up Your PC to Recognize the Print Server" on page 4-8.

Setting Up Your PC to Recognize the Print Server

Refer to page 4-8 for instructions on setting up your PC to recognize the print server.

Installing and Setting Up FirstGear—Diskette Option

Use this option if your system does not have a CD-ROM drive.

To install the FirstGear software:

1. **Insert a blank diskette into the Drive A, and click on OK, as illustrated in Figure 4-25.**

   The diskette installation will not work in any other drive but drive A, and you must also use a high-density disk.

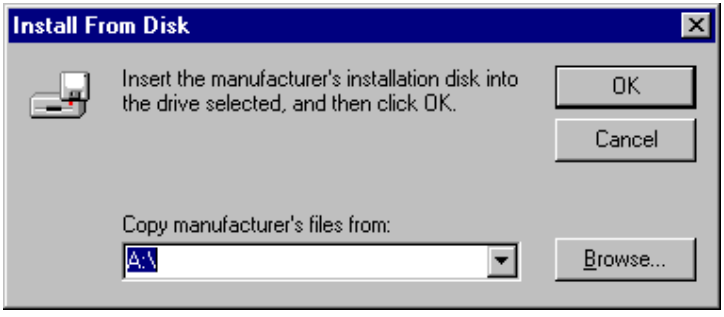


Figure 4-25. Install From Disk Window

2. Refer to "Installing and Setting Up FirstGear—User Installation" on page 4-2 to continue with the installation and setup process.

For information about the advanced setup procedures for the NETGEAR print server, refer to Chapter 7, "Using Advanced Management Tools."

Setting up the Print Server Using NetBEUI and TCP/IP

Configuring the Print Server Using NetBEUI

No additional print server configuration is necessary after you have followed the steps outlined in "Setting Up Your PC to Recognize the Print Server" starting on page 4-8.

Configuring the Print Server Using TCP/IP

To configure the print server using TCP/IP:

1. **Double-click on the Firstgear for Print Server icon, as illustrated in Figure 4-26, on your desktop.**

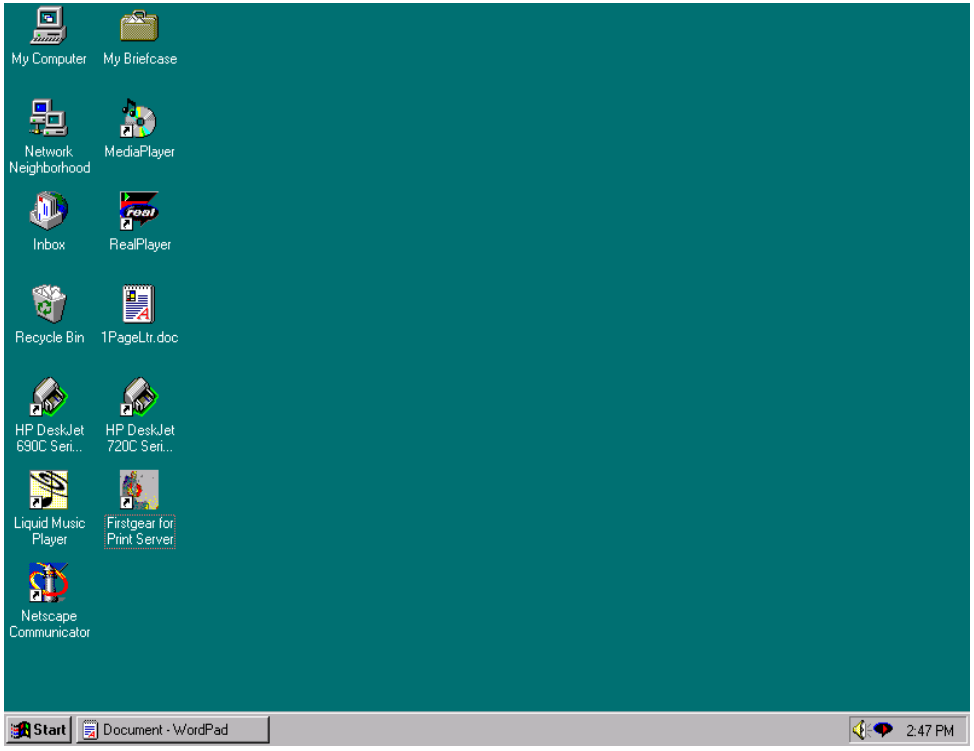


Figure 4-26. Firstgear for Print Server Icon

The Firstgear for Print Server window, as illustrated in Figure 4-27, opens.

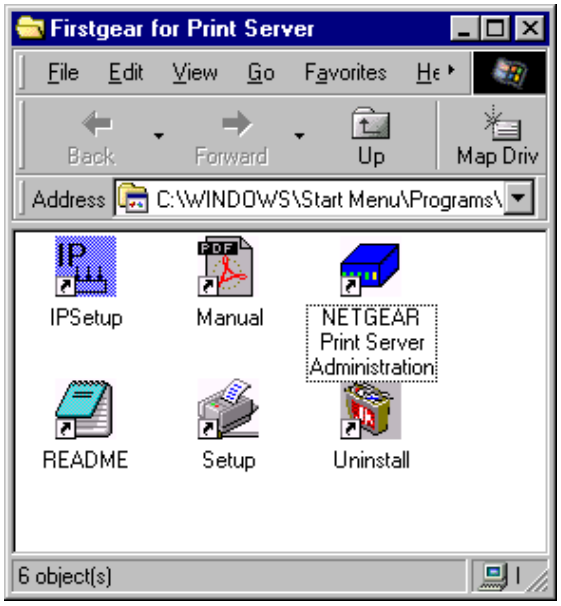


Figure 4-27. Firstgear for Print Server Window

2. **Double-click on the NETGEAR Print Server Administration icon.**

   The NETGEAR Print Server Administration Program window, as illustrated in Figure 4-28, opens.

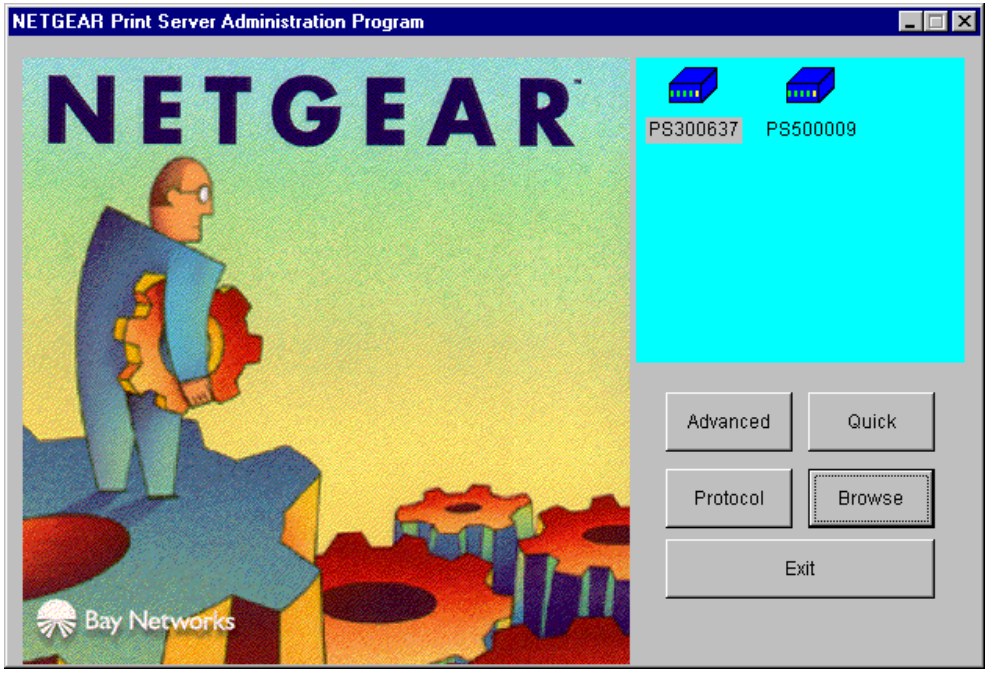


Figure 4-28. NETGEAR Print Server Administration Program Window

3. **Click on the Advanced button, as illustrated in Figure 4-28.**

   The TCP/IP menu opens, as illustrated in Figure 4-29.

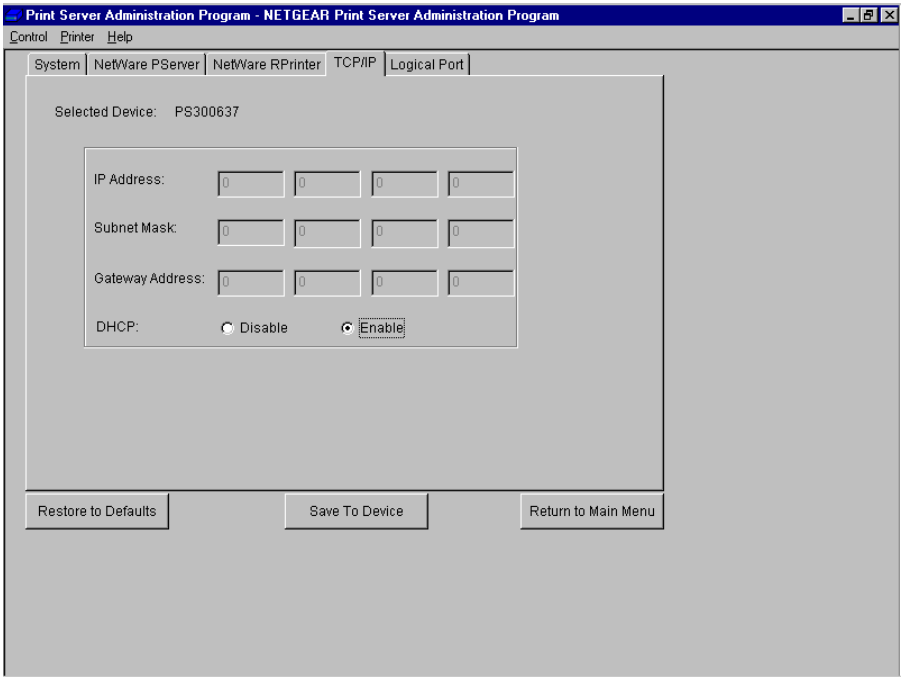


Figure 4-29. TCP/IP Menu

4. **Click on the TCP/IP menu tab, which is located at the top of the window, as illustrated in Figure 4-29.**

   Refer to Table 4-1 on page page 4-28 for a description of each field in the TCP/IP menu.

5. **Select Enable or Disable to enable or disable DHCP.**

   If DHCP is enabled, the print server can be set up to obtain its IP address from a DHCP (Dynamic Host Configuration Protocol) server or can be manually assigned an IP address at this menu tab.

   If DHCP is disabled, be sure that the IP address assigned to the device is not already in use when assigning the IP address manually.

   For a private TCP/IP network, you can use the IETP-designated private addresses (for example, 192.168.X.X or 10.X.X.X). For more information about IP addresses, refer to Appendix B, "Understanding IP Addresses."

6. **Type the subnet mask and gateway address (if DHCP is disabled) or proceed to step 7.**
7. **Click on the Save To Device button to download the new print server configuration.**
8. **Click on Return to Main Menu to exit the Advanced Configuration window.**
9. **Click on Exit on the main menu, and proceed to the next section, "Setting Up Spooled LPR Printing with Windows NT 3.51.**

Table 4-1. Fields and Descriptions for TCP/IP Configuration

Field	Description
DHCP	This option allows you to enable or disable the print server's ability to get its IP address from a DHCP (Dynamic Host Configuration Protocol) server. When disabled, you can provide a fixed IP address in the IP address, Gateway address, and Subnet Mask fields (listed in this table).
IP Address	This IP address is assigned to the print server. If you have a private LAN and do not plan to connect to the TCP/IP-based Internet, NETGEAR recommends that you use an address from the IETP-designated private addresses (for example, 192.168.x.x or 10.x.x.x).
Gateway Address	This IP address is what the print server uses for stations with IP addresses not reachable on your local LAN.
Subnet Mask	This subnet mask defines the range of addresses that are reachable on your local LAN.

Your print server is now set up to use the TCP/IP protocol for networking. If you enable DHCP, you must prepare the DHCP server to receive a DHCP query from the print server. Then reset the print server so it can then obtain an IP address from the DHCP server.

If you run into any difficulty with the static IP Setup, there is the possibility that you inadvertently disabled the DHCP protocol and/or assigned a wrong subnet IP address. Proceed to Appendix E, "IP Setup," for more information to help you force a static IP address to the print server.

Setting Up Spooled LPR Printing with Windows NT 3.51

Before starting the PC configuration, you must configure the print server for using TCP/IP as described in "Configuring the Print Server Using TCP/IP" on page 4-24.

To prepare for spooled LPR printing:

1. **Click on the Network icon in the Control Panel.**

   The Network Settings dialog box opens.

2. **Click on the Add Software button.**

   The Network Software dialog box opens.

3. **Select TCP/IP Protocol And Related Components in the Network Software dialog box, and then click on Continue.**

   The Windows NT TCP/IP Installation Options dialog box opens.

4. **Click on the TCP/IP Network Printing Support option.**

5. **Click on OK.**

   Windows NT Setup displays a message asking for the full path to the Windows NT distribution files.

6. **Type the appropriate location, and then click on Continue.**

   All necessary files are copied to your hard disk.

   If you did not check the Enable Automatic DHCP Configuration option in the Windows NT TCP/IP Installation Options dialog box, you must complete all the required TCP/IP configuration procedures manually. After you finish configuring TCP/IP, the Network Settings dialog box opens. For more information about IP addresses, refer to Appendix B, "Understanding IP Addresses."

7. **Click on Close, and then restart your computer so the changes take effect.**

To add a spooled LPR printer in the NT station:

1. **Choose Create Printer from the Printer menu in Print Manager to open the dialog box.**
2. **Type data in the entry fields of the dialog box, using the definitions in Table 4-2.**

Table 4-2. Add a Spooled LPR Printer Fields

Field	Description
Printer Name	Type a name (up to 32 characters). This name appears in the title bar of the printer window.
Driver	Click on the appropriate driver for the attached printer.
Description	Type a printer description for other network users to reference.

3. **Click on Other in the Print To entry field.**

   The Print Destinations dialog box opens.

4. **Click on LPR Port in the Available Print Monitor list, and then click on OK.**

   The Add LPR Compatible Printer window opens.

5. **Type data in the entry fields of the Add LPR Compatible Printer window, using the definitions in Table 4-3.**

Table 4-3. Add LPR Compatible Printer Fields

Field	Description
Name or Address of Host Providing LPD	Enter the IP address of your print server.
Name of Printer On That Machine	Enter the appropriate logical printer number (for example, L1). Use only logical printers when implementing the LPR printer port in the Windows NT system. If you are using the Model PS104 and Model PS105, L1 and L2 logical ports are mapped into physical port P1. If you are using the Model PS110 Print Server, the factory default L1 and L2 logical ports are mapped into physical ports P1 and P2, respectively. If you are using the Model PS113 Print Server, the factory default L1, L2, and L3 logical ports are mapped into physical ports P1, P2, and P3, respectively.

6. **Click on the Share This Printer on the Network option, when the Create Printer dialog box reopens.**

   In the Share Name box, Printer Manager creates an MS-DOS compatible resource name, which you can change. In the Location box, you can enter information about the printer location. Network users see this information when browsing to find this printer.

7. **Complete any other configuration information in the Create Printer dialog box.**

Setting Up Spooled LPR Printing with Windows NT 4.0

Before starting the PC configuration, you must configure the print server for using TCP/IP as described in "Configuring the Print Server Using TCP/IP" on page 4-24.

To prepare for spooled LPR printing:

1. **Click on Start from the Windows NT desktop, select Settings, and then select Control Panel.**
2. **Double-click on Network.**

3. **Click on the Service option and make sure that Simple TCP/IP Service and Microsoft TCP/IP Printing are enabled.**

   If they are not enabled, select the Add option and enable them.

4. **Reboot the computer for the changes to take effect, if you added services in step 3.**

To add a spooled LPR printer:

1. **Click on Start from the Windows NT desktop, select Settings, and then select Printers.**
2. **Double-click on Add Printer to start the Add Printer Wizard.**
3. **Click on My Computer, and then click on Next when prompted with "This printer will be managed by."**
4. **Click on Add Port, click on LPR Port, and then click on New Port.**
5. **Type the IP address of the print server in the Name of Address of the server providing the LPR dialog box.**
6. **Use the information provided in Table 4-2 to type the appropriate logical printer number (L1..L3 or L1..L8, depending on the model) as previously configured on the print server in the Name of printer or print queue field on the Create Printer dialog box.**

   Use only the logical printer when implementing the LPR printer port on the Windows NT system. If you are using the Model PS104 or PS105 Print Server, all three logical ports are mapped to the same PRINTER port. If you are using the Model PS110 Print Server, the factory default is L1 = P1 and L2 = P2. If you are using the Model PS113 Print Server, the factory default is L1 = P1, L2 = P2, and L3 = P3.

7. **Click on OK.**
8. **Click on Close when the Printer Ports window reopens, and then install your printer driver as usual.**
9. **Click on Sharing when prompted to indicate whether or not the printer will be shared.**
10. **Type the shared printer name in the Shared dialog box.**

    This shared name is how other PCs will see this printer on the network.

With this procedure, other windows-based PCs can browse the network to see the print spooler on the Windows NT PC and print to it. The configuration procedure for each PC is the same as described in "Setting Up Spooled LPR Printing with Windows NT 3.51" on page 4-28.

Chapter 5
Novell NetWare Printing

This chapter describes how to configure and use the NETGEAR Model PS104 Print Server, Model PS105 Print Server, Model PS110 Print Server, and Model PS113 Print Server in the Novell NetWare environment.

Configuration Overview

This section describes the requirements and outlines the PSERVER or RPRINTER mode configuration in either a NetWare Bindery or a NetWare Directory Services (NDS) network environment.

To configure your print server for the Novell NetWare environment, you must have:

- NetWare Version 3.1x, NetWare Version 4.x, or NetWare Version 5.x
- NetWare PCONSOLE V1.21 or higher installed in your network file server
- NetWare Print Server V1.22 or higher (for remote printer mode only)
- DOS 3.3 or higher installed on all of the workstations in your network
- Network installation completed

The following two operating modes are possible in bindery (NetWare 3.x), NDS network environment (NetWare 4.x), or NDPS (NetWare 5.x):

- PSERVER mode

  PSERVER mode is faster and uses fewer resources than RPRINTER mode but occupies a user login slot. The NETGEAR print server emulates a NetWare PSERVER.

  When activated, the device:

  – Logs in to specified NetWare file server(s)

  – Polls the specified print queues

    If there are print jobs in the print queue, the print server retrieves them from the print queue.

  – Sends the received network packet data to the printer

- RPRINTER mode

  RPRINTER mode does not use a login slot. NETGEAR recommends that PSERVER mode be used if possible. The print server emulates a NetWare Remote Printer.

  When activated, the device:

  – Connects to NetWare PSERVER

  – Receives the print jobs sent by PSERVER

  – Sends the received network packet data to the printer

It is a two-step process to set up the Model PS104/PS105/PS110/PS113 print server in the NetWare environment. The NetWare file server must first be configured, and then you can configure your print server.

Configuring the NetWare File Server

NetWare server configuration can be executed through the DOS-based PCONSOLE (NetWare 3.x and NetWare 4.x), NWADMIN (NetWare 4.x), or NWADMN32 (NetWare 5.x) based on Windows. All of these programs are provided as part of NetWare. Refer to the following sections for configuring the file server using PCONSOLE. For information about NWADMIN, refer to the NetWare user's manual.

The following sections describe how to determine a device name for your print server and set up the following three printing components on a Novell NetWare server:

- Print queue
- Print server
- Print

Configuring Your Print Server

There are two methods for configuring the print server in a NetWare environment: the FirstGear Administration Program based on Windows, or the PSCONFIG program based on MS-DOS. Both programs are on the *Model PS104/PS105/PS110/PS113 Print Server Resource CD* that comes with your print server.

Additionally, you can also run the QUICKSET configuration program to configure the print server and the current Novell server in a single operation.

This chapter provides step-by-step instructions to set up the file server and the print server using PCONSOLE and PSCONFIG programs. For detailed descriptions on the various options of PSCONFIG, the FirstGear Administration Program, and QUICKSET, refer to Chapter 7, "Using Advanced Management Tools."

Determining a Device Name for Your Print Server

The Model PS104/PS105/PS110/PS113 print server is capable of servicing multiple protocols simultaneously. However, you must always use the same name for the print server when you are using more than one protocol. When the print server name is changed, the print operations in all protocols are affected; therefore, it is important that you decide on a permanent print server name before setting up the device. Also make sure that you decide on and assign a different name for each of the print servers on the network.

Using Your Print Server in a NetWare 3.x Network

When configuring using the PSCONFIG utility, copy all files in \DOS directory on the *Model PS104/PS105/PS110/PS113 Print Server Resource CD* to the hard disk of your workstation. The PSCONFIG program is in this directory.

Setting PSERVER Mode in NetWare 3.x (Bindery Mode)

To set up the NetWare file server to connect to the Model PS104/PS105/PS110/PS113 print server in the NetWare PSERVER mode, first designate a NetWare file server that your print server will log on to retrieve print jobs. Log on to the file server as SUPERVISOR or as a user with SUPERVISOR privileges. The print server can be configured to service multiple NetWare Bindery file servers as described in "Using Advanced Functions" on page 5-20. However, one of the NetWare file servers has to be designated as the master file server, and this file server is the one that must be configured and logged on to.

To set up the NetWare file server:

1. **Execute the PCONSOLE program from the system volume of the file server.**
2. **Create queues.**

   To create queues:

   a. **Select Print Queue Information in the Available Options window.**

   b. **Press the [Ins] key to add a new queue.**

   c. **Type in a queue name and press [Enter].**

   d. **Repeat steps b and c until you have the number of queues you want.**

   e. **Press [Esc] to return to the PCONSOLE Main Menu.**
3. **Add the print server.**

   To inform the NetWare file server that a print server exists:

   a. **Select Print Server Information from the PCONSOLE Main Menu.**

   b. **Press [Ins] to add a new print server.**

   c. **Type the print server name.**

      The factory default name for the print server is PSxxxxxx (shown on the label on the bottom of the device).
4. **Assign printers.**

   To associate a NetWare printer object with each printer port of the print server:

   a. **Select the print server you added in step 3.**

   b. **Select Print Server Configuration.**

   c. **Select Printer Configuration.**

d. Select the printer number on the Configured Printers submenu, using the printer number mapping as shown in Table 5-1.

For more information about logical ports, refer to "Using Logical Ports" on page 5-22.

Table 5-1. PSERVER Mode Printer Number Mapping

Print Server Port	File Server Printer Number
Printer port 1	Printer number 0
Printer port 2	Printer number 1
Logical port 1	Printer number 8
Logical port 2	Printer number 9
Logical port 3	Printer number 10
Logical port 4	Printer number 11
Logical port 5	Printer number 12
Logical port 6	Printer number 13
Logical port 7	Printer number 14
Logical port 8	Printer number 15

e. Enter the print server name in the Name entry field.

Leave the Type entry field with the default value of Defined elsewhere.

f. Press [Esc].

g. Select Yes to save the changes.

h. Repeat steps d, e, and f for each printer port on the print server.

i. Press [Esc] to return to the Print Server Configuration menu.

5. Associate printers with print queues.

To associate print queues with the printer(s) attached to your print server:

a. Select Queues Serviced by Printer from the Print Server Configuration menu.

b. Select a printer you want to assign a print queue to.

c. Press [Ins] when the File Server Queue Priority window opens.

d. Select the print queue that you want the printer to service.

e. Press [Enter] to accept the default priority level.

f. Press [Esc] to return to the Defined Printers window.

g. Repeat steps b through f until all printer and queue associations are configured completely.

h. Press [Esc] until you exit out of the PCONSOLE program.

6. Configure your print server.

To configure your print server:

a. Execute PSCONFIG while logged on to the file server.

This program was previously copied from the print server resource CD into your hard disk.

b. Select the print server that you want to configure.

c. Select Change Configuration.

d. Select NetWare Configuration.

e. Verify that PS is the Operation Mode.

PS must be the operation mode for the print server to operate in PSERVER mode. If the operation mode is RP, the print server operates in RPRINTER mode. It can operate in only one mode at a time.

f. Select the Master File Server entry field to open the Select the Master File Server window.

g. Select the name of the file server you just configured.

h. Press [Esc] to return to the Select Configuration Item window.

i. Select System Configuration if any change to the print server is necessary.

j. Select Execute Change.

k. Press [Enter] when asked if you are sure.

l. Press [Esc] when a window opens indicating the configuration is complete.

m. Press [Esc] to return to the Active Device List main menu.

Press F2 to make sure that the new print server name is activated if it was changed.

n. Press [Esc] to exit out of the PSCONFIG program.

Your print server is now set up in the NetWare networking environment. You can access the print server using NetWare commands printing to the designated queue.

Setting RPRINTER Mode in NetWare 3.x (Bindery Mode)

To set up the NetWare file server to connect to the Model PS104/PS105/PS110/PS113 print server in the NetWare RPRINTER mode, first designate a NetWare file server that your print server will log on to retrieve print jobs. Log on to the file server as SUPERVISOR or as a user with SUPERVISOR privileges. The print server can be configured to service multiple NetWare Bindery file servers as described in "Using Advanced Functions" on page 5-20. However, one of the NetWare file servers has to be designated as the master file server, and this file server is the one that must be configured and logged on to.

To set up the NetWare file server:

1. **Execute the PCONSOLE program from the system volume of the file server.**
2. **Create queues.**

   To create queues:

   a. **Select Print Queue Information in the Available Options window.**

   b. **Press [Ins] to add a new queue.**

   c. **Type in a queue name and press [Enter].**

   d. **Repeat steps b and c until you have the number of queues you want.**

   e. **Press [Esc] to return to the PCONSOLE Main Menu.**
3. **Add the print server.**

   To inform the NetWare file server that a print server exists:

   a. **Select Print Server Information from the PCONSOLE Main Menu.**

   b. **Press [Ins] to add a new print server.**

   c. **Type the print server name.**

      This name is not the name of the print server. It is the print server that you will set up on the NetWare file server. At the end of the installation process, you will load PSERVER.NLM on the file server using this name.
4. **Assign printers.**

   This step should be done every time you add a new print server or when you connect a new printer to the print server.

To associate a NetWare printer object with each printer port of the print server:

a. Select the print server you added in step 3.

b. Select Print Server Configuration.

c. Select Printer Configuration.

d. Select the entry with printer number 0 on the Configured Printers submenu to open the Printer 0 Configuration window.

e. Type the predetermined print server name in the Name entry field, using the convention shown in Table 5-2.

When referring to the table, assume that PSxxxxxx is the predetermined name of the print server. You can provide a name different from the one presently in the print server, and then you can change the name of the device when you execute the PSCONFIG program for the RPRINTER setup.

The factory default name for the print server is PSxxxxxx as shown on the label on the bottom of the device.

Table 5-2. RPRINTER Mode Printer Name Mapping

Print Server Port	Printer Name in File Server
Printer port 1	PSxxxxxx
Printer port 2	PSxxxxxx_P2
Logical port 1	PSxxxxxx_L1
Logical port 2	PSxxxxxx_L2
Logical port 3	PSxxxxxx_L3
Logical port 4	PSxxxxxx_L4
Logical port 5	PSxxxxxx_L5
Logical port 6	PSxxxxxx_L6
Logical port 7	PSxxxxxx_L7
Logical port 8	PSxxxxxx_L8

f. Select the Type entry field to open the Printer Types window.

g. Select Remote Parallel, LPT1 in the Printer Types window and press [Enter].

h. Press [Esc].

i. Select Yes to save the changes.

j. Repeat steps d through f for each printer port on the print server.

k. Press [Esc] to return to the Print Server Configuration menu.

5. Associate printers with print queues.

To associate print queues with the printer(s) attached to your print server:

a. Select Queues Serviced by Printer from the Print Server Configuration menu.

b. Select a printer you want to assign a print queue to.

c. Press [Ins] when the File Server Queue Priority window opens.

d. Select the print queue that you want the printer to service.

e. Press [Enter] to accept the default priority level.

f. Press [Esc] to return to the Defined Printers window.

g. Repeat steps b through f until all printer and queue associations are configured completely.

h. Press [Esc] until you exit out of the PCONSOLE program.

6. Configure your print server.

To configure your print server:

a. Execute PSCONFIG while logged on to the file server.

This program was previously copied from the print server resource CD into your hard disk.

b. Select the print server that you want to configure.

c. Select Change Configuration.

d. Select NetWare Configuration.

e. Verify that RP is the operation mode.

RP must be the operation mode for the print server to operate in RPRINTER mode. If the operation mode is PS, the print server operates in PSERVER mode. It can operate only in one mode at a time.

f. Select and enter the name of the NetWare print server in the Novell PSERVER (P1) entry field.

This name is the NetWare print server that you entered in step 3 c.

You can also modify the Novell PSERVER field of the other printer ports if they exist.

g. **Press [Esc] to return to the Select Configuration Item window.**

h. **Select System Configuration if any change to the print server is necessary.**

   If a change is necessary, select Device Name, change it to the new print server name, and exit back into the Select Configuration Item window.

i. **Select Execute Change.**

j. **Press [Enter] when asked if you are sure.**

k. **Press [Esc] when a window opens indicating that the configuration is complete.**

l. **Press [Esc] to return to the Active Device List main menu.**

   Press F2 to make sure that the new print server name is activated if it was changed.

m. **Press [Esc] to exit out of the PSCONFIG program.**

7. **Load the PSERVER.NLM on the NetWare file server.**

   If the NetWare print server to which the NETGEAR print server will be connected has been previously loaded, you must unload and reload it again. If you are unloading and reloading the PSERVER NetWare Loadable Module (NLM), start with step a. If you are loading the NLM for the first time, go to step d.

   To load the NetWare PSERVER module:

   a. **Go to the file server console where the PSERVER.NLM is running.**

   b. **Press [Alt] + [Esc] until the print server NLM window opens.**

   c. **Press [Esc] to stop the print server NLM and answer Yes.**

   d. **Enter the following command when the NetWare NLM has been unloaded:**

      ```
      load pserver xxxx
      ```

      xxxx is the same NetWare print server entered in steps 3 c and 6 f.

Your print server is now set up as a remote printer in the NetWare networking environment. You can access the print server using NetWare commands printing to the designated queue or printer.

Using Your Print Server in a NetWare 4.x Network

In NetWare 3.x, all user-related information is stored in a database called the Bindery. NetWare server administration programs such as SYSCON and PCONSOLE modify information in the Bindery to manage the operation of the file server. The main disadvantage of the Bindery database is that it is limited to a single file server. Networks with a large number of servers can become difficult to manage, because each server has to be configured separately. In a large enterprise with a large number of servers, it could become extremely difficult to coordinate the administration of file servers across the entire enterprise.

Novell introduced NetWare Directory Services (NDS), which allows administration on a more global basis, in NetWare 4.x. NDS organizes objects by administrative domain, not by file server. The advantage of NDS is that the user logs on to a tree rather than a particular file server. However, to retain backward compatibility, NetWare 4.x still provides Bindery emulation to ease the transition into NDS.

To be able to configure the NetWare 4.x or IntraNetWare file server in NDS mode, the client station conducting the configuration must have Novell Client32 installed. There are different versions of Client32 software for Ms-DOS, Windows 3.1, and Windows 95. With Windows NT, the IntraNetWare software for Windows NT is necessary. Without Client32 or IntraNetWare, the file server can only be configured in Bindery mode.

Setting PSERVER Mode in a NetWare 4.x NDS Mode Network

As described at the beginning of the chapter, you should determine a unique name and permanent name for the print server prior to starting any configuration process. Also make sure that you have a unique name for each of the NETGEAR print servers on the network.

Log in to your NDS network as ADMIN or as a user with Administrator access privileges. Make a note of the NDS tree and NDS context name that appear on the screen. This information will be used later to configure the NETGEAR print server.

To configure the NDS file server to use the Model PS104/PS105/PS110/PS113 print server in PSERVER mode:

1. **Execute the PCONSOLE program from the System volume of the file server.**

   The Available Options window opens. Make sure that the following five menu selections are in the window:

   - Print Queues
   - Printers
   - Print Servers
   - Quick Setup
   - Change Context

   If you do not see these five menu selections, you are not running Client32. You will have to exit PCONSOLE, log out, and log in to the NDS file server when you have Client32 installed.

2. **Configure the file server using Quick Setup.**

   To configure the file server using Quick Setup:

   a. **Select Quick Setup from the Available Options window.**

   b. **Type the predetermined print server name in the Print Server field.**

      This name is the one you chose earlier before starting the file server configuration. The factory default name for the print server is PSxxxxxx (shown on the label on the bottom of the device).

   c. **Type the printer name you want in the New Printer field.**

      This name is the one used to associate a NetWare printer object with each printer port of the Model PS104/PS105/PS110/PS113 print server.

   d. **Type the print queue name you want in the New Print Queue field.**

   e. **Press F10 to save.**

      The printer number is automatically assigned by Quick Setup starting from printer number 0. It can be modified by selecting Printers from the Available Options main menu, selecting the designated printer, and changing the Printer Number in the Printer Configuration window. The print server port to printer number mapping is shown in Table 5-1 on page 5-5.

f. Repeat steps a through e if you are using the Model PS110 Print Server and if you want to configure parallel port 2. Similarly, repeat steps a through e if you are using the Model PS113 Print Server, which has three parallel ports.

g. Press [Esc] to exit PCONSOLE.

3. Configure your print server.

To configure your print server:

a. Execute the PSCONFIG program while logged on to the file server.

b. Select the NETGEAR print server that you want to configure.

c. Select Change Configuration.

d. Select NetWare Configuration.

e. Verify that the Operation Mode is PS.

PS must be the operation mode for the print server to operate in PSERVER mode. If the operation mode is RP, the print server operates in RPRINTER mode. It can operate in only one mode at a time.

f. Select the NDS Tree Name entry field to open the Available Trees window.

g. Select the name of the tree you just configured.

This information appears on the screen when you are logging in to the file server as ADMIN.

h. Select the NDS Context entry field.

i. Select the name of the NDS context recorded earlier when logging in to the file server.

j. Press [Esc] to return to the Select Configuration Item window.

k. Select System Configuration if any changes to the print server name are necessary.

To change the print server name, Select Device Name, change the print server to the new name, and then exit back to the Select Configuration Item window.

l. Select Execute Change.

m. Press [Enter] when asked if you are sure.

n. Press [Esc] when a window opens indicating that the new print server name is activated, if it was changed.

o. Press [Esc] to exit the PSCONFIG program.

Your print server is now set up in the NetWare networking environment. You can access the print server using NetWare commands printing to the designated queue or printer.

Setting PSERVER Mode in a NetWare 4.x Bindery Emulation Network

Besides the NDS mode, NetWare 4.x also allows file servers to provide Bindery emulation services to devices or computers that are capable of operating only in Bindery mode. In this setup example, the Model PS104/PS105/PS110/PS113 print server is connecting to the NetWare 4.x file server in Bindery emulation mode.

Log in to your NDS network as ADMIN or as a user with Administrator access privileges. Make a note of the attached server name that appears on the screen. This information will be used later to configure the NETGEAR print server.

To configure the file server to use the Model PS104/PS105/PS110/PS113 print server in PSERVER mode:

1. **Execute the PCONSOLE program from the System volume of the file server.**

   The Available Options window opens. Make sure that the following five menu selections are in the window:

   - Print Queues
   - Printers
   - Print Servers
   - Quick Setup
   - Change Context

   If you are running Client32, you see these five menu selections in the window to indicate that you are configuring the file server in NDS mode. Press F4 to switch to Bindery mode.

   If you use 16-bit client to log in to the NetWare 4.x file server, you have only four menu items in the window (Print Queues, Print Servers, Quick Setup, and Change current NetWare Server).

2. **Configure the file server using Quick Setup.**

   To configure the file server using Quick Setup:

   a. **Select Quick Setup from the Available Options window.**

   b. **Type the predetermined print server name in the Print Server field.**

      This name is the one you chose earlier before starting the file server configuration. The factory default name for the print server is PSxxxxxx (shown on the label on the bottom of the device).

c. Type the printer name you want in the New Printer field.

This name is used to associate a NetWare printer object with each printer port of the Model PS104/PS105/PS110/PS113 print server.

d. Type the print queue name you want in the New Print Queue field.

e. Press F10 to save.

The printer number is automatically assigned by Quick Setup starting from printer number 0. It can be modified by selecting Printers from the Available Options main menu, selecting the designated printer, and changing the Printer Number in the Printer Configuration window. The print server port to printer number mapping is shown in Table 5-1 on page 5-5.

f. Repeat steps a through e if you are using the Model PS110 Print Server and want to configure parallel port 2. Similarly, repeat steps a through e if you are using the Model PS113 Print Server, which has three parallel ports.

g. Press [Esc] to exit PCONSOLE.

3. Configure your print server.

To configure your print server:

a. Execute the PSCONFIG program while logged on to the file server.

b. Select the NETGEAR print server that you want to configure.

c. Select Change Configuration.

d. Select NetWare Configuration.

e. Verify that the Operation Mode is PS.

PS must be the operation mode for the print server to operate in PSERVER mode. If the operation mode is RP, the print server operates in RPRINTER mode. It can operate only in one mode at a time.

f. Select the Master File Server entry field to open the Select Master File Server window.

g. Select the name of the file server you just configured to be the master file server to your print server.

h. Press [Esc] to return to the Select Configuration Item window.

i. Select System Configuration if any changes to the print server name are necessary.

To change the print server name, Select Device Name, change the print server to the new name, and then exit back to the Select Configuration Item window.

j. **Select Execute Change.**

k. **Press [Enter] when asked if you are sure.**

l. **Press [Esc] when a window opens indicating that the configuration is complete.**

m. **Press [Esc] to return to the Active Device List main menu.**

   You can press F2 to make sure that the new print server name is activated, if it was changed.

n. **Press [Esc] to exit the PSCONFIG program.**

Your print server is now set up in the NetWare networking environment. You can access the print server using NetWare commands printing to the designated queue or printer.

Setting RPRINTER Mode in a NetWare 4.x NDS Mode Network

Make sure that you are running Client32 in the NDS mode before configuring the print server as a NetWare NDS Remote Printer.

To configure the NDS file server to use the Model PS104/PS105/PS110/PS113 print server in RPRINTER mode:

1. **Execute the PCONSOLE program from the System volume of the file server.**

   The Available Options window opens. Make sure that the following five menu selections are in the window:

   - Print Queues
   - Printers
   - Print Servers
   - Quick Setup
   - Change Context

   If you do not see these five menu selections, you are not running Client32. You will have to exit PCONSOLE, log out, and log in to the NDS file server when you have Client32 installed.

2. **Configure the file server using Quick Setup.**

   To configure the file server using Quick Setup:

   a. **Select Quick Setup from the Available Options window.**

b. Type the predetermined print server name in the Print Server field.

This name is not the one for the NETGEAR print server. It is the print server you will set up on the NetWare file server. At the end of the installation process, you will load PSERVER.NLM on the file server using this name.

c. Type the chosen printer name in the New Printer field, using the convention shown in Table 5-2 on page 5-8.

When referring to the table, assume that PSxxxxxx is the predetermined name of the print server. You can provide a name different from the one presently in the print server, and then you can change the name of the device when you execute the PSCONFIG program for the RPRINTER setup.

The factory default name for the print server is PSxxxxxx as shown on the label on the bottom of the device.

d. Type the chosen print queue name in the New Print Queue entry field.

e. Type the proper destination port in the Port entry field.

Select LPT1 and LPT2 for printer ports 1 and 2, respectively.

f. Press F10 to save.

g. Repeat steps a through e for parallel port 2, if it exists on your print server.

h. Press [Esc] to exit PCONSOLE.

3. Configure your print server.

To configure your print server:

a. Execute the PSCONFIG program while logged on to the file server.

b. Select the NETGEAR print server that you want to configure.

c. Select Change Configuration.

d. Select NetWare Configuration.

e. Verify that the Operation Mode is RP.

RP must be the operation mode for the print server to operate in RPRINTER mode. If the operation mode is PS, the print server operates in PSERVER mode. It can operate in only one mode at a time.

f. Select and type the name of the NetWare print server in the Novell PSERVER (P1) entry field.

You can also modify the Novell PSERVER field of the other printer ports if they exist.

g. **Press [Esc] to return to the Select Configuration Item window.**

h. **Select System Configuration if any changes to the print server name are necessary.**

To change the print server name, Select Device Name, change the print server to the new name, and then exit back to the Select Configuration Item window.

i. **Select Execute Change.**

j. **Press [Enter] when asked if you are sure.**

k. **Press [Esc] when a window opens indicating that the configuration is complete.**

l. **Press [Esc] to return to the Active Device List main menu.**

You can press F2 to make sure that the new print server name is activated, if it was changed.

m. **Press [Esc] to exit the PSCONFIG program.**

4. **Load the PSERVER.NLM on the NetWare file server.**

If the NetWare print server to which the NETGEAR print server will be connected has been previously loaded, you must unload and reload it again. If unloading and reloading the PSERVER NetWare Loadable Module (NLM), start with step a. If you are loading the NLM for the first time, go to step d.

To load the NetWare PSERVER module:

a. **Go to the file server console where the PSERVER.NLM is running.**

b. **Press [Alt] + [Esc] until the print server NLM window opens.**

c. **Press [Esc] to stop the print server NLM and answer Yes.**

d. **Enter the following command when the NetWare NLM has been unloaded:**

```
load pserver .XXXX.YYYY
```

xxxx is the NetWare print server selected in step 3 f.

YYYY is the NDS context information recorded when you logged in to the file server as ADMIN.

e. **Select Printer Status when the Available Options main menu opens to monitor the print server status.**

Setting PSERVER Mode in NetWare 5.x NDS Mode Network

As described at the beginning of the chapter, you should determine a unique name and permanent name for the print server prior to starting any configuration process. Also make sure that you have a unique name for each of the NETGEAR print servers on the network.

You must use Windows 95 or Windows 98 and be running Client32.

To configure the NDS file server to use the Model PS104/PS105/PS110/PS113 print server in PSERVER mode:

1. **Execute the NWADMN32 program from the system volume (for example, "F:\public\win32") on the file server.**
2. **Log in to your NDS network as ADMIN or as a user with Administrator access privileges.**

   Make a note of the NDS tree and NDS context name that appear on the screen. This information is used later to configure the NETGEAR print server.
3. **Configure the file server using Quick Setup.**

   To configure the file server using Quick Setup:

   a. **Select a context where you want to add the new print server object, printer object, and print queue object.**

   b. **Select Tools from the NWADMN32's menu bar.**

   c. **Select Print Services Quick Setup (Non-NDPS).**

   d. **Type your print server name in the Print Server Name field.**

      (NETGEAR recommends that you use the default name of the NETGEAR Print Server, which is NETGEAR PRINT SERVER).

   e. **Type the printer name you want in the Name field (within the "Printer" section of the Quick Setup Window).**

   f. **Select Parallel in the Type field.**

   g. **Select Text in the Banner field.**

   h. **Type the Queue name you want in the Name field (within the Print Queue section of the Quick Setup Window).**

   i. **Select the NetWare File server volume in the Volume field.**

4. **Launch the Print Server Administrator Program.**

   To launch the Print Server Administrator Program:

   a. **Select "Netgear Print Server Administration" from the FirstGear for Print Server icon on your desktop.**

   b. **Select Print Server from the Active Print Server list.**

   c. **Select NetWare PSERVER.**

   d. **Select the Advanced icon.**

   e. **Select NetWare PSERVER.**

   f. **Click on Print Server Mode.**

   g. **Select the NDS Tree Name (refer to step 1 on page 4-20).**

   h. **Enter the Context Name (refer to step 1 on page 4-20).**

   i. **Click on Save to Device.**

Using Advanced Functions

The print server is capable of servicing multiple queues from multiple file servers at one time. The print server also supports a function called logical printer that allows manipulation of print data before sending it to the printer. One typical use of the logical printer function is the conversion of line feed into carriage return and line feed for proper printing on to a line printer.

Servicing Multiple NetWare Bindery File Servers

If your print server is configured as a NetWare Print Server and you want it to service more than one Bindery file server:

1. **Log in, with supervisory rights, to each file server you want your print server to service.**
2. **Execute PCONSOLE from the System volume of each file server.**
3. **Create queues and provide the predetermined print server name for your Model PS104/PS105/PS110/PS113 print server on each Bindery file server you want the print server to service.**

   These steps are outlined in "Setting PSERVER Mode in NetWare 3.x (Bindery Mode)" on page 5-4.

4. **Log in, with SUPERVISORY access privileges, to the file server you want to designate as the master file server for your print server.**
5. **Execute the PCONSOLE program.**
6. **Create queues and provide the print server name to the master file server.**

   This procedure is the same as setting up the other Bindery file servers.
7. **Select Print Server Information from the Available Options main menu.**
8. **Select your print server in the print server list.**
9. **Select Print Server Configuration, and then select File Server To Be Serviced.**
10. **Insert the names of the other file servers to be serviced by your print server.**
11. **Press [Esc] until you exit PCONSOLE.**
12. **Execute the PSCONFIG program while you are logged in to the file server.**
13. **Select the NETGEAR print server and configure it to attach to the designated master Bindery file server.**

    This step is not necessary if the print server has previously been configured.
14. **Reset your print server by turning the power off and then on again.**

    You can also reset the print server by executing the PSCONFIG program, selecting the preferred print server, and then selecting Reset Device from the Available Options window.

Your print server is now ready to service more than one Bindery file server.

Attaching to More Than One NetWare Print Server

If your print server is configured as a NetWare remote printer and you want each port of your print server to attach to a different NetWare print server, perform the following procedure.

To attach each port of your print server to a different NetWare print server:

1. **Use PCONSOLE to create and assign the required printers and queues as outlined in "Setting RPRINTER Mode in NetWare 3.x (Bindery Mode)" on page 5-7 or "Setting RPRINTER Mode in a NetWare 4.x NDS Mode Network" on page 5-16.**

   When in NetWare RPRINTER mode, each printer port on the Model PS104/PS105/PS110/PS113 print server can be configured to service different NetWare print servers residing on different file servers.
2. **Execute PSCONFIG.**

3. **Select the print server.**
4. **Select Change Configuration.**
5. **Select NetWare Configuration.**
6. **Verify that the Operation Mode field shows RP for RPRINTER mode.**
7. **Enter the correct NetWare print server names in each one of the Novell PSERVER fields.**
8. **Return to the Select Configuration Item window.**
9. **Select Execute Change.**

Your print server is now configured in NetWare RPRINTER mode and ready to service multiple NetWare print servers.

Using Logical Ports

Logical ports can be used to create a "virtual" printer. For example, to create a landscape printer, you could define a logical printer as:

- Pre-string—printer control codes to switch the printer to landscape mode
- Post-string—printer control codes to reset the printer, restoring the default settings

Another example of the use of logical printers is to print UNIX-format text files properly, by converting UNIX-style LF (Line Feeds) to DOS-style LF/CR (Line Feed, Carriage Return) pairs. Each Model PS104 and Model PS105 Print Server has one parallel port and supports three logical printers. Each Model PS110 and PS113 Print Server, with two and three parallel ports respectively, supports eight logical printers.

Configuring Logical Printers on the Print Server

To define pre-string, post-string, and the physical output port of a logical printer:

1. **Execute the PSCONFIG program.**
2. **Select the Model PS104/PS105/PS110/PS113 print server, and then select Change Configuration.**

3. Select Logical Printer Configuration, and then set the items listed in Table 5-3 in each of the appropriate entry fields.

Table 5-3. Logical Printer Configuration Entries

Entry Field	Definition
Physical Port	Select the physical port for this logical printer (P1 to P2 for parallel ports). Logical printers are numbered from L1 to L3 for the Model PS 104 and Model PS105 print server and numbered L1 to L8 for the Model PS110 and Model PS113 print server.
String Before Job	The printer control string (in hexadecimal notation) to be sent to the printer before each print job. The maximum number of ASCII characters in the control string is 15. The examples are: • ASCII = [Esc]&10O Hexadecimal = 1B266C304F • ASCII = [Esc]&110 Hexadecimal = 1B266C314F
String After Job	The printer control string (in hexadecimal notation) to be sent to the printer after each print job. The maximum number of ASCII characters in the control string is 15.
Convert LF to CR+LF	If On is indicated in the entry field, LF (line feed) characters are changed to CR+LF (carriage return + line feed). If Off, no conversion is done.

Configuring NetWare File Server to Connect to Logical Printers

The NetWare PCONSOLE must be used to create connections to logical ports and assign print queues to the ports. When creating logical printers, be sure to select printer numbers greater than 7 from the Configured Printer listing. When operating in a NetWare environment, all printer numbers greater than 7 are logical printers. Remember that selecting printer 8 corresponds to logical printer L1, selecting printer 9 corresponds to logical printer L2, and so on up to printer 15, which corresponds to logical printer L8.

Refer to Table 5-2 on page 5-8 for printer name mapping.

For more information about using NDPS, refer to Appendix D, "Using NetWare 5 NDPS."

Chapter 6
UNIX Printing Using TCP/IP

This chapter explains how to configure and set up the NETGEAR Model PS104/PS105/PS110/ PS113 print server and your UNIX system if you are operating in a UNIX networking environment. The print server can work with most UNIX operating systems with the TCP/IP protocol, but the following protocols and printing methods are supported:

- Protocols—DHCP, BOOTP, RARP, FTP, TCP, IP
- Printing methods—LPD, FTP, DSI

Setting up your print server and UNIX PC requires a few extra steps and some decisions that must be made before configuring both your print server and your PC. In all network environments, the print server must be configured before configuring any PCs on your network. If your network:

- Includes both PCs and UNIX systems

  NETGEAR highly recommends that you configure the print server from a Windows PC as outlined in the instructions in Chapter 7, "Using Advanced Management Tools." The administration program software assigns an IP address to the print server by using the NetBEUI or the IPX/SPX protocol for communication. IPX address resolution is done automatically by the workstation, and no local manual configuration is necessary. Configure any UNIX system in your network with the instructions provided in "Setting the Print Method" on page 6-9 to choose a printing method.

- Includes only UNIX systems or if you have PCs without Windows on your network

  You must configure both your print server and all your PC systems with the instructions provided in this chapter. Before you can configure the print server (which must be done first) you must assign an IP address to it. (For information about IP addresses, refer to Appendix B, "Understanding IP Addresses.") Use one of the following two methods:

  – Assign active IP address resolution

    With temporary IP address assignment, the print server sends out broadcast packets actively searching for a server to provide the print server with an IP address. The print server sends out DHCP packets, BootP packets, and RARP packets (in this sequence) to resolve its own IP address. This broadcast mechanism is conducted only upon reset or power cycle.

    Assign a temporary IP address to your print server by referring to:

    - "Assigning an IP Address to the Print Server Using DHCP" as outlined on page 6-3
    - "Assigning an IP Address to the Print Server Using BootP" as outlined on page 6-3.
    - "Assigning an IP Address to the Print Server Using RARP" as outlined on page 6-4.

  – Assign passive IP address resolution

    Assign a static IP address to your print server by referring to "Assigning an IP Address to the Print Server Using ARP" on page 6-6.

  With all four methods of IP address resolution, the print server loses the IP setting after reset or a power loss. To permanently configure the print server and save the IP address assignment in the flash EEPROM of the print server, you must use FTP. Using FTP, you can modify the CONFIG file in the print server.

After you configure the print server as described in "Configuring Your Print Server Using FTP" on page 6-7, choose a printing method as described in "Setting the Print Method" on page 6-9 to configure each UNIX PC in your network.

Temporary IP Address Resolution

If the IP address is left at 0.0.0.0 (the default value), a temporary IP address is assigned when the print server is powered on. DHCP, BootP, and RARP are attempted in sequence for finding an address.

Assigning an IP Address to the Print Server Using DHCP

Using Dynamic Host Configuration Protocol (DHCP) is possible only if you have a DHCP server with management software that allows you to take advantage of this feature. Otherwise, the IP address of the print server will be unknown, and connection to the print server is not possible. To use DHCP, turn on power to the print server; the DHCP server automatically assigns an IP address to it.

If you do not have a DHCP server and you are assigning an IP address to the print server, you can use BootP, RARP, or ARP.

Assigning an IP Address to the Print Server Using BootP

To assign an IP address using the Bootstrap Protocol (BootP):

1. **Determine the physical address and the device name of the print server.**

   The factory default name and the physical address are shown on a sticker on the bottom of the unit. The default name on your device is PSxxxxxx.

2. **Log in to the UNIX host as root.**

3. **Add the print server to the *letc/hosts* file by adding to the file:**

   ```
   IP_Address NAME # Comment
   ```

   Use these definitions for entering the information:

   - **IP_Address** is the IP address of your print server.
   - **NAME** is the name of your print server.

   A sample entry is:

   ```
   192.10.2.54 PS_Rm203 #Default name PS123456
   ```

   In the example, a print server with an IP address of 192.10.2.54 is called PS_Rm203 and has a default name of PS123456.

4. **Add to the Boot Table in the */etc/booptab* file:**

   ```
   NAME:ht=ether:vm=rfc1024::ha=PA:ip=IP:sm=SM:gw=GW
   ```

   Use these definitions for entering the information:

   - **NAME** is the name of your print server.
   - **PA** is the physical address of your print server.
   - **IP** is the IP address of your print server.
   - **SM** is the Subnet Mask IP address.

     Refer to Appendix B, "Understanding IP Addresses," for additional information about assigning a Subnet Mask IP address.

   - **GW** is the Gateway IP address.

     Refer to Appendix B, "Understanding IP Addresses," for additional information about assigning a Gateway IP address.

5. **Start the BootP daemon (the usual command is BOOTPd) if the command in step 2 did not start the BootP process, and then reset the print server so that it obtains an IP address using BootP.**

6. **Compare the IP address to MAC address association to assure that an IP address has been assigned, using the ping command:**

   ```
   ping NAME
   ```

   NAME is the name of the print server. You should receive a response. If you get a timeout message, the BootP procedure has failed. You can either follow the steps again for using BootP or use one of the other methods for assigning an IP address.

7. **Proceed to "Configuring Your Print Server Using FTP" on page 6-7 to configure the print server, if it has not yet been configured.**

Assigning an IP Address to the Print Server Using RARP

To assign an IP address using the Reverse Address Resolution Protocol (RARP):

1. **Determine the physical address and the device name of the print server.**

   The factory default name and the physical address are shown on a sticker on the bottom of the unit. The default name on your device is PSxxxxxx.

2. **Log in to the UNIX host as root.**

3. **Add the print server to the */etc/hosts* file by adding to the file:**

   ```
   IP_Address NAME # Comment
   ```

   Use these definitions for entering the information:

   - **IP_Address** is the IP address of your print server.
   - **NAME** is the name of your print server.

   A sample entry is:

   ```
   192.10.2.54 PS_Rm203 #Default name PS123456
   ```

   In the example, a print server with an IP address of 192.10.2.54 is called PS_Rm203 and has a default name of PS123456.

4. **Add to the Ethernet Address table */etc/ethers*:**

   ```
   00:c0:02:xx:yy:zz NAME
   ```

   Use these definitions for entering the information:

   - **00:c0:02:xx:yy:zz** is the location of your print server.
   - **NAME** is the name of your print server.

5. **Reset the print server by turning the power off and then on again.**

   When the print server reboots, it acquires an IP address using RARP.

6. **To assure that an IP address has been assigned, check the IP address to MAC address association using the ping command:**

   ```
   ping NAME
   ```

   NAME is the name of the print server. You should receive a response. If you get a timeout message, the RARP procedure has failed. You can either follow the steps again for using RARP or use one of the other methods for assigning an IP address.

7. **Proceed to "Configuring Your Print Server Using FTP" on page 6-7 to configure the print server, if it has not yet been configured.**

Assigning an IP Address to the Print Server Using ARP

To assign an IP address using the Address Resolution Protocol (ARP):

1. **Determine the physical address and the device name of the print server.**

   The factory default name and the physical address are shown on a sticker on the bottom of the unit. The default name on your device is PSxxxxxx.

2. **Log in to the UNIX host as root.**

3. **Add the print server to the *letc/hosts* file by adding to the file:**

   ```
   IP_Address NAME # Comment
   ```

   Use these definitions for entering the information:

   - **IP_Address** is the IP address of your print server.
   - **NAME** is the name of your print server.

   A sample entry is:

   ```
   192.10.2.54 PS_Rm203 #Default name PS123456
   ```

   In the example, a print server with an IP address of **192.10.2.54** is called **PS_Rm203** and has a default name of PS123456.

4. **Compare the physical address with the IP address of the print server, using the ARP command as follows:**

   ```
   arp -s NAME 00:c0:02:xx:yy:zz
   ```

   Use these definitions for entering the information:

   - **NAME** is the name of your print server.
   - **00:c0:02:xx:yy:zz** is the physical address of the print server.

   A sample entry is:

   ```
   arp -s PS_Rm203 00:c0:02:12:34:56
   ```

5. **To assure that an IP address has been assigned, check the IP address to MAC address association using the ping command:**

   ```
   ping NAME
   ```

   NAME is the name of the print server. You should receive a response, but if you get a timeout message, the ARP procedure has failed. You can either follow the steps again for using ARP or use one of the other methods for assigning an IP address.

6. **Proceed to "Configuring Your Print Server Using FTP," which follows.**

Configuring Your Print Server Using FTP

FTP allows a user to log on to a remote host and to manipulate files on the host. The print server can act as an FTP host. Using FTP, you can access and modify the *CONFIG* file in the print server. Modifying the *CONFIG* file changes the configuration of the print server.

The limitations of print server support when using FTP are:

- Only one FTP user can connect to the print server at a time.
- Only command line FTP programs can be used. FTP programs that attempt to browse the file system are not supported.

Configuration Example

This section provides commands to use and responses to each command when you use FTP to connect to the print server.

Example instructions are:

1. **Connect to the print server by entering the command:**

   ```
   ftp NAME or ftp IP_Address
   ```

   You can connect using a name instead of an IP address only if your system has been configured to recognize the name to IP address association.

2. **Enter the default name (on the base of the device) when you are prompted for the user name.**
3. **Press [Enter] when prompted for the password.**
4. **Copy the configuration file by entering the command:**

   ```
   ftp>get CONFIG
   ```

5. **Quit copying the file by entering the command:**

   ```
   ftp>quit
   ```

6. **Edit the *CONFIG* file by typing with a text editor.**

   NETGEAR recommends that you edit the *CONFIG* file to provide a permanent IP address to the print server. The *CONFIG* file is shown in Appendix C, “CONFIG File.”

7. **Copy the *CONFIG* file back to the print server and then reset the device by using the commands:**

```
ftp NAME
ftp>put CONFIG
ftp>get RESET
```

8. **Quit by using the command:**

```
ftp>quit
```

List of FTP Files and Commands Supported by the Print Server

Table 6-1 lists the file names that appear in the directory.

Table 6-1. FTP Files in the Directory

File Name	Purpose	Mode
CONFIG	Configuration file	Read/Write
PSINF	Device information	Read
DEFAULTC	Reset device to default configuration	Read
RESET	Reset device	Read
PASSRESET	Clear password	Read
SETIP	Save current IP address	Read

Table 6-2 lists the case-sensitive commands that are implemented. When a command requires a parameter, the parameter is shown in italics.

Table 6-2. FTP Commands

Command	Function
dir	Lists files as shown in Table 6-1.
get FILENAME	Retrieves a file. The only files that can be retrieved are CONFIG and PSINF.
get RESET	Resets the print server and terminates the current connection.
get PASSRESET	Clears the password.
get SETIP	Sets the current IP address as a static IP address. To avoid an address conflict, do not use this command if a DHCP server assigned the IP address to the print server.

Table 6-2. FTP Commands (continued)

Command	Function
put CONFIG	Copies the CONFIG file to the print server, overwriting the existing CONFIG file. After using this command to write a new configuration file, use the get RESET command; all LEDs should turn on and then off while the print server is resetting.
put PASSWORD	Copies the password file to the print server and gives it a new password. Passwords can be up to 19 bytes in length.
put filename Ln	Copies the filename file to the printer connected to n port and prints the file.
quit	Terminates the current FTP session.

Other FTP commands cannot be used, and they return an Invalid Command error message.

Setting the Print Method

The following three printing methods can be used in any environment:

- Line Printer Daemon (LPD)

  LPD is a standard print method for most UNIX systems. The benefit of this method is that it eliminates the need to install additional software on the host.

- File Transfer Protocol (FTP)

  FTP is also a standard print method in most UNIX systems, but it is not recommended except as a test and backup method of printing.

- Direct Socket Interface (DSI)

  DSI is a UNIX-based method of providing a direct connection between a host computer and a printer. The host and the print server establish a TCP connection, using a special socket number. All data sent over this connection is treated as print data and sent transparently to a logical printer defined on the print server.

Of the three choices, LPD and DSI work well with a large number of users because they both employ print queue processes. FTP does not implement a print queue; if the printer is busy, the print command may fail.

The three methods are explained more fully in the following sections.

LPD Configuration and Printing

LPD is a built-in printing protocol for most UNIX systems including BSD type UNIX. It is also supported in Windows NT 3.5 or later. The following sections provide information about configuring LPD on:

- IBM AIX 4.15
- System V
- BSD

Configuring LPD on IBM AIX 4.15

Before proceeding, make sure that the print server has been assigned an IP address.

To set up your AIX system for LPD printing:

1. **Type the name of your print server, adding it to the */etc/hosts.lpd* file.**
2. **Start the LPD daemon if it is not running, using the command:**

   ```
   start src -s qdaemon
   ```

3. **Start the system administration tool smith and select Print Spooling.**
4. **Create the required number of queues (one for each logical printer) by selecting Add a Print Queue, Remote (Printer attached to Remote Host), and then Standard Processing.**

   Use these definitions for entering the information:

   - Name of queue to add

     Use a single-word queue name that indicates the printer attached.
   - Hostname for remote server

     Print server name as used in /etc/hosts.lpd.
   - Name of queue on remote server

     It is the logical printer number (L1 to L3 or L1 to L8) to service this queue.
   - Type of print spooler on remote server

     Use the default value.
5. **Make sure the logical printers are configured in the print server.**

   Refer to the information provided in Table 6-2 on page 6-8 for information about configuring logical printers.

6. **Print using the command:**

```
lp -d printer_queue file_name
```

Use these definitions for entering the information:

- **printer_queue** is one of the entries used in Name of queue to add.
- **file_name** is the file you want to print.

Configuring LPD on System V

Before beginning LPD Setup, make sure that an IP address has been assigned to your print server and that the following statements apply:

- The remote host name is the name of the print server.
- The remote printer name is the print queue name for the logical printer.
- Logical printers are configured on the print server itself.
- You identify the service type as BSD if your UNIX system asks for the LPD type.

  The LPD protocol that the print server uses meets BSD system standards.

Table 6-3 shows sample commands when using LPD. The definitions used in the sample commands are:

- **printer_name** is the name of the print queue serviced by the print server.
- **Spooler_directory** is the name of the directory used to spool the print jobs.

Table 6-3. Sample Commands for Using LPD on System V

Action	Sample Command
Stop Print Services	/usr/lib/lpshut
Add a System Printer	/usr/lib/lpadmin -p printer_name -v /dev/null
Restart the Print Services	/usr/lib/lpsched
Enable printing to the new printer device	enable printer_name
Start accepting jobs for the new printer device	accept printer_name
Create a spooling directory	mkdir /usr/spool/Spooler_directory
Make spooling daemon the owner of this directory	chown daemon /usr/spool/Spooler_directory
Create read/write permissions	chmod 775 /usr/spool/Spooler_directory

Table 6-3. Sample Commands for Using LPD on System V (continued)

Action	Sample Command
Give permissions to LPD processes	chgrp daemon /usr/spool/Spooler_directory
Add remote printer(s). (Repeat this process for each logical printer/print queue combination that you want to create.) Sample command should be entered as one line, using a tab character where shown.	Add to the /etc/printcap file: printer_name|Remote_Printer_Alias:\ [Tab] :lp=:\ [Tab] :rm=PS_NAME:\ [Tab] :rp=Logical_Printer_name:\ [Tab] :sd=Spooler_directory:\ [Tab] :mx#0 Use these definitions for entering the information: • printer_name is the print queue name used to store jobs for the corresponding logical printer. • PS_NAME is the print server name defined in /etc/hosts. • Logical_Printer_name is the logical printer name on the print server (L1 to L3 or L1 to L8, depending on the print server that you are using). • Spooler_directory is the directory you created.

Configuring LPD on BSD

Make sure that an IP address has been assigned to the print server and the following statements apply:

- The remote host name is the name of the print server.
- The remote printer name is the logical printer (L1 to L3 or L1 to L8).
- You identify the service type as BSD if your UNIX system asks for the LPD type.

  The LPD protocol that the print server uses meets BSD system standards.
- Enter the service type as BSD if asked for the LPD type.

Table 6-4 shows sample commands when using LPD. The definitions used in the sample commands are:

- **printer_name** is the print queue serviced by the logical printer on the print server.
- **Spooler_dir** is the name of the directory used to spool the print jobs.

Table 6-4. Sample Commands for Using LPD on BSD

Action	Sample Command
Create a spooling directory	Mkdir /usr/spool/Spooler_dir
Set spooling daemon as owner of this directory	Chown daemon /usr/spool/Spooler_dir
Create read/write permissions	Chmod 775 /usr/spool/Spooler_dir
Give permissions to LPD processes	Chgrp daemon /usr/spool/Spooler_dir
Add remote printer(s)	See adding remote printers in Table 6-3
Start lpc print mechanism	lpc start printer_name

Printing Using LPD

For LPD printing instructions, refer to your UNIX manual. An example command that is used for a BSD UNIX system is:

```
lpr  -P printer_name filename
```

The definitions used are:

- **printer_name** is the name of the print queue defined on the UNIX host.
- **filename** is the name of the file you want to print.

An example command with parameters is:

```
lpr  -P Marketing  /etc/hosts
```

In the above example, the */etc/hosts* file is sent to the Marketing printer queue. It is then sent to the logical printer associated with this queue.

Printing Using FTP

Using FTP to print lets you send print jobs to the printers directly. Because there is no spooling, if the printer is not ready, the print job is terminated immediately. The advantage of FTP is that no host configuration is required.

To print using FTP, use the command lines:

```
#ftp Name
ftp>put FileName Ln
```

The definitions used are:

- **Name** is the name of the print server.
- **FileName** is the file you want to print.
- **Ln** is the logical printer you want to print to.

Printing Using DSI

Logical printers must be configured on the print server. Even if you are using the Model PS110 or Model PS113 Print Server that normally supports up to eight logical printers, using DSI to print limits the support to three logical printers.

Socket numbers are defined as listed in Table 6-5.

Table 6-5. Socket Number Definitions

Logical Printer Number	Socket Number
1	4010
2	4020
3	4030

Chapter 7
Using Advanced Management Tools

This chapter describes in more detail the three print server management programs bundled with the Model PS104/PS105/PS110/PS113 print server. These programs are included on the *Model PS104/PS105/PS110/PS113 Print Server Resource CD*.

The three programs described in this chapter are:

- NETGEAR Print Server Administration Program

  This software program is a print server administration program based on Windows 95, Windows 98, Windows NT, or Windows 2000. It runs on any of the four protocols that the print server supports.

- PSCONFIG

  This program is an MS-DOS equivalent of the FirstGear Print Server Administration Program.

- QUICKSET

  To speed up the configuration process, QUICKSET is also included. This program allows the configuration of both the NetWare file server and the print server in a single command line under MS-DOS.

Configuring Using the FirstGear Print Server Administration Program

Before you begin this section, you must first install the NETGEAR FirstGear print server software on your PC. Refer to, Chapter 2, “Installation,” and install the software before proceeding.

To start the FirstGear Administration Program:

1. **Click on Start, move along the program folders to highlight the FirstGear program folder, and then click on the Print Server Administration program.**

   As illustrated in Figure 7-1, the main screen of the FirstGear print server setup utility opens and searches the network for NETGEAR print servers.

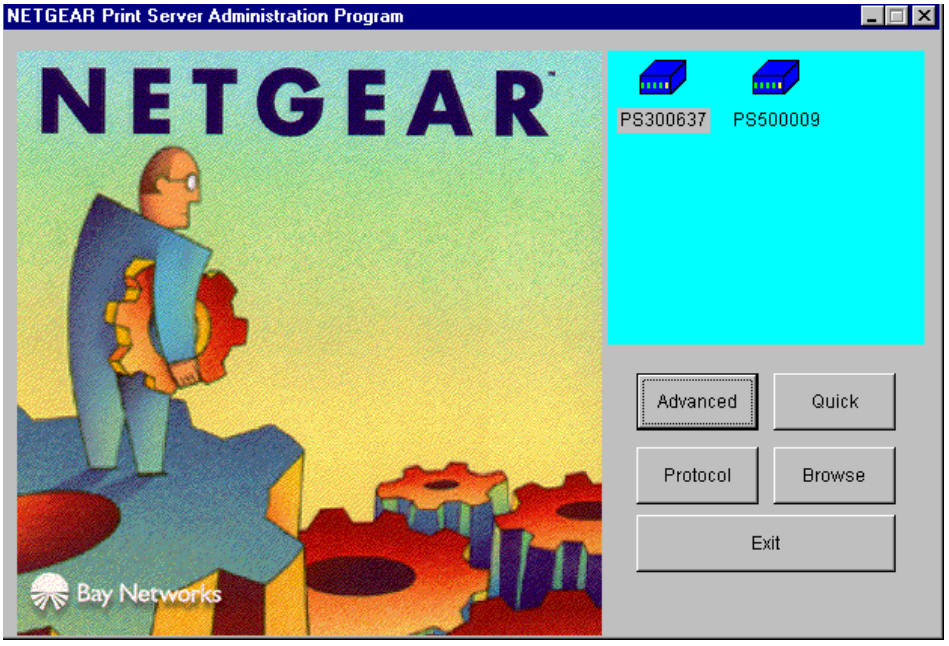


Figure 7-1. NETGEAR Print Server Administration Program

All active NETGEAR print servers are listed on the screen as shown. If there is any print server missing from the screen, you may click on the Browse button to scan the network one more time. By default, the FirstGear Administration Program only browses the network with NetBEUI to minimize unnecessary packets on the network.

If you still do not see all the print servers, the print server that you are trying to configure might have the default NetBEUI protocol disabled. If the protocol is disabled, click on the Protocol button to enable browsing with IPX/SPX and TCP/IP. Make sure that the IPX/SPX and TCP/IP protocols are also enabled and bound to the network adapter card in your Windows 95, Windows 98, Windows NT, or Windows 2000 system.

The Exit button ends the FirstGear setup utility.

2. **Click on the Quick button to open the FirstGear Setup Utility Quick Setup Screen as shown in Figure 7-2. Choosing the Quick button performs a quick configuration of the print server in a Microsoft network running the NetBEUI protocol.**

   or

   Click on the Advanced button for detailed full configuration of the print server. Refer to "Advanced Print Server Configuration" for information about the Advanced option.

Figure 7-2. FirstGear Setup Utility Quick Setup Screen

Advanced Print Server Configuration

From the main menu, click on the Advanced button to use the advanced configuration procedure. The Advanced Print Server Configuration screen opens.

The Advanced Print Server Configuration screen contains the fields listed on tabs that can be selected in any order to customize the configuration of the print server. The following field tabs are provided by the Advanced Print Server Configuration screen:

- System
- NetWare PServer
- NetWare RPrinter
- TCP/IP
- NetBEUI
- Logical Port

Each tab is described in the following sections on page 7-5 through page 7-12. There are control buttons associated with every menu tab and also a menu bar containing Status, Configuration, Diagnostics, and Help, which are described in "Advanced Print Server Configuration Menu Bar" on page 7-13.

There are two control buttons associated with every menu tab, and there is a Return to Main Menu button at the bottom of the menu tab. The function of each button is described in Table 7-1.

Table 7-1. Control Buttons on All Menu Tabs

Field	Description
Restore to Default	This button appears on many screens. Clicking it replaces the onscreen values with the default settings. The menu tab settings are not saved until you click on the Save to Device button. The quickest way to set all device values to the factory default setting is to click on the Configuration selection on the menu bar and select Restore Factory Default.
Save to Device	Click this button to write any changed configuration information to the print server. If you switch to another menu tab without clicking on the Save to Device button, all new settings are lost.
Return to Main Menu	Click this button to return to the print server administration main menu. If you want to configure another print server, you must click on this button to return to the main menu and select another print server.

Any configuration change is lost unless you click on the Save to Device button at the bottom of the field window to send the configuration to the print server. When moving into a new field screen, all settings in the previous screen are lost. It is essential that you make a decision on the present field screen whether to abandon or save the new parameters into the print server.

The menu bars and their fields are described in the following sections.

System Menu Tab

The System menu tab contains the fields to change the print server name and activate or disable the various networking protocols supported by the print server. Figure 7-3 and Table 7-2 show the System menu tab and list the fields in the menu, describe the functions, and explain how to provide information in each field.

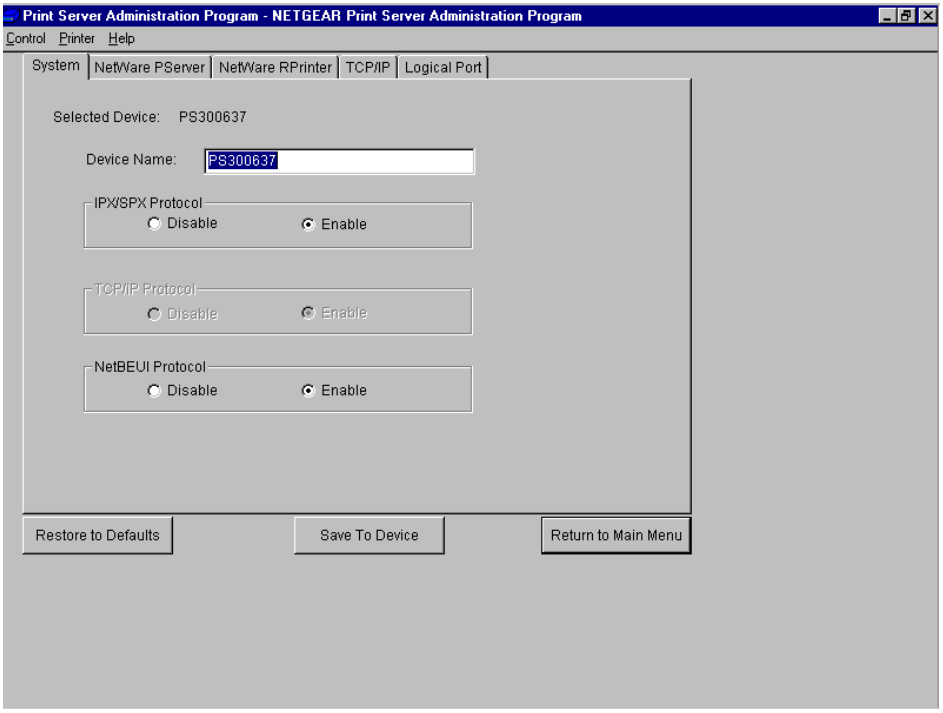


Figure 7-3. System Menu Tab Window

Table 7-2. System Menu Tab Fields

Field	Description
Device Name	Choose a descriptive name for the router for identification purposes (for example, EngPrsv). This name is used in all protocols to identify the specific print server. There is a factory default name. For any change, NETGEAR recommends that a name be determined before setting the print server in any network. This name should be no more than 16 characters. Spaces are not allowed, but dashes (-) and underscore marks (_) are accepted.
IPX/SPX Protocol	Choose to enable or disable the IPX/SPX protocol used in the NetWare environment. This selection is always shadowed to indicate that the IPX/SPX protocol is always active and cannot be disabled.
TCP/IP Protocol	Choose to enable or disable the TCP/IP protocol. TCP/IP is used for UNIX networking and Microsoft networking. The factory default is Enable.
NetBEUI Protocol	Choose to enable or disable the NetBEUI protocol. NetBEUI is primarily used in a small-scale Microsoft networking environment.

NetWare PServer Menu Tab

The NetWare PServer menu tab sets the NetWare server (Bindery mode) or tree (NetWare Directory Services mode) that the print server should service. Figure 7-4 shows the menu and its fields, and Table 7-3 describes the functions and explains how to provide information in each field.

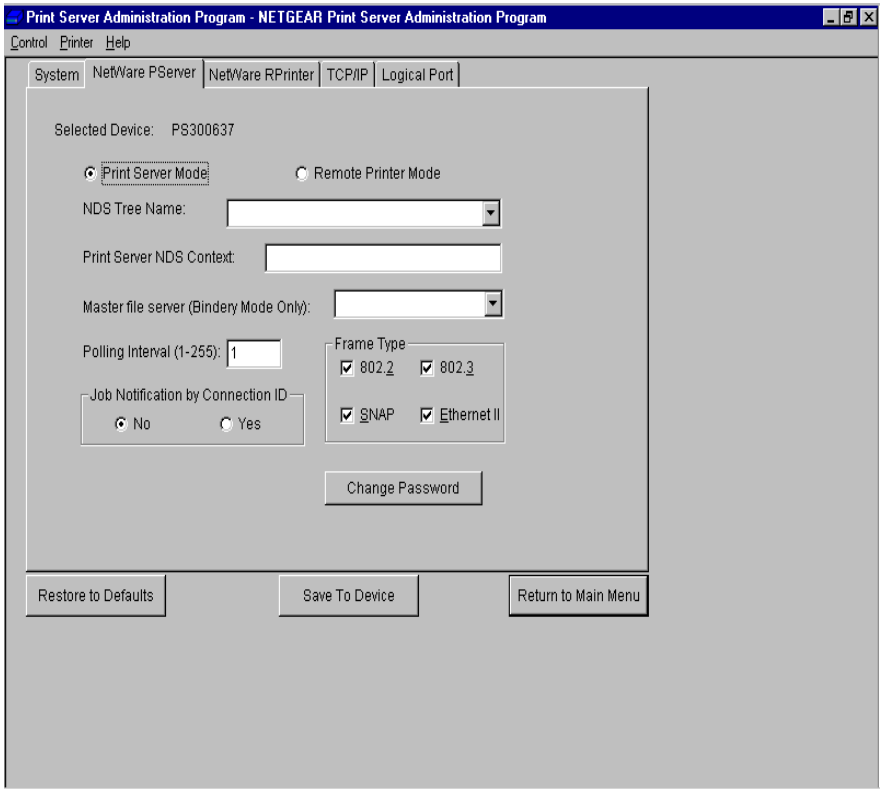


Figure 7-4. NetWare PServer Tab Window

Table 7-3. NetWare PSERVER Menu Tab Fields

Field	Description
Print Server Mode	Indicates if the print server is in NetWare PSERVER mode. If this button is not selected, you will not be able to modify the following PSERVER parameters.
Remote Printer Mode	When selected, the print server operates in RPRINTER mode. The print server can operate only in one of the two modes.
NDS Tree Name	For use in NetWare 4.X NetWare Directory Services (NDS) mode only. This is the NDS tree that the print server logs on. The name must not exceed 19 characters or contain any space.
Print Server NDS Context	NetWare 4.X NDS mode only. Enter the Print Server NDS Context. The entry should contain the path to the context but not the context itself, and each OU should be separated by a period (for example, department.company).

Table 7-3. NetWare PSERVER Menu Tab Fields (continued)

Field	Description
Master file server (Binary Mode Only)	When operating in Bindery mode, the print server logs on to a file server and services the queue set up on that particular file server. Enter the name of the master file server of the print server.
Polling Interval	Defines how often the print server will poll the queues to be serviced. The control unit is in seconds.
Job Notification by Connection ID	Set to Yes to receive a job notification at only the workstation where the print job originated. Set to No to receive a job notification at all workstations that you have logged on.
Frame Type	Select the frame types used by your network (Ethernet 802.2, Ethernet 802.3, Ethernet SNAP, and Ethernet II).
Change Password	Click on this button to open the password control window for the print server when operating in NetWare PSERVER mode. The print server uses this password to log on to the NetWare server or NDS tree. Click on this button to open the change password window. Type in the same password twice and click the Save to Device button to confirm the password entry. When a print server object is created in the file server, the password for the print server is set to Null (no password protection). The factory default password for the print server is also set to Null. When changing the password, both passwords in the print server and the file server need to be modified for the two servers to communicate properly. The print server password can be changed through this popup window, but PCONSOLE or NWADMIN needs to be executed to provide the proper password setting to the file server.

NetWare RPrinter Menu Tab

Figure 7-5 shows the menu and its fields, and Table 7-4 lists the fields of the NetWare RPrinter Menu Tab, describes the functions, and explains how to provide information in each field.

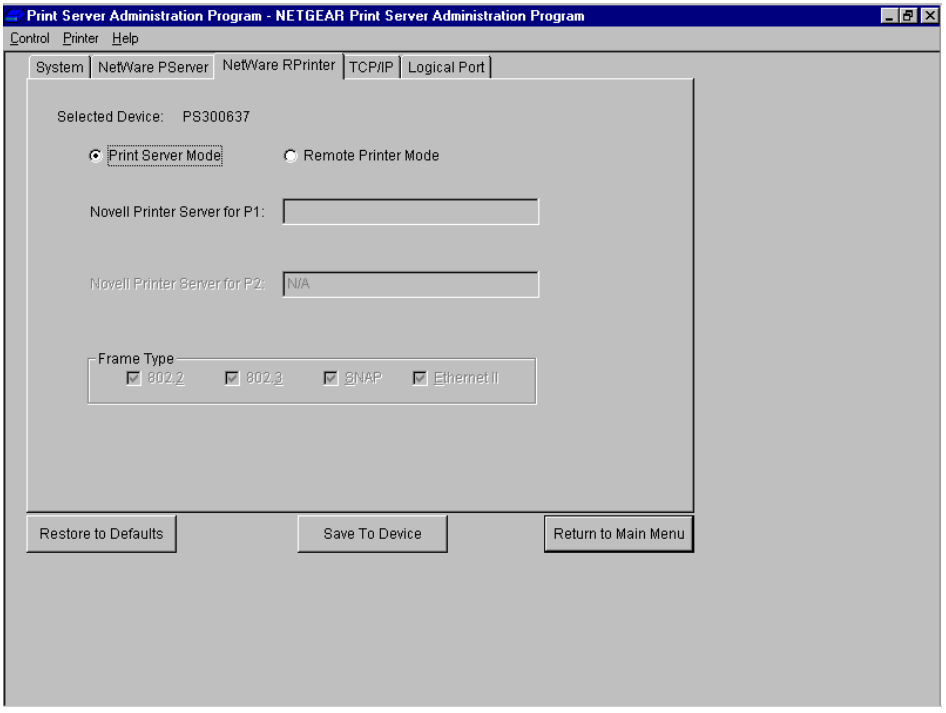


Figure 7-5. NetWare RPrinter Tab Window

Table 7-4. NetWare RPrinter Menu Tab Fields

Field	Description
Print Server Mode	Indicates if the print server is in NetWare PSERVER mode.
Remote Printer Mode	When selected, the print server operates in RPRINTER mode. If this button is not selected, you will not be able to modify the following RPRINTER parameters.
Novell Printer Server for P1	Enter the name of the NetWare print server to service the PRINTER 1 port of the print server.

Table 7-4. NetWare RPrinter Menu Tab Fields (continued)

Field	Description
Novell Printer Server for P2	Enter the name of the NetWare print server to service the PRINTER 2 port of the print server. If there is no PRINTER 2 port on the print server, this selection is not available and is shadowed out.
Frame Type	Select the frame types used by your network (Ethernet 802.2, Ethernet 802.3, Ethernet SNAP, and Ethernet II). By default, all four frame types are enabled.

TCP/IP Menu Tab

Figure 7-6 shows the menu and its fields, and Table 7-5 lists the fields, describes their functions, and explains how to provide information in each field. For further information about TCP/IP, refer to"Configuring the Print Server Using TCP/IP" in Chapter 3, "Microsoft Windows 95 and Windows 98 Printing."

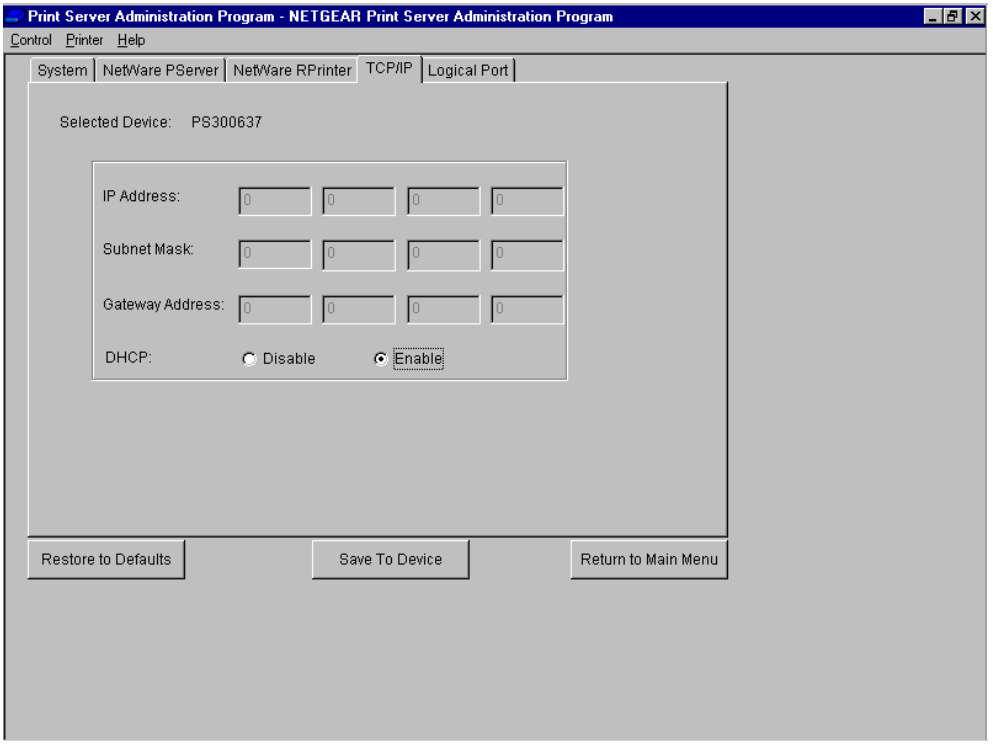


Figure 7-6. TCP/IP Menu Tab Window

Table 7-5. TCP/IP Menu Tab Fields

Field	Description
DHCP	This field allows you to enable or disable the print server's ability to get its IP address from a DHCP (Dynamic Host Configuration Protocol) server. When disabled, you can provide a fixed IP address in the following fields.
IP Address	This IP address is assigned to the print server. If you have a private LAN and do not plan to connect to the TCP/IP-based internet, NETGEAR recommends that you use the address from the IETP-designated private addresses (for example, 192.168.x.x or 10.x.x.x).
Subnet Mask	This subnet mask defines the range of addresses that are reachable on your local LAN.
Gateway Address	This IP address is what the print server uses for stations with IP addresses not reachable on your local LAN.

Logical Port Menu Tab

Figure 7-7 shows the Logical Port menu tab, and Table 7-6 lists the fields in the menu tab, describes their functions, and explains how to provide information in each field.

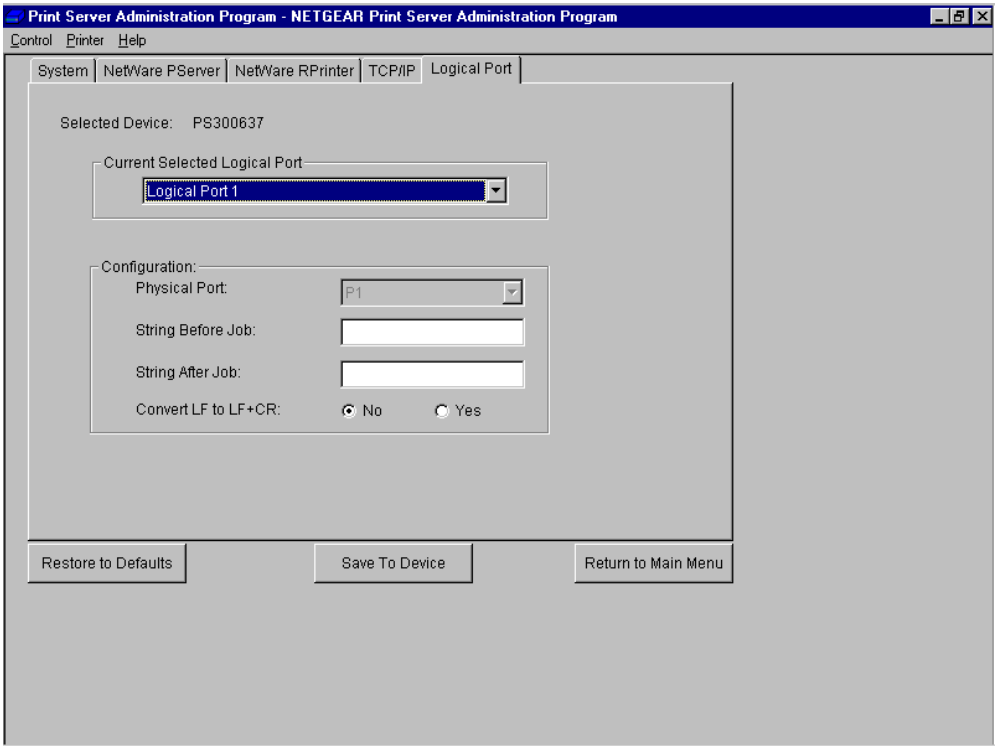


Figure 7-7. Logical Port Menu Tab Window

The fields of the Logical Port menu tab, describes the functions, and explains how to provide information in each field.

Table 7-6. Logical Port Menu Tab Fields

Field	Description
Current Selected Logical Port	Selects the logical port to be configured. Eight logical ports are available for print servers with two printer ports; three logical ports are available for one printer port print servers.
Physical Port	Selects which physical printer port the logical port is mapped into. Converts LF to LF+CRAdd a carriage return (CR) every time the line feed (LF) character code is received by the print server when any print data is sent to this logical port.
String Before Job	Provides the control character string to send to the printer before the first character of the job is sent to the printer. One example of such an application would be switching to landscape mode when printing to the logical port. The character string must be in hexadecimal format as in these examples: • ASCII = [Esc]&l0O Hexadecimal = 1B266C304F • ASCII = [Esc]&l1O Hexadecimal = 1B266C314F
String After Job	Provides the control character string to send to the printer after the last character of the job is sent to the printer. The character string must be in hexadecimal format as illustrated in the String Before Job example above.

Advanced Print Server Configuration Menu Bar

The Advanced Printer Server Configuration for FirstGear contains a menu bar that provides a number of options including Control, Printer, and Help, which are outlined in the following section.

Control Menu Bar Option

Control, the first item on the top menu bar is for print server control. Click on the Control selection, move the cursor down to select one of the menu selections and click again to carry out the intended action. Table 7-7 lists and describes the menu selections.

Table 7-7. Advanced Print Server Configuration Menu Bar Selections

Menu Selection	Description
Device Information	Select this option to pop up a scrolling window providing a status of the various parameters on the print server that can be customized. This information includes the various NetBEUI, NetWare, and TCP/IP parameters.
Reset Device	Issues a soft reset to reboot the print server. This process allows newly modified print server parameters to take effect.
Restore Default Configuration	Changes all print server parameters to their factory default values. If only partial restoration is intended, use the menu tab options for the different protocols and choose Set to Default from that particular screen.

Printer Menu Bar Options

Individual printer ports are displayed as options under the Printer Menu Bar, and a pop-up window opens when any of the printer ports are selected. The printer ports not existing on the print server are shadowed.

On the popup window, you can check the connection status of the print server such as on-line, off-line, paper jam, and out-of-paper. Also on display is the printing information indicating if the print server is sending data to the printer or if the printer is idling. At the bottom of the screen are four buttons as described in Table 7-8.

Table 7-8. Printer Menu Options

Field	Description
Configure	If the connected printer supports directional communication such as many of the new Hewlett-Packard LaserJet and DeskJet printers, you can click on this button to customize the various printing parameters of the printer. The pop-up window consists of a table with the following column headings: • Environment Variable The configuration variables available on this printer. The list of printer configuration variables vary from printer to printer. • Variable Value Displays the current setting. To change the Variable Value (if Read Only is NO) double-click the line you wish to change; then enter or select a new value. • Read Only Indicates whether or not the Environment Variable is modifiable.
Test page	Informs the print server to send a test page to the printer. The printout includes print server status information, which is useful when troubleshooting any printing problems.
Refresh	If you suspect that the printer status is not properly updated on the screen, click this button to generate packets to collect updated printer information.
Cancel	Close this pop-up window.

Configuring Using PSCONFIG

This section of the manual describes the MS-DOS-based print server configuration program, PSCONFIG. Prior to executing PSCONFIG, you must have the following software or drivers installed in the system:

- NetWare Link Support Layer, LSL.COM

  This program looks into the NET.CFG file for various network parameters such as packet type.

- DOS ODI driver for the network adapter card installed and the network adapter card connected to the network

  The network speed, duplex mode, and frame types settings for the network adapter card are all controlled within the *NET.CFG* file.

- NetWare IPX/SPX protocol, IPXODI.COM

  This program provides the IPX protocol support for the adapter card.

To start the PSCONFIG program, execute it from the *\DOS* directory of the *Model PS104/PS105/PS110/PS113 Print Server Resource CD*.

When the PSCONFIG program is executed, you see a list of the print servers on the attached network. The network number shown is the NetWare IPX network number that is valid only to NetWare networks. From the main screen, move the cursor up and down to select the print server you want to configure and then press [Enter]. A second popup window with the Available Options headline appears in the lower-right corner of the screen. The options available are outlined in the next section, "PSCONFIG Fields".

PSCONFIG Fields

Table 7-9 lists the PSCONFIG Program options available on the Available Options window.

Table 7-9. PSCONFIG Program Options

Field	Description
Change Configuration	Pops up another screen for more detailed configuration of the various protocol parameters.
Device Information	Select this option to pop up a scrolling window providing a status of the various parameters on the print server that can be customized. This information includes the various NetBEUI, NetWare, and TCP/IP parameters.

Table 7-9. PSCONFIG Program Options (continued)

Field	Description
Reset Device	Issues a soft reset to reboot the print server. This allows newly modified print server parameters to take effect.
Restore Default Configuration	Changes all print server parameters to their factory default values. If only partial restoration for a particular protocol is intended, use the menu tab options for the different protocols and choose Set to Default from that particular screen.
Printer Status	Checks the connection status of the different printer ports on the print server such as on-line, off-line, paper jam, and out-of-paper. Also on display is the printing information indicating if the print server is sending data to the printer or if the printer is idling.
Print Diagnostics Report	Sends a test page to the printer that is connected to one of the print server ports. The printout includes print server status information, which is useful in troubleshooting any printing problem.

Changing Configuration Menu Options

The selections available under the Change Configuration menu are:

- System Configuration
- NetWare Configuration
- TCP/IP Configuration
- NetBEUI Configuration
- Logical Printer Configuration
- Execute Change

Move the cursor up and down to select the chosen item, and press [Enter] to get to the individual configuring item. When all the changes are made, move the cursor to the last selection, Execute Change, and press [Enter] for the new parameters to be sent to the print server. After passing the new parameters to the print server, you must reset the print server for the new parameters to take effect. To do this, return to the original popup window and select the Reset Device menu item.

System Configuration

You use the System Configuration window to change the device name. Except for the IPX/SPX protocol that the PSCONFIG program uses to communicate with the print server, you can enable or disable the other protocols, TCP/IP or NetBEUI.

The print server supports multiple protocols but only one name is used for the print server, no matter what protocol is used. As a result, whatever name chosen affects the operation of the print server under different protocols. Therefore, NETGEAR recommends that the device name be determined for the whole network and not changed.

NetWare Print Server Mode

The NetWare Print Server Mode selection sets the NetWare server (Bindery mode) or tree (NetWare Directory Services mode) that the print server should service. It configures the printer to operate in either PSERVER mode or RPRINTER mode.

Table 7-10 lists the fields of the NetWare Print Server Mode, describes their functions, and explains how to provide information in each field.

Table 7-10. NetWare Print Server Mode Fields

Field	Description
Operation Mode	Configures the printer server to operate in either PSERVER mode (PS) or RPRINTER mode (RP).
Frame Ethernet_II	Enable or disable the print server to decode Ethernet II packets.
Frame Ethernet_802.2	Enable or disable the print server to decode Ethernet 802.2 packets.
Frame Ethernet_802.3	Enable or disable the print server to decode Ethernet 802.3 packets.
Frame Ethernet_SNAP	Enable or disable the print server to decode Ethernet SNAP packets.
Master File Server (Binary Mode Only)	When operating in Bindery mode, the print server logs on to a file server and services the queue set up on that particular server. Enter the name of the master file server of the print server. This entry field is valid only when the print server is operating in PSERVER mode.
Notification by Connection ID	Set to YES to receive a job notification at only the workstation where the print job originated. Set to NO to receive a job notification at all workstations that you have logged on. This entry field is valid only when the print server is operating in PSERVER mode.
Queue Polling Interval	Defines how often the print server will poll the queues to be serviced. The control unit is in seconds. This entry field is valid only when the print server is operating in PSERVER mode.
NDS Tree Name (NDS mode only)	This is the NDS tree that the NETGEAR print server logs on. The name must not exceed 19 characters or contain any space. This entry field is valid only when the printer server is operating in PSERVER mode.

Table 7-10. NetWare Print Server Mode Fields (continued)

Field	Description
NDS Context (NDS mode only)	Enter the Print Server NDS Context. The entry should contain the path to the context but not the context itself, and each OU should be separated by a period (for example, department.company). This entry field is valid only when the print server is operating in PSERVER mode.
Novell PSERVER (P1)	Enter the name of the NetWare print server to service the PRINTER 1 port of the print server (valid only when operating in RPRINTER mode).
Novell PSERVER (P2)	Enter the name of the NetWare print server to service the PRINTER 2 port of the print server (valid only when operating in RPRINTER mode).

TCP/IP Configuration

Table 7-11 lists the fields for TCP/IP configuration, describes their functions, and explains how to provide information in each field. For additional information about IP addressing, refer to Appendix B, "Understanding IP Addresses."

Table 7-11. TCP/IP Configuration Fields

Field	Description
DHCP	This field allows you to enable or disable the print server from getting its IP address from a DHCP (Dynamic Host Configuration Protocol) server. When disabled, you can provide a fixed IP address in the IP Address, Gateway Address, and Subnet Mask fields (listed in this table).
IP Address	This IP address is assigned to the print server. If you have a private LAN and do not plan to connect to the TCP/IP-based Internet, NETGEAR recommends that you use an address from the IETP-designated private addresses (for example, 192.168.x.x or 10.x.x.x).
Gateway Address	This IP address is what the print server uses for stations with IP addresses not reachable on your local LAN.
Subnet Mask	This subnet mask defines the range of addresses that are reachable on your local LAN.

NetBEUI Configuration

Table 7-12 lists the fields for NetBEUI configuration, describes their functions, and explains how to provide information in each field.

Table 7-12. NetBEUI Configuration Fields

Field	Description
Drop Job as Paper Out	Set to YES to terminate the current print job when a printing error is encountered. When set to NO (default), the print server tries to continue but may cause print errors. If any error occurs, try setting this value to YES.
Response Time (0.1 sec)	Sets how fast jobs are sent to the printer. The default value of zero (0) delay should be increased only if your printer cannot cope with no delay.

Logical Printer Configuration

For the print server with one printer port, there are three logical printers. For print server models with two printer ports, there are eight logical printers. You can define how each one of the logical printers will map into the physical port. The following table shows how the four parameters are related to each logical printer. The same entries are repeated for each logical printer.

Table 7-13 lists the fields of the Logical Printer configuration, describes the functions, and explains how to provide information in each field.

Table 7-13. Parameters and Definitions for Logical Printer Configuration

Field	Description
L1 Physical Port	Selects into which physical printer port the logical port L1 is mapped.
L1 String Before Job	Provides the control character string to send to the printer before the first character of the job is sent. One example of such an application would be switching to landscape mode when printing to the logical port. The character string must be in hexadecimal format as the example illustrates: • ASCII = [Esc]&l0O Hexadecimal = 1B266C304F • ASCII = [Esc]&l1O Hexadecimal = 1B266C314F
L1 String After Job	Provides the control character string to send to the printer after the last character of the job is sent to the printer. The character string must be in hexadecimal format as illustrated in the previous example included in this table.
L1 Convert LF to LF+CR	Add a carriage return (CR) every time the line feed (LF) character code is received by the print server when any print data is sent to this logical port.

Configuring Using QUICKSET

This section describes how to use the QUICKSET program to configure the Novell server and the print server. Use QUICKSET /? to display the help screen. You must have the following software and drivers loaded prior to executing the QUICKSET program:

- NetWare Link Support Layer, LSL.COM

  This program looks into the NET.CFG file for parameters.

- Network adapter card driver for the adapter card installed and connected to the network

  The network speed, duplex mode, and frame types are all controlled within the NET.CFG file.

- NetWare IPX/SPX protocol, IPXODI.COM

  This program provides the IPX support for the adapter card.

- NetWare shell, NETX.EXE, or NetWare virtual loadable module; VLM.EXE and its associated modules

NetWare Print Server (PSERVER) Mode

In the NetWare Print Server mode, QUICKSET uses these settings:

- Ethernet 802.2 frame type: Enable
- Ethernet 802.3 frame type: Enable
- Ethernet SNAP frame type: Enable
- Ethernet II frame type: Enable
- Polling NetWare Queues interval: 1 second
- Job Notification by Login Name
- Set the Master file server as the specified server (in Binary-based file server environment)
- Set the context name to the current context name (in NDS environment)
- Set the NDS tree name to the current NDS tree name (in NDS environment)
- Set NetWare Operation Mode: Print Server Mode
- Set the device name as specified in the parameter list
- Set the device password to NULL

In the Novell PSERVER mode, use these QUICKSET commands:

- For the Binary-based file server

  ```
  QUICKSET Name (/UN=P) (/Q1=W) (/Q2=X) (/FS=F)
  ```

- For NDS Network

  ```
  QUICKSET Name (/UN=P) (/Q1=W) (/Q2=X)
  ```

Table 7-14 lists the parameters and definitions for setting the QUICKSET Name in a Binary environment or an NDS environment.

Table 7-14. Parameters and Definitions for PSERVER Mode

Parameter	Definition
Name	The default name displayed on the bar code label on the bottom of the unit.
P	New name of the print server. Do not change it unless necessary.
W, X	W and X are the names of the queues to be serviced by parallel ports 1 to 2. P1 and P2 are the default queue names.
F	F is the name of the master file server of the device. When multiple file servers are serviced, this information is stored in the master file server.

QUICKSET creates a print server object, printer objects, and queue objects with the current context and current tree that the user logs on to. The printer names are set to dv_P1 and dv_P2, where dv is the default name of the print server and P1 and P2 indicate the port.

Examples of the commands are:

- In the Binary environment

  ```
  QUICKSET PS123456 /UN=Marketing /FS=Net311
  ```

  The print server PS123456 has been set up in NetWare PSERVER mode. The new name of the NETGEAR print server is Marketing, and it is attached to the master file server Net311.

- In the NDS environment

  ```
  QUICKSET PS123456 /UN=Marketing
  ```

  The print server PS123456 has been renamed Marketing and set up in NetWare PSERVER mode in the current NDS network.

NetWare Remote Printer (RPRINTER) Mode

In the NetWare RPRINTER mode, QUICKSET uses these settings:

- Ethernet 802.2 frame type

  Set to Enable

- Ethernet 802.3 frame type

  Set to Enable

- Ethernet SNAP frame type

  Set to Enable

- Ethernet II frame type: Enable
- Set attached NetWare Print Server as the specified server
- Set NetWare Operation Mode: Remote Printer Mode
- Set the print server name as specified in the parameter list

The QUICKSET program configures all of the printer ports on the printer to service the same NetWare print server. If you want to configure the printer ports to service different NetWare print servers, refer to "Attaching to More Than One NetWare Print Server" on page 5-21.

In the Novell RPRINTER mode, use these QUICKSET commands:

- For Binary-based file server

  ```
  QUICKSET Name R (UN=P) (/Q1=W) (/Q2=X) (/FS=F)
  ```

- For NDS Network

  ```
  QUICKSET Name R (/UN=P) (/Q1=W) (/Q2=X)
  ```

Table 7-15 lists the parameters and definitions for setting the QUICKSET Name in a Bindery environment or an NDS environment.

Table 7-15. Parameters and Definitions for RPRINTER Mode

Parameter	Definition
Name	The default NETGEAR print server name, as displayed on the bar code label on the bottom of the unit.
R	R is the name of the NetWare print server created on the file server to which the NETGEAR print server (in RPRINTER mode) will connect.
P	New name of the print server. Do not change it unless necessary.
W, X	W and X are the names of the queues to be serviced by parallel ports 1 to 2, respectively. If you do not enter W or X, then P1 and P2 are the default names of the queues for parallel ports 1 to 2, respectively.
F	F is the name of the file server that the NetWare print server R logs on to.

Examples of the commands are:

- In the Binary environment

  ```
  QUICKSET PS123456 PS1 /UN=Marketing /FS=Net311
  ```

  The print server PS123456 has been set up as a remote printer that is attached to the NetWare print server PS1 on the Net311 file server. The new name of the PS123456 print server (now in RPRINTER mode) is Marketing.

- In the NDS environment

  ```
  QUICKSET PS123456 PS1 /UN=Marketing
  ```

  The print server PS123456 has been set up as a remote printer that is attached to the NetWare print server S1. The new name of the PS123456 print server (now in RPRINTER mode) is Marketing.

Appendix A
Technical Specifications

This appendix provides technical specifications for the NETGEAR Model PS104 Print Server, Model PS105 Print Server, Model PS110 Print Server, and Model PS113 Print Server.

General Specifications

Network Protocol and Standards Compatibility

IEEE 802.3u, 100BASE-TX, Fast Ethernet
IEEE 802.3i 10BASE-T CSMA/CD
NetBEUI, IPX/SPX, and TCP/IP protocols

Data Rate

100 Mbps with 4B/5B encoding and MLT-3 physical interface
10 Mbps differential Manchester encoded

Interface

Model PS104 Print Server:	Four 10BASE-T network ports (RJ-45)
Model PS105 Print Server:	Four 10BASE-T network ports (RJ-45) and one BNC network port.
Model PS110 Print Server:	One 10BASE-T/100BASE-TX network port (RJ-45)
Model PS113 Print Server:	One 10BASE-T/100BASE-TX network port (RJ-45)

Power Specifications for the Power Adapter

Input voltage:	100 to 240 V AC, 50 to 60 Hz, according to the power adapter
Localized plug:	For North America, Japan, UK, Europe, and Australia
Output voltage:	12 V DC at 0.8-1.2 Amps, maximum

Power Specifications for the Print Server

Power consumption:	7 W maximum
Input voltage:	12 V DC at 0.8-1.2 Amps, maximum

Physical Specifications

Width:	7.4 in. (18.9 cm)
Height:	1.2 in. (2.1 cm)
Depth:	4.8 in. (12.2 cm)
Weight:	1.61 lb (0.73 kg)

Environmental Specifications

Operating temperature:	0° to 40° C (32° to 104° F)
Operating humidity:	90% maximum relative humidity, noncondensing

Electromagnetic Emissions

Meets requirements of:	CE mark, commercial
	FCC Part 15, Class B
	EN 55 022 (CISPR 22), Class B
	VCCI Class B ITE

Safety Agency Approvals, Power Adapter

Meets requirements of:	CE mark, commercial
	UL listed (UL 1950)
	CSA certified (CSA 22.2 #950)
	TUV licensed (EN 60 950)
	T-Mark

Appendix B
Understanding IP Addresses

This appendix provides information about understanding IP addresses, which you must assign to the NETGEAR Model PS104/PS105/PS110/PS113 print server when operating in a TCP/IP environment.

IP Addresses and the Internet

Because TCP/IP networks are interconnected widely across the world, every machine on the Internet must have a unique address to make sure that transmitted data reaches the correct destination. Blocks of addresses are assigned to organizations by the Internet Assigned Numbers Authority (IANA). Individual users and small organizations may obtain their addresses either from the IANA or from an Internet service provider (ISP).

The Internet Protocol (IP) uses a 32-bit address structure. The address is usually written in dot notation (also called dotted-decimal notation), in which each group of eight bits is written in decimal form, separated by decimal points. For example, the binary address:

```
11000011  00100010  00001100  00000111
```

is normally written as:

```
195.34.12.7
```

which is easier to remember and easier to enter into your computer.

In addition, the 32 bits of the address are subdivided into two parts. The first part of the address identifies the network, and the second part identifies the host node or station on the network. The dividing point may vary depending on the address range and the application.

There are five standard classes of IP addresses. These address classes have different ways of determining the network and host sections of the address, allowing for different numbers of hosts on a network. Each address type begins with a unique bit pattern, which is used by the TCP/IP software to identify the address class. After the address class has been determined, the software can correctly identify the host section of the address. The three main address classes are illustrated in Figure B-1, which shows the network and host sections of the address for each address type.

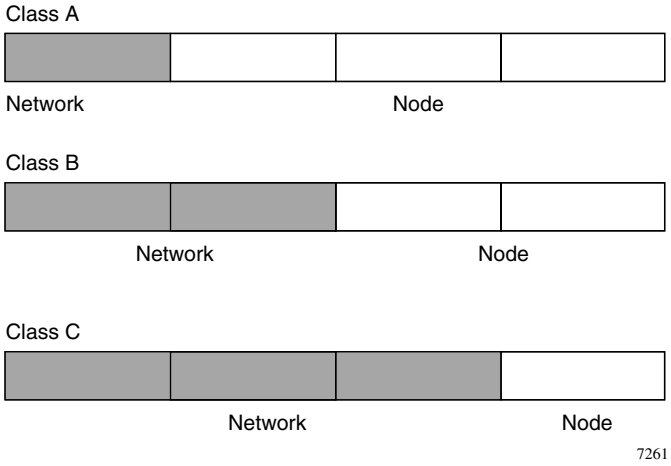


Figure B-1. Three Main Address Classes

Class A addresses can have up to 16,777,214 hosts on a single network. They use an 8-bit network number and a 24-bit node number. Class A addresses are in this range:

```
1.x.x.x to 126.x.x.x.
```

Class B addresses can have up to 65,354 hosts on a network. Class B addresses use a 16-bit network number and a 16-bit node number. Class B addresses are in this range:

```
128.1.x.x to 191.254.x.x.
```

Class C addresses can have 254 hosts on a network. Class C addresses use 24 bits for the network address and 8 bits for the node. They are in this range:

```
192.0.1.x to 223.255.254.x.
```

Class D addresses are used for multicasts (messages sent to many hosts). Class D addresses are in this range:

```
224.0.0.0 to 239.255.255.255.
```

Class E addresses are for experimental use.

This addressing structure allows IP to uniquely identify each physical network and each node on each physical network.

For each unique value of the network portion of the address, the base address of the range (host address of all zeros) is known as the network address and is not usually assigned to a host. Also, the top address of the range (host address of all ones) is not assigned but is used as the broadcast address for sending a packet simultaneously to all hosts with the same network address.

Netmask

In each of the above address classes, the size of the two parts (network address and host address) is implied by the class. This partitioning scheme can also be expressed by a netmask associated with the IP address. A netmask is a 32-bit quantity that, when logically ANDed with an IP address, yields the network address. For instance, the netmasks for Class A, B, and C addresses are 255.0.0.0, 255.255.0.0, and 255.255.255.0, respectively.

For example, the address 192.168.170.237 is a Class C IP address whose network portion is the upper 24 bits. When ANDed with the Class C netmask, as shown here, only the network portion of the address remains:

```
11000000  10101000  10101010  11101101 (192.168.170.237)
```

ANDed with:

```
11111111  11111111  11111111  00000000 (255.255.255.0)
```

Equals:

```
11000000  10101000  10101010  00000000 (192.168.170.0)
```

As a shorter alternative to dotted-decimal notation, the netmask may also be expressed in terms of the number of ones from the left. This number is appended to the IP address, following a backward slash (/), as “/n.” In the example, the address could be written as 192.168.170.237/24, indicating that the netmask is 24 ones followed by 8 zeros.

Subnet Addressing

By looking at the addressing structures, you can see that even with a Class C address there are a large number of hosts per network. Such a structure is an inefficient use of addresses if each end of a routed link requires a different network number. It is unlikely that the smaller office LANs would have that many devices. You can resolve this problem by using a technique known as subnet addressing.

Subnet addressing allows us to split one IP network address into smaller multiple physical networks known as subnetworks. Some of the node numbers are used as a subnet number instead. A Class B address gives us 16 bits of node numbers translating to 64,000 nodes. Most organizations do not use 64,000 nodes, so there are free bits that can be reassigned. Subnet addressing makes use of those bits that are free, as illustrated in Figure B-2.

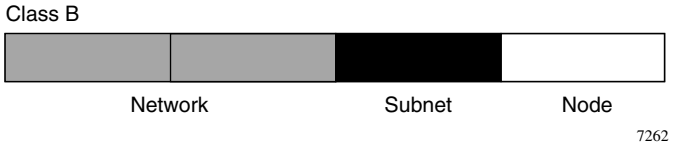


Figure B-2. Example of Subnetting a Class B Address

A Class B address can be effectively translated into multiple Class C addresses. For example, the IP address of 172.16.0.0 is assigned, but node addresses are limited to 255 maximum, allowing 8 extra bits to use as a subnet address. The IP address of 172.16.97.235 would be interpreted as IP network address 172.16, subnet number 97, and node number 235. In addition to extending the number of addresses available, subnet addressing provides other benefits. Subnet addressing allows a network manager to construct an address scheme for the network by using different subnets for other geographical locations in the network or for other departments in the organization.

Although the preceding example uses the entire third octet for a subnet address, note that you are not restricted to octet boundaries in subnetting. To create more network numbers, you need only shift some bits from the host address to the network address. For instance, to partition a Class C network number (192.68.135.0) into two, you shift 1 bit from the host address to the network address. The new netmask (or subnet mask) is 255.255.255.128. The first subnet has network number 192.68.135.0 with hosts 192.68.135.1 to 129.68.135.126, and the second subnet has network number 192.68.135.128 with hosts 192.68.135.129 to 192.68.135.254.

Note: The number 192.68.135.127 is not assigned because it is the broadcast address of the first subnet. And 192.68.135.128 is not assigned because it is the network address of the second subnet.

Table B-1 lists the additional subnet mask bits in dotted-decimal notation. To use the table, write down the original class netmask and replace the 0 value octets with the dotted-decimal value of the additional subnet bits. For instance, to partition your Class C network 204.247.203.0 with subnet mask 255.255.255.0 into 16 subnets (4 bits), the new subnet mask becomes 255.255.255.240.

Table B-1. Netmask Notation Translation Table for One Octet

Number of Bits	Dotted-Decimal Value
1	128
2	192
3	224
4	240
5	248
6	252
7	254
8	255

Table B-2 displays several common netmask values in both the dotted-decimal and the masklength formats.

Table B-2. Netmask Formats

Dotted-Decimal	Masklength
255.0.0.0	/8
255.255.0.0	/16
255.255.255.0	/24

Table B-2. Netmask Formats (continued)

255.255.255.128	/25
255.255.255.192	/26
255.255.255.224	/27
255.255.255.240	/28
255.255.255.248	/29
255.255.255.252	/30
255.255.255.254	/31
255.255.255.254	/32

NETGEAR strongly advises that all hosts on a LAN segment use the same netmask for the following reasons:

- So that hosts recognize local IP broadcast packets

  When a device broadcasts to its segment neighbors, it uses a destination address of the local network address with all ones for the host address. In order for this scheme to work, all devices on the segment must agree on which bits comprise the host address.

- So that a local router or bridge will know which addresses are local and which are remote

Private IP Addresses

If your networks are isolated from the Internet (for example, only between your two branch offices), you can assign any IP addresses to the hosts without problems. However, the IANA has reserved the following three blocks of IP addresses specifically for private networks:

```
10.0.0.0 - 10.255.255.255
172.16.0.0 - 172.31.255.255
192.168.0.0 - 192.168.255.255
```

NETGEAR recommends that you choose your private network number from this list.

Regardless of your particular situation, do not create an arbitrary IP address; always follow the guidelines explained here. For more information about address assignment, refer to RFC 1597, *Address Allocation for Private Internets,* and RFC 1466, *Guidelines for Management of IP Address Space*.

Address Resolution Protocol

An IP address alone cannot be used to deliver data from one device to another on a LAN. In order for data to be sent from one device on the LAN to another, you must convert the IP address of the destination device to its media access control (MAC) address. Each device on an Ethernet network has a unique Ethernet MAC address, which is a 48-bit number assigned to each device by the manufacturer. The technique that associates the IP address with a MAC address is known as address resolution, and IP uses the Address Resolution Protocol (ARP) to do this.

If a device needs to send data to another station on the network and it does not already have the destination MAC address recorded, ARP is used. An ARP request is broadcast onto the network, and all stations receive and read the request. The destination IP address for the chosen station is included as part of the message so that only the station with this IP address responds to the ARP request and all other nodes discard it.

The node with the right IP address responds with its own MAC address directly to the sender, providing the transmitting station with the destination MAC address needed for it to send the data. The IP address data and MAC address data for each node are held in an ARP table, so that the next time data needs to be sent, the address can be obtained from the address information in the table.

IP Configuration by DHCP

When an IP-based local area network is installed, each workstation must be configured with an IP address. If the workstations need to access the Internet, they should also be configured with a gateway address and one or more DNS server addresses. As an alternative to manual configuration, there is a method by which each device on the network can obtain this configuration information automatically. A device on the network may act as a Dynamic Host Configuration Protocol (DHCP) server. The DHCP server stores a list or pool of IP addresses, along with other information (such as gateway and DNS addresses) that it may assign to the other devices on the network. The NETGEAR Model RT328/RH348 router has the capacity to act as a DHCP server.

Appendix C
CONFIG File

This appendix provides information for editing a *CONFIG* file. *CONFIG* files are stored in the flash EEPROM of the NETGEAR Model PS104/PS105/PS110/PS113 print server and used for configuring the device using the FTP method. For more information about using the *CONFIG* file and to see an example of FTP commands, refer to "Configuring Your Print Server Using FTP" on page 6-7. Only the parameters related to TCP/IP operation of the print server are listed. For modification of the various NetWare IPX/SPX and NetBEUI settings, NETGEAR recommends that you use the included FirstGear Print Server Administration Program or the PSCONFIG program.

CONFIG File TCP/IP Settings

When modifying the *CONFIG* file, use the configuration settings outlined in Table C-1.

Table C-1. Configuration Settings

Parameter and Command	Definition
Device Name **(0001 BOX_NAME)**	The default name of the print server is PSxxxxxx (PS followed by 6 numbers). You can change this, but the new name must not exceed 19 characters and must not include any spaces.
TCP/IP Protocol **(0012 TCPIP_P)**	Enables or disables reception or transmission of TCP/IP packets.
IP Address **(4000 IP_ADDR)**	This is the IP address for your print server. For more information about IP addressing, refer to Appendix B, "Understanding IP Addresses."
Device IP Address **(4001 GATEWAY)**	If your network segment has a router, enter the router address here. If there is no router, leave the address as 0.0.0.0.

Table C-1. Configuration Settings (continued)

Parameter and Command	Definition
Subnet Mask **(4002 MASK)**	If the Gateway Address is 0.0.0.0, leave the Subnet Mask at 0.0.0.0. If you have a router, enter the Subnet mask for the segment to which the print server is attached.
TCP Session Retry Interval **(4010 TCP_INT)**	Sets how long the print server should wait before retrying a TCP/IP connection that is lost. Allowable values are from 0 to 255 seconds, with 2 as the default.
Retry Count **(4011 TCP_CNT)**	Sets how many attempts for reconnection will be made. After attempting the set number, the TCP/IP session is terminated. Allowable values are from 0 to 255, with 254 as the default.
L1 Logical Printer Mapping **(0100 L1_PROUT)**	The physical port that this L1 logical printer maps to.
String Before Job for L1 Logical Printer **(0101 L1_PREST)**	The L1 logical printer control string (in hex) to be sent to the printer before each print job. Note: A printer control string is limited to 15 characters. Examples are: • ASCII = [Esc]&l0O Hexadecimal = 1B266C304F • ASCII = [Esc]&l1O Hexadecimal = 1B266C314F
String After Job **(0102 L1_POSTR)**	The L1 logical printer control string (in hex) to be sent to the printer after each print job. Note: A printer control string is limited to 15 characters. Examples are: • ASCII = [Esc]&l0O Hexadecimal = 1B266C304F • ASCII = [Esc]&l1O Hexadecimal = 1B266C314F
Convert LF to CR+LF **(0103 L1_CHGLF)**	If On, LF (line feed) characters are changed to CR+LF (carriage return + line feed). If off, no conversion is done.

Each Model PS104 and Model PS105 Print Server has one parallel port and supports three logical printers. Each Model PS110 and Model PS113 Print Server, with two and three parallel ports respectively, supports eight logical printers. You cannot change the names. Each logical printer has four settings as shown in Table C-1.

Refer to Table C-2 for the line numbers of the logical printers in the *CONFIG* file.

Table C-2. *CONFIG* File Line Numbers

Logical Printer	Line Numbers
L1	0100 to 0103
L2	0120 to 0123
L3	0140 to 0143
L4	0160 to 0163
L5	0180 to 0183
L6	0200 to 0203
L7	0220 to 0223
L8	0240 to 0243

Appendix D
Using NetWare 5 NDPS

This appendix provides an overview of using the Print Server with NDPS (Novell Distributed Printing Services) under Novel NetWare 5.0.

Overview

The NETGEAR print server must be configured as a valid device on your TCP/IP network. To use NDPS (Novell Distributed Printing Services), the Novell server must be running Novell NetWare 5, and the PCs (clients) must be running IntranetWare Client 2.0 or later.

The following procedure is designed to enable Public Access Printing under NDPS. Public Access Printing allows anybody on the network to access the printer. The procedure has three parts:

- Create an NDPS Manager Object on the server.
- Create an NDPS Printer Agent on the server.
- Configure each workstation requiring access to the NDPS printers.

Creating an NDPS Manager Object

To create an NDPS manager object:

1. **Log in to NetWare 5.0 Server as Admin and start the NetWare Administrator program Nwadmn32.exe.**
2. **Select the container on NetWare Administrator where you want the NDPS Manager object to reside (for example, TeSupp).**
3. **Select Create - Object from the menu bar to view the New Object dialog.**

4. **Select NDPS Manager as the object to create. The Create NDPS Manager Object window, as illustrated in Figure D-1, opens.**

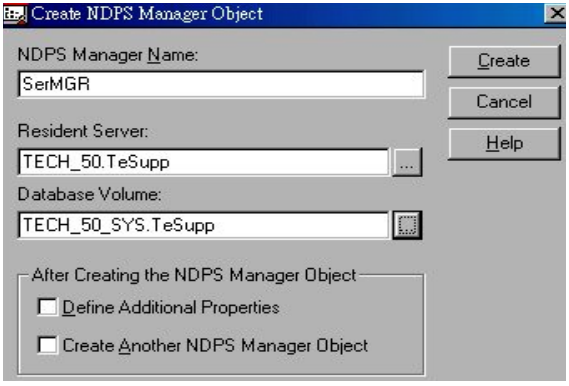


Figure D-1. Create NDPS Manager Object Window

5. **Type a name in the NDPS Manager Name.**
6. **Browse the Resident Server and select where you want the NDPS Manager object to be assigned.**
7. **Browse the Database Volume and select where you want the NDPS Manager database to be assigned.**
8. **Click on Create.**

   The new NDPS Manager is displayed in the main browser window.

To start the NDPS Manager in future, enter the following command at the console:

```
LOAD NDPSM
```

Then select the NDPS Manager object.

To start the NDPS Manager whenever you bring up the server, add a command like the following to your server's AUTOEXEC.NCF file:

```
LOAD NDPSM SerMGR.TeSupp
```

The last item is the name of the NDPS Manager object you want to load.

After creating an NDPS Manager, you can create NDPS printers by using NetWare Administrator, which is explained in the following section.

Creating an NDPS Printer Agent

To create Public Access Printers using the NDPS Manager Object in NetWare Administrator, follow these instructions. You will need to repeat the procedure for any other ports on the print server or for any other logical printers you want to use.

To create an NDPS printer agent:

1. **Start the NDPS Manager object you will be using to control the Printer Agent.**
2. **At the Identification page, click on the Printer Agent List.**
3. **Click on New to see the Create Printer Agent window, as illustrated in Figure D-2.**

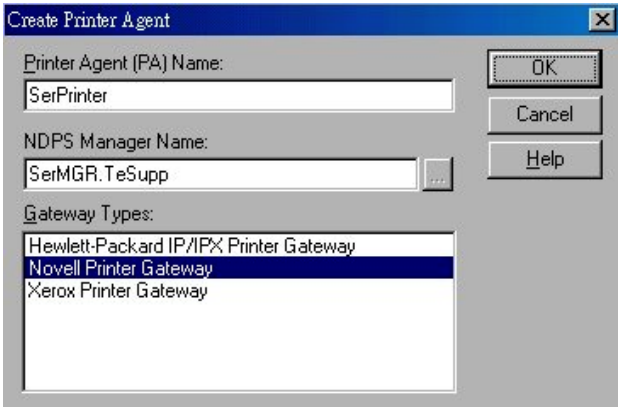


Figure D-2. Create Printer Agent Window

4. **Enter the name you want for the Printer Agent (PA) Name.**

   The NDPS Manager will be the NDPS Manager object you are using.
5. **Select Novell Printer Gateway In the Gateway Type.**
6. **Click on OK, and then select the available printer.**
7. **Select Remote (LPR on IP) in the Connection Type.**
8. **Click on Next to view the Configure Port Handler Screen.**

9. **In the Host Address IP field, enter the IP address previously assigned to the Print Server device, as illustrated in Figure D-3.**

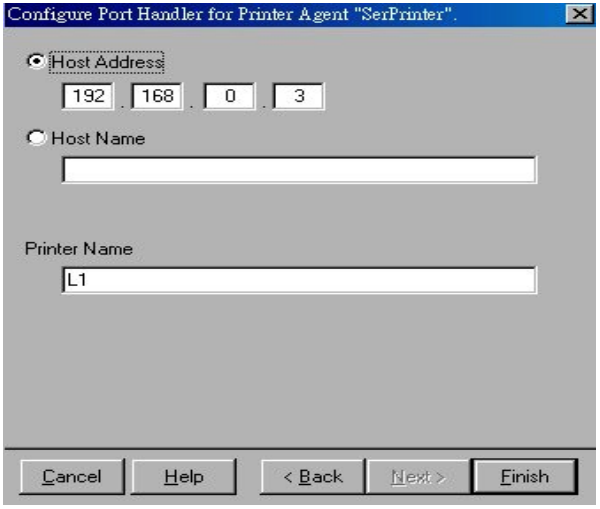


Figure D-3. Configure Port Handler Window

10. **In the Printer Name field, enter the Logical Port name on the Print Server (for example, L1).**

	Note: For print servers with one parallel port, the logical ports are named L1, L2, and L3. For devices with two or three parallel ports, the logical ports are named L1 to L8.

11. **Click Finish; then select appropriate drivers for Windows 95, Windows 98, Windows NT 4, and Windows 2000.**

The new printer agent will now appear in the Printer Agent List window.

Workstation Configuration

Before installation and configuration of the Public Access Printers on your workstation, ensure that the following statements apply:

- Novell IntranetWare Client v2.2 (or later) is installed on your PC.
- You have access to the Novell Printer Manager utility (Nwpmw32.exe).

Installing and Configuring the Public Access Printers

To install and configure public access printers:

1. **Start the Novell Printer Manager utility.**
2. **Select Printer>New from the menu, and click on Add.**
3. **Select the required printer and click on Install.**
4. **Click on Close.**

   The printer appears in the main Printer Manager window under the Name listing and is now available for print jobs. Printer drivers are automatically downloaded from the server as required.

The printer is now in your Windows printer list and may be used by any Windows application.

Appendix E
IP Setup

This appendix provides a brief overview of IP addressing.

Overview

This appendix is intended only when the user has inadvertently disabled the DHCP protocol and/or assigned a wrong subnet IP address. Refer to Table E-1 to assign a static IP address.

Table E-1 describes each setting.

Table E-1. IP Configuration Settings

Setting	Recommended Value
Device Name	Shown on a sticker on the base of the device in the form "PSxxxxxx."
Device IP Address	192.168.0.1
Gateway IP Address	0.0.0.0
Subnet Mask	0.0.0.0.

Clicking on Reset will set all values back to zero, and clicking on OK sets the data entered.

Ensure that the IP address assigned to the device is not already in use.

Figure E-1 illustrates the NETGEAR Print Server IP Address Configuration window.

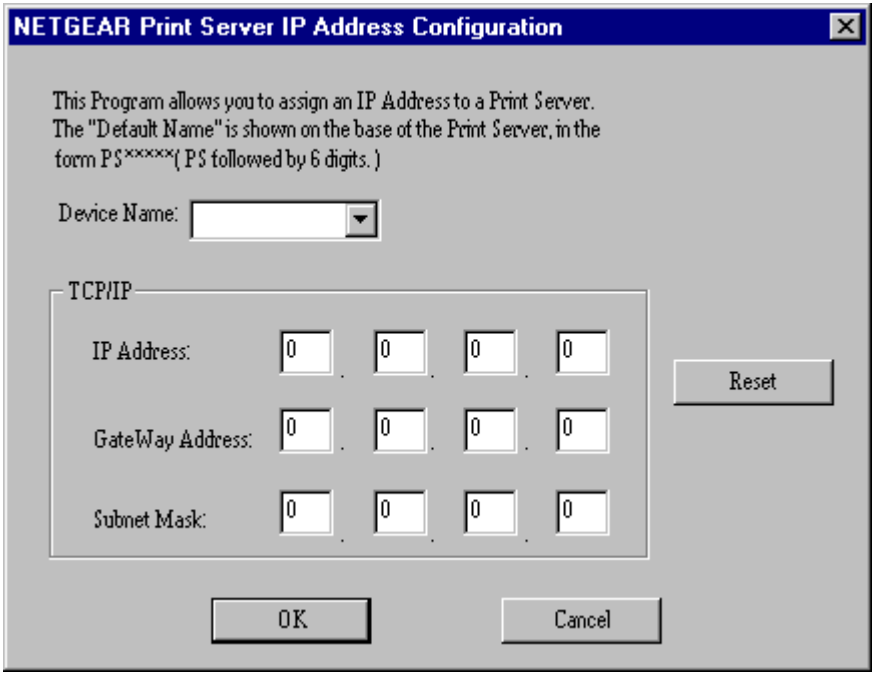


Figure E-1. NETGEAR Print Server IP Address Configuration

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