Multiprotocol Print Server 1-Port
Multiprotocol Print Server 3-Port
Ethernet IPDS Print Server
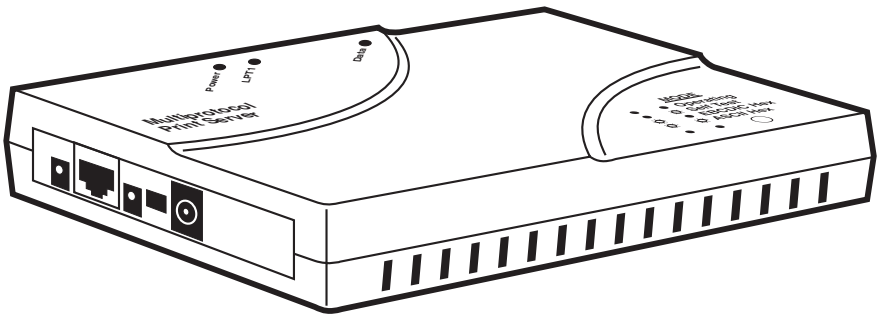
**FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

TRADEMARKS

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CONTENTS

Getting Started Guide

Follow these simple steps to get your Print Server up and running in minutes.

Before you begin, locate these parts:

- One of the Print Servers

- This users' manual

- PrintControl™ diskette

CAUTION

The Print Server is sensitive to static. Make sure you do not damage the print server with static electricity. Touch something metal first and stand on an anti-static work surface when installing the Print Server.

Hardware Installation

After you have successfully completed a printer self-test (check your printer's users' guide), power OFF the printer, and then follow these instructions:

1. Attach the LAN cable to the appropriate Print Server connector. When the Print Server is powered up, it will automatically sense which cable type is attached. The supported cable types are:

- Thin Ethernet (10BASE2, BNC connector) (PC425A only)

- Twisted Pair (10BASE-T or 100BASE-T, RJ-45 connector) (PC420A, PC425A, or PC430A)

NOTE

Do not attach more than <u>one</u> network cable at a time. Also, do not change the network connector while the Print Server is powered ON. For more detailed installation instructions, see Chapters 2 and 3.
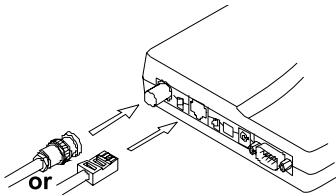
2. Attach the printer cable(s).
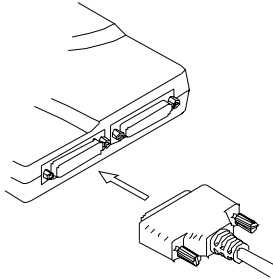
3. Power ON the printer.

4. Attach the power supply to the Print Server. A self-test page will print on the printer attached to the Print Server's LPT1 port.
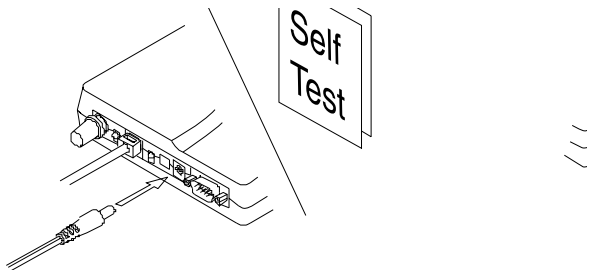
PrintControl Installation

Before you begin, make sure your PC is running Windows®, is attached to the same LAN segment as the Print Server, and has at least 2 MB of disk space available. Also, the PC must be able to communicate with other network devices via TCP/IP or IPX™/SPX.

1. Insert the floppy disk or CD containing the PrintControl utility into your PC's CD-ROM or floppy drive.

2. If you are installing PrintControl on a Windows 3.x or Windows NT 3.x PC, click **File** in the Program Manager, then select **Run**.

   If you are installing PrintControl on a Windows 95/98 or Windows NT 4.x PC, and the Autorun feature has been disabled, click **Start**, then select **Run**. Otherwise, the PC will automatically load the startup menu (then skip ahead to step 4 below).

3. Type **d:\autorun** (**d:** is your CD-ROM) then press **Enter**.

4. Follow the instructions that appear on your computer screen during the installation process.

Configure the Print Server

1. Start the PrintControl utility by double-clicking on the PrintControl icon. The utility will automatically scan the local network for Black Box Print Servers and display them on your PC screen.

2. Select one of the listed print servers and click on the **Configure** button displayed in the tool bar.
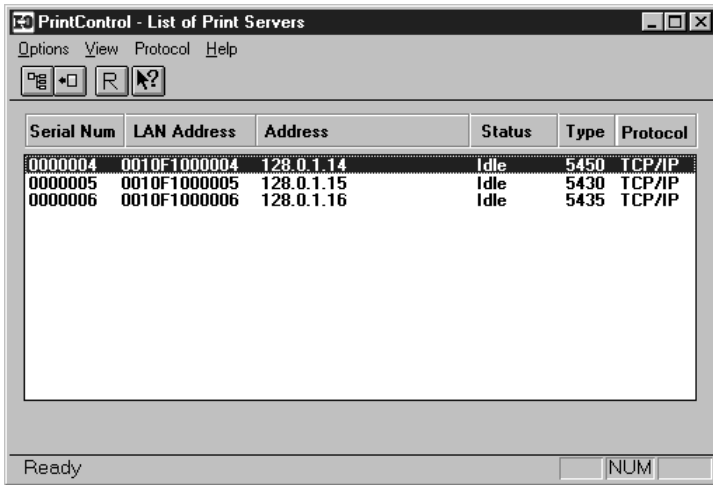
3. Select and configure the desired network protocols and IBM® printer emulation parameters. For SCS printing from an AS/400®, use TN5250e.

4. To configure TN5250e printing from an AS/400:

   a. Check the box adjacent to the **TCP/IP** button. Enter the TCP/IP address, and if needed, the router and subnet mask.

   b. Check the box adjacent to the **TN5250e** button. Enter the address and printer name(s) of the AS/400 TCP/IP.

   c. Click on the **Printer Ports/Emulations** button to configure the printer driver and other settings.

   d. Click on the **Apply Changes** button when done.

Additional Configurations for the Print Server

If you need more instructions for AS/400 printing, refer to the following chapters in this manual.

To Configure AS/400 Printing Using:	Refer to Chapter(s):
TN5250e	4 and 8
IPDS	4 and 9
SNA (APPC)	7
AnyNet	4 and 8
LPR/LPD	4 and 8

1. Specifications

1.1 Multiprotocol Print Servers

LAN (ASCII) Hosts Supported—Novell (NDS, Bindery, PSERVER, RPRINTER), Windows 95/98, Windows NT®, Windows for Workgroups, OS/2, OS/2 Warp, UNIX

Memory—Flash ROM

Printer Drivers Supported—For EBCDIC/ASCII Conversion: HP® PCL®, IBM Proprinter®, PPDS, Epson® ESC/P2, FX, LQ, Generic

Printer Emulation—IBM 3212-1 (SCS), 4214, 5224/25/26

Protocols—AS/400 printing: TCP/IP (TN5250e), TCP/IP (LPR/LPD), SNA, AnyNet; LAN (ASCII) printing: TCP/IP (LPR/LPD), IPX®/SPX, NetBIOS, TCP/IP Windows Peer-to-Peer

Connectors—Network: (1) 10BASE2 BNC; (1) 10/100BASE-T RJ-45; Printer: PC420A: (1) IEEE 1284 bidirectional Centronics® parallel, (1) RS-232 serial DB9, DTE

Indicators—LEDs: All: Power, LPT1, COM1, Mode, Network Data, Link, Activity; PC425A: Also has LPT2

Power—115 to 230 VAC, 60/50 Hz, external

Size—1.3"H x 7.4"W x 5.3"D (3.3 x 18.8 x 13.5 cm)

Weight—1.6 lb. (0.7 kg)

1.2 Ethernet IPDS Print Server

Ethernet Connections Supported—10BASE-T and 100BASE-TX (autosensing)

Operating Systems Supported—Novell (NDS, NetWare® Bindery), OS/2, OS/2 Warp, UNIX, Windows 95/98, Windows NT, Windows for Workgroups

Printer Ports—(1) Bidirectional Centronics® parallel

Printers Supported—Any PCL 5e printer

Printing Protocols—AS/400: AnyNet (SNA over TCP/IP), SNA (APPC), TCP/IP (TN5250e, LPR/LPD); LAN (ASCII): IPX™/SPX, NetBIOS, PSERVER, RPRINTER, TCP/IP (LPR/LPD), Windows 95/98 Peer-to-Peer

Twinax Emulation—IPDS: IBM 4028 AS1, 3812-2/3816-1D/S; SCS: IBM 3812-1

Size—1.3"H x 7.8"W x 5.5"D (3.3 x 19.8 x 14 cm)

Weight—1.6 lb. (0.7 kg)

2. Introduction

2.1 About the Print Server

The Multiprotocol Print Server combines the functionality of a 10/100-Mbps Ethernet print server with reliable, full-function AS/400 to LAN printing. Single- and three-port models are available. The Ethernet IPDS Print Server enables AS/400 AFP printing over a LAN using TCP/IP. All three print servers support Windows NT, 95, 98, Novell, OS/2, and UNIX operating systems.

2.2 What the Package Includes

- Multiprotocol 1-Port or 3-Port Print Server, or Ethernet IPDS Print Server

- This users' manual

- PrintControl™ Installation Diskette

- TCP/IP DirectPort™ Installation Diskette

- Power Supply

  Keep the original packaging in case you need to move or ship the interface.

2.3 Print Server Connectors and LEDs
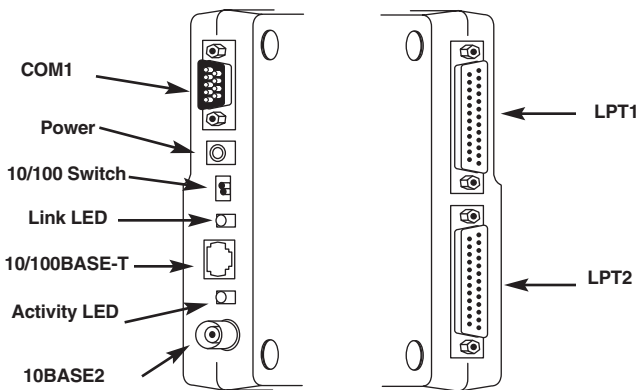
Figure 2-1. Print Server Connectors and LEDs.

An explanation of each connector, switch, and LED follows.

NOTE

The number of connectors, switches, and LEDs will vary depending on the model. For example, the 3-Port Multiprotocol Print Server will have all the connectors, switches and LEDs shown in Figure 2-1, but the 1-Port Multiprotocol Printer Server does not have the 10BASE2, LPT2, or COM1 connectors and respective LEDs.

2.3.1 LED INDICATORS

NOTE

Some of these LED indicators are on the top of the Print Server, and others are located on the side of the Print Server. They may not be pictured in Figure 2-1.

- **Power**—This green LED will be ON, indicating that the Print Server has successfully completed its internal self-tests and is READY. If this light blinks slowly, the Print Server is not in operating mode (for example, during Flash Upgrade). A rapidly blinking light indicates a problem with the Print Server (for example, failed self-test, or faulty power supply).

- **LPT1**—This green LED will be ON, indicating that the printer attached to the interface's LPT1 port is READY. It will blink slowly while the attached printer is printing. It is OFF if no printer is attached or if the attached printer is NOT READY (for example, paper jam, toner low, or no communication).

- **LPT2**—See the LPT1 description. (Available only on the 3-Port Multiprotocol Print Server.)

- **COM1**—See the LPT1 description. (Available only on the 3-Port Multiprotocol Print Server.)

- **Mode**—These two orange LEDs are associated with the mode button and indicate which Print Server function is currently active. You can turn the test LEDs ON and OFF through the mode button. Functions are Self-Test, EBCDIC Hex Dump, ASCII Hex Dump, and Restore Factory Defaults. For more information, refer to **Chapter 10, Troubleshooting**.

- **Network Data**—This green LED will be ON when the Print Server receives network data. This light may seem to be blinking at times since the Print Server receives many small data packets in the form of status requests or other inquiries by servers in the network.

- **Link**—This green LED (located on the side of the print server) indicates that the Print Server has established communication with an Ethernet hub and has verified link integrity.

- **Activity**—This green LED (located on the side of the print server) indicates that the Print Server is detecting signals on the network.

2.3.2 CONNECTOR/SWITCH DESCRIPTIONS

- **Power**—This connector is used for the 5-VDC 2.5A power supply shipped with the Print Server.

- **10/100 Switch**—Only use this switch when the auto-sensing 10/100BASE-T connector does not function properly. The possible settings are shown below. Moving the switches toward the bottom of the Print Server will place them in the DOWN position.

Setting	Switch 1	Switch 2
Auto-sensing (default)	UP	UP
100BASE-T Only	DOWN	UP
10BASE-T Only	DOWN	DOWN

- **10/100BASE-T**—Use this connector to attach a 10BASE-T or 100BASE-T cable.

- **10BASE2**—Use this connector to attach a 10BASE2 (coax) cable. (Available only on the 3-Port Multiprotocol Print Server.)

- **LPT1**—Use this IEEE 1284 compliant parallel port to attach a parallel printer via a standard Centronics connector.

- **LPT2**—See the LPT1 description. (Available only on the 3-Port Multiprotocol Print Server.)

- **COM1**—Use this RS-232 serial port (DB9 connector) to attach a serial printer. (Available only on the 3-Port Multiprotocol Print Server.)

2.4 Network Connectivity

The Print Server acts as a node in the local area network with its own unique network address. It receives data from across the network in packets and converts the packets to a format that serial or parallel printers can recognize.

2.5 Multiprotocol LAN Printing

When printing from ASCII hosts (PC, UNIX) the Print Server supports the following protocols:

- TCP/IP—Used by UNIX, NetWare, Windows NT, OS/2.

- IPX/SPX—Used by NetWare.

- NetBIOS—Used by Windows 3.x, Windows for Workgroups, Windows NT, OS/2.

2.6 Multi-Host Printing

The Print Server can support printing from several different types of hosts at the same time. This expands the capability of a printer attached to a Print Server, yet still provides the benefits of a dedicated host-printer relationship.

For example, in LAN printing, you may have UNIX systems, Windows, and PCs running OS/2, all using various combinations of NetWare and TCP/IP. All systems can send their printed data to a single Print Server.

The Print Server can support up to 10 different AS/400 hosts for each printer (when using TN5250e), greatly expanding the number of hosts that can use the printers attached to a Print Server.

2.7 Multiprotocol AS/400 to LAN Printing

When printing from an IBM AS/400 host, the Print Server supports these protocols:

- TCP/IP (TN5250e)

- TCP/IP (LPR/LPD)

- AnyNet (SNA data encapsulated in TCP/IP)

- SNA (APPC)

2.8 IBM Printer Emulations

The Print Server converts native AS/400 print jobs from EBCDIC to ASCII, freeing the host or client PCs from the often heavy overhead associated with this task.

MULTIPROTOCOL AND ETHERNET IPDS PRINT SERVERS

The 3-Port Multiprotocol Print Server runs up to three independent printer emulations concurrently, and each of the attached printers can be used for AS/400 printing. The Ethernet IPDS Print Server can handle two logical AS/400 printer sessions: one for SCS data streams and the other for AFP/IPDS.

When using SNA (APPC) or AnyNet, the AS/400 will output 3812-1, 4214, 5224, 5225, or 5256 SCS data streams. The Print Server will convert these SCS data streams to ASCII data. It will also convert the IBM command structure into PCL, Epson, or Proprinter commands. All functions supported by the IBM SCS printers can be implemented on the ASCII printers. For example, the IBM 3812-1 Paper Printer's Computer Output Reduction (COR) feature is fully implemented on PCL laser printers. For IBM dot-matrix printers such as the 4214, the forms alignment message lets you properly align printed forms on Epson or Proprinter compatible printers.

When using one of the AFP/IPDS Print Servers, full IBM 3812-2, 3816, and 4028 functionality is supported on a PCL 5e attached laser printer.

When using TN5250e, the AS/400 only outputs 3812-1 SCS data. The Print Servers will convert the 3812-1 SCS to PCL for use with PCL laser printers. Also, the Print Servers can convert the 3812-1 SCS data for use with dot-matrix printers. However, certain dot-matrix features, such as the forms alignment messaging feature, are not supported, since the AS/400 only accepts 3812-1 page printer functions back from the printer.

3. Installation

You don't need special training to install the Print Server. Simply follow the steps outlined under Hardware Installation (**Section 3.1**), then PrintControl Installation (**Section 3.2**), and then configure the Print Server for the protocol(s) that you will be using (see **Chapter 4**).

3.1 Hardware Installation

1. Run a self-test of the printer(s) you want to attach (check the printers' Users' Guides). Then power OFF the printer(s).

2. Attach the LAN cable to the appropriate Print Server connector. If the Print Server supports multiple LAN cable types, it will automatically sense which type of cable is attached when it is powered up. The supported cable types are:

• Thin Ethernet (10BASE2, BNC connector)

• Twisted Pair (10BASE-T or 100BASE-T, RJ-45 connector)

If the Link LED does not come on, you will need to set the 10/100 switch as follows. Moving the switches toward the bottom of the Print Server will place them in the DOWN position.

Setting	Switch 1	Switch 2
Auto-sensing (default)	UP	UP
100Base-T Only	DOWN	UP
10Base-T Only	DOWN	DOWN

NOTE

Do not attach more than one network cable at a time. Also, do not change the network connector while the Print Server is powered ON.

3. Attach the printer cable(s) and power ON the printer(s).

4. Connect the power supply to the Print Server.

5. After the self-test page prints, review it for more information about Print Server settings. By default, a self-test page will print on the printer attached to the Print Server's LPT1 port. You can override this default setting through port-specific selections that you can make through the PrintControl utility.

6. Install the PrintControl software so you can configure the Print Server for the LAN protocols of your choice.

3.2 PrintControl™ Installation

PrintControl runs under Windows 3.1, 95/98, or NT. Before you begin, make sure your PC is attached to the same LAN segment as the Print Server and has at least 2 MB of disk space available. The PC must also be able to communicate with other network devices via TCP/IP or IPX/SPX.

1. Insert the CD or floppy disk containing the PrintControl™ utility into your PC's CD-ROM or floppy drive.

2. If you are installing PrintControl on a Windows 3.x or Windows NT 3.x PC, click **File** in the Program Manager, then select **Run**.

   If you are installing PrintControl on a Windows 95/98 or Windows NT 4.x PC, and the Autorun feature has been disabled, click **Start**, then select **Run**. Otherwise, the PC will automatically load the startup menu. (Skip ahead to step 4 below.)

3. Type **d:\autorun** (d: is your CD-ROM) then press Enter or **a:\setup** (a: is your floppy drive).

4. Follow the instructions that appear on your computer screen during the installation process.

   The installation creates a separate group for PrintControl. The icon for the PrintControl utility and a help file will appear in the group.

3.3 Using PrintControl

PrintControl can be used to configure, monitor, and reset the Print Server. Additional functions include downloading of firmware upgrades to the print server and the restoring of factory defaults. By default, the PrintControl software uses the TCP/IP protocol to communicate to the Print Server on the network. Novell IPX/SPX can also be enabled through the Protocol Menu. The PC running the PrintControl utility has to support at least one of these protocols to function.

3.4 Where To Now...

From the list on the next page, select the protocol(s) your LAN environment is using and skip to the appropriate configuration section(s):

- TCP/IP (AS/400 via TN5250e, AnyNet, IPDS via PPR/PPD, LPR/LPD; UNIX; Windows NT; Windows 95/98 via TCP/IP; DirectPort™), **Chapter 4**.

- Novell NetWare (IPX/SPX), **Chapter 5**.

- NetBIOS (Windows 95, 98, NT, Windows for Workgroups, OS/2), **Chapter 6**.

- SNA/APPC (AS/400), **Chapter 7**.

After you have completed the configuration of these protocols, go to either **Chapter 8, IBM SCS Printer Emulations** or **Chapter 9, IPDS Printer Emulation** to identify the printer types attached to the physical port(s) of the Print Server, their IBM emulation types, etc.

4. TCP/IP Printing

If you have not already installed the PrintControl utility, go back to PrintControl Installation (see **Section 3.2**) and do so now. Then you'll need to configure the Print Server and the hosts that you will be printing from. **Chapter 4** consists of these sections:

- Configuring the Print Server, **Section 4.1**

- Configuring a Print Server on a Remote TCP/IP Subnet, **Section 4.2**

- Configuring OS/400 for IPDS Printing, **Section 4.3**

- Configuring OS/400 for TN5250e, **Section 4.4**

- Configuring OS/400 for AnyNet, **Section 4.5**

- Configuring OS/400 for LPR/LPD, **Section 4.6**

- Configuring Windows NT V3.x, **Section 4.7**

- Configuring Windows NT V4.x, **Section 4.8**

- TCP/IP DirectPort Printing for Windows 95/98, **Section 4.9**

After you have completed the configuration of these protocols, go to either **Chapter 8, IBM SCS Printer Emulations** or **Chapter 9, IPDS Printer Emulation** to identify the printer types attached to the physical port(s) of the Print Server, their IBM emulation types, etc.

4.1 Configuring the Print Server

4.1.1 ASSIGN TCP/IP ADDRESS

After starting the PrintControl utility, select the desired Print Server from the displayed list. The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test print out.

Open the configuration dialog box by double clicking on the desired print server or by highlighting the desired print server and then pressing the **Configure** button displayed in the tool bar. Follow the simple steps listed on the next page to configure the Print Server for TCP/IP printing.

1. Select **TCP/IP** by clicking on the white box in front of that selection.

2. The right column titled **Object Information** will display the available configuration parameters.

    a. Enter the TCP/IP address of the Print Server.

    b. If necessary, enter the IP address for the default router and the subnet mask. If you intend to communicate remotely with the print server (for printing or configuration), the default router and subnet mask must be entered here.

3. Click on the **Apply** button on the bottom of the configuration window. Then exit the utility.

4.1.2 VERIFY CORRECT INSTALLATION

From the command line (or DOS prompt) of a TCP/IP enabled host, type

```
ping <TCP/IP address of Print Server>
```

If you are getting responses, your configuration of the Print Server has been successful.

4.2 Configuring a Print Server on a Remote TCP/IP Subnet

The PrintControl utility can also change the configuration of a Print Server that is located on a remote TCP/IP subnet. You must initially configure the Print Server with an IP address from a PC running PrintControl that is located within the same TCP/IP subnet as the print server. After you complete this step, you can move the Print Server to a remote location.

There are two ways to change the configuration of a Print Server that is located on a remote TCP/IP subnet. The first is to have the exact IP address of the print server.

The second is to scan the remote TCP/IP subnet where the Print Server is located. To do this, you will need to have the "subnet mask" and an IP address of any device on that subnet (the device does not have to be a Print Server). Obtain this information from your network manager. With these two pieces of addressing information, the PrintControl utility can scan the remote TCP/IP subnet and find all Print Servers on that subnet.

The following steps will guide you through selecting a remotely or locally attached Print Server:

1. From the menu bar in PrintControl, select the VIEW option.

2. Select the **SCAN…** option.

- To scan for a specific Print Server located on a remote TCP/IP subnet:

   a. Check the radio button to the left of the "Scan for a Single Print Server" option.

   b. Enter the IP address of the Print Server in the "IP Address" field. You may view the last eight addresses entered in this field by clicking on the down arrow. If the desired IP address is listed, click on that entry.

   c. Click **OK.**

- To scan a remote TCP/IP subnet for all Print Servers located on that subnet:

   a. Check the radio button to the left of the "Scan a Remote Subnet."

   b. Enter the address of any device in the remote TCP/IP subnet in the "IP Address" field. Click on the down arrow to view the last eight addresses entered in this field. If the desired IP address is listed, click on that entry.

   c. Enter the remote TCP/IP subnet mask in the "Remote Subnet Mask" field. Click on the down arrow to view the last eight subnet mask entries made in this field. If the desired subnet mask is listed, click on that entry.

   d. Click OK.

- To scan for all Print Servers located on the local subnet:

   a. Check the radio button to the left of the "Scan the local subnet" option.

   b. Click **OK.**

3. Once you select "Scan the Local Subnet," "Scan a Remote Subnet," or for a specific Print Server, press the **Scan** button on the button bar to refresh the listing of Print Server(s). From here, you can double click on the desired print server or click on the **Configure** button to view or change the highlighted print server's configuration.

You are now ready to configure the host(s). From here go to the appropriate section for each host you want to configure.

- Configuring OS/400 for IPDS Printing, **Section 4.3**

- Configuring OS/400 for TN5250e, **Section 4.4**

- Configuring OS/400 for AnyNet, **Section 4.5**

- Configuring OS/400 for LPR/LPD, **Section 4.6**

- Configuring Windows NT 3.x, **Section 4.7**

- Configuring Windows NT 4.x, **Section 4.8**

- TCP/IP DriectPort Printing for Windows 95/98, **Section 4.9**

4.3 Configuring OS/400 for IPDS Printing

Once you have assigned a TCP/IP address and verified the address (see **Sections 4.1.1** and **4.1.2**), go to **Chapter 9, IPDS Printer Emulation** to continue the configuration of both the IPDS-enabled Print Server (such as the Ethernet IPDS Print Server) and the AS/400 host system.

4.4 Configuring OS/400 for TN5250e

TN5250e is an extension of the Telnet display and printer protocol used in the IBM AS/400 systems. We have customized the TN5250e protocol used in the Print Servers to include the same laser and dot-matrix printer emulations as are used in all of our printer emulation products. The host AS/400 sees a TN5250e printer as a 3812 page printer, yet our Print Servers allow you to attach either laser or dot-matrix printers.

We recommend using TN5250e as the preferred AS/400 LAN printing protocol over other TCP/IP printing processes (LPR/LPD and AnyNet). TN5250e is easy to configure, fast to operate, and has enhanced printer emulations to provide nearly the same functionality as a twinax-attached printer.

4.4.1 CONFIGURING THE AS/400

To configure your AS/400 to support TN5250e printing, make sure the AS/400 meets the following software requirements:

- Running OS/400 V3R2 or newer,

- have the most recent version of Client Access installed on the AS/400 (Client Access for Windows 95/NT V3R1M3 or newer, or Client Access Enhanced for Windows 3.1 V3R1), and

- have the most recent version of the Telnet server installed (See **Appendix D** for a list of the required PTFs).

In addition, the AS/400 system administrator must:

- Make certain that the AS/400 can create virtual devices and that there is a sufficient number of devices available to be created. Do this via the AS/400 command:

```
CHGSYSVAL SYSVAL(QAUTOVRT) + VALUE(?)
```

- The "?" is the maximum number of user-created virtual devices that can be created.

- If the OS/400 version is earlier than V4R2, you will need to start the Telnet server using this AS/400 command:

```
STRTCPSVR SERVER(*TELNET)
```

V4R2 and newer versions will automatically start the Telnet server.

After these requirements are met, the AS/400 will automatically configure TN5250e printer devices as 3812 printers.

4.4.2 CONFIGURING THE PRINT SERVER FOR TN5250E PRINTING

1. After starting the PrintControl utility, select the desired Print Server from the displayed list. (Only those Print Servers located on the same LAN segment as the PC where the PrintControl utility is running appear in the list.) The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test print out.

2. Double-click on the desired Printer Server to open the configuration dialog box, or highlight the desired Print Server and press the **Configure** button displayed in the tool bar.

3. If the Print Server already has an IP address, go directly to step 4. Otherwise, follow these instructions:

   a. Select TCP/IP by checking the white box in front of that selection. The right column titled "Object Information" will display the available configuration parameters.

   b. Enter the Print Server IP Address.

   c. If necessary, enter the IP address for the default router and sub-net mask. You may need to get this from your system administrator.

4. Select **TN5250e** by checking the white box in front of that selection in the left column of the PrintControl configuration screen. The right column titled "Object Information" will display the available configuration parameters.

5. The Print Server supports up to 10 IBM hosts. Enter the Host IP Address (see your system administrator for this address). You may not enter a host more than one time.

6. In the Type field, click on the drop-down arrow and highlight the type of host to select the type of IBM host.

7. Click on the Printer button to display the Printer Device Names screen. The Print Server supports an individual TN5250e printer session for each attached printer. Click on the box for each printer that is attached and enter a printer name (maximum of 8 characters). The 3-Port Multiprotocol Print Server supports up to three printers (LPT1, LPT2, COM1); the other two models support only one printer.

   When the Print Server is reset, the AS/400 will automatically configure a printer device for each attached printer that you selected and named here.

   The printer must be in the "ready" mode for auto-configuration.

   If you leave out the printer name, the host AS/400 will still automatically create a 3812 device but will give the printer the name of QPADEV*nnnn* (*nnnn* is a 4-digit number). However, each time the Print Server connects to the host, the *nnnn* number for the printer may be different. This may cause problems if you use a specific printer name for the location of printed output. We do not recommend that you let the AS/400 create the printer name.

8. The Print Server will automatically restart a TN5250e printer session on the AS/400 whenever any of the attached printers are powered on. However, you

can also click on the **Restart Now** button to restart a TN5250e printer session while leaving other protocols uninterrupted.

9. For continued communication with the AS/400 host, you can click on the **Options** button to configure the Print Server to periodically contact the host and attempt to re-establish TN5250e sessions if required.

a. When a printer is powered on, the Server restarts the TN5250e session; this cannot be changed. The Print Server will always restart TN5250 sessions when an attached printer is powered on.

b. The Print Server can restart sessions every five minutes that have been terminated by the AS/400; to do this, check the box to the left of this option.

c. You may also set the Print Server to restart sessions only upon receiving a TCP/IP PING command by checking the box to the left of this option. The PING can come from any other device with an IP address or from a specific AS/400 by entering the desired host's IP address in the address field. Leave this field as 0.0.0.0 if you do not want to select a specific host.

d. The Print Server reports the success or failure of an attempt to communicate with the AS/400 by printing a brief connection status message on each attached printer.

For a description of the connection status message, see **Section 10.5.3**. You can disable printing of these status messages to save paper or to preserve alignment of continuous forms. Checking the box to the left of this option will turn this option off.

e. After setting these options, click on the **Return** button.

10. If you want to start your TN5250e session now, click on the Restart Now button.

11. Set up any other protocols desired, then click on the **Apply Changes** button, and exit the PrintControl utility.

4.5 Configuring OS/400 for AnyNet

AnyNet is an IBM gateway technology that allows any application to run over any networking protocol. AnyNet allows printing of SNA (APPC) data over TCP/IP, giving you the security and functionality of SNA (APPC) as well as the routability and ease-of-use of the popular TCP/IP protocol.

Proceed with the following steps to configure the Print Server and your AS/400 for AnyNet printing:

- AnyNet Configuration Worksheet, **Section 4.5.1**

- Configuring the AS/400 (AnyNet), **Section 4.5.2**

  - Changing the AS/400 Network Attribute

  - Adding the Print Server to the AS/400 TCP/IP Host Table

  - Creating an AnyNet Controller

  - Alternately: Creating One AnyNet Controller for each Print Server

  - Changing the AS/400 APPN Remote Configuration List

- Configuring the Print Server for AnyNet Printing, **Section 4.5.3**

4.5.1 ANYNET CONFIGURATION WORKSHEET

As you configure the AS/400, and later the Print Server, you will be asked to supply various names and parameters. To make the process easier, retrieve or decide on the information now. Enter the requested names and parameters in the following worksheet.

1. Print Server TCP/IP Address: _____

   Choose a unique IP address to assign to the Print Server later. You may have already assigned this address in **Section 4.1**.

2. Print Server Name: _____

   Choose a unique name to assign to the Print Server later. This name must comply with the following requirements:

   A. The name must be exactly 8 characters.

   B. The name must start with an alphanumeric character (for example, A, B, C, etc.).

   C. The name must consist of the these characters: upper-case letters A to Z, lower-case letters a to z, or numbers 0 to 9. Spaces, underscores, slashes, etc., are not accepted.

   D. The first four characters should uniquely identify the device, since the Print Server will automatically create printer devices on your AS/400 using the

first four characters of the name you assigned to the Print Server followed by `PRTXX`.

3. AS/400 TCP/IP Address: _____

You can retrieve the AS/400 TCP/IP address from the TCP/IP host table. From your AS/400 command line, type `go tcpadm`. Then select **1. Configure TCP/IP** and **10. Work with TCP/IP** host table entries.

4. Host Network ID: _____

You can retrieve the AS/400 network ID from the network attributes listing. On the AS/400 command line, type `DSPNETA` (Display Network Attributes). Press <**Enter**>. The Host Network ID is listed as the Local network ID.

5. Host Control Point Name: _____

You can retrieve the AS/400 control point name from the network attributes listing. On the AS/400 command line, type `DSPNETA` (Display Network Attributes). Press <**Enter**>. The Host Control Point Name is listed as the Local control point name.

6. AnyNet Controller Name: _____

If you already have an AnyNet Controller defined on your AS/400 and plan to use the Print Server under this controller, skip this step. Otherwise, you must select a name for a new AnyNet controller.

If you are following our recommended method of using only one AnyNet controller for all your AnyNet devices (including one or several Print Servers), this name should be different from the Print Server Name.

If your AS/400 supports more than 254 AnyNet devices, configure one AnyNet controller for every Print Server. The name of the AnyNet controller should be the same as the Print Server Name.

The AnyNet Controller Name can be up to 10 characters long.

7. AnyNet Remote Control Point Name: _____

If you already have an AnyNet Controller defined on your AS/400 and plan to use the Print Server under this controller, on the AS/400 command line, type `WRKCTLD`. Locate the AnyNet Controller and enter the value "5" in front of that controller. Locate the Remote Control Point and enter the value in the worksheet space above.

Otherwise, if you are following the recommended method of using only one AnyNet controller for all your AnyNet devices (including one or several Print Servers) and you are creating a new AnyNet controller, the AnyNet Remote Control Point Name should be different from the Print Server Name.

If your AS/400 supports more than 254 AnyNet devices, configure one AnyNet controller for every Print Server. The AnyNet Remote Control Point Name should be the same as the Print Server Name.

4.5.2 CONFIGURING THE AS/400 (ANYNET)

Changing the AS/400 Network Attribute

To allow AnyNet communication from your AS/400, set the Allow AnyNet Support option to ***Yes**. Check the current setting first by typing DSPNETA on the AS/400 command line and then scroll to the last page of the available parameters. If the value is set to ***No**, return to the command prompt (CMD3) and enter the following:

```
CHGNETA ALWANYNET (*YES)
```

Adding the Print Server to the AS/400 TCP/IP Host Table

1. On your AS/400 command line, type go tcpadm to enter the TCP/IP Administration menu.

2. **Select 1. Configure TCP/IP**.

3. **Select 10. Work with TCP/IP host table entries**. Scroll down and make sure there are no duplicate Print Server addresses.

4. Place a **1** in front of the blank line on top of the list to add another TCP/IP device. Press <**Enter**>.

5. Enter the Print Server TCP/IP address in the **Internet address** field.

6. Under **Host names: Name...** enter the following:

   *Print Server Name.Host Network ID.*SNA.IBM.COM

   (For example: IO5450PS.APPN.SNA.IBM.COM)

7. If you wish, you may enter an additional description for the Print Server in the **Text description** field.

8. Press <**Enter**>.

Creating an AnyNet Controller

To configure the Print Server as an AnyNet device, we recommend that you create only one AnyNet APPC controller on the AS/400. However, this method is limited to attaching a maximum of 254 AnyNet devices (including the Print Server). If you are using more AnyNet devices, you should skip to the section called "Creating One AnyNet Controller for each Print Server" (below). Otherwise proceed with these instructions:

1. If you already have an AnyNet Controller defined on your AS/400, skip to step 2. Otherwise, type the following on the AS/400 command prompt:

   ```
   CRTCTLAPPC CTLD (AnyNet Controller Name) LINKTYPE
   (*ANYNW)
   RMTCPNAME (AnyNet Remote Control Point Name) RMTNETID
   (*NETATR)
   ```

   Press <**Enter**>.

2. Vary On the newly created controller by typing the following on the AS/400 command prompt:

   ```
   WRKCFGSTS *CTL AnyNet Controller Name
   ```

   Press <**Enter**>.

3. Type a "1" in front of the APPC controller and press <**Enter**>.

Alternately: Creating One AnyNet Controller for Each Print Server

You can create an individual AnyNet controller for every Print Server installed. However, this approach can be confusing since any programmable AnyNet APPC device (and the printers attached to the Print Server will fall into this category) will randomly configure under the different APPC controllers. Although this does not affect operation, it does make it more difficult to locate and administer the various AnyNet APPC devices.

To create an AnyNet controller specifically for the Print Server, type the following on the AS/400 command prompt:

```
CRTCTLAPPC CTLD (Print Server Name) LINKTYPE
(*ANYNW) RMTCPNAME (Print Server Name)
RMTNETID (*NETATR)
```

Changing the AS/400 APPN Remote Configuration List

When using the recommended method of just one AnyNet APPC controller for all AnyNet APPC devices, each Print Server must be added to the AS/400 APPN remote configuration list.

1. On the AS/400 command prompt, type:

   CHGCFGL *APPNRMT

2. Press <**Enter**>.

3. Scroll to the bottom of the displayed list and enter the requested parameters. Refer to the worksheet for the needed information.

Remote Location:	Print Server Name
Remote Network ID:	Host Network ID
Local Location:	Host Control Point Name
Remote Control Point:	AnyNet Remote Control Point Name
Control Point Net ID:	Host Network ID

   The other parameters are optional.

4. Press <**Enter**>.

4.5.3 CONFIGURING THE PRINT SERVER FOR ANYNET PRINTING

1. After starting the PrintControl utility, select the desired Print Server from the displayed list. (Only those Print Servers located on the same LAN segment as the PC where the PrintControl utility is running appear in the list.) Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test print out.

2. To open the configuration dialog box, double-click on the desired Print Server or highlight the desired Print Server; then press the Configure button displayed in the tool bar.

3. If the Print Server already has an IP address, go to step 4. Otherwise, follow these instructions:

a. Select **TCP/IP** by clicking on the white box in front of that selection. The right column titled "Object Information" will display the available configuration parameters.

b. Enter the Print Server TCP/IP address (see worksheet).

c. If necessary, enter the IP address for the default router and the subnet mask. You may need to get this from the system administrator.

4. Select **AS/400 AnyNet** by clicking on the white box in front of that selection in the left column of the PrintControl configuration screen.

5. The right column titled "Object Information" will display the available configuration parameters. (See worksheet.)

a. In the field titled "Adapter Address" enter the AS/400 TCP/IP address. Make sure to use the format specified in the field (XXX.XXX.XXX.XXX; for example, 128.0.1.12)

b. Enter the Host Network ID.

c. Enter the Host Control Point Name.

d. In the field titled "Interface Control Point Name," enter the Print Server Name.

6. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

7. The Print Server will now automatically create the following devices on your AS/400:

• A 5494 Controller with the first five characters of the "Interface Control Point" name followed by the identifier "RMT."

• A printer device for every printer that was attached to the Print Server at the time the new configuration was sent to the Print Server or when the Print Server was last reset. Names for the printer devices are actually given by the AS/400 system and follow this format:

ABCDPRTXX

where

- ABCD are the first four characters of the "Interface Control Point";

- PRT is a fixed identifier for printers;

- XX identifies the printers that were actually attached to the Print Server at the time the SNA (APPC) configuration was applied to the Print Server or at the time the Print Server was last reset.

XX-Value	Printer Attached to Print Server physical port	Corresponding logical port with 5250 printer session
00	LPT1	SCS1
01	LPT2	SCS2
02	COM1	SCS3

4.6 Configuring OS/400 for LPR/LPD

You can print from your AS/400 via TCP/IP using an industry standard mechanism called Line Printer Requester/Line Printer Daemon (LPR/LPD). However, since only an OUTQUE and not an actual DEVICE is created on the AS/400, this printing mechanism lacks the level of control inherent to SNA printing and is more difficult to implement. Basic functions like printing multiple copies, page ranges, and printer error reporting are not supported.

There are two ways to print data from the AS/400. The first approach uses an AS/400 feature called Host Print Transform to convert EBCDIC data into ASCII and then send it to the LAN printer. This method uses precious AS/400 CPU cycles that could impact the overall performance of the host system, especially when you need to convert large numbers of documents and reports.

The second approach is to have the Print Server do the conversion. The Print Server's powerful RISC processor can offload EBCDIC-ASCII conversion from the AS/400 and assure that the attached printers print at their rated speed.

Follow these steps to configure the AS/400 for LPR/LPD printing. If you haven't already done so, refer to Configuring the Print Server (**Section 4.1**) to assign an IP address to the Print Server.

- Adding the Print Server to the AS/400 TCP/IP Host Table, **Section 4.6.1**

- Creating Remote OUTQUE, **Section 4.6.2**

- Start the Remote Writer, **Section 4.6.3**

• Printing from the AS/400 via LPR/LPD, **Section 4.6.4**

4.6.1 ADDING THE PRINT SERVER TO THE AS/400 TCP/IP HOST TABLE

1. On your AS/400 command line, type `go tcpadm` to enter the TCP/IP Administration menu.

2. Select **1. Configure TCP/IP**.

3. Select **10. Work with TCP/IP host table entries**.

4. Place a **1** in front of the blank line on top of the list to add another TCP/IP device. Press <**Enter**>.

5. Enter the IP address you assigned to the Print Server in **Section 4.1** in the Internet address field.

6. Under **Host names: Name...**, enter a name for the Print Server.

7. You may enter an additional description for the Print Server in the Text "description" field.

8. Press <**Enter**>.

4.6.2 CREATING A REMOTE OUTQUE

1. On your AS/400 command line type `crtoutq`.

2. Enter a name for the Output queue and for the Library.

3. In the Remote system field enter the name you assigned to the Print Server when adding it to the TCP/IP host table (see step 6 above). Press F10 to display additional parameters.

4. In the Remote printer queue field enter the name of the Print Server's logical port. Use the table below to determine the proper logical port.

If your printer is attached to this physical port of the MPS	...enter the name of this logical port in the Remote printer queue field
LPT1	SCS1
LPT2	SCS2
COM1	SCS3

NOTE

**If you are planning to use the AS/400 Host Print Transform utility or a
third party EBCDIC-ASCII conversion program, the remote printer queue
is one of the TCP/IP logical ports (TCP1/TCP2/TCP3).**

5. Scroll to the next screen and specify:

   Connection type ..> *IP or

   Destination type ..> *OTHER

6. Press <**Enter**>.

7. We recommend you select **Host print transform >*NO**. That way you can take
   advantage of the Print Server's printer emulations and offload the host from
   any unnecessary conversion processing.

8. Press <**Enter**>.

4.6.3 START THE REMOTE WRITER

On the AS/400 command line type `strrmtwtr outq_name`, where `outq_name` is
the name you assigned to the outque (see step 2 on the previous page).

4.6.4 PRINTING FROM THE AS/400 VIA LPR/LPD

To print from the AS/400, send your print jobs to the newly created OUTQ.
To do this, modify the user profiles of those individuals who will be using the
printer(s). Type the following on the AS/400 command line:

        CHGUSRPRF USRPRF(user_name) OUTQ(library/outq_name)

where

        user_name is the name of the user whose profile you want to change.

        library is the name of the library where the new outque is stored.

        outq_name is the name of the new outque you created above.

   Alternately, you may want to change or create a new Job Description and then
have the user profile make use of that description. Type the following on the
AS/400 command line:

        CHGJOBD JOBD(job_name) OUTQ(library/outq_name)

where

>   `job_name` is the name of the job you want to change.
>
>   `library` is the name of the library where the new outque is stored.
>
>   `outq_name` is the name of the new outque you created above.

In either case, the AS/400 must have a valid printer device description to format the print data properly. In the User Profile, the Job Description of the OfficeVision Print Options menu, you should specify a printer device description of an existing, similar printer in your AS/400 network. The printer device whose description you are "borrowing" can be attached in a myriad of ways (twinax, remote, LAN, etc.). It may be a printer that doesn't even physically exist.

The AS/400 must recognize the printer description as valid and the "borrowed" printer device description must be of the same type as the IBM printer emulation you are running on the Print Server (that is, IBM 3812, 4214, 5224, 5225, or 5256). The AS/400 will use this device description to format the print job properly and then use the OUTQ to route it to the right printer.

If you haven't already done so, review the default 5250 print parameters, and modify them if necessary. Refer to **Chapter 8**, **IBM SCS Printer Emulations** for information on the different 5250 print parameters.

4.7 Configuring Windows NT V3.x

Make sure your Windows NT workstation has the TCP/IP protocol and the TCP/IP Printing service active. If you are unsure, do the following:

1. Go to the workstation's Main group and double-click on the **Control Panel** icon.

2. In the Control Panel, double-click on the **Network** icon.

3. Review the **Installed Network Software** list.

If the TCP/IP protocol and Microsoft TCP/IP Printing service are not found, you must add them before continuing with the instructions below. Consult your Microsoft documentation for more information.

Follow the procedures below to create printers for the Print Server on a Windows NT workstation. If there is more than one printer attached to the Print Server, perform this procedure once for each attached printer.

1. Go to the Main program group and open the Print Manager.

2. Go to the Print Manager's Printer menu and choose **Create Printer…**.

3. In the Create Printer's Printer Name dialog box, enter a name for the printer.

4. Use the Driver pull-down list to choose a printer driver that matches the type of printer that you are creating on the workstation.

5. In the Description text box, enter a description that helps you remember the printer.

6. In the **Print to:** pull-down list, go to the bottom of the list and choose **Other…**.

7. In the Print Destination dialog box's **Available Print Monitors** list, click on **LPR Port** and choose **OK**.

8. In the **Name or Address of host providing lpd:** text box, enter the IP address you assigned to the Print Server (see **Section 4.1.1**).

9. In the **Name of printer on that machine** text box, enter the physical or logical port of the Print Server that the target printer is attached to (that is, LPT1, LPT2, COM1, TCP1, TCP2, or TCP3).

NOTE

Selecting one of the TCP/IP logical ports will give you added configuration options, such as turning banner (header and trailer) pages off and suppressing blank pages when printing to an HP LaserJet printer.

10. Choose **OK**. The printer attached to the Print Server is now available. Simply select it from your application as you would any other printer.

11. (Optional) Go to Print Manager's Default pull-down list and select the new printer as the workstation's default printer.

4.8 Configuring Windows NT V4.x

Make sure your Windows NT workstation has the TCP/IP protocol and the TCP/IP Printing service active. If you are unsure, do the following:

A. Click on **Start**, then select **Settings** and lastly **Control Panel**.

B. Double-click on the **Network** icon and review the lists under the **Protocol** and **Services** tabs.

If the TCP/IP protocol and Microsoft TCP/IP Printing service are not found, you must add them before continuing with the instructions below. Consult your Microsoft documentation for more information.

Follow the procedures below to create printers for the Print Server on a Windows NT workstation. If there is more than one printer attached to the Print Server, perform this procedure once for each attached printer.

1. From the Windows NT desktop click on Start.

2. Select **Settings** then open the Printer folder.

3. Double click on the **Add Printer** icon.

4. Choose **My Computer**.

5. Select **Add Port**.

6. From the **Available Printer Ports** list, double-click on **LPR Port**.

7. In the **Name or address of server providing lpd:** field, enter the IP address you assigned to the Print Server (see **Section 4.1.1**).

8. In the Name of printer or print queue on that server: field, enter the physical or logical port of the Print Server that the target printer is attached to (that is, LPT1, LPT2, COM1, TCP1, TCP2, or TCP3).

NOTE

Selecting one of the TCP/IP logical ports will give you added configuration options, such as turning banner (header and trailer) pages off and suppressing blank pages when printing to an HP LaserJet printer.

9. Click **OK** and close the Printer Ports screen.

10. From the **Add Printer Wizard** screen select the LPR port you just added and press **Next**.

11. Complete the remaining requests from the Windows NT Add Printer Wizard. The printer attached to the Print Server is now available. Simply select it from your application as you would any other printer.

4.9 TCP/IP DirectPort™ Printing for Windows 95/98

The TCP/IP DirectPort™ print driver is a more reliable method of Windows 95/98 peer-to-peer printing than NetBIOS. You can access Print Servers directly from a PC running Windows 95/98 via TCP/IP by installing the TCP/IP DirectPort client software on the PC. You can easily configure any number of PCs to print directly to a printer connected via a Print Server. Also, you can access any number of Print Servers from one PC.

4.9.1 TCP/IP DIRECTPORT INSTALLATION

To install the TCP/IP DirectPort print driver for Windows 95/98, follow these simple steps:

1. Insert the CD or floppy disk containing the TCP/IP DirectPort utility in the PC's CD-ROM or floppy drive.

2. If installing from a CD and the Autorun feature is active, the CD will automatically load the Startup Menu. If the autorun feature has been disabled, click **Start**, select **Run**, type **d:\autorun** (**d:** represents the drive letter for your CD-ROM drive), then press **Enter**.

   If installing from a floppy drive, click **Start**, select **Run**, type **a:\setup.exe** (**a:** represents the drive letter of your floppy drive), then press **Enter**.

3. Follow the instructions that appear on your computer screen during the installation process. During installation, you can either accept the suggested TCP/IP DirectPort peer-to-peer printer port name (IPPort1) or enter a name of your choice. Remember this name; you will need it to complete the configuration process.

4.9.2 SELECTING DIRECTPORT PRINTING

To access a printer attached to a Print Server using the TCP/IP DirectPort print driver, you may either add a new printer to your Windows 95/98 system or reconfigure an existing printer to use the TCP/IP DirectPort print driver.

To add a new printer, follow these steps.

1. Click on **Start**, select **Settings**, and then go to **Printers**.

2. Click on the **Add Printer Wizard** icon. Follow the normal Windows process to add a local printer. Select the brand and type of printer attached to the Print Server.

3. When the screen gives you a listing of the available ports, select **IPPort1 TCP/IP DirectPort** (or the port name you choose during the DirectPort installation process).

4. Click on the **Configure Port…** button.

5. On the **Port Configuration** screen, enter the TCP/IP address of the Print Server in the **IP Address** field.

6. Select the physical port that the printer is attached to on the Print Server:

    a. If your Print Server is a single-parallel printer model, verify that **LPT1** appears in the **Select Device Port…** field. If not, click on the **Select Device Port>>** button and select **LPT1**.

    b. If your printer is a serial printer, click on the **Select Device Port>>** button, and select **COM1**.

    c. If you are using a 3-Port Multiprotocol Print Server (which supports up to three printers), you can select LPT1, LPT2, or COM1 as the physical port that the printer is attached to on the Print Server.

7. Make any other desired changes to port configuration. Then click on **OK**.

8. Continue with the remainder of the **Add Printer Wizard** steps to complete the process.

To re-configure an already installed printer as the printer attached to a Print Server for DirectPort printing, follow these steps.

1. Click on **Start**, select **Settings**, and then go to **Printers**.

2. **Right Click** on the desired printer.

3. Take the **Properties** option, and select the **Details** tab.

4. In the **"Print to the following port"** drop-down box, select **IPPort1** (**TCP/IP DirectPort**) or the name you gave the port during the DirectPort installation process.

5. Click on the **Port Settings…** button.

6. On the **Port Configuration** screen, enter the TCP/IP address of the Print Server in the **IP Address** field.

7. Select the physical port that the printer is attached to on the Print Server.

a. If your Print Server is a single-parallel printer model, verify that LPT1 appears in the **Select Device Port…** field. If not, click on the **Select Device Port>>** button and select **LPT1**.

b. If your printer is a serial printer, click on the **Select Device Port>>** button and select **COM1**.

c. If you are using a 3-Port Multiprotocol Print Server (which supports up to three printers), you can select LPT1, LPT2, or COM1 as the physical port that the printer is attached to on the Print Server.

8. Make any other desired changes to port configuration. Then click on **OK**.

9. Make any other desired changes to the printer configuration. Click on **OK**, then **Apply**.

Now when you print to that specific printer, the output will be automatically redirected to the printer attached to the Print Server.

4.9.3 ADDING ANOTHER PRINTER FOR DIRECTPORT PRINTING

To access a printer attached to another Print Server, or to add a second or third printer to the 3-Port Multiprotocol Print Server using DirectPort printing, you will need to add both a new printer and a DirectPort device to your Windows 95/98 system. Do not install the TCP/IP DirectPort print driver again—instead, just follow these steps.

1. Click on **Start**, select **Settings**, and then go to **Printers**.

2. Click on the **Add Printer** icon. Follow the normal Windows process to add and configure a **local** printer. Do not print a Windows test page.

3. After the printer has been added, **right click** on the printer.

4. Take the **Properties** option, and select the **Details** tab.

5. Click on the **Add Port** button.

6. Click the **Other** radio button, highlight **TCP/IP DirectPort** in the dialog box, then click **OK**.

7. On the Port Configuration screen, enter the TCP/IP address of the Print Server in the **IP Address** field. If you are setting up another printer on a 3-Port Multiprotocol Print Server, this address will be the same as the first printer you set up during the initial port monitor installation above. Otherwise, enter the address of any other Print Server.

8. Select the physical port that the printer is attached to on the Print Server:

   a. If your Print Server is a single-parallel printer model, verify that **LPT1** appears in the **Select Device Port…** field. If not, click on the **Select Device Port>>** button and select **LPT1**.

   b. If your printer is a serial printer, click on the **Select Device Port>>** button and select **COM1**.

   c. If you are using a 3-Port Multiprotocol Print Server, click on the **Select Device Port>>** button, and select LPT2 or COM1. This identifies the physical port that the printer is attached to on the Print Server.

9. Enter the TCP/IP DirectPort name that you would like this port to be known as in the **Name** field.

10. Make any other desired changes to port configuration. Then click on **OK**.

11. Make any other desired changes to the printer's configuration. Click on **OK**, then **Apply**.

5. Novell NetWare Printing

If you have not already installed the PrintControl utility, please go back to **Section 3.2, PrintControl Installation** and do so now. Then skip to the section that applies to your NetWare setup.

- Controlled or Public Access Printer, NetWare 5.x (NDPS), NWAdmin, **Section 5.1**

- Print Server, Novell NetWare 4.x (NDS), NWAdmin, **Section 5.3**

- Print Server, Novell NetWare 4.x (NDS), PCONSOLE, **Section 5.4**

- Remote Printer, Novell NetWare 4.x (NDS), NWAdmin, **Section 5.5**

- Remote Printer, Novell NetWare 4.x (NDS), PCONSOLE, **Section 5.6**

- Print Server, NetWare 3.x and 2.x, **Section 5.7**

- Remote Printer, NetWare 3.x and 2.x, PCONSOLE, **Section 5.8**

After you have completed these configurations, go to either **Chapter 8, IBM SCS Printer Emulations** or **Chapter 9, IPDS Printer Emulation** to identify the printer types attached to the physical ports of the Print Server, their IBM emulation types, etc.

5.1 Controlled or Public Access Printer, NetWare 5.x (NDPS), NWAdmin

Under NetWare 5.x, printers attached through a Print Server can be configured as Controlled Access or Public Access printers. The instructions below cover types unless noted otherwise. The following steps are covered:

- Prerequisites, **Section 5.1.1**

- Creating a NDPS Printer Object, **Section 5.1.2**

- Configuring the Print Server, **Section 5.2**

- Client Configuration, **Section 5.2.4**

5.1.1 PREREQUISITES

To create a Printer Agent under NDPS, the following requirements must be met.

- User must have at least Read, Write, Modify, and Create rights for the destination container where its associated Printer object will reside. This is not necessary when creating a Public Access printer.

- User must be designated as a Manager of the NDPS Manager that will control this Printer Agent.

- A NDPS Broker must be running.

- A NDPS Manager object must be created.

Please refer to your Novell documentation for more information on these requirements. You can find an on-line user's guide at *www.novell.documentation.com.*

5.1.2 CREATING A NDPS PRINTER OBJECT

1. After logging into the Novell network with the above-mentioned rights, start the NetWare Administrator.

2. Creating a printer:

    a. When creating a Controlled Access printer, click on the container where you want the NDPS Printer object to reside.

    i.   From the Object menu, select **Create**.

    ii.   From the displayed list, select **NDPS Printer**. Click **OK**.

    iii. Enter a name of your choice in the **NDPS Printer Name** field.

    iv.   Select **Create a New Printer Agent** as the Printer Agent Source and click **Create**.

    v.   If desired, change the default **Printer Agent (PA) Name**, then browse for the **NDPS Manager Name**.

    b. When creating a Public Access printer, double-click on the **NDPS Manager**.

    i. Click on the **Printer Agent List** button on the right side of the displayed window.

    ii. Click **New**.

    iii. Enter a name of your choice in the **Printer Agent (PA) Name** field.

3. Click on the **Novell Printer Gateway** and then click **OK**.

4. If the NDPS Manager has not been loaded before, you will now be prompted to do so. Click **OK**, then respond with **OK** again.

5. Select the most appropriate **Printer Type** and then highlight the **Novell Port Handler** in the bottom window. Click **OK**.

6. Select the appropriate **Connection Type** (see below).

   a. Remote (printer on IPX)

   b. Remote (LPR on IP)

   c. Forward Jobs to a Queue

NOTE

Only select the last option, Forward Jobs to a Queue, if you already have created and linked the following NDS objects: Print Server, Printer, and Print Queue. You should also have configured the Print Server for NDS Print Server mode printing. See Section 5.3.

7. If you selected "Remote (printer on IPX)," select **Port Type "Other."**

8. Click **Next**.

   a. If you selected "Remote (printer on IPX)," specify a **SAP Name** and a **Port Number**. You will use these values to configure the Print Server.

NOTE

The SAP Name is specific to the Print Server. If multiple printers are attached to the Print server, then the SAP Name should be different from the name of the Printer Agent, since it will be shared by the other printer(s).

   b. If you selected "Remote (LPR on IP)," enter the Print Server's IP address in the **Host Address** field. In the **Printer Name** field, enter TCPx where *x* corresponds to the Print Server's physical port(s) as shown in the table on the next page.

Printer Server Type	Physical Port	x Value	TCP/IP Port
Single Port	LPT1 or COM1	1	TCP1
Multiport	LPT 1	1	TCP1
	LPT2	2	TCP2
	COM1	3	TCP3

c. If you selected "Forward Jobs to a Queue," enter the Queue Name
that is associated with the Print Server and a Queue User Name.

9. Click **Finish**.

NOTE

**If you have selected Remote (printer on IPX), your workstation will post
an error message. Click OK. Once you have configured the Print
Server, this error condition will be resolved.**

10. Select a printer driver for each client operating system. Click **Continue**
and then **OK**.

11. Proceed with configuration of the Print Server below.

5.2 Configuring the Print Server

After starting the PrintControl utility, select the desired Print Server from the
displayed list. The Print Servers are identified by their serial number and network
address. Both of these are unique to the specific print server; you can find them
on the bottom of the Print Server as well as on the self-test print out.

To open the configuration dialog box, double-click on the desired print server,
or highlight the desired print server and then press the Configure button displayed
in the tool bar. Follow these simple steps to configure the Print Server according
to the Connection Type you chose. The options were:

• Remote (printer on IPX), **Section 5.2.1**

• Remote (LRP on IP), **Section 5.2.2**

• Forward Jobs to a Queue, **Section 5.2.3**

5.2.1 REMOTE (PRINTER ON IPX)

1. Select **NW Remote Printer** by clicking on the white box in front of that selection.

2. The right column titled "Object Information" will display the available configuration parameters.

   a. In the Print Server field, enter the SAP Name assigned during step 8A in **Section 5.1.2**.

   b. In the field next to the Print Server's local port (LPT1, LPT2, or COM1) that the target printer is attached to, enter the Printer number.

3. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

5.2.2 REMOTE (LPR ON IP)

1. If you haven't already done so, assign an IP address to the Print Server. Refer to **Section 4.1.1** for more information.

2. To turn off the printing of the banner page, the trailer page or any possible blank pages, configure the TCP/IP logical ports: TCP1, TCP2, and/or TCP3. On the main Print Server Information screen, click on **Printer Ports/Emulation** and then on the respective TCP/IP Logical Port.

5.2.3 FORWARD JOBS TO A QUEUE

If the Print Server isn't already configured for servicing a NDS queue, refer to **Section 5.2** for more information.

5.2.4 CLIENT CONFIGURATION

You can configure Public Access printers from any client running the NetWare 5 client software. You do not have to be signed on to the Novell network. To set up a Controlled Access printer, you must be signed on to the Novell network.

5.2.5 PUBLIC ACCESS PRINTERS

1. Double-click on the **Network Neighborhood** icon on the Windows desktop.

2. Double-click on the **Entire Network** icon.

3. Open the **NDPS Public Access Printers** folder.

4. Double-click on the desired Public Access printer.

5. Follow the instructions given by the Windows Add Printer Wizard.

5.2.6 CONTROLLED ACCESS PRINTERS

1. Double-click on the **Network Neighborhood** icon on the Windows desktop.

2. Open the NDS context that the NDPS printer object resides in.

3. Locate the desired NDPS printer object and double-click its icon.

4. Follow the instructions given by the Windows Add Printer Wizard.

5.3 Print Server, Novell NetWare 4.x (NDS), NWAdmin

Configuring the Print Server as a NetWare Print Server under NDS requires the following steps:

- Entering NWAdmin, **Section 5.3.1**

- Adding a Print Server Object, **Section 5.3.2**

- Adding Printer Objects, **Section 5.3.3**

- Adding Print Queue Objects, **Section 5.3.4**

- Configuring the Print Server, **Section 5.3.5**

- Client Configuration, **Section 5.3.6**

5.3.1 ENTERING NWADMIN

1. Login to NetWare as ADMIN, or as a user with ADMIN security equivalence.

2. Open the **NetWare Tools** group and double click on **NWAdmin**.

3. Check the current context on the **Title Bar**. If it is incorrect, select the appropriate context from the displayed list.

5.3.2 ADDING A PRINT SERVER OBJECT

1. Using the right mouse button, click the context to which the Print Server is to be added.

2. Select **Create** from the displayed menu.

3. Select **Print Server** and type a new print server name.

IMPORTANT!

When naming the Print Server:

• Do not use more than 19 characters in the Print Server's name. NWAdmin allows you to enter print server names longer that this, but the Print Server does not support names longer than 19 characters.

• Do not use spaces in the print server name. Use dashes or underscores instead. NWAdmin allows spaces in the print server name, but the Print Server does not support this. However, you can use spaces in the names of the queues or printer objects.

4. Click the **Create** button.

5.3.3 ADDING PRINTER OBJECTS

1. Using the Right mouse button, click the context that you want to add the printer to.

2. Select **Create** from the displayed menu.

3. Select **Printer** object.

4. Enter the new printer name.

5. Click the **Create** button.

6. At the main NWAdmin screen, double-click the icon for the just-created **Print Server**.

7. From the **Print Server** window, click the **Assignments** button.

8. Select **Add**.

9. Select **Printer**.

10. Select **OK**.

11. Select **OK** at the Print Server window.

5.3.4 ADDING PRINT QUEUE OBJECTS

1. Using the Right mouse button, click the context in which the queue is to be created.

2. Select **Create** from the displayed menu.

3. Select **Print Queue**.

4. At the **Create Print Queue** window, enter the queue name in the **Print Queue Name** field.

5. Select the volume from the **Print Queue Volume** pull-down list on the **Select Object** window.

6. Click **OK**.

7. Click the **Create** button on the **Create Print Queue** window.

8. Double-click the icon for the just-created **Printer**.

9. Click the **Assignments** button.

10. Click the **Add...** button.

11. Select the **Queue** name. This name becomes the selected object.

NOTE
The selected printer is automatically set as the default.

12. Click **OK**.

13. Click **OK**.

5.3.5 CONFIGURING THE PRINT SERVER

After starting the PrintControl utility, select the desired Print Server from the displayed list. The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test printout.

Open the configuration dialog box by double-clicking on the desired print server or by highlighting the desired print server and then pressing the **Configure** button displayed in the tool bar. Follow these simple steps to configure the Print Server as a Novell Netware 4.x NDS Print Server:

1. Select **NW Print Server** by clicking on the white box in front of that selection.

2. The right column titled "Object Information" will display the available configuration parameters.

a. Replace the default **Print Server Name** (that is, the serial number) with the Print Server Name assigned during Adding a Print Server Object (see **Section 5.3.2**).

b. If necessary, enter the **Password** for this print server object and change the **Ethernet** [frame] **Type** and the **Queue Polling Time**.

The Queue List and Notify List are for information only. You must change this information on the Novell NetWare server.

3. In the left column of the PrintControl screen, click on the white circle in front of **NDS**.

4. Then click the button labeled **NDS**.

5. The right column titled "Object Information" will display the available configuration parameters. Enter the name of the correct **NDS Tree** and **NDS Context** manually or via the **Browse** button.

6. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

5.3.6 CLIENT CONFIGURATION

To enable a client workstation to print to a NetWare queue, a local port must be captured. Use the NetWare User Tools from within MS Windows or use a capture command from the DOS prompt.

To capture a local port using NetWare User Tools from within MS Windows:

1. Open **NetWare User Tools** from your desktop.

2. Click on the **printer icon** on the top tool bar. The client's available ports (LPT1, LPT2,...) will be displayed on the left side of the screen. The available queues (resources) will be displayed on the right.

3. Click on the desired **port**, then on the **queue** you want to capture, and finally on the **Capture** button.

4. Complete the capture process by configuring the **LPT Settings** and making the capture **Permanent** if so desired. Then exit the program.

You can obtain the same results by using the CAPTURE command from the DOS prompt:

1. At the DOS prompt type the following command:

   ```
   capture local=n queue=name
   ```

   where n is the number of the LPT port you want to assign the queue to and name is the name of the queue you want to capture.

5.4 Print Server, Novell NetWare 4.x (NDS), PCONSOLE

Configuring the Print Server as a NetWare print server under NDS requires the following steps:

- Adding a Print Server Object, **Section 5.4.1**

- Adding Printer Objects, **Section 5.4.2**

- Adding Print Queue Objects, **Section 5.4.3**

- Configuring the Print Server, **Section 5.4.4**

- Client Configuration, **Section 5.4.5**

5.4.1 ADDING A PRINT SERVER OBJECT

1. Login to NetWare as **ADMIN**, or as a user with ADMIN security equivalence.

2. Start the NetWare **PCONSOLE** program.

3. If necessary, use PCONSOLE's **Change Context** selection to change to the context where you want to install the print server. If you are not sure which context you should install the print server in, install the print server in the context that contains the users that will be using the print server most. For more information about contexts and other NetWare 4.x concepts, see your NetWare manuals.

4. On a piece of paper, write down the context in which you are installing the print server. You can read this from the Context: item at the top of PCONSOLE's screen. Later, you will use this information to configure the Print Server.

5. Go to PCONSOLE's **Available Options** menu and choose **Print Servers**. The Print Servers list appears.

6. Press <**Ins**> to add a new print server to the list. The **New Print Server Name** form appears.

7. Enter a name for the new print server and press <**Enter**>.

IMPORTANT!

When naming the Print Server:

• Do not use more than 19 characters in the Print Server's name. PCONSOLE allows you to enter print server names longer that this, but the Print Server does not support names longer than 19 characters.

• Do not use spaces in the print server name. Use dashes or underscores instead. PCONSOLE allows spaces in the print server name, but the Print Server does not support this. However, you can use spaces in the names of the queues or printer objects.

After a moment, PCONSOLE returns to the **Print Servers** list. The new print server appears in the list.

5.4.2 ADDING PRINTER OBJECTS

Perform the procedures below to associate NetWare printer objects with the printers connected to the Print Server's ports. Do this when installing a new Print Server, or when connecting a new printer to the Print Server to service NetWare print queues.

1. If you haven't already done so, start PCONSOLE and change to the context where the Print Server is installed.

2. In the **Print Servers** list, select the Print Server and press <**Enter**>. The **Print Server Information** menu appears.

3. In the **Print Server Information** menu, select **Printers** and press <**Enter**>. The **Serviced Printers** list appears.

4. Press <**Ins**> to insert a new printer into the print server's **Serviced Printers** list. The **Object, Class** list appears.

5. Navigate the **Object, Class** list to the context where the printer object resides, or where you want to install a new printer object. This should be the context where the majority of the printer's users reside.

6. If the printer you want to add to the **Serviced Printer** list does not exist yet, press <**Ins**> to add a new printer to the **Object, Class** list. PCONSOLE prompts you for a name, then adds the new printer to the **Object, Class** list.

7. In the **Object, Class** list, select a printer to add to the print server's **Serviced Printers** list. If you just added a new printer to the **Object, Class** list, select that new printer. Then press <**Enter**>. The new printer appears in the print server's **Serviced Printers** list.

8. In the **Serviced Printers** list, select the printer you just added, and press <**Enter**>. The **Printer Configuration** form appears.

NOTE

Ignore the Printer Type, Configuration, Buffer size, and Sampling Interval items on the Printer Configuration form. These items are not relevant to Print Server installations.

9. Select the **Printer Number** entry and enter a value from the table below to associate that printer with one of the Print Server's ports.

NetWare Printer Number	Associated Physical Port on the Print Server
0	LPT1
1	LPT2
2	COM1

10. If you want to add another printer to the print server's Serviced Printers list, return to the **Serviced Printers** list. Then repeat steps 2 through 9 for this procedure.

11. If you are going to add print queues to the new printers, go to **Section 5.4.3**. Otherwise, reset the Print Server by powering it OFF and back ON again or by using the Reset button in the PrintControl Utility.

5.4.3 ADDING PRINT QUEUE OBJECTS

Perform the following procedure to associate NetWare print queue objects with the Print Server's NetWare printer objects (see **Section 5.4.2**). Do this when installing a new Print Server, or when adding a new queue to be serviced by an existing NetWare printer object associated with the Print Server.

1. If you haven't already done so, start PCONSOLE, and change to the context where the Print Server's NetWare printer object resides. Then select the **Printer** you want to associate the print queue(s) with, and press <**Enter**>. The **Printer Configuration** form appears.

2. Select the **Print queues assigned <see list>** entry and press <**Enter**>. The **Print Queues** list appears. Make sure that there is at least one queue in the list.

3. Press <**Ins**> to add a queue to the Print Queues list. The **Object, Class** list appears.

4. Navigate the **Object, Class** list to the context where the print queue object resides, or where you want to create a new print queue object. This should be the context where majority of the queue users reside.

5. If the queue you want to add to the Print Queue list does not exist yet, press <**Ins**> to add a new queue to the Object, Class list. PCONSOLE prompts you for a name and volume, then adds the new queue to the Object, Class list.

6. In the Object, Class list, select a **Printer Queue** to add to the printer's Print Queues list. Then press <**Enter**>. The new queue appears in the printer's Print Queues list.

7. If you want to add another queue to the printer's Print Queues list, repeat step 2 through 6.

8. Press <**Esc**> several times until the **Exit?** menu appears. Select **Yes** and press <**Enter**>.

9. If you are installing a new Print Server, go to **Section 5.4.4**. Otherwise, reset the Print Server by powering it OFF and back ON again or by using the **Reset** button in the PrintControl Utility.

5.4.4 CONFIGURING THE PRINT SERVER

After starting the PrintControl utility, select the desired Print Server from the displayed list. The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server and can be found on the bottom of the Print Server as well as on the self-test printout.

Open the configuration dialog box by double clicking on the desired print server or by highlighting the desired print server and then pressing the **Configure** button displayed in the tool bar. Follow these simple steps to configure the Print Server as a Novell Netware 4.x NDS Print Server:

1. Select **NW Print Server** by clicking on the white box in front of that selection.

2. The right column titled "Object Information" will display the available configuration parameters.

    a. Replace the default **Print Server Name** (that is, the serial number) with the Print Server Name assigned during Adding a Print Server Object (see **Section 5.4.1**).

    b. If necessary, enter the **Password** for this print server object and change the **Ethernet [frame] Type** and the **Queue Polling Time**.

    The **Queue List** and **Notify List** are for information only. You can change this information on the Novell NetWare server.

3. In the left column of the PrintControl screen, click on the white circle in front of **NDS**.

4. Then click the **NDS** button labeled.

5. The right column titled "Object Information" will display the available configuration parameters. Enter the name of the correct **NDS Tree** and **NDS Context** manually or by using the **Browse** button.

6. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

5.4.5 CLIENT CONFIGURATION

To enable a client workstation to print to a NetWare queue, you must capture a local port. Do this via the NetWare User Tools from within MS Windows or through a capture command from the DOS prompt.

    To capture a local port using NetWare User Tools from within MS Windows:

1. Open **NetWare User Tools** from your desktop.

2. Click on the **printer icon** on the top tool bar. The client's available ports (LPT1, LPT2,...) will be displayed on the left side of the screen. The available queues (resources) will be displayed on the right.

3. Click on the desired **port**, then on the **queue** you want to capture, and finally on the **Capture** button.

4. To complete the capture, configure the LPT Settings and make the capture **Permanent** if required. Then exit the program.

You can obtain the same results by using the CAPTURE command from the DOS prompt by typing the following command:

```
capture local=n queue=name
```

where **n** is the number of the LPT port you want to assign the queue to and `name` is the name of the queue you want to capture.

5.5 Remote Printer, Novell NetWare 4.x (NDS), NWAdmin

Configuring the Print Server as a NetWare remote printer under NDS requires the following steps:

- Entering NWAdmin, **Section 5.5.1**

- Adding a Print Server (Optional), **Section 5.5.2**

- Adding Printer Objects, **Section 5.5.3**

- Adding Print Queue Objects, **Section 5.5.4**

- Loading or reloading the Print Server NLM, **Section 5.5.5**

- Configuring the Print Server, **Section 5.5.6**

- Client Configuration, **Section 5.5.7**

5.5.1 ENTERING NWADMIN

1. Login to NetWare as **ADMIN**, or as a user with ADMIN security equivalence.

2. Open the **NetWare Tools group** and double click on **NWAdmin**.

3. Check the current context on the **Title Bar**. If it is incorrect, select the appropriate context from the displayed list.

5.5.2 ADDING A PRINT SERVER (OPTIONAL)

If the print server NLM is already running on your Novell server, skip this section and go to **Section 5.5.3**. Otherwise, follow these steps:

1. Using the Right mouse button, click the context to which you want to add the Novell print server.

2. Select **Create** from the displayed menu.

3. Select **Print Server** and type a new print server name.

IMPORTANT!

When naming the print server:

• Do not use more than 19 characters in the print server's name. NWAdmin allows you to enter print server names longer that this, but the Print Server does not support names longer than 19 characters.

• Do not use spaces in the print server name. Use dashes or underscores instead. NWAdmin allows spaces in the print server name, but the Print Server does not support this. However, you can use spaces in the names of the queues or printer objects.

4. Click the **Create** button.

5.5.3 ADDING PRINTER OBJECTS

1. Using the Right mouse button, click the context to which you want to add the printer.

2. Select **Create** from the displayed menu.

3. Select **Printer** object.

4. Enter a new **Printer Name**.

5. Click the **Create** button.

6. Double-click the **Printer** icon for the just-created printer.

7. Click the **Configuration** button.

8. At the **Printer Type** window, select **Other/Unknown**.

9. Set the IPX/SPX network address (optional).

10. Click **OK**.

11. At the main NWAdmin window, double-click the Novell print server that exists in the context.

12. From the **Print Server** window, click the **Assignments** button.

13. Select **Add**.

14. Select **Printer**.

15. Select **OK**.

16. Select **OK** at the Print Server window.

5.5.4 ADDING PRINT QUEUE OBJECTS

1. Using the Right mouse button, click the context in which you want to create the queue.

2. Select **Create** from the displayed menu.

3. Select **Print Queue**.

4. At the **Create Print Queue** window, enter the queue name in the **Print Queue Name** field.

5. Select the volume from the **Print Queue Volume** pull-down list on the **Select Object** window.

6. Click **OK**.

7. Click the **Create** button on the **Create Print Queue** window.

8. Double-click the **Printer** icon for the just-created printer.

9. Click the **Assignments** button.

10. Click the **Add...** button.

11. Select the **Queue** name. This name becomes the selected object.

NOTE
The selected printer is automatically set as the default.

12. Click **OK**.

13. Click **OK**.

5.5.5 LOADING OR RELOADING THE PRINT SERVER NLM

1. Go to the **console** of the file server where the print server NLM is running or will be running.

2. If you already have a print server NLM loaded, unload it now by typing `unload pserver` at the prompt. Otherwise proceed directly to step 3.

3. Reload the print server NLM by typing the following at the prompt:

   `load pserver pserver_name`

   pserver_name is the name of the existing print server NLM or of the print server created in **Section 5.5.2**.

5.5.6 CONFIGURING THE PRINT SERVER

After starting the PrintControl utility, select the desired Print Server from the displayed list. The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test printout.

Open the configuration dialog box by double clicking on the desired Print Server, or by highlighting the desired Print Server and then pressing the **Configure** button displayed in the tool bar. Follow these simple steps to configure the Print Server as a Novell Netware Remote Printer.

1. Select **NW Remote Printer** by clicking on the white box in front of that selection.

2. The right column titled "Object Information" will display the available configuration parameters.

   a. In the **Print Server** field, enter the name of the Novell Print Server NLM.

   b. In the field next to the Print Server's local port that the target printer is attached to, enter the Printer Number assigned step 9 of **Section 5.5.3** or select the printer by name from the pop-up menu.

3. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

5.5.7 CLIENT CONFIGURATION

To enable a client workstation to print to a NetWare queue, you must capture a local port. Do this using the NetWare User Tools from within MS Windows or through a capture command from the DOS prompt.

To capture a local port using NetWare User Tools from within MS Windows:

1. Open **NetWare User Tools** from your desktop.

2. Click on the **printer icon** on the top tool bar. The client's available ports (LPT1, LPT2,...) will be displayed on the left side of the screen. The available queues (resources) will be displayed on the right.

3. Click on the desired **port**, then on the **queue** you want to capture, and finally on the **Capture** button.

4. Complete the capture by configuring the LPT Settings and making the capture **Permanent** if required. Then exit the program.

You can obtain the same results by using the CAPTURE command from the DOS prompt:

At the DOS prompt type the following command:

```
capture local=n queue=name
```

where n is the number of the LPT port you want to assign the queue to and name is the name of the queue you want to capture.

5.6 Remote Printer, Novell NetWare 4.x (NDS), PCONSOLE

Configuring the Print Server as a NetWare remote printer under NDS requires the following steps:

- Adding a Print Server (Optional), **Section 5.6.1**

- Adding Printer Objects, **Section 5.6.2**

- Adding Print Queue Objects, **Section 5.6.3**

- Loading or reloading the Print Server NLM, **Section 5.6.4**

- Configuring the Print Server, **Section 5.6.5**

- Client Configuration, **Section 5.6.6**

5.6.1 ADDING A PRINT SERVER (OPTIONAL)

If the print server NLM is already running on your Novell server, skip this section and proceed directly to **Section 5.6.2**. Otherwise, follow these steps:

1. Login to Netware as **ADMIN**, or as a user with ADMIN security equivalence.

2. Start the NetWare **PCONSOLE** program.

3. If necessary, use PCONSOLE's **Change Context** selection to change to the context where you want to install the print server. If you are not sure which context you should install the print server in, install the print server in the context that contains the users that will be using the print server most. For more information about contexts and other NetWare 4.x concepts, see your NetWare manuals.

4. On a piece of paper, write down the context in which you are installing the print server. You can read this from the **Context: item** at the top of PCONSOLE's screen. Later, you will use this information to configure the Print Server.

5. Go to PCONSOLE's **Available Options** menu and choose **Print Servers**. The Print Servers list appears.

6. Press <**Ins**> to add a new print server to the list. The **New Print Server Name** form appears.

7. Enter a name for the new print server and press <**Enter**>.

IMPORTANT!

When naming the Print Server:

• Do not use more than 19 characters in the print server's name. PCONSOLE allows you to enter print server names longer that this, but the Print Server does not support names longer than 19 characters.

• Do not use spaces in the print server name. Use dashes or underscores instead. PCONSOLE allows spaces in the print server name, but the Print Server does not support this. However, you can use spaces in the names of the queues or printer objects.

After a moment, PCONSOLE returns to the **Print Servers** list. The new print server appears in the list.

5.6.2 ADDING PRINTER OBJECTS

Follow the procedures below to associate NetWare printer objects with the printers connected to the Print Server's ports. Do this when installing a new Print Server, or when connecting a new printer to the Print Server to service NetWare print queues.

1. If you haven't already done so, start PCONSOLE, and change to the context where the Print Server is installed.

2. In the **Print Servers** list, select the desired Novell print server and press <**Enter**>. The Print Server Information menu appears.

3. In the **Print Server Information** menu, select **Printers** and press <**Enter**>. The **Serviced Printers** list appears.

4. Press <**Ins**> to insert a new printer into the print server's **Serviced Printers** list. The **Object, Class** list appears.

5. Navigate the **Object, Class** list to the context where the printer object resides, or where you want to install a new printer object. This should be the context where the majority of the printer's users reside.

6. If the printer you want to add to the Serviced Printer list does not exist yet, press <**Ins**> to add a new printer to the Object, Class list. After you have entered a new name, PCONSOLE adds the new printer to the Object, Class list.

7. In the Object, Class list, select a printer to add to the print server's **Serviced Printers** list. If you just added a new printer to the Object, Class list, select that new printer. Then press <**Enter**>. The new printer appears in the print server **Serviced Printers** list.

8. In the **Serviced Printers** list, select the printer you just added, and press <**Enter**>. The **Printer Configuration** form appears.

NOTE

Ignore the Configuration, Buffer size, and Sampling Interval items on the Printer Configuration form. These items are not relevant to Print Server installations.

9. We recommend that you use the default **Printer Number**. If you do need to change the number, make sure it uniquely identifies the printer among other printers associated with the Novell print server.

10. In the **Printer Type** field, select **Other/Unknown**.

11. If you want to add another printer to the print server's Serviced Printers list, return to the **Serviced Printers** list. Then repeat steps 2 through 10.

12. Return to the **Available Options** menu by pressing <**Esc**> repeatedly.

5.6.3 ADDING PRINT QUEUE OBJECTS

Perform the procedure below to associate NetWare print queue objects with the Print Server's NetWare Printer objects (see **Section 5.6.2**). Do this when installing a new Print Server, or when adding a new queue to be serviced by an existing NetWare Printer object associated with the Print Server.

1. If you haven't already done so, start PCONSOLE and change to the context where the Print Server's NetWare Printer object resides. Then select the **Printer** you want to associate the print queue(s) with, and press <**Enter**>. The **Printer Configuration** form appears.

2. Select the **Print queues assigned <see list>** entry and press <**Enter**>. The Print Queues list appears. Make sure that there is at least one queue in the list.

3. Press <**Ins**> to add a queue to the Print Queues list. The Object, Class list appears.

4. Navigate the **Object, Class** list to the context where the print queue object resides, or where you want to create a new print queue object. This should be the context where the majority of the queue users reside.

5. If the queue you want to add to the Print Queue list does not exist yet, press <**Ins**> to add a new queue to the Object, Class list. PCONSOLE prompts you for a name and volume, then adds the new queue to the Object, Class list.

6. In the Object, Class list, select a **Printer Queue** to add to the printer's Print Queues list. Then press <**Enter**>. The new queue appears in the printer's Print Queues list.

7. If you want to add another queue to the printer's Print Queues list, repeat step 2 through 6.

8. Press <**Esc**> several times until the **Exit?** menu appears. Select **Yes** and press <**Enter**>.

5.6.4 LOADING OR RELOADING THE PRINT SERVER NLM

1. Go to the **console** of the file server where the print server NLM is running or will be running.

2. If you already have a print server NLM loaded, unload it now by typing `unload pserver` at the prompt. Otherwise proceed directly to step 3.

3. Reload the print server NLM by typing the following at the prompt:

   `load pserver pserver_name`

   pserver_name is the name of the existing print server NLM or of the print server created in **Section 5.6.1**.

5.6.5 CONFIGURING THE PRINT SERVER

After starting the PrintControl utility, select the desired Print Server from the displayed list. The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test printout.

Open the configuration dialog box by double clicking on the desired Print Server, or by highlighting the desired Print Server and then pressing the Configure button displayed in the tool bar.

Follow these simple steps to configure the Print Server as a Novell NetWare Remote Printer.

1. Select **NW Remote Printer** by clicking on the white box in front of that selection.

2. Click the "**NW Remote Printer**" button.

3. The right column titled "Object Information" will display the available configuration parameters.

   a. In the **Print Server** field, enter the name of the Novell Print Server NLM.

   b. In the field next to the Print Server's local port that the target printer is attached to, enter the **Printer Number** assigned in step 9 of **Section 5.6.2** or select the **printer** by name from the pop-up menu.

4. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply**

Changes button on the bottom of the configuration window. Then exit the utility.

5.6.6 CLIENT CONFIGURATION

To enable a client workstation to print to a NetWare queue, you must capture a local port. Use the NetWare User Tools from within MS Windows or use a capture command from the DOS prompt.

To capture a local port using NetWare User Tools from within MS Windows:

1. Open **NetWare User Tools** from your desktop.

2. Click on the **printer icon** on the top tool bar. The client's available ports (LPT1, LPT2,...) will be displayed on the left side of the screen. The available queues (resources) will be displayed on the right.

3. Click on the desired **port**, then on the **queue** you want to capture, and finally on the **Capture** button.

4. Complete the capture by configuring the LPT Settings and making the capture **Permanent** if required. Then exit the program.

You can obtain the same results by using the CAPTURE command from the DOS prompt:

At the DOS prompt, type the following command:

```
capture local=n queue=name
```

where n is the number of the LPT port you want to assign the queue to and name is the name of the queue you want to capture.

5.7 Print Server, NetWare 3.x and 2.x

You can configure the Print Server as a bindery print server under NetWare from within the PrintControl utility. This section contains the following two parts:

- Creating NetWare Objects, **Section 5.7.1**

- Client Configuration, **Section 5.7.2**

5.7.1 CREATING NETWARE OBJECTS

1. Login to a NetWare file server as **SUPERVISOR**, or as a user with SUPERVISOR security equivalence. If there is more than one file server on your network, log into the one you want to be the Print Server's master file server.

IMPORTANT!

When installed as NetWare Print Server, the Print Server's master file server must have a name that is no longer than 19 characters. If your file server has a longer name, you must either choose a different file server as the Print Server's master file server or shorten the file server's name.

2. If you haven't already done so, start the PrintControl utility.

3. Select the desired Print Server from the displayed list. The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server and can be found on the bottom of the Print Server as well as on the self-test printout.

4. Open the configuration dialog box by double clicking on the desired print server, or by highlighting the desired print server and then pressing the **Configure** button displayed in the tool bar.

5. Select **NW Print Server** by clicking on the white box in front of that selection.

6. Then click the **NW Print Server** button.

7. The right column titled "Object Information" will display the available configuration parameters.

   a. Replace the default **Print Server Name** (that is, the serial number) with a Print Server Name of your choice.

IMPORTANT!

When naming the Print Server:

• Do not use more than 19 characters in the Print Server's name. PCONSOLE allows you to enter print server names longer that this, but the Print Server does not support names longer than 19 characters.

• Do not use spaces in the print server name. Use dashes or underscores instead. PCONSOLE allows spaces in the print server name, but the Print Server does not support this. However, you can use spaces in the names of the queues or printer objects.

    b. If necessary, enter the **Password** for this print server object and change the **Ethernet [frame] Type** and the **Queue Polling Time**.

8. In the left column of the **PrintControl** screen, click on the white circle in front of **bindery**.

9. Then click the **bindery** button.

10. The right column titled "Object Information" will display the available configuration parameters. Enter the name of the **Master File Server**.

11. Click on the **Queues** button.

12. Select the Print Server's printer **port** you want to assign queues to from the available options displayed in the **Ports** field.

13. Add a new queue by typing the name of the new queue into the field labeled "**New Queue Name**."

14. Click on the **Add** button next to the "New Queue Name" field.

15. Repeat steps 12 through 14 to add additional queues to the same or other print server printer ports. Click **OK**.

16. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

17. PrintControl will automatically create the following objects on the NetWare file server:

• a print server object,

• print queue object(s), and

• printer objects for all physical ports on the Print Server

5.7.2 CLIENT CONFIGURATION

To enable a client workstation to print to a NetWare queue, you must capture a local port. Use the NetWare User Tools from within MS Windows or use a capture command from the DOS prompt.

To capture a local port using NetWare User Tools from within MS Windows:

1. Open **NetWare User Tools** from your desktop.

2. Click on the **printer icon** on the top tool bar. The client's available ports (LPT1, LPT2,...) will be displayed on the left side of the screen. The available queues (resources) will be displayed on the right.

3. Click on the desired **port**, then on the **queue** you want to capture, and finally on the **Capture** button.

4. Complete the capture by configuring the LPT Settings and making the capture **Permanent** if required. Then exit the program.

You can get the same results by using the CAPTURE command from the DOS prompt by typing the following:

```
capture local=n queue=name
```

where n is the number of the LPT port you want to assign the queue to and name is the name of the queue you want to capture.

5.8 Remote Printer, NetWare 3.x and 2.x , PCONSOLE

Configuring the Print Server as a remote printer under NetWare requires the following steps:

• Adding Print Queue Objects on the Novell Server, **Section 5.8.1**

• Adding a Print Server Object on the Novell Server (Optional), **Section 5.8.2**

• Adding Printer Objects on the Novell Server, **Section 5.8.3**

• Associating Printer Objects with Print Queue Objects, **Section 5.8.4**

• Loading or reloading the PServer NLM, **Section 5.8.5**

• Configuring the Print Server, **Section 5.8.6**

• Client Configuration, **Section 5.8.7**

5.8.1 ADDING PRINT QUEUE OBJECTS ON THE NOVELL SERVER

If you are going to set up the Print Server remote printer to use print queues that already exist, skip this section. Otherwise, follow the steps below to create NetWare print queue objects. Do this when installing a new Print Server, or when adding a new queue to be serviced by an existing NetWare Printer object associated with the Print Server.

1. Login to a NetWare file server as **SUPERVISOR**, or as a user with SUPERVISOR security equivalence. If there is more than one file server on your network, log into the one you want to be the Print Server's master file server.

2. If you haven't already done so, start **PCONSOLE**.

3. From the **Available Options** menu, select **Print Queue Information** and press <**Enter**>.

4. Press <**Insert**> to add a new queue to the list.

5. Type a queue name, and press <**Enter**>.

6. If you want to add additional queues, repeat steps 3 and 4.

7. Press <**Esc**> until the **Available Options** menu appears.

5.8.2 ADDING A PRINT SERVER OBJECT ON THE NOVELL SERVER (OPTIONAL)

If the print server NLM is already running on your Novell server, skip this section and proceed directly to **Section 5.8.3**. Otherwise, follow these steps.

1. From PCONSOLE's **Available Options** menu, select **Print Server Information**.

2. Press <**Ins**>.

3. Enter a name for the new print server and press <**Enter**>.

IMPORTANT!

When naming the Print Server:

• Do not use more than 19 characters in the Print Server's name. PCONSOLE allows you to enter print server names longer that this, but the Print Server does not support names longer than 19 characters.

• Do not use spaces in the print server name. Use dashes or underscores instead. PCONSOLE allows spaces in the print server name, but the Print Server does not support this. However, you can use spaces in the names of the queues or printer objects.

After a moment, PCONSOLE returns to the Print Servers list. The new print server appears in the list.

4. Press <**ESC**> to return to the **Available Options** menu.

5.8.3 ADDING PRINTER OBJECTS ON THE NOVELL SERVER

Perform the procedures below to associate NetWare printer objects with the printers connected to the Print Server's ports. Do this when installing a new Print Server, or when connecting a new printer to the Print Server to service NetWare print queues.

1. From the **Available Options** menu, select **Print Server Information**.

2. In the **Print Servers** list, select the desired Novell print server and press <**Enter**>.

3. Select **Print Server Configuration** and press <**Enter**>.

4. Select **Printer Configuration** and press <**Enter**>.

5. For each of the Print Server ports to which you are connecting a printer select one of the **Not Installed** printers and press <**Enter**>.

6. Assign a **name** to the printer and select the **type** according to the following table :

Printer Attached to Printer Server's Physical Port	NetWare Printer Type
LPT1	Remote Parallel, LPT1
LPT2	Remote Parallel, LPT2
COM1	Remote Serial, COM1

7. Press <**ESC**> and select **Save Changes**? **Yes**.

8. Press <**ESC**> again to return to the **Print Server Configuration** menu.

5.8.4 ASSOCIATING PRINTER OBJECTS WITH PRINT QUEUE OBJECTS

1. From the **Printer Server Configuration** menu, select **Queues Serviced by Printer** and press <**Enter**>.

2. Select the printer you want to assign a print queue to and press <**Enter**>.

3. Press <**Insert**> to add a queue to the list.

4. Select the queue that you want the printer to service and press <**Enter**>.

5. Enter a priority level and press <**Enter**>.

6. If you have additional printers attached to the Print Server, repeat steps 2 through 5 to assign at least one queue to the additional printers.

7. Press <**Esc**> until the **Exit PCONSOLE** dialog box appears. Choose **Yes** and press <**Enter**>.

5.8.5 LOADING OR RELOADING THE NETWARE PSERVER NLM

1. Go to the console of the file server where the print server NLM is running or will be running.

2. If you already have a print server NLM loaded, unload it now by typing `unload pserver` at the prompt. Otherwise proceed directly to step 3.

3. Reload the print server NLM by typing the following at the prompt:

```
load pserver pserver_name
```

`pserver_name` is the name of the existing print server NLM or of the print server above.

5.8.6 CONFIGURING THE PRINT SERVER

After starting the PrintControl utility, select the desired Print Server from the displayed list. The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test printout.

Open the configuration dialog box by double clicking on the desired print server or by highlighting the desired print server and then pressing the **Configure** button displayed in the tool bar. Follow these simple steps to configure the Print Server as a Novell NetWare Remote Printer.

1. Select **NW Remote Printer** by clicking on the white box in front of that selection.

2. The right column titled "Object Information" will display the available configuration parameters.

   a. In the **Print Server** field, enter the name of the Novell Print Server NLM.

   b. In the field next to the Print Server's local port that the target printer is attached to, enter the **Printer Name** assigned earlier (see **Section 5.8.1**). Alternately, you may enter the Novell **printer number** associated with the printer.

3. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

5.8.7 CLIENT CONFIGURATION

To enable a client workstation to print to a NetWare queue, you must capture a local port. Use the NetWare User Tools from within MS Windows or use a capture command from the DOS prompt.

To capture a local port using **NetWare User Tools** from within MS Windows:

1. Open **NetWare User Tools** from your desktop.

2. Click on the **printer icon** on the top tool bar. The client's available ports (LPT1, LPT2,...) will be displayed on the left side of the screen. The available queues (resources) will be displayed on the right.

3. Click on the desired **port**, then on the **queue** you want to capture, and finally on the **Capture** button.

4. Complete the capture by configuring the LPT Settings and making the capture **Permanent** if required. Then exit the program.

You can get the same results by using the **CAPTURE** command from the DOS prompt by typing the following:

```
capture local=n queue=name
```

where n is the number of the LPT port you want to assign the queue to and name is the name of the queue you want to capture.

6. NetBIOS Printing

If you have not already installed the PrintControl utility, go back to **Section 3.2, Print Control Installation** and do so now. Then proceed with the following instructions.

- Configuring the Print Server, **Section 6.1**

- Configuring Windows 95 for Peer-to-Peer Printing, **Section 6.2**

- Configuring Windows for Workgroups, **Section 6.3**

- Configuring Windows NT 4.XX, **Section 6.4**

- Configuring OS/2 Warp for Peer-to-Peer Printing, **Section 6.5**

After you have completed the configuration of these protocols, go to either **Chapter 8, IBM SCS Printer Emulations** or **Chapter 9, IPDS Printer Emulation** to identify the printer types attached to the physical port(s) of the Print Server, their IBM emulation types, etc.

6.1 Configuring the Print Server

After starting the PrintControl utility, select one of the listed print servers. Open the configuration dialog box by double clicking on the desired print server, or by highlighting the desired print server and then pressing the **Configure** button displayed in the tool bar. Follow these simple steps to configure the Print Server for NetBIOS printing:

1. Select the **NetBIOS** protocol by clicking on the white box in front of the protocol selection **NetBIOS**.

2. The right column titled "Object Information" will display the available configuration parameters. In this case the only configuration parameter is the **Print Server Name**. The default name consists of "SDE_*xxxxxxxx*," where *xxxxxxx* represents the Print Server's serial number. As you change this name, make sure that:

   a. The new name starts with an alphanumeric character.

   b. The total number of characters does not exceed 15.

3. If you want to configure additional protocols, refer to the respective section herein. If your configuration of the Print Server is complete, click on the

Apply Changes button on the bottom of the configuration window. Then exit the utility.

Proceed with the section that matches your client environment. The sections are:

- Configuring Windows 95 for Peer-to-Peer Printing, **Section 6.2**

- Configuring Windows for Workgroups, **Section 6.3**

- Configuring Windows NT 4.XX, **Section 6.4**

- Configuring OS/2 Warp for Peer-to-Peer Printing, **Section 6.5**

6.2 Configuring Windows 95 for Peer-to-Peer Printing

1. Open Windows 95 and click on **Start**.

2. Select **Settings** then open the **Printer** folder.

3. Double click on the **Add Printer** icon.

4. At the prompt **How is the printer attached to your computer?**, choose **Local Printer**.

5. Select the printer parameters that best describe the printer attached to the Print Server.

6. Select one of the available **local ports**. You will further modify this later.

7. Do NOT print a test page. Click **Finish** to close the Add Printer Wizard.

8. Double click on the **printer icon** of the printer you just created.

9. From the **Printer** menu, select **Properties**.

10. Click on the **Details** tab and then on the **Capture Printer Port** button.

11. Choose the **Device** (LPT1, LPT2, or COM1) and the desired **Path**. Make sure that the path is in this format:

    \\print server name\print server port

    print server name is the same as assigned to the Print Server during its NetBIOS configuration (see **Section 6.1**) and the print server port is the corresponding printer port on the Print Server.

NOTE

For NetBIOS to run effectively, the PC printer port being captured should be assigned to the corresponding Print Server port. Device LPT1 goes to print server port LPT1.

12. You can check the **reconnect at logon** box to automatically capture the PC's local port every time Windows 95 starts up.

6.3 Configuring Windows for Workgroups

Windows for Workgroups allows redirection of up to three local ports (LPT1 through LPT3) without additional configuration. You can add up to six more ports—LPT4 through LPT9—by modifying WIN.INI. Refer to your Windows for Workgroups documentation for instructions on how to add more ports. This instruction describes how to configure a Workgroup client workstation to print through the Print Server directly.

1. Open the **Control Panel** in the Windows Main folder.

2. Select **Printer** and click on **Add**>>.

3. Add the printer that is attached to the Print Server to the list of printers available to the client workstation. Be sure to assign a local port for the remote device. You can make this your default printer.

4. Click on **Connect...**

5. Click on **Network**.

6. From the **Device Name** list, select a local port to redirect to your Print Server.

7. In the **Path** field, type:

    `\\print server name\print server port`

where `print server name` is the same as assigned to the Print Server during its NetBIOS configuration (see **Section 6.1**) and the `print server port` is one of the available printer ports on the Print Server.

NOTE

For NetBIOS to run effectively, the PC printer port being captured should be assigned to the corresponding Print Server port. That is, Device LPT1 goes to print server port LPT1.

8. Make sure the **Reconnect at Startup** box is checked, and click on **OK**.

NOTE

If the printer attached to the print server is slow, increase the Transmission Retry value option in the Connect dialog box to 900.

9. Click **OK** to close the Connect dialog and **Close** to close **Printers**. The printer attached to the Print Server is now available. Simply select it from your application as you would any other printer.

NOTE

This setup defaults to the fastest printing method: foreground printing. If you want a slower printing method, enable Background printing. You can find the switch to enable Background printing in the Options menu of Print Manager. Be sure to clear the Send Documents Directly to Network option.

6.4 Configuring Windows NT 4.XX

Make sure your Windows NT workstation has the NetBIOS protocol active. If you are unsure do the following:

A. Click on **Start**, then select **Settings**, and lastly **Control Panel**.

B. Double-click on the **Network** icon and review the lists under the **Protocol** tab.

If the NetBIOS protocol is not found, you must add it before continuing with the instructions below. Consult your Microsoft documentation for more information.

Follow the procedures below to create printers for the Print Server on a Windows NT workstation. If there is more than one printer attached to the Print Server, perform this procedure once for each attached printer.

1. From the DOS prompt type:

   `net use local port \\print server name\print server port`

   `local port` is one of the PC's local ports (LPT1, LPT2, or COM1), `print server name` is the same as assigned to the Print Server during its NetBIOS configuration (see **Section 6.1**) and `print server port` is one of the available physical printer ports on the Print Server.

NOTE

For NetBIOS to run effectively, the PC printer port being captured should be assigned to the corresponding Print Server port. That is, Device LPT1 goes to print server port LPT1.

2. Exit MS-DOS.

3. From the Windows NT desktop, click on **Start**.

4. Select Settings, then open the **Printer** folder.

5. Double click on the **Add Printer** icon.

6. Choose **My Computer**.

7. Select **Add Port**.

8. From the **Available Printer Ports** list, double-click on **Local Port**.

9. Type \\print server name\print server port (see step 1 above).

10. Click **OK** and **Close** the Printer Ports screen.

11. From **Add Printer Wizard** screen, select the NetBIOS port you just added and press **Next**.

12. Complete the remaining requests from the Windows NT Add Printer Wizard. The printer attached to the Print Server is now available. Simply select it from your application as you would any other printer.

6.5 Configuring OS/2 Warp for Peer-to-Peer Printing

The OS/2 Warp Peer-to-Peer Setup consists of these steps:

• Creating a Printer Object, **Section 6.5.1**

• Sharing (Optional), **Section 6.5.2**

• Mapping the Print Server to a Local Printer Port, **Section 6.5.3**

• Modifying the startup.cmd, **Section 6.5.4**

6.5.1 CREATING A PRINTER OBJECT

1. Double-click on the **OS/2 System** icon.

2. Double-click on **Templates**.

3. Point to the **Printer** template.

4. Press and hold the Right mouse button.

5. Drag the template to a folder or to the desktop.

6. Release the Right mouse button.

7. Type a name for the printer in the **Name** field.

8. Select a LPT **port**. This local printer port will later be associated with the Print Server.

9. Select the appropriate **printer driver**. Complete additional instructions associated with loading the desired printer driver.

10. Click on **Create**.

6.5.2 SHARING (OPTIONAL)

Share the printer with other clients on the network by doing the following:

1. Right-click on the icon of the printer you just created.

2. Select **Start Sharing**.

6.5.3 MAPPING THE PRINT SERVER TO A LOCAL PRINTER PORT

1. Open an OS/2 Window (from the LaunchPad or by clicking on OS/2 System and then on **Command Prompts**).

2. At the OS/2 prompt, enter the following:

   ```
   net use local port \\remote name\port
   ```

   where:

   `local port` is a port on the OS/2 workstation that is used for printing (for example: lpt1, lpt2, lpt3, and so on)

   `remote name` is the name used to identify the Print Server (that is, the name assigned during NetBIOS configuration using the PrintControl utility. See **Section 6.1**)

   `port` is the Print Server's physical port that the target printer is attached to. For example, the 3-Port Multiprotocol Print Server offers three physical ports: LPT1, LPT2, and COM1.

NOTE

For NetBIOS to run effectively, the PC printer port being captured should be assigned to the corresponding Print Server port. That is, Device LPT1 goes to print server port LPT1.

Example:

```
net use lpt1 \\sde_123456\lpt1
```

6.5.4 MODIFYING THE STARTUP.CMD

By including the **net use** command in the OS/2 startup.cmd, the printer attached to the Print Server will automatically be available to the OS/2 workstation. In addition, the **net share** command will automatically make the printer available to other OS/2 workstations on the LAN.

To modify the startup.cmd, do the following:

1. Open the **Enhanced Editor** (EPB) or another text editor.

2. From the menu bar, select **File**, then **Open...** .

3. Click on the **startup.cmd** file, then press **OK**.

4. Add the following lines to the startup.cmd file:

```
net use local port \\remote name\port

net share printer name /PR
```

where:

local port is a port on the OS/2 workstation that is used for printing (for example: lpt1, lpt2, lpt3, and so on)

remote name is the name used to identify the Print Server (that is, the name assigned during NetBIOS configuration using the PrintControl utility. See **Section 6.1**)

port is the Print Server's physical port that the target printer is attached to. For example, the 3-Port Multiprotocol Print Server offers three physical ports: LPT1, LPT2, and COM1.

printer name is the name you assigned to the printer object (see **Section 6.5.1**).

5. If the startup.cmd file does not already end with it, enter the word **EXIT** on the last line of the script. (See the following example.)

```
NET USE LPT4 \\SDE_123456\LPT1

NET SHARE 5450_PRT /PR

EXIT
```

7. SNA (APPC) Printing

If you haven't already installed the PrintControl utility, please go back and do so now. Then proceed with the following instructions. **Section 7.2** can help you locate the necessary AS/400 parameters to properly configure the Print Server.

- Configuring the Print Server, **Section 7.1**

- Retrieving AS/400 Parameters, **Section 7.2**

   After you have configured these protocols, go to either **Chapter 8, IBM SCS Printer Emulations** or **Chapter 9, IPDS Printer Emulation** to identify the printer types attached to the physical port(s) of the Print Server, their IBM emulation types, etc.

7.1 Configuring the Print Server

After starting the PrintControl utility, select the desired Print Server from the displayed list. The Print Servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test printout.

   Open the configuration dialog box by double-clicking on the desired print server, or by highlighting the desired print server and then pressing the **Configure** button displayed in the tool bar. Follow these simple steps to configure the Print Server for SNA (APPC) printing.

1. Select **SNA (APPC)** by clicking on the white box in front of that selection.

2. The right column titled "Object Information" will display the available configuration parameters.

   a. In the field titled "Adapter Address," enter the **Local adapter address** found in the AS/400 line description. If the Print Server is attached to a remote controller or gateway, enter the address of the Ethernet adapter of that remote controller or gateway. Make sure to use the format specified in the field (XX:XX:XX:XX:XX:XX).   Refer to **Section 7.2.1** if you need help locating this address on your AS/400.

   b. In the field titled "Host Network ID," enter the **Local network ID** found in the AS/400 network attributes listing. Refer to **Section 7.2.2** if you need more help locating this information.

c. In the "Host Control Point Name" field, enter the **Local control point name** found in the AS/400 network attributes listing.

d. In the field titled "Interface Control Point Name," enter a name for the Print Server. Make sure the name complies with the following requirements:

1) The name must be exactly 8 characters.

2) The name must start with an alphanumeric character (for example, A, B, C, a, b, c, or 0, 1, 2).

3) The name must consist of alphanumeric or numeric characters only. Spaces, underscores, slashes, etc., are not accepted.

4) The first four characters should uniquely identify the device, since the Print Server will automatically create printer devices on your AS/400 using the first four characters of the name you assigned to the Print Server followed by **PRTXX**.

3. If you want to configure additional protocols, refer to the respective section. If your configuration of the Print Server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

4. The Print Server will now automatically create the following devices on your AS/400:

a. APPC Controller with the name you assigned as the "Interface Control Point." This step will be omitted if the Print Server is attached to a 5494 controller.

b. 5494 Controller with the first five characters of the "Interface Control Point" name followed by the identifier **RMT**.

c. A printer device for every printer that was attached to the Print Server at the time the new configuration was sent to the Print Server or when the Print Server was last reset. Names for the printer devices are actually given by the AS/400 system and follow this format:

ABCDPRTXX

where:

ABCD are the first four characters of the "Interface Control Point" name;

PRT is a fixed identifier for printers;

XX identifies the printer(s) that was(were) actually attached to the Print Server at the time the SNA (APPC) configuration was applied to the Print Server or at the time the Print Server was last reset.

7.2 Retrieving AS/400 Parameters

This section explains how to locate the parameters needed for the configuration of the Print Server, namely:

- Adapter Address (AS/400), **Section 7.2.1**

- Host Network ID and Host Control Point Name, **Section 7.2.2**

7.2.1 ADAPTER ADDRESS (AS/400)

1. Type **WRKLIND** (Work Line Description) on the AS/400 command line. Press **Enter**.

2. Locate the line that the Print Server is attached to from the displayed lines. Enter **5** (Display) in the field in front of that line. Press **Enter**.

3. Locate the **Local adapter address**. This is the value you wanted to find. As you enter it in the PrintControl's menu, make sure to change the format to XX:XX:XX:XX:XX:XX.

7.2.2 HOST NETWORK ID AND HOST CONTROL POINT NAME

1. Type **DSPNETA** (Display Network Attributes) on the AS/400 command line. Press **Enter**.

2. The Host Network ID is listed as the **Local network ID** and the Host Control Point Name is listed as the **Local control point name**.

8. IBM SCS Printer Emulations

The Print Server allows you to turn every attached printer into a unique, individually configurable 5250 printer. For instance, if you are operating a 3-Port Multiprotocol Print Server, you will be able to run up to three different 5250 printer sessions.

   To assure trouble-free operation, 5250 EBCDIC data streams (SCS) are sent to "logical ports." The following diagram illustrates how logical ports, physical ports, and attached printers relate to each other. Logical ports are called SCS1, SCS2, and SCS3 in a TCP/IP network or ABCDPRT01, ABCDPRT02, ABCDPRT03 when using the IBM SNA protocol. ABCD in the latter represents the Control Point Name assigned to the Print Server during configuration. Print Servers equipped with IPDS capability will also include another logical port called AFP1.
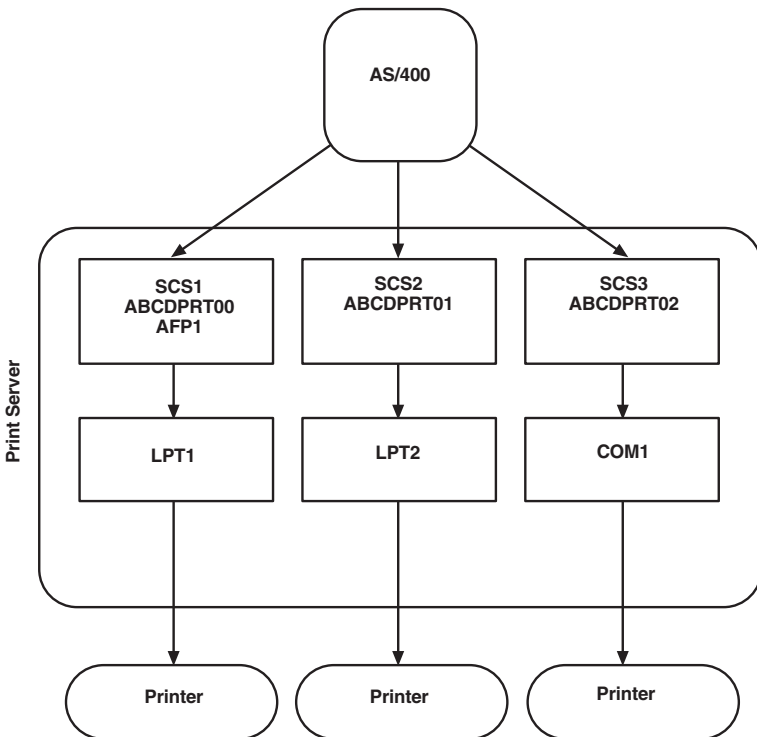

Figure 8-1. The Relationship Between Logical Ports, Physical Ports, and Attached Printers.

Logical ports act as filters. They convert incoming EBCDIC data according to a pre-determined 5250 printer profile before sending the data to the associated physical port and from there to the attached ASCII printer.

Follow the instructions below to configure the Print Server's 5250 printer emulations.

- Configuration Using PrintControl, **Section 8.1**

- Configuration Using Host Download Commands, **Section 8.2**

- Configuration Options, **Section 8.3**

- Description of Configuration Options, **Section 8.4**

- Laser Printer Operation, **Section 8.5**

- Matrix Printer Operation, **Section 8.6**

- Advanced Features, **Section 8.7**

8.1 Configuration Using PrintControl

After starting the PrintControl utility, select the desired print server from the displayed list. The print servers are identified by their serial number and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test printout.

Open the configuration dialog box by double-clicking on the desired print server, or by highlighting the desired print server and then pressing the **Configure** button displayed in the tool bar. Follow these simple steps to configure the IBM 5250 logical ports.

1. From the table below select the appropriate **AS/400 SCS Printing** port by clicking on the respective button.

If your printer is attached to this physical port of the Print Server	Click on this logical port button
LPT1	SCS1
LPT2	SCS2
COM1	SCS3

2. The right column titled "Object Information" will display the available configuration parameters.

   a. Select the **IBM Printer Emulation** that best fits your needs from the pop-up list.

   b. From the available pop-up list select the **Printer Driver** that best matches the attached printers personality.

3. If you need to configure more 5250 printer emulation parameters, click on **Advanced**. Refer to Configuration Options (see **Section 8.3**) for descriptions of the various parameters.

4. If you want to configure additional protocols, refer to the respective section. If your configuration of the print server is complete, click on the **Apply Changes** button on the bottom of the configuration window. Then exit the utility.

8.2 Configuration Using Host Download Commands

Host Download commands are an alternative to the PrintControl utility for configuring the Print Server. Host Download commands are sent from the AS/400 to the Print Server. All configuration parameters pertaining to the IBM printer emulation can be modified using Host Download commands. For a description of the Host Download commands, see **Section 8.4**. The text below explains how to use Host Download commands.

Host Download commands are placed in a Host document or on the screen. The document or screen print is then sent to one of the SCS logical ports of the Print Server. As part of the 5250 data stream processing, the Print Server monitors the data stream and filters out Host Download commands. These commands will not print, but will be used to configure the Print Server.

Host Download commands sent to the Print Server take effect immediately and stay only in the print server's active memory. To save the changed configuration beyond a power off, you must send a **Host Download command &%Z99,0**.

Take the following steps to enter a host download command.

1. Type the Command Pass-Thru (CPT) delimiter **&%** (or the alternate CPT start delimiter) in the document or on the screen at the point where the command is to take effect.

2. Type an upper case **Z**.

3. Type the **command number** for the command to be used, as shown in **Table 8-1**. Always use two digits for the command number (that is, **&%Z05,1**).

4. Type a **comma**.

5. Type the **value** representing the desired selection. No spaces are allowed. A space or invalid character in a command causes the Print Server to ignore the command and resume printing from the point the error occurred.

6. A space or control character (that is, NL, FF, CR, LF) signals the end of the Host Download command.

7. Multiple commands can be chained together by using a slash (/) or backslash (\) to separate the commands (no spaces are allowed). For example, to set the Default Print Quality (Command 22) to NLQ (Value 1), Draft Printing (Command 23) to Fast Draft (Value 1), and the Wrap/Truncate Text selection (Command 26) to Truncate (Value 1), type:

```
&%Z22,1/Z23,1/Z26,1
```

8.3 Configuration Options

The following table shows the available configuration options for the 5250 printer emulations of the Print Server in alphabetical order. However, please refer to the associated Reference Number to locate the corresponding description later in this chapter.

Table 8-1. Configuration Options for 5250 Printer Emulations

Configuration Option	Ref. No.	Host Download	PrintControl
10 CPI string	86	Yes	User-Defined Strings
15 CPI printing	28	Yes	Dot-Matrix Printing
15 CPI string	87	Yes	User-Defined Strings
6 LPI string	84	Yes	User-Defined Strings
8 LPI string	85	Yes	User-Defined Strings
ASCII Hex Dump	43	Yes	Troubleshooting
Auto Print Orientation	08	Yes	Laser Printing
Bin Selection	09	Yes	Dot-Matrix Printing
Character Set	17	Yes	5250 Setup
CPT End Delimiter	02	Yes	5250 Setup

Table 8-1 (continued). Configuration Options for 5250 Printer Emulations

Configuration Option	Ref. No.	Host Download	PrintControl
CPT Start Delimiter	01	Yes	5250 Setup
Default Print Quality	22	Yes	Dot-Matrix Printing
Draft Printing	23	Yes	Dot-Matrix Printing
Duplex Printing	33	Yes	Paper Handling Supp.
EBCDIC Hex Dump	42	Yes	Troubleshooting
Font Strings	21	Yes	User-Defined Strings
Horizontal Margin	19	Yes	Laser Printing
Host Initialization String	11	Yes	User-Defined Strings
Host Language	05	Yes	5250 Setup
IBM Drawer 1	13	Yes	Paper Handling Supp.
IBM Drawer 2	14	Yes	Paper Handling Supp.
IBM Drawer 3	15	Yes	Paper Handling Supp.
IBM Drawer 4	30	Yes	Paper Handling Supp.
IBM Drawer 5	31	Yes	Paper Handling Supp.
IBM Motion Cmds	25	Yes	Dot-Matrix Printing
LP1	10	Yes	Laser Printing
Override Format Cmds	16	Yes	5250 Setup
Paper Size	09	Yes	Laser Printing
Print Orientation	07	Yes	Laser Printing
Print Setup Parameters	98	Yes	N/A
Printer Emulation	24	No	SCS
Restore Factory Defaults	98	Yes	Factory Defaults
Restore Previous Settings	98	Yes	N/A
Save All Current Settings	99	Yes	N/A
User-Defined Strings	04	Yes	User-Defined Strings
Vertical Margin	18	Yes	Laser Printing
Wrap/Truncate	26	Yes	Dot-Matrix Printing

8.4 Description of Configuration Options

The following pages will describe the configuration options available for your
particular printer.

NOTE

Asterisks (*) identify factory default settings. Invalid commands are ignored.

The last valid setting will be unchanged.

REFERENCE NO 01: CPT START DELIMITER

Replaces the default Command Pass-Thru (CPT) start delimiter "&%." This delimiter is also a Host Download delimiter. It may be one or two characters long. The first character may be any printable character.

Value	Description
New characters	New CPT start delimiter
Two spaces	Deletes CPT start delimiter

Example: &%Z01,#*

This Host Download command creates the CPT start delimiter **#***.

REFERENCE NO. 02: CPT END DELIMITER

Replaces the default delimiter and creates an alternate CPT end delimiter "&%" as above. This delimiter cannot be used as a Host Download delimiter.

Value	Description
New characters	New CPT end delimiter
Two spaces	Deletes the CPT end delimiter

REFERENCE NO. 04: USER-DEFINED STRINGS

Creates up to ten user-defined strings to send to the printer later. Use this feature to avoid re-keying frequently used printer commands (which appear as hex values embedded in Command Pass-Thru delimiters). When using Host Download commands, place the hex codes representing the desired printer command inside the parentheses (up to 25 hex pairs). Spaces between hex pairs are allowed to aid in readability. Consult the printer's users' guide for proper hex codes. The user-defined string is stored in the interface's memory under the selected value number (0 to 9). To activate the command, place a **&%UX** (where *X* is the value number) in the document.

Value	Description
0 to 9 (hex codes)	Assigns the hex command to a one-digit delimiter (0 to 9)
0 to 9()	Deletes the specified user-defined string from memory

Example: &%Z04,3(1B26643044)

This Host download command creates a user-defined string for a PCL Laser printer to start underlining. The string is represented by the value 3. To use this function, place **&%U**3 in the document.

REFERENCE NO. 05: HOST LANGUAGE

Selects the host language to be used by the twinax host, when the command "Use Default Language" is received.

Value	Description
00	Multinational
01	USA/Canada
02	Austria/Germany
03	Belgium
04	Brazil
05	Canada/French
06	Denmark/Norway
07	Finland/Sweden
08	France
09	Italy
10	Japan
11	Japan (U.S.)
12	Portugal
13	Spain
14	Spanish speaking
15	United Kingdom

Example: &%Z05,00

This Host Download command selects the multinational character set.

REFERENCE NO. 07: PRINT ORIENTATION

HP PCL. Determines the print orientation if it is not already determined through the host or the interface's Automatic Page Orientation (APO) feature (Reference No. 08).

Value	Description
0	COR, but host override through Print Quality setting allowed
1	Portrait
2	Landscape
3	COR

NOTE
Refer to Section 8.5.4 for a detailed description about print orientation.

Example: &%Z07,2

This Host Download command selects landscape.

REFERENCE NO. 08: AUTOMATIC PRINT ORIENTATION

HP PCL only. Selects or deselects Automatic Print Orientation (APO).

Value	Description
0	APO Off
1	APO On

NOTE
Refer to Section 8.5.4 for a detailed description regarding APO.

Example: &%Z08,1

This Host Download command turns the Automatic Print Orientation on.

REFERENCE NO. 09: PAPER SIZE/BIN SELECTION

Selects paper size settings if the printer attached is a laser. With the default "Host Selected," the Print Server will automatically look for and recognize the paper sizes mentioned below:

Letter Paper	8.5 x 11 in. (21.6 x 27.9 cm)
A4 Paper	8.27 x 11.69 in. (21 x 29.7 cm)
Legal Paper	8.5 x 14 in. (21.6 x 35.6 cm)
Executive Paper	7.25 x 10.5 in. (18.4 x 26.7 cm)

If the host sends one of these paper sizes, the Print Server will request that the attached printer load the respective paper. Otherwise, it will instruct the printer to load the previously used paper size or, if the host print job is the first after power up, it will request letter-size paper.

With "A4 Only" selected, the Print Server will always instruct the printer to load A4-size paper. If you choose the "Printer Selected" option, the Print Server will not send any paper requests and the paper size selected through the printer's front panel will be used.

If the printer attached is an Epson DFX dot-matrix printer with multiple-bins for different input paper paths, this command will either allow the bin commands to be passed onto the printer, or suppress those commands.

Value	Description	Epson DFX Dot-Matrix Printers
0	Paper size specified by host software	Bin commands are sent to the printer
1	A4-size paper	No bin commands are sent to the printer
2	Paper size selected through the Printer's front panel	

Example: &%Z09,1

This Host Download command selects A4-size paper.

REFERENCE NO. 10: LPI

Laser Printing Only: Selects compressed or true LPI (lines per inch) printing. By default, LPI is compressed so 66 lines can be printed onto a letter-sized paper when the host requests 6 LPI. If you are using an electronic forms package or print on pre-printed forms, select true LPI. The last selection applies only if you want to run software that was set up for older XPoint Twinax Controllers.

Value	Description
0	Compressed LPI
1	True LPI
2	XPoint Twinax Controller Compatible Mode

Example: &%Z10,1

This Host Download command selects true LPI printing.

REFERENCE NO. 11: HOST INITIALIZATION STRING

Laser Printing Only: Stores a string of up to 25 ASCII hex pairs that is sent to the printer after the print server has reconfigured the printer for host printing. This allows you to further modify the printer configuration (that is, select a different font for all host printing). If you are using the IBM 3812 printer emulation, this init string will be sent to the printer at the beginning of each printed page.

Value	Description
0 (hex codes)	Stores the hex command as a part init string

Example: &%Z11,0(1B 26 6C 38 44)

This Host Download command sets LPI to 8 LPI on a PCL laser printer.

REFERENCE NO. 13: IBM DRAWER 1

Laser Printing Only: Assigns the host's Paper Drawer 1 command to a physical paper source on the printer. On the host, the available paper sources are called Source Drawer (in the print file) or Paper Drawer (in OfficeVision/400). On the printer, the actual paper sources are usually called input trays or bins.

Since input-tray selections have been implemented differently from printer to printer, the Print Server uses the unique numeric value found in the printer's PCL escape code for the particular input tray. For example, the 500-sheet Cassette of an HP LaserJet 4 Plus printer can be selected through the PCL escape code

ESC&l5H. By assigning the numeric value 5 to the IBM Drawer 1 command, the Print Server would cause paper to be drawn from the 500-sheet Cassette whenever the AS/400 sends the Drawer 1 request. Refer to your printer's users' guide for information on the PCL codes.

Value	Description
01 to 99	Numeric identifier for paper trays available on the printer
01	Default

Example: &%Z13,5

This Host Download command assigns the host's Paper Drawer 1 command to pull paper from the printer's input bin associated with the PCL command ESC&l5H. On an HP LaserJet 4 Plus, this would be the 500-sheet Cassette.

REFERENCE NO. 14: PAPER DRAWER 2 COMMAND

HP PCL only. Matches the host's Paper Drawer 2 command with a physical paper source from the printer. When the host sends a command to the printer to feed from paper drawer 2, the printer will feed from the paper source assigned to paper drawer 2. Consult the printer's users' guide for the available paper sources and respective numbers.

Value	Description
01 to 99	Paper sources available on the printer
04	Default

Example: &%Z14,05

This Host Download command assigns the optional 500-sheet cassette on an HP LaserJet 4 Plus to the host's paper drawer 2 command.

REFERENCE NO. 15: PAPER DRAWER 3 COMMAND

HP PCL only. Matches the host's Paper Drawer 3 command with a physical paper source from the printer. When the host sends a command to the printer to feed from paper drawer 3, the printer will feed from the paper source assigned to paper drawer 3. Consult the printer's users' guide for the available paper sources and respective numbers.

Value	Description
01 to 99	Paper sources available on the printer
05	Default

Example: %Z15,04

This Host Download command assigns the multi-purpose tray on an HP LaserJet 4 Plus to the host's paper drawer 3 command.

REFERENCE NO. 16: OVERRIDE FORMAT COMMANDS

Allow operator settings on the printer's front panel to override format commands coming from the host.

Value	Description
0	No, do not override IBM format commands
1	Yes, override all IBM format commands
2	Yes, override NLQ commands
3	Yes, override CPI commands

Example: &%Z16,1

This Host Download command enables the front panel to override all IBM format commands.

REFERENCE NO. 17: CHARACTER SET

Selects which character set will be used when both are available for the desired font. The character set selected is used as the underlying ASCII table for EBCDIC to ASCII translations. Consult the printer's users' guide to verify that the printer also uses the font and character set selected.

Value	PCL Laser Printers	Dot-Matrix Printers
0	Roman 8	Roman 8
1	CP 850	CP 850
2	Latin 1 Euro#	CP 437
3	(not available)	CP 858#

Example: &%Z17,2

This command selects the Latin 1 character set, which includes the Euro symbol.

NOTE

The Euro symbol is supported in code page 858 for dot-matrix printers, and in the Latin 1 Euro character set for laser printers.

REFERENCE NO. 18: STARTING VERTICAL POSITION

HP PCL only. Adjusts the upper-left-corner starting vertical position for printing on the page in $\frac{1}{60}$ of an inch.

Value	Description
-127 to 127	Adjustment of vertical position in $\frac{1}{60}$ of an inch
0	Default

Example: &%Z18,-20

This Host Download command moves printing on the page up $\frac{1}{8}$ inch or 2 lines at 6 LPI.

REFERENCE NO. 19: STARTING HORIZONTAL POSITION

HP PCL only. Adjusts the upper-left-corner starting horizontal position for printing on the page in $\frac{1}{60}$ of an inch.

Value	Description
-127 to 127	
0	Default

Example: &%Z19,12

This Host Download command moves printing on the page $\frac{1}{5}$ inch right or 2 characters at 10 CPI.

REFERENCE NO. 21: FONT STRINGS

This section only applies when operating IBM 3812 emulation. Assigns a font ID to a font. The first number (0 to 9) is one of 10 available strings, the second number (0-65535) is the host font number. The characters shown in parentheses are sent to the printer when the host font number is received. Refer to the printer's users' guide or the documentation accompanying the font cartridge /SIMM/DIMM/Soft font for a list of available fonts and their respective strings. Use the < character to indicate the ESCape character.

Value	Description
0 to 9	One of ten available strings
0-65535	Host font number
(ASCII Char.)	Up to 25 ASCII characters representing the desired font

Example: &%Z21,3,12345(<(12U<(s0p12h10v1s3b6T)

This Host Download command selects the third font string to be font #12345
and selects for an HP LaserJet or Lexmark Laser printer:

12U =	code page 850
0p =	fixed spacing
12h =	12 pitch
10v =	10 point
1s =	italic
3b =	bold
6T =	letter gothic

NOTE

**Font IDs assigned through this Font String feature cannot be used with
the ¬F font change command.**

REFERENCE NO. 22: DEFAULT PRINT QUALITY

The selection only applies when running the IBM 4214 printer emulation. Defines
the print quality when the host sends a command to use the "default" print quality.
The Print Server offers the selections **Draft** and **NLQ**. If the attached printer has
the capability, you can further define Draft printing. Refer to **Reference No. 23:
Draft Printing**, for more information.

Another way to modify the print quality is to set the printer to a certain value
through its front panel. Refer to **Reference No. 16: Override Format Commands**,
for more information.

Value	Description
0	DRAFT is default print quality
1	NLQ is default print quality

Example: &%Z22,1

This Host Download command selects NLQ as the default print quality.

REFERENCE NO. 23: DRAFT PRINTING

This section only applies when running the IBM 4214 printer emulation. Selects the Draft Printing mode when a draft print command comes from the host or from the Print Server.

Value	Description
*0	Normal draft
1	Fast draft

Example: &%Z23,1

This Host Download command sets the printer to print fast draft.

REFERENCE NO. 24: IBM PRINTER EMULATION

This selection is not accessible through Host Download command. It selects the IBM printer emulation.

If you are attaching a PCL laser or ink jet printer, select the IBM 3812 emulation. If you are attaching a dot-matrix or line printer, we recommend choosing the IBM 4214 emulation. If you are printing to a specialty printer such as a bar-code-label printer or embosser, or if you are printing to an older, lower-featured dot-matrix or line printer, select the IBM 5256 printer emulation.

The AS/400 will auto-configure when the Print Server is reset, which happens automatically when you click on the PrintControl's Apply Changes button.

Refer to **Section 8.6** for more information on the available IBM printer emulations.

REFERENCE NO. 25: IBM MOTION COMMAND

Non-HP PCL only: Manipulates the IBM motion command.

Value	Description
0	Use FF (when possible)
1	Substitute multiple LF for FF
2	Suppress FF
3	Suppress CR, LF, and FF

NOTE

We strongly recommend the Generic printer driver when using a selection other than the default.

Example: &%Z25,1

This Host Download command sets the interface to count the lines specified through LPI settings and replace FF with multiple LF.

REFERENCE NO. 26: WRAP/TRUNCATE

This selection only applies when a dot-matrix printer is attached. Selects whether the printer should wrap or truncate text lines longer than 8 inches. For printing on normal or wide paper (14⅞"), select WRAP. This allows printing to the full extent of the width of the paper. The printer wraps printing beyond the margin to the next line (if the printer is configured for that paper size). When using narrow paper (8.5"), you may select TRUNCATE. This ignores any printing beyond 8". You must format documents to fit the narrower paper, since the text beyond the 8" margin will truncate (that is, not print).

Value	Description
0	Wrap text
1	Truncate text at 8 inches

Example: &%Z26,1

This Host Download command will cause all text beyond 8 inches to truncate (that is, not print).

NOTE

Also see Reference No. 09: Paper Size.

REFERENCE NO. 28: 15 CPI PRINTING

IBM Proprinter only: Determines how host commands for 15 CPI printing should be executed.

Value	Description
0	No, prints 15 CPI as 17.1 CPI
1	Yes, prints 15 CPI as 15 CPI

NOTE

IBM Proprinters cannot print 15 CPI. The Print Server can "artificially" print 15 CPI by printing 17.1 CPI and adjusting the spacing by inserting a space in graphics mode. Although this option allows users to effectively print 15 CPI (for example, when using pre-printed forms) it significantly slows down the printer.

If your printer doesn't support 15 CPI printing, select the Epson DFX+ printer driver.

Example: &%Z28,1

This Host Download command sets the printer interface to produce 15 CPI printing.

REFERENCE NO. 30: PAPER DRAWER 4 COMMAND

HP PCL only: Matches the host's Paper Drawer 4 command with a physical paper source from the printer. When the host sends a command to the printer to feed from paper drawer 4, the printer will feed from the paper source assigned to paper drawer 4. Consult the printer's users' guide for the available paper sources and respective numbers.

Value	Description
01 to 99	Paper sources available on the printer
01	Default

Example: &%Z30,05

This Host Download command assigns the optional 500-sheet cassette on an HP LaserJet 4 Plus to the host's paper drawer 4 command.

REFERENCE NO. 31: PAPER DRAWER 5 COMMAND

HP PCL only: Matches the host's Paper Drawer 5 command with a physical paper source from the printer. When the host sends a command to the printer to feed from paper drawer 5, the printer will feed from the paper source assigned to paper drawer 5. Consult the printer's users' guide for the available paper sources and respective numbers.

Value	Description
01 to 99	Paper sources available on the printer
01	Default

Example: &%Z31,05

This Host Download command assigns the optional 500-sheet cassette on an HP LaserJet 4 Plus to the host's paper drawer 5 command.

REFERENCE NO. 33: DUPLEX PRINTING

HP PCL only. Sets the Print Server to duplexing mode. This applies only when a printer with duplexing capability is attached.

Value	Description
0	Off
1	Duplexing
2	Duplexing-Tumble

Example: &%Z33,2

This Host Download command instructs the Print Server to duplex and tumble all host print jobs.

REFERENCE NO. 42: EBCDIC HEX DUMP

After receiving a start command, the Print Server, starting with the next buffer received, sends all host data directly to the printer as hexadecimal printing until the print server is powered off.

Value	Description
1	Start EBCDIC hex dump

NOTES

This command enables the user to print only the section of the document that is in question in buffer hex dump format.

Hex printing starts with the buffer after the start command and stops when the interface is powered off.

Example: &%Z42,1

This Host Download command starts buffer hex dump printing.

REFERENCE NO. 43: ASCII HEX DUMP

After receiving a start command, the Print Server, starting with the next buffer received, translates all host data into ASCII (from EBCDIC) and then causes the ASCII data to print in hexadecimal form. The ASCII hex dump is performed until the print server is powered OFF or until Host Download command Z43,0 is received.

Value	Description
0	Stop ASCII Hex Dump
1	Start ASCII Hex Dump

Example: &%Z43,1

This Host Download command starts ASCII hex dump printing.

REFERENCE NO. 84: 6 LPI STRING

Used with the Generic Printer Driver to define the 6 LPI string. This string represents the printer-specific command to set the printer to 6 LPI. Consult the printer's users' guide for the appropriate ASCII hex value representing the 6 LPI command. Whenever the Print Server receives a 6 LPI command from the host, it sends the string specified through this configuration option.

Value	Description
1(up to 25 hex bytes)	Defines the 6 LPI string*
1()	Deletes the 6 LPI string

* Only characters from 01 to FF are recognized (alphabetic characters must be in upper case). Errors in the hex string will cause the print server to ignore the command and printing will resume at the point the error occurred.

Example: &%Z84,1(1B 32)

This Host Download command assigns the 6 LPI command for an Epson LQ-2500 printer (hex value 1B 32) in the interface's memory.

NOTE

If 6 LPI string is specified, the interface will ignore all 6 LPI requests from the host.

REFERENCE NO. 85: 8 LPI STRING

Used when you select the Generic printer driver and IBM 5224 or 5225 emulation to define the 8 LPI string. See **Reference No. 84**.

Value	Description
1(up to 25 hex bytes)	Defines the 8 LPI string
1()	Deletes the 8 LPI string

Example: &%Z85,1(1B 30)

This Host Download command stores the 8 LPI command for an Epson LQ-2500 printer (hex value 1B 30) in the interface's memory.

REFERENCE NO. 86: 10 CPI STRING

Used with the Generic printer driver to define the 10 CPI string. See **Reference No. 84**.

Value	Description
1(up to 25 hex bytes)	Defines the 10 CPI string
1()	Deletes the 10 CPI string

Example: &%Z86,1(1B 50)

This Host Download command stores the 10 CPI command for an Epson LQ-2500 printer (hex value 1B 50) in the interface's memory.

REFERENCE NO. 87: 15 CPI STRING

Used when the Generic printer driver and IBM 5224 or 5225 emulation is selected to define the 15 CPI string. See **Reference No. 84**.

Value	Description
1(up to 25 hex bytes)	Defines the 15 CPI string
1()	Deletes the 15 CPI string

Example: &%Z87,1(1B 67)

This Host Download command assigns the 15 CPI command for an Epson LQ-2500 printer (hex value 1B 67) in the interface's memory.

REFERENCE NO. 99: SAVE ALL CURRENT SETTINGS

Permanently saves all current settings specified through Host Download commands. Parameters set through the PrintControl utility are automatically stored permanently.

Value	Description
0	Save all current settings

Example: &%Z99,0

This Host Download command saves all current settings to permanent memory.

8.5 Laser Printer Operation

The Print Server allows you to operate an ASCII laser printer just as you would an IBM 3812 printer. The following section describes how to access the many features of this emulation of the IBM 3812 printer.

The IBM 3812-1 printer is a laser-type printer that provides font changing capability, plus text rotation and compression features (Automatic Print Orientation [APO] and Computer Output Reduction [COR]).

The Print Server emulation of the 3812 provides bolding, underlining, super and subscripts by recognizing the host commands for these features in the document. A shadow print for bolding is performed automatically on fixed pitch fonts. For proportionally spaced (typographic) fonts, you must specify the font you want to print.

Like an IBM 5219 printer, the 3812 printer is configured with a default font ID on the host. Configure the most commonly used font as the system default, then change as necessary with a printer override or OCL command.

8.5.1 CHANGING TYPESTYLES

The typestyle number (FGID) selected determines which font is used. The system operator selects a default typestyle when the printer is configured on the host; however, a word-processing program may also have a default typestyle. Since the default typestyle can vary depending on the system setup, ask the system operator if you have questions about the default typestyle on the system.

There are two ways to change typestyles:

- Select a typestyle number within the program or document.

- Use Font Change commands in the document.

Refer to the program manuals (OfficeVision/400) to change typestyles in the program. You can place Font Change commands in the document (see below). The four-character font command changes the text to the new font until you enter another Font Change command.

The host does not know that a font change has taken place, and may send the original font number to the printer at the beginning of each page. Therefore, you may have to put a Font Change command at the beginning of each new page. If you change the pitch, there may be formatting problems since the host is still formatting each line according to the pitch of the original typestyle number.

8.5.2 FONT CHANGE COMMANDS

Font Change Commands allow you to change fonts in the document without using host commands. You can use the commands in either data processing (RPG, Basic programs, etc.) or in word-processing documents.

Two types of Font Change Commands exist. Both commands can be placed anywhere within a document. The command consists of the "logical not" (¬) symbol, and either a capitalized "Q" or "F" followed by the typestyle number corresponding to the desired font. The "^" symbol can be used in place of the "¬" for non-US applications.

The Font Change Command occupies space in the program or text; however, the command does not print.

¬Q - Font change commands using the capital letter "Q" allow you to access a vast number of printer-resident and optional cartridge fonts. **Appendix A** shows the typestyle numbers assigned to the supported fonts. Each typestyle number describes a particular font with particular attributes. For example, typestyle number 88 represents Courier Bold, 12 pitch, 10 point.

To change a font, insert a font change command at the beginning of the text where the change is to take place. For example, to bold the word "saves" in the following sentence (assuming the current font is Courier, 12 CPI or pitch, 10 point) type:

```
Quality ¬Q88saves¬Q85 you time and money.
```

Here's how the print will look:

```
Quality saves you time and money.
```

The ¬Q85 following "saves" returns the printing back to the original font.

¬F - Font change commands using the capital letter "F" allow you to access all of the scalable fonts available on a printer. **Appendix B** shows the typestyle numbers assigned to the supported fonts. Unlike the typestyle numbers used with ¬Q commands, the typestyle numbers in **Appendix B** describe only the typestyle of the supported font. You enter the size of the desired font separately in the font change command. For example, to increase the size of the word "saves" in the following sentence to 30 points (assuming the current font is Arial, 12 point), type:

Quality ¬F6199,30saves¬F6199,12 you time and money.

Here's how the print will look:

Quality **saves** you time and money.

The ¬F6199,12 following "saves" returns the printing back to the original font. The numbers following the comma (¬F6199,30 and ¬F6199,12) set the point size of a proportional font (such as Arial) and the pitch size of a fixed pitch (such as Courier).

To print fonts that are not already supported through your Print Server, refer to **Reference No. 21 Font Strings, Section 8.4**.

8.5.3 PAPER OUTPUT BIN SELECTION

The Print Server allows you to direct host print jobs to any of the printer's available output bins. The HP LaserJet 5Si, for instance, can be equipped with the optional multi-bin mailbox, which offers 8 additional output bins.

To send a host job to a particular output bin, insert an output command on the first line (line 1, position 1) of the document/report. The output command consists of the "logical not" (¬) or the "caret" (^) symbol followed by a capital letter

"O" (for Output) and two digits designating the destination bin. The two-digit number corresponds to the printer's PCL command for the particular output bin.

Once you select an output bin, all host print jobs will be directed to that output bin. To send host print jobs to another output bin, insert a second command. **¬O00** causes the printer server to not send any output instructions to the printer. All print jobs will be directed to the output bin set through the printer's operator panel.

The output commands are as follows:

Output Command	Description	PCL Command
^O00	Automatic Selection	ESC&l0G
^O01	Selects output bin #1	ESC&l1G
^O02	Selects output bin #2	ESC&l2G
^O03	Selects output bin #3	ESC&l3G
^O04	Selects output bin #4	ESC&l4G
^O05	Selects output bin #5	ESC&l5G
^O06 to 99	Selects bins #6 to 99	not yet assigned

8.5.4 PRINT ORIENTATION

When operating the Print Server in IBM 3812-1 emulation mode, the print orientation of the host document or report is determined by a variety of factors, listed below in order of their impact on the final print orientation:

1. Page Rotation specified in the print file of a data-processing document or in the document format menu of a word-processing document.

2. Automatic Print Orientation (APO) setting on the Print Server.

3. Print Orientation setting on the Print Server.

As you read the following explanation, refer to **Figure 8-1** (on page 116) for an illustration of the print orientation logic.

Page Rotation (Block 1)

You can specify degrees of page rotation through the print file of a data-processing document or in the document format menu of a word-processing document. The available settings are 0, 90, 180, 270 degrees and AUTO (AS/400 only). The print file also offers DEVD and COR (AS/400 only).

a. With 0, 90, 180, and 270 degrees you can specify the desired rotation directly from the host.

b. The COR setting will always print COR, unless the print quality (AS/400 and S/38) is set to NLQ or STD, or Text (S/36) is set to YES. If the page rotation is set to COR and print quality/text is one of the above-mentioned settings, the print job will print in portrait in the requested font.

c. With the DEVD and AUTO settings, the host does not influence the print orientation. Rather, the print orientation is determined by the settings on the Print Server.

Automatic Print Orientation (Block 2)

If no page rotation was specified on the host, the printer server's Automatic Print Orientation (APO) feature is the first setting to determine the final print orientation. This feature automatically rotates print jobs with dimensions of 8.5 x 14 inches or smaller to portrait or landscape orientation.

a. With the APO feature ON, the interface first checks the dimensions of the host print job. If the print job is larger than 8.5 x 14 inches, the interface cannot fit the print job on one page. In this case the orientation of the print job is determined by the print orientation setting on the interface (Block 3).

b. If the dimensions of the print job are 8.5 x 14 inches or smaller, the interface compares the width to the height and automatically rotates the print job to portrait if the height is larger than the width, or landscape if the width is larger than the height.

   The dimensions of a word-processing document are specified directly through the document format menu. The dimensions of a data-processing report are calculated in the following manner:

Width = Page Width (in number of columns) / CPI

Length = Page Length (in number of lines) / LPI

Print Orientation Settings (Block 3)

The print server's print orientation settings determine the orientation of the host document/report AFTER the host's page rotation setting AND the print server's APO setting have been obeyed.

The available print orientation settings are portrait, landscape, and two COR options. The COR feature rotates documents to landscape orientation and compresses the font as needed to fit the complete document on a standard 8.5" x 14" page. This allows you to print a report initially designed to fit on 14⅞" x 11" green-bar paper onto a standard letter or legal size page without redesigning the report.

When used together, the APO and COR features can be a powerful tool to print host jobs in portrait, landscape, or in landscape with reduced font (COR), without user intervention.

The Print Server's first COR option is not a true IBM 3812 emulation. We added this COR setting to give you a more straightforward way of obtaining COR. The COR setting ignores print-quality settings and always prints COR (unless the host's page rotation or the interface's APO setting determine the print orientation).

The Print Server has a second COR option. This COR option is a true 3812-1 emulation. With certain page-rotation settings on the host, the IBM 3812-1 printer allows the user to manipulate the final print orientation through the print-quality setting.

NOTE

This "override" only applies if the print server's print orientation is set to COR, host override allowed.
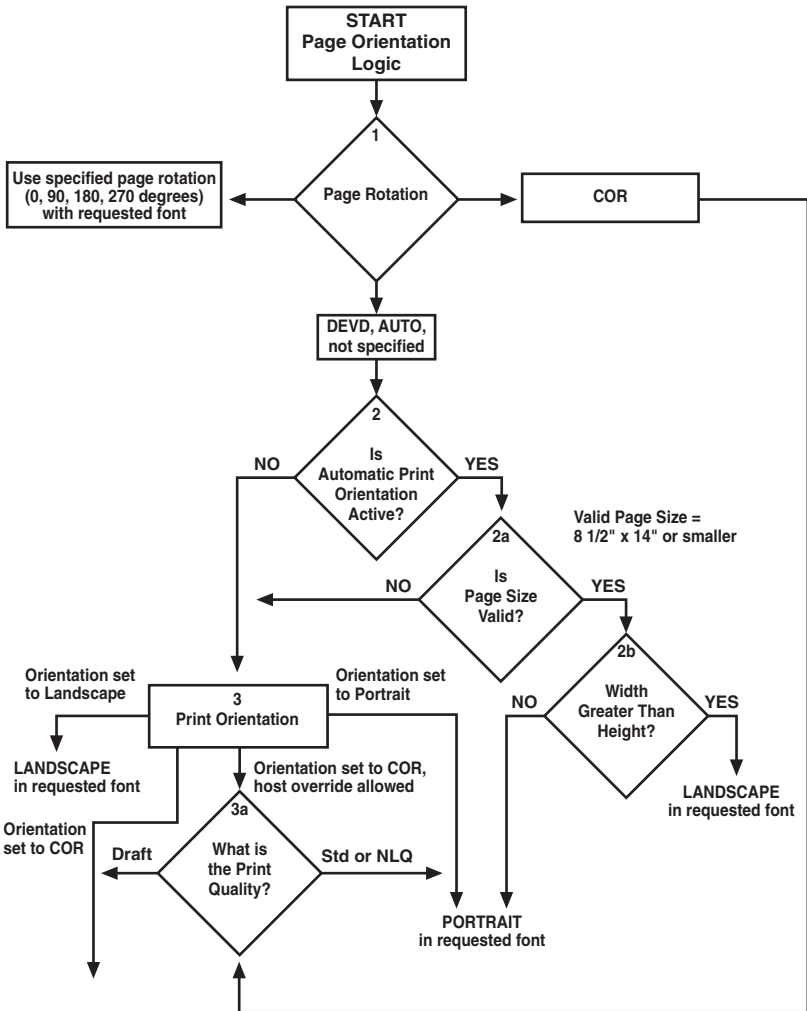
Figure 8-2. Print Orientation Logic Chart.

The following tables show what page-rotation settings you can manipulate through print-quality settings and how the combination of page rotation and print quality affects the final print orientation.

Host System	Page-Rotation Setting	Print-Quality Setting causing portrait orientation
AS/400	DEVD (print file)	NLQ STD
AS/400	AUTO (OfficeVision/400)	NLQ Text
S/36	not specified	Text—Yes
S/38	not specified	NLQ STD

COR is defined as printing in landscape orientation, top left margins set at 0.5", with CPI and LPI reduced according to the following tables:

Host CPI	Reduced to:
10	13.3
12	15
15	20

Host LPI	Reduced to:	Maximum Rows (Lines/Page)
6	8.7	66
8	11.6	88

The table on the next page shows the print orientation results desired and recommends a combination of settings required to obtain that result. Most print orientation results can be achieved with different setting combinations. Refer to **Figure 8-1** and the accompanying text.

Table 8-2. Print Orientation Results

Result	Host Setting	APO	Print Orientation
Data processing: Print report with a width of 80 columns or less (at 10 CPI) in portrait and print reports with a width of 132 (at 15 CPI) columns in landscape with reduced font (COR)	Degree of page Rotation… AUTO	ON	COR
Word processing: Print documents of up to 8.5" x 14" in portrait 14" x 8.5" in landscape, and anything larger in landscape with reduced font (COR)	Rotate Paper…=1 (Automatic)	OFF	COR
Print all reports/ documents in landscape with reduced font (COR)	Degree of Page Rotation… AUTO, Rotate Paper…=1 (Automatic)	OFF	COR
Print all reports/ documents in landscape with requested font	Degree of Page Rotation… AUTO, Rotate Paper…=1 (Automatic)	OFF	Landscape
Print all reports/ documents in portrait with requested font	Degree of Page Rotation… AUTO, Rotate Paper…=1 (Automatic)	OFF	Portrait

Changing Page-Rotation Settings

Before changing page-rotation settings, first verify the current settings. In Office Vision/400, you can view and change page-rotation settings in this way:

1. Press **F20** "Format options."

2. Press **1** "Document options," then **ENTER**.

3. Press **1** "Document format," then **ENTER**.

4. Press **4** "Page layout/paper options," then **ENTER**.

5. Press **Page Down** to scroll to the second screen.

6. Locate "Rotate Paper .... option."

7. Move the cursor to the currently selected rotation setting and type in the desired selection.

   To permanently change the page-rotation setting for a data-processing report, you must change the print file. An MIS staff member should do this, since a changed print file most likely affects many printers. You can change the page rotation setting temporarily by overriding the print file. You must change or override the print file before the host creates the print job. An overridden print file applies only to print jobs created on the host session that was active when the print file was overridden.

   To view the current print file settings, type **CHGPRTF** followed by a space and the name of the print file on the command line of the host. Press **F4**. Do not change any settings unless authorized by the IS director. To change the print file:

1. Type **CHGPRTF** on the command line of the host, and press **Enter**.

2. Type in the name of the print file you want to change.

3. Press **F10** to display additional parameters.

4. Press **Page Down** to scroll to the fourth screen.

5. Locate "Degree of page rotation ...." option.

6. Move the cursor to the beginning of the dashed line and enter the desired selection.

7. Press **ENTER** to activate the selection and exit the print file menu.

To override the print file:

1. Type **OVRPRTF** on the command line of the host, and press Enter.

2. Type the name of the print file you want to change.

3. Press **Page Down** to scroll to the third screen.

4. Locate "Degree of page rotation....." option.

5. Move the cursor to the beginning of dashed line and enter the desired selection.

6. Press **ENTER** to activate the selection and exit the print file menu.

8.5.5 ENVELOPE PRINTING

To print envelopes, set the Print Server to landscape orientation (Host Download command Reference No. 7) or activate the Auto Print Orientation feature (Host Download command Reference No. 8). The following example shows how to print envelopes from a word-processing program, using the printer's optional envelope feeder.

1. Select line **1** as the first typing line.

2. Specify **Envelope** size in the program.

3. Select **Feed Envelope** in the program. Then choose the font desired.

4. Set the left margin to **1**.

5. Type the return address, starting at line 1, column 1.

6. Type the mailing address. The appropriate space for the address will vary with the envelope size. For a Commercial 10 envelope, the address starts at about line 10, column 55.

7. Print the envelope.

The following envelope sizes are supported by the Print Server:

Monarch	3⅞" x 7½"
Commercial 10	4⅛" x 9½"
International DL	110 mm x 220 mm
International D5	162 mm x 229 mm

8.5.6 OFFICEVISION/400 ENVELOPE PRINTING

You can print a letter and an envelope from OfficeVision/400 in the same document by following this procedure:

1. Set the format for the letter and enter the letter file. On the first typing line, press CMD20 for **Format options**.

2. Select **1** for **Document options**, then another 1 for **Document format**. Select **3** for **Typestyle/color**.

3. Select the font ID Number for the letter, such as No. 11, 86, etc., then press **ENTER**.

4. From the Document Format screen, select option **4** for **Page layout/paper options**. Scroll to the second screen of these options and select a paper size of 8.5 (width) x 11 (length) inches and paper source 1. If the letter is more than one page, select paper source of 1 for the following pages. Press **ENTER** to return to the **Document format** screen, then CMD 12 to return to the **Document options** screen.

5. Now set up the Alternate Format for the envelope. Select 2 for **Alternate format**, then **3** for **Typestyle/color**.   Select the font ID for the envelope and press ENTER to return to the Alternate Format screen.

6. Select **4, Page layout/paper options**. Choose a first typing line of 1, then scroll down to the second screen of the options and choose a paper width of 7.5 (monarch size) or 9.5 (commercial, or #10 size) and a paper length of 4 inches. For a paper source, select 5 for Envelope Feed. Press ENTER to return to the Alternate Format screen.

7. Select option **1** for **Margins and Tabs** and make the left margin 1. Press **ENTER** and **CMD3** until you are back in the document.

8. Type in the letter. When done, add in a page end by pressing **ALT P**.

9. Now load in the Alternate Format for the envelope. To do this, press the CMD5 key, **Goto**, and type in **rf** for Resetting Format. Press ENTER. Select option 4 on the Alternate Format screen, **Begin Alternate Format**. Press **ENTER**.

10. You will now be back in the document, with the Alternate Format. If you've followed these instructions, the cursor will be on the first typing line of 1, with the left margin of 1. Type in the envelope address, and send the file to print. The letter will print out first, followed by the envelope.

NOTE

The printer may eject a blank page when printing orientation has been changed. If the buffer and ready light remain steady, press the Print/Check button on the printer's operator panel to eject the last page.

8.5.7 DUPLEX PRINTING

Some printers can perform both simplex (single-sided) and duplex (double-sided) printing. For duplex printing:

- In OfficeVision/400, select duplex printing in the print options menu for that document (*Type of page printing… Double- sided or Double-sided Tumble)

- In OS/400 V2 R3 and later, select duplex printing in the printer file (*Print on both sides. . . *Yes or *Tumble)

- Place Duplexing commands in the document.

- Set the Print Server to duplexing mode.

   For most documents, select duplex printing through the host's print options menu (OfficeVision/400) or through the printer file (OS/400 V2 R3).

   The duplexing commands are similar to the Font Change commands. These commands are placed on the first line of the document (if not on the first line, the commands do not take effect until the second page of the document). The commands are:

   ¬**D0** for simplex printing

   ¬**D1** for duplex printing

   ¬**D2** for duplex printing (tumble)

   When the printer receives a duplexing command, it prints in that mode until it receives another printing command. Place the simplex command at the end of the document to return the printer to simplex mode. Envelope printing between documents does not change the printer's mode.

   The Print Server can also be set to duplexing mode through the Print Control utility or Host Download command 33. The options are:

   0 = Simplex

   1 = Duplex

2 = Duplex (tumble) printing

Using Host Download Command, type `&%Z33,1` or `&%Z33,2` into the document or on the screen and print the document or the screen to set the print server to duplex printing. To return to simplex printing, type and print `&%Z33,0`.

On some duplex printing, if the last page is single sided, it may remain in the printer. The form-feed light remains on. When you send the next print job, this page will be ejected. To manually eject the last page, take the printer off-line by pressing the ONLINE button, then press the **FORM FEED** button to eject the last page. Put the printer back on-line by pressing the **ONLINE** button once more.

8.5.8 OTHER PRINTER COMMANDS

The table below is a summary list of special commands that the laser printer emulation will obey if they are embedded in a document.

Command	Function
¬E	Sends an ASCII ESC command to the printer
¬TY	Enables true 6 LPI printing
¬TN	Disables true 6 LPI printing
¬I	Ignores all host formatting commands
¬S	Stops ignoring host formatting commands

The **¬E** command lets you send an "Esc" command to the printer to control the printing. Simple "escape" commands eliminate the need for putting in hex codes using Command Pass-Thru. These commands allow you to use some of the special features of the laser printer.

Check the printer's manual or any optional technical manual for a description of the feature and the escape commands needed to access the feature. For example, **¬E(s3B** would begin bold printing on an HP LaserJet printer.

The printer will slightly compress line spacing to fit 66 lines onto the page. This may be undesirable (such as when using pre-printed forms that must align correctly). In these cases, the **¬TY** command prevents the printer from compressing the line spacing.

Use the **¬I** and **¬S** commands to remove unwanted host commands from a print file. For example, when printing with electronic forms software, these files are recognized by the host as text files, which causes the host to format the files with unwanted carriage returns and line feeds. Placing the **¬I** at the end of a line and

¬S at the front of the next line causes the interface to remove the host carriage return and line feed commands and send only the data to the printer.

The laser printer emulation is compatible with the many popular electronic forms software applications. If the Print Server replaces XPoint's Twinax Controller, set the interface's True LPI menu to "XPoint Controller."

8.6 Matrix Printer Operation

8.6.1 IBM MATRIX PRINTER EMULATIONS

The Print Server offers the following IBM matrix printer emulations in addition to the IBM 4214 emulation which is used as the default.

> IBM 5224 Model 1
> IBM 5225 Model 1
> IBM 5256 Model 3

You can select these IBM matrix printer emulations through the PrintControl Utility. The Print Server allows access to all the capabilities of the emulated IBM printer. The IBM 4214 printer offers 5, 10, 12, 15, 16.7, and 20 CPI; 3, 4, 6, and 8 LPI; and print qualities of draft, fast draft, or NLQ.

The IBM 5224 and 5225 printers offer 10 and 15 CPI; 6 and 8 LPI; and only a draft print quality. The IBM 5256 printer only offers 10 CPI , 6 LPI printing. These printer emulations are often used when connecting a specialty printer, such as a barcode printer to an IBM host.

The Print Server offers the following printer drivers for matrix and specialty printers. Choose the one that most closely fits the attached printer.

> IBM PPDS
> IBM Proprinter 4201/4202
> Epson FX, DFX, DFX+ with 15 cpi option
> Epson FX, DFX, DFX+
> Epson LQ
> Generic

8.6.2 GRAPHICS PRINTING

The Print Server will print the same Advanced Printer Functions (APF) and Business Graphics Utility (BGU) graphics as the IBM 4214, 5224, and 5225 printers using All Points Available (APA) bit image graphics. This method is for printing continuous patterns such as bar codes and logos that come from the AS/400 host. This is the method of graphic printing that IBM used before IPDS was developed.

This capability is supported by 5224 and 5225 printers in spacing of 10 and 15 CPI and 4214 printers in spacing of 10, 12, and 15 CPI.

The interface implements the LAC command by taking the dot pattern received from the AS/400 host and then printing that exact dot pattern using the printer's APA bit image graphics at high-density 240 dots/inch. This permits the printer to print APF and BGU graphic output using exactly the same spacing as the IBM 4214/5224/5225 printers.

8.6.3 GENERIC MODE

Use the Generic printer driver when the other printer drivers of the Print Server are inappropriate. This could be the case with printers such as certain barcode-label printers or embossers, but also with printers from Okidata, Mannesmann-Tally, or others. Refer to the printer's users' guide to find out if the printer operates with one of the Print Server's output protocols.

In Generic mode, the print server does not pass on the LPI and CPI commands from the host. Rather, it allows you to match the printer-specific CPI or LPI command with the CPI or LPI command from the host (through Host Download commands, see Reference Nos. 84 through 87).

For example, assume the printer protocol the printer requires is not available on the Print Server. To change the printer to 10 CPI, the printer's users' 5 manual provides the hexadecimal value of 1B 50. Use the Host Download command 86 to assign the value 1B 50 to the 10 CPI string (type &%Z86,1(1B 50)). From now on, when the interface receives a request for 10 CPI from the host, it will send the value 1B 50 to the printer and thereby set it to 10 CPI.

If nothing is assigned to the CPI or LPI string, the print server will send nothing to the printer (that is, it will ignore the CPI or LPI command from the host).

The Print Server stores commands for the following CPI and LPI values:

6 LPI	Host/PC download command 84
8 LPI	Host/PC download command 85
10 CPI	Host/PC download command 86
15 CPI	Host/PC download command 87

8.7 Advanced Features

8.7.1 COMMAND PASS-THRU™

The Command Pass-Thru™ feature allows access to all of the built-in features of the printer, even if these features aren't normally available through the host software. Command Pass-Thru lets you place printer-specific command sequences into the data sent to the printer. The Print Server recognizes these special sequences and "passes the command through" to the printer. The steps below describe how to use Command Pass-Thru.

1. Find the command for the print feature in the printer's users' guide.

2. Convert the printer command to hexadecimal (ASCII).

3. Place **&%** (or the alternate CPT start delimiter) in the document at the point where the feature is to take effect. This signals the start of the print feature.

   Enter the beginning printer command, then enter **&%** or the alternate CPT end delimiter. A space may be entered between hexadecimal code pairs to make the command easier to read, but do not put spaces between the delimiter and the hexadecimal characters.

4. Move the cursor to the point in the text where the print feature ends. Enter **&%** or the alternate CPT start delimiter, followed by the ending printer command and then **&%** or the alternate CPT end delimiter again, into the document.

For example:

The command **ESC &d0D** begins underlining and **ESC &d@** ends underlining on an HP LaserJet printer. First, convert the start command to the hexadecimal **1B 26 64 30 44** and the ending command to **1B 26 64 40**.

   If the delimiter is the default **&%** (hex 50 6C), then enter the commands as follows:

        This is an &%1B26643044&%underlined&%1B266440&% word.

to print on the printer as:

        This is an <u>underlined</u> word.

   Only characters from 01 to FF are recognized (alphabetic characters must be in upper case). Errors in the Command Pass-Thru sequence will cause the Print

Server to ignore the command, and printing will resume at the point the error occurred.

Command Pass-Thru may invalidate horizontal spacing.

Although the command is displayed on the screen, the Print Server treats it as a command and does not print it. If part of the sequence is printed, an error has been made entering the codes. Check the document and make sure you're using the correct format and EBCDIC hexadecimal characters.

Avoid sending codes that would move the print position during Command Pass-Thru. Since the Print Server does not process these commands, it cannot keep track of the print position changes. This may affect the position of characters that follow the command and the page layout.

8.7.2 PRINTING BAR CODES USING THE BAR-CODE FEATURE

When generating bar codes on an IBM AS/400 using the bar-code feature, the Print Server must be attached to a PCL laser printer with PJL support and emulate an IBM 3812-1 printer, or to a dot-matrix printer operating in either Epson or IBM Proprinter or PPDS mode and emulate an IBM 4214 or 5224/25/56 printer.

The following applies to printing bar codes on laser printers as well as on dot-matrix printers, unless specified otherwise.

Using the bar-code feature, the following bar codes can be easily printed. To print any of these bar codes, use the following format:

Type	Bar Code
1	Code 3 of 9
2	Code 128
3	Interleaved 2 of 5
4	POSTNET
5	UPC A
6	EAN 8
7	EAN 13

```
¬B<type>,<height>,<width>,<hr>,<chkd>,<ast>,<data>¬B
```

The bar-code command string (above) must contain all of these parameters, even if the parameter is irrelevant for the type of bar code being printed. For example, POSTNET comes in only one size, therefore, any height or width specifications are ignored.

¬B Identifies the strings as a bar-code command string. **¬B** must be placed at the beginning and at the end of the string.

<type> Specifies the bar-code type according to the table shown on the previous page.

<height> Specifies the height of the bar code. Height is expressed in multiples of 2.5 mm (approximately $\frac{1}{10}$ inch). The height of the bar code can range from 1 (2.5 mm) to 9 (22.5 mm) inches.

Height values are ignored if you're printing a POSTNET bar code, since POSTNET uses one standard height. However, you must enter a valid value (1 through 9) for the height parameter to make sure the bar-code command string is complete.

<width> Specifies the width of a bar-code module. A module is a specific combination of bars and spaces used to represent a human-readable character.

By changing the width parameter, you can determine the width of the module and the thickness of the bars and spaces. Width parameters can range from 1 to 9.

To determine the total length of the bar code, simply multiply the module length (found in the table on the following page) with the number of bar-code characters.

NOTE
Be aware that the table gives rounded values only.

Example: Using Code 3 of 9, you want to bar code the word "PRINTERS." Assume the interface also generates a check digit and the start/stop characters. Setting the width parameter to 2 will yield a total bar-code length of approximately 4 cm or about 1 inch.

Number of characters: 11 (8 letters (PRINTERS) + 2 start/stop characters + 1 check digit)

Module width (from table below:)   3.6 mm (.14 inches) Calculation: 11 x 3.6 mm = 39.6 mm = 3.96 cm; or 11 x .14 in = 1.54 inches

Table 8-3. Module Width in mm (inches)—PCL Laser

Width	1	2	3	4	5	6	7	8	9
Code 3 of 9	2.6 (.1)	3.6 (.14)	4.5 (.18)	5.5 (.22)	6.5 (.25)	7.5 (.29)	8.4 (.33)	9.4 (.37)	10.4 (.41)
Code 128	2.2 (.09)	3.2 (.12)	4 (.15)	4.9 (.19)	5.8 (.22)	6.6 (.25)	7.5 (.29)	8.4 (.32)	9.3 (.35)
Interleaved 2 of 5	2.3 (.09)	3.2 (.12)	4 (.16)	4.9 (.19)	5.8 (.23)	6.6 (.26)	7.5 (.3)	8.4 (.33)	9.3 (.36)
POSTNET					5.7 (.23)				
EAN 13	1.5 (.06)	2 (.08)	2.5 (.1)	3.1 (.12)	3.6 (.14)	4.2 (.16)	4.7 (.18)	5.2 (.20)	5.8 (.23)
EAN 8	1.7 (.07)	2.3 (.09)	2.9 (.11)	3.6 (.14)	4.2 (.16)	4.8 (.19)	5.4 (.21)	6.1 (.24)	6.7 (.26)
UPC A	1.6 (.06)	2.2 (.08)	2.8 (.11)	3.4 (.13)	4 (.16)	4.6 (.18)	5.2 (.2)	5.8 (.23)	6.4 (.25)

Table 8-4. Module Width in mm (inches)—Epson or IBM Dot-Matrix

Width	1	2	3
Code 3 of 9	2.7 (.11)	5.4 (.22)	8.1 (.32)
Code 128	2.5 (.1)	5 (.2)	7.6 (.3)
Interleaved 2 of 5	2.2 (.9)	4.4 (.18)	6.6 (.26)
POSTNET	6.5 (.25)		
EAN 13	1.5 (.06)	3.1 (.12)	4.6 (.18)
EAN 8	1.8 (.07)	3.6 (.14)	5.5 (.21)
UPC A	1.8 (.07)	3.6 (.14)	5.5 (.21)

Width parameters are ignored when printing POSTNET bar codes, since POSTNET uses one standard width. However, you must enter a valid value (1 to 9) for the width parameter to make sure the bar-code command string is complete.

<hr>   Identifies whether human readables are printed or not. Human readables are printed underneath the bar code. Valid values are:

0 = Do not print human readables.

1 = Print human readables.

<chkd>   Indicates whether the interface automatically calculates and causes a check digit to be printed. The following bar codes require a check digit, therefore, the interface automatically generates and adds a check digit to the bar-code data: Code 128, POSTNET, UPC A, EAN 8, EAN 13

If you selected any of the bar codes listed above, the **<chkd>** selection is ignored by the interface. However, you must enter one of the following values to make sure the bar-code command string is complete and valid. The options for the <chkd> parameter are:

0 = Do not calculate and add a check digit.
1 = Calculate and add a check digit to the bar-code data.

<ast> Specifies whether start/stop characters are automatically generated or manually added. This parameter only applies to bar-code type Code 3 of 9. For all other bar-code types, the start/stop characters are automatically generated by the interface and input for the <ast> parameter is ignored. However, you must enter one of the following values to make sure the bar-code command string is complete and valid. The options for the <ast> parameter are:

0 = Do not automatically add start/stop characters.
1 = Automatically add start/stop characters.

NOTE

If you select value 0, you must manually enter start/stop characters (asterisks) together with the data. If you don't add the asterisks, an invalid bar code will be printed (that is, a bar code without start/stop characters). If human readables are being printed, the asterisks will also print as human readables.

If value 1 is selected, you must not add asterisks as start/stop characters to the data. If you don't omit the asterisks, an invalid bar code will be printed (that is, a bar code with a start/stop character pair in the beginning and a start/stop character pair in the end.)

<data> The data to be printed as a bar code. Some bar codes require a certain number of characters. Others only allow alphanumeric or numeric characters. Before the interface processes the data string, it will check the complete data string and verify that it is valid. This is why the ¬B at the end is so important. If an invalid data string has been entered, the interface will print "Invalid Data" in the place of the bar code.

NOTES

1. You must enter valid values for each of the parameters specified above, even if the parameter is irrelevant for the type of bar code being printed.

2. If you entered an invalid parameter value (other than invalid data), the interface will process the bar-code command up to that point and then reject any information it receives after the incorrect value.

For example, a bar-code command string has been entered; however, an invalid <hr> value of 3 has been specified:

¬B2,6,6,3,0,0,code128¬B

The interface would cause all characters after the invalid value 3 to be printed:

,0,0,code128

This helps quickly identify where the mistake occurred.

3. Spaces in the bar-code command string are invalid and will lead to the same result as mentioned in Step 2.

4. If you enter invalid data (either too many characters or the wrong type of characters), the interface will print the error message: ** Invalid Data *

5. Allow for sufficient vertical spacing when printing text data beneath the bar code.

For example, when you enter the bar code command string on line 1 of the document with a bar-code height specified as 5 (approximately ½ inch or 3 lines at 6 LPI), and text is then entered on line 2 as follows:

¬B5,7,1,0,0,0,1234567890¬B
This data overrun by barcode

this will cause the bar code to overlap the text in the second line.

To avoid overlapping bar codes with text, always allow for sufficient vertical line spacing (for example, line feeds) to accommodate the height of the bar code.

6. When text data is entered to the right of the bar-code command string, the printed text will appear immediately to the right of where the bar code print ends.

Overview and Examples

The following examples give an overview of the supported bar-code types.

NOTE

The "maximum number of data characters" does not include start/stop characters and check digits.

Code 3 of 9

Maximum number of data characters: 30
Valid numeric characters: 0 to 9
Valid alphanumeric characters: A to Z
Valid other characters: space $ % + - . / *

Example: ¬B1,4,1,1,1,1,0123456789¬B

0123456789

POSTNET

Maximum number of data characters: 0
Valid numeric characters: 0 to 9
Valid alphanumeric characters: N/A
Valid other characters: N/A

Example: ¬B4,1,1,1,1,0,0123456789¬B

UPC A

Required number of data characters: 10
Valid numeric characters: 0 to 9
Valid alphanumeric characters: N/A
Valid other characters: N/A

Example: ¬B5,5,1,1,1,0,0123456789¬B

0 01234 56789 5

EAN 8

Required number of data characters: 7
Valid numeric characters: 0 to 9
Valid alphanumeric characters: N/A
Valid other characters: N/A

Example: ¬B6,3,1,1,1,0,0123456¬B

0123 4565

EAN 13
Required number of data characters: 12
Valid numeric characters: 0 to 9
Valid alphanumeric characters: N/A
Valid other characters: N/A

Example: ¬B7,3,1,1,1,0,012345678912¬B

0 123456 789128

Interleaved 2 of 5
Maximum number of data characters: 30
Valid numeric characters: 0 to 9
Valid alphanumeric characters: N/A
Valid other characters: N/A

Example: ¬B3,3,1,1,1,0,0123456789¬B

0123456789

NOTE

Since Interleaved 2 of 5 symbols are created from data character pairs, the number to be encoded must have an even number of digits. If you enter an odd number of data characters (including the optional check digit), the interface adds an "0" to the beginning of the bar code. If you enter an even number of data characters (including the optional check digit), the interface prints the bar code exactly as it is input.

Code 128

Code 128 has three unique character subsets (code A, B, and C) shown in the table on the following pages. When entering data representing Code 128 bar code, follow these two steps:

1. Define which code set you want to use. For example, type "A" to represent code A; type "B" to represent Code B; and type "C" to represent code C.

2. If you are using code set B, enter the data characters directly. The **~** character and other special characters are represented by the Symbol Character Value found in the left column of the table on the following pages.

   If you are using code set A or C, enter the Symbol Character Value found in the left column of the table. Each character is represented by two digits or a **~** followed by a digit. For example, to bar code the character "&" using Code Set A, type **06**.

Maximum number of data characters: 30 (includes special characters)

Valid characters: Differs with selected code set (see table on following pages)

Example: ¬B2,3,2,1,1,0,BABCDEFGHIJKLMNOPQRSTUVWXYZ¬B

ABCDEFGHIJKLMNOPQRSTUVWXYZ

To show how multiple character sets are used, study the following data string. Height, width, and other parameters were omitted in this example to focus your attention on the data string. This example is for illustration purposes only and is not a recommended way of bar coding. The following data string is a fairly complex way of bar coding **10PrintBoxes10**.

    ¬B2,...,A1716~6PrintBoxes~510¬B

A:	selects code set A
17:	selects the number 1 from code set A
16:	selects the number 0 from code set A
~6:	switches from code set A to code set B
PrintBoxes:	selects the characters PrintBoxes from code set B
~5:	switches from code set B to code set C
10:	selects the number 10 from code set C

Table 8-5. Symbol and Data Character Values

Symbol

Character	Data Character		
Value	Code A	Code B	Code C
00	SP	SP	00
01	!	!	01
02	"	"	02
03	#	#	03
04	$	$	04
05	%	%	05
06	&	&	06
07	'	'	07
08	(	(	08
09	)	)	09
10	*	*	10
11	+	+	11
12	,	,	12
13	-	-	13
14	.	.	14
15	/	/	15
16	0	0	16
17	1	1	17
18	2	2	18
19	3	3	19
20	4	4	20
21	5	5	21
22	6	6	22
23	7	7	23
24	8	8	24
25	9	9	25
26	:	:	26
27	;	;	27
28	<	<	28
29	=	=	29
30	>	>	30
31	?	?	31

Table 8-5 (continued). Symbol and Data Character Values

Symbol

Character	Data Character		
Value	Code A	Code B	Code C
32	@	@	32
33	A	A	33
34	B	B	34
35	C	C	35
36	D	D	36
37	E	E	37
38	F	F	38
39	G	G	39
40	H	H	40
41	I	I	41
42	J	J	42
43	K	K	43
44	L	L	44
45	M	M	45
46	N	N	46
47	O	O	47
48	P	P	48
49	Q	Q	49
50	R	R	50
51	S	S	51
52	T	T	52
53	U	U	53
54	V	V	54
55	W	W	55
56	X	X	56
57	Y	Y	57
58	Z	Z	58
59	[	[	59
60	\	\	60
61	]	]	61
62	^	^	62
63	_	_	63

Table 8-5 (continued). Symbol and Data Character Values

Symbol

Character Value	Data Character		
	Code A	Code B	Code C
64	NUL	`	64
65	SOH	a	65
66	STX	b	66
67	ETX	c	67
68	EOT	d	8
69	ENQ	e	69
70	ACK	f	70
71	BEL	g	71
72	BS	h	72
73	HT	i	73
74	LF	j	74
75	VT	k	75
76	FF	l	76
77	CR	m	77
78	So	n	78
79	S	o	79
80	DLE	p	80
81	DC1	q	81
82	DC2	r	82
83	DC3	s	83
84	DC4	t	84
85	NAK	u	85
86	SYN	v	86
87	ETB	w	87
88	CAN	x	88
89	EM	y	89
90	SUB	z	90
91	ESC	{	91
92	FS	l	92
93	GS	}	93
¬0	RS	-	94
¬1	US	DEL	95
Symbol			

Table 8-5 (continued). Symbol and Data Character Values

Character Value	Data Character		
	Code A	Code B	Code C
¬2	FNC3	FNC3	96
¬3	FNC2	FNC2	97
¬4	SHIFT	SHIFT	98
¬5	CODE C	CODE C	99
¬6	CODE B	FNC4	CODE B
¬7	FNC4	CODE A	CODE A
¬8	FNC1	FNC1	

9. IPDS Printer Emulation

Print Servers equipped with IPDS capability (such as the Ethernet IPDS Print Server) allow you to turn every attached laser printer into a unique individually configurable AFP/IPDS printer. (The laser printer must support PCL 5e). You can also configure SCS printing sessions so that both SCS and IPDS logical printing sessions can share the same physically attached printer. (See **Chapter 8** for a diagram of this process.)

In this chapter you will complete the configuration of the Print Server as well as complete the configuration steps necessary on the IBM AS/400 System for successful IPDS printing.

If you have not already installed the PrintControl utility, please go back to PrintControl Installation in **Chapter 3** and do so now. Then, perform the initial Print Server configuration functions of setting the TCP/IP address and verifying the installation found in **Chapter 4**, TCP/IP Printing.

- Configuring the AS/400 for IPDS Printing, **Section 9.1**

- PTFs Required, **Section 9.1.1**

- Creating a Line Description on the AS/400, **Section 9.1.2**

- Configuring a TCP/IP Host Table Entry, **Section 9.1.3**

- Configuring OS/400 for V3R1 or V3R6, **Section 9.1.4**

- Configuring OS/400 for V3R2, **Section 9.1.5**

- Configuring OS/400 for V3R7, V4R1, and above, **Section 9.1.6**

- Verifying the IPDS Configuration, **Section 9.1.7**

- Configuring the Print Server Using PrintControl, **Section 9.2**

- Configuring Using Host Download Commands, **Section 9.2.1**

9.1 Configuring the AS/400 for IPDS Printing

You should already have completed the basic configuration of the Print Server using instructions found in **Chapter 4**, TCP/IP Printing. You can set additional configuration options for the Print Server through either the PrintControl Utility

or by using host download commands. These functions are described later in this chapter.

Several steps are required to configure the AS/400 host system to enable IPDS printing to an Print Server. You must make sure that your AS/400 has the required PTFs installed and is configured properly to support TCP/IP printing, verify that line descriptions and host TCP/IP table entries are made, configure printer devices for use with PSF/400, and configure the data area that is used by AFP.

- PTFs Required, **Section 9.1.1**

- Creating a Line Description on the AS/400, **Section 9.1.2**

- Configuring a TCP/IP Host Table Entry, **Section 9.1.3**

- Configuring OS/400 for V3R1 or V3R6, **Section 9.1.4**

- Configuring PSF/400 for V3R1 or V3R6, **Section 9.1.4.1**

- Configuring AFP for V3R1 or V3R6, **Section 9.1.4.2**

- Configuring OS/400 for V3R2, **Section 9.1.5**

- Configuring PSF/400 for V3R2, **Section 9.1.5.1**

- Configuring AFP for V3R2, **Section 9.1.5.2**

- Configuring OS/400 for V3R7, V4R1, and Above, **Section 9.1.6**

- Configuring AFP for V3R7, V4R1, and Above, **Section 9.1.6.1**

- Configuring OS/400 for V3R7, V4R1, and Above, **Section 9.1.6.2**

- Verifying the IPDS Configuration on the AS/400, **Section 9.1.7**

9.1.1 PTFs REQUIRED

Make sure that the AS/400 host is running a version of OS/400 that supports TCP/IP and that you have the most recent PTFs installed and configured.

The PTF information presented on the next page may have been superceded with more recent releases. For versions not shown below, check with IBM for the appropriate PTF information. Additional information about PTFs to use can be obtained from the IBM AS/400 service Web site *http://as400service.rochester.ibm.com.*

OS/400 V3R1

General	C6198310 Cumulative tape or later
	SF35164 TCP/IP for PSF/400 (order cover letter only)
	SF24140 IPDS pass through (order cover letter only)
Sockets	SF30018
WRKAFP2	SF40039
PSF/400	APAR SA44304

OS/400 V3R2

PSF/400	APAR SA44304

OS/400 V3R6

General	C5346360 Cumulative tape or later
	SF45620 TCP/IP for PSF/400 (order cover letter only)
	SF45624 IPDS pass through
Sockets	SF30508
WRKAFP2	SF31461
PSF/400	APAR SA44304

OS/400 V3R7

PSF/400	APAR SA44304

9.1.2 CREATING A LINE DESCRIPTION ON THE AS/400

If the Print Server and the AS/400 host are not on the same LAN segment, have the system administrator verify that there is a route defined in the TCP/IP route List. If there is not a route defined, use the AS/400 **ADDTCPRTE** COMMAND to create a route definition.

Also, verify if a line description has been created for the line to which the Print Server will be attached. If there is not a line description, have the system administrator use the AS/400 CRTLINETH to create an Ethernet line description.

9.1.3 CONFIGURING A TCP/IP HOST TABLE ENTRY

This step is optional. IBM suggests that you create a host entry in the TCP/IP table. Have the system administrator use the AS/400 CFGTCP command to add the host name and TCP/IP address of the Print Server.

9.1.4 CONFIGURING OS/400 FOR V3R1 OR V3R6

9.1.4.1 CONFIGURING PSF/400 FOR V3R1 OR V3R6

To create a printer device description:

1. At the AS/400 command line, enter the command **CRTDEVPRT**.

2. Press the **F11** key to display the keywords.

3. In the "Device Description" (**DEVD**) field, enter the name of the printer attached to the Print Server. The name may comprise of the letters A to Z and numerals 0 to 9. It must begin with a letter, and a maximum of 10 characters are allowed.

4. In the "Device Class" (**DEVCLS**) field, enter *RMT.

5. In the "Device Type" (**TYPE**) field, enter *IPDS.

6. In the "Device Model" (**MODEL**) field, enter **0**.

7. In the "Advanced Function Printing" (**AFP**) field, enter *YES.

8. In the "AFP Attachment" (**AFPATTACH**) field, enter *APPC.

9. In the "Font" (**FONT**) field, enter an appropriate value such as **11**.

10. In the "Form Feed" (**FORMFEED**) field, enter *AUTOCUT.

11. In the "Remote Location" (**RMTLOCNAME**) field, enter **TCPIP**.

9.1.4.2 CONFIGURING AFP FOR V3R1 OR V3R6

The following instructions are used to create a data area that is used by PSF/400:

1. At the AS/400 command line, enter the command **WRKAFP2**.

2. Press the **F11** key to display the keywords, then press **F10** to display additional values.

3. In the "Printer Device Name (**DEVD**) field, enter the name of the printer attached to the Print Server. This name must be identical to the name entered for the device name in the **DEVD** field in the **CRTDEVPRT** command.

4. In the "IPDS Pass Through" (**IPDSPASTHR**) field, enter *YES. This causes PSF/400 to transform SCS into IPDS before printing.

5. In the "TCP/IP Support" (**TCPIP**) field, enter ***YES**.

6. In the "Remote System" (**RMTSYS**) field, enter the TCP/IP address of the Print Server. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.

7. In the "Port" (**PORT**) field, enter **5001**.

8. In the "Activation Timer" (**ACTTMR**) field, enter ***NOMAX**. This will cause PSF/400 to wait indefinitely for a response to an activation request.

9. In the "Inactivity Timer" (**INACTTMR**) field for V3R1, or "Release Timer" (**RLSTMR**) field for V3R6, enter ***SEC15**. This is parameter should be set to a value at least equal to the timeout value on the printer. This is the time PSF/400 will maintain a session with the Print Server while there are no spooled files with a status of RDY.

9.1.5 CONFIGURING OS/400 FOR V3R2

9.1.5.1 CONFIGURING PSF/400 FOR V3R2

To create a printer device description:

1. At the AS/400 command line, enter the command **CRTDEVPRT**.

2. Press the F11 key to display the keywords.

3. In the "Device Description" (**DEVD**) field, enter the name of the printer attached to the Print Server. The name may comprise of the letters A to Z and numerals 0 to 9. It must begin with a letter, and a maximum of 10 characters are allowed.

4. In the "Device Class" (**DEVCLS**) field, enter ***RMT**.

5. In the "Device Type" (**TYPE**) field, enter ***IPDS**.

6. In the "Device Model" (**MODEL**) field, enter **0**.

7. In the "Advanced Function Printing" (**AFP**) field, enter ***YES**.

8. In the "AFP Attachment" (**AFPATTACH**) field, enter ***APPC**.

9. In the "Font" (**FONT**) field, enter an appropriate value such as **11**.

10. In the "Form Feed" (**FORMFEED**) field, enter ***AUTOCUT**.

11. In the "Remote Location" (**RMTLOCNAME**) field, enter **TCPIP**.

9.1.5.2 CONFIGURING AFP FOR V3R2

The following instructions are used to create a data area that is used by PSF/400:

1. At the AS/400 command line, enter the command **CRTPSFCFG**.

2. Press **F11** to display the keywords, then press F10 to display additional values.

3. In the "PSF Configuration" (**PSFCFG**) field, enter the name of the printer attached to the Print Server.

4. In the "Library" field, enter **QGPL**.

5. In the "IPDS Pass Through" (**IPDSPASTHR**) field, enter *YES. This causes PSF/400 to transform SCS into IPDS before printing.

6. In the "Activation Release Timer" (**ACTRLSTMR**) field, enter *NORDYF. This will cause PSF/400 to print all spooled files with a status of RDY before releasing the session.

7. In the "Release Timer" (**RLSTMR**) field, enter *SEC15. Set this parameter to a value at least equal to the timeout value on the printer. This is the time PSF/400 will maintain a session with the Print Server while there are no spooled files with a status of **RDY**.

8. In the "Remote Location Name or Address" (**RMTLOCNAME**) field, enter the TCP/IP address of the printer attached to the Print Server.

   You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.

9. In the "Port" (**PORT**) field, enter **5001**.

10. In the "TCP/IP Activation Timer" (**ACTTMR**) field, enter **NOMAX**. This will cause PSF/400 to wait indefinitely for a response to an activation request.

9.1.6 CONFIGURING OS/400 FOR V3R7, V4R1, AND ABOVE

9.1.6.1 CONFIGURING AFP FOR V3R7, V4R1, AND ABOVE

This command is optional. You can use it to set parameters for such features as IPDS pass through, activation release timer, and the release timer.

1. At the AS/400 command line, enter the command **CRTPSFCFG**.

2. Press **F11** to display the keywords.

3. In the "PSF Configuration" (**PSFCFG**) field, enter the name of the Print Server. This must be the exact name used in the USRDFNOBJ field in the CRTDEVPRT command.

4. In the "IPDS Pass Through" (**IPDSPASTHR**) field, enter ***YES**. This causes PSF/400 to transform SCS into IPDS before printing.

5. In the "Activation Release Timer" (**ACTRLSTMR**) field, enter ***NORDYF**. This will cause PSF/400 to print all spooled files with a status of RDY before releasing the session.

6. In the "Release Timer" (**RLSTMR**) field, enter ***SEC15**. Set this parameter to a value at least equal to the timeout value on the printer. This is the time the PSF/400 will maintain a session with the Print Server while there are no spooled files with a status of **RDY**.

9.1.6.2 CONFIGURING PSF/400 FOR V3R7, V4R1, AND ABOVE

To create a printer device description:

1. At the AS/400 command line, enter the command **CRTDEVPRT**.

2. Press the **F11** key to display the keywords.

3. In the "Device Description" (**DEVD**) field, enter the name of the printer attached to the Print Server. The name may comprise of the letters A to Z and numerals 0 to 9, and must begin with a letter, with a maximum of 10 characters allowed.

4. In the "Device Class" (**DEVCLS**) field, enter ***LAN**.

5. In the "Device Type" (**TYPE**) field, enter ***IPDS**.

6. In the "Device Model" (**MODEL**) field, enter **0**.

7. In the "LAN Attachment" (**LANATTACH**) field, enter ***IP**.

8. In the "Port Number (**PORT**) field, enter **5001**.

9. In the "Font" (**FONT**) field, enter an appropriate value such as **11**.

10. In the "Form Feed" (**FORMFEED**) field, enter ***AUTOCUT**.

11. In the "Activation Timer" (**ACTTMR**) field, enter ***NOMAX**. This will cause the AS/400 host to wait indefinitely for a response to an activation request.

12. In the "Remote Location" (**RMTLOCNAME**) field, enter the TCP/IP address of the printer attached to the Print Server. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.

13. In the "User-Defined Object" (**USRDFNOBJ**) field, enter the name of the Print Server. Leave the library blank unless you know its name. Enter ***PSFCFG** as the object type.

9.1.7 VERIFYING THE IPDS CONFIGURATION ON THE AS/400

To test that the AS/400 and the Print Server are connected and communicating, ping the print server from an AS/400 workstation with the following command:

```
PING 'TCP/IP ADDRESS' or PING HOST NAME
```

"TCP/IP Address" is the address of the Print Server (be sure to include the single quote marks around the address). Host name is the optional name you may have defined for the printer attached to the Print Server if you created an optional TCP/IP Host Table entry. If the pings are not successful, refer to **Chapter 10, Troubleshooting**.

   If the pings are successful, vary on the Print Server's printer device description by typing this command (all on one line):

```
VRYCFG(Print Server printer device name)
CFGTYPE(*DEV) STATUS(*ON)
```

   To use PSF/400 to send IPDS files to the Print Server, start the writer by typing this command:

```
STRPRTWTR DEV(Print Server printer device name)
```

9.2 Configuring the Print Server Using PrintControl

You can change many configuration parameters that affect IPDS printing through the use of either the PrintControl utility or Host Download Commands. The PrintControl utility is described in this section, and the use of host download commands follow in **Section 9.2.1**.

   Using the PrintControl utility, you can select whether the printer attached to an IPDS-enabled Print Server (such as the Ethernet IPDS Print Server) can print both SCS and IPDS jobs. The PrintControl utility allows you to select and control such

functions as the type of IPDS emulation, page setup features such as text compression, paper handling support, initiating troubleshooting features such as EDCDIC and ASCII dumps, and entering customized initialization and font strings.

To use the PrintControl utility to configure the Print Server, follow these steps (use the on-line Help for more specific instructions on these options):

1. After starting the PrintControl utility, select the desired print server from the displayed list. Print Servers are identified through their serial numeral and network address. Both of these are unique to the specific print server; you can find them on the bottom of the Print Server as well as on the self-test printout.

2. Open the configuration dialog box by double-clicking on the desired Print Server or by highlighting the desired Print Server and then pressing the **Configure** button displayed on the tool bar.

3. If the Print Server already has an IP address, go directly to the next step. Otherwise, go back to **Chapter 4, TCP/IP Printing** and enter the TCP/IP address, default router, and sub-net mask.

4. Click on the **Printer Ports/Emulations** box on the left side of the Print Server Information Screen to bring up various options for the printer ports.

5. Click on the **LPT1** (through **LPT3** if applicable) button to change settings pertaining to the port that the printer is physically attached. Use the on-line **Help** button for specific instructions.

6. Click on the **TCP1** (through **TCP3** if applicable) button to change settings pertaining to TCP/IP printing functions such as initialization strings, banner pages, etc. Use the on-line **Help** button for specific instructions.

7. Click on the **SCS1** (through **SCS3** if applicable) button to select SCS printer emulations and the associated print driver settings for the printer attached. Use the on-line Help button for specific instructions.

8. Click on the **AFP1** button to configure the Print Server for IPDS options.

9. Click on the **IPDS/AFP Setup** button to configure the following:

   a. IBM Emulation—Select one of the IBM IPDS printers to emulate (3812, 3816, 4028, or 43XX).

   b. Store Overlay in Printer Memory—"No" keeps the overlay in the Print Server's memory, and protects it from loss if the attached printer is turned

off. "Yes" stores the overlay as a macro in the printer's memory and increases the speed of printing.

c. True Print Complete—Gives a response to the AS/400 when the last page is dropped into the output bin.

d. Default font—Select the font by FGID that you want to use if the AS/400 only requests the printer's default font be used.

e. Font Mapping—Selecting "Best Fit" allows the Print Server to match the desired font closely with what is actually available in the attached printer. Selecting "Emulate 4028/43XX" or "Emulate 3812/16" fonts maps the IPDS font like an IBM 4028, 43XX, 3812, or 3816 printer would (including substitutions).

f. Code Page Version—Selects which code page version will be used, if available.

g. Default Code Page—Selects the default EBCDIC code page that is used in the EBCDIC-to-ASCII conversion.

10. Click on **Page Setup** to configure the following:

a. Text Compression—Determines the direction of compression of host text data (vertical only, or vertical and horizontal). Take care when choosing text compression because graphic elements and bar codes are not compressed. This could cause mis-alignment of the various text and graphical elements on a page.

b. Compression Ratio—Specifies the percent of text compression.

c. Horizontal Margin Offset—Selects the horizontal offset of the logical page on the physical page in $\frac{1}{60}$ of an inch.

d. Vertical Margin Offset—Selects the vertical offset or the logical page on the physical page in $\frac{1}{60}$ of an inch.

11. Click on **Paper Handling Support** to configure the following:

a. Input Tray Mapping—The Print Server currently supports 4 input trays. The IBM drawer IDs and their associated PCL command IDs are selected here.

b. Paper Size—Select the type of paper that will be in each input tray.

c. Output Tray Mapping—The Print Server will allow you to select which printer output tray you would like to direct the printed pages to by matching

the IBM printer output tray ID to the PCL ID for the desired output tray in the printer.

d. After you make each of your output tray selections, Click on the **Save Displayed Mapping** button to save that specific output tray selection.

12. Click on **Troubleshooting** to select whether you would like a print jobs to be printed in a "hex dump" format. Selecting EBCDIC will generate a listing of the commands just as they are received from the AS/400. Selecting ASCII will generate a listing of the commands that the Print Server sends to the attached printer.

13. Click on **User-Defined Strings** to configure the following:

a. Host Initialization—Allows you enter a printer initialization string that you would like to send to the printer each time a print job is received from the AS/400. Formatting instructions sent with the host data generally override this setting.

b. Fonts—Allows you to call fonts in the printer that are unknown to the AS/400. For each of the 10 font strings, you select a valid host font number (FGID number) and then enter the font command calling that specific printer's font.

14. To return all IPDS settings to their original default settings, click on the **Return Factory Defaults**.

15. After you have completed making all your desired configuration settings, click on the **Return** button.

16. Click on the **Apply Changes** button to save your settings, and then exit the PrintControl utility.

For more detailed instructions on these configuration options, use the **HELP** button to access the PrintControl utility's on-line help text. You may also want to refer to the more detailed descriptions of these IPDS configuration options by referring to the respective command in the following host download command section.

9.2.1 CONFIGURING USING HOST DOWNLOAD COMMANDS

By sending download commands from the AS/400 host to an IPDS-enabled Print Server (such as the Ethernet IPDS Print Server), you can also change the configuration parameters.

Most host download commands are placed in a host document, on command line of the AS/400 screen, or contained within the data stream being sent from a host program. Regardless of whether the incoming print job is a screen print, a report, or a word-processing document created on the AS/400 host, the Print Server will recognize the host download command.

The command itself will not be printed if you entered it correctly. If any part of the command is printed, the Print Server did not recognize the command because of a problem in the format. Check the syntax of the command and send the command again. No spaces are allowed. A space or invalid character in a command causes the Print Server to ignore the command and resume printing from the point the error occurred.

Most host download commands sent to the Print Server take effect immediately but stay only in the Print Server's active memory. To save the changed configuration, you must send the host download command **I99,0**.

Take the following steps to enter a host download command.

1. Type the Command Pass-Thru delimiter **&%** in the document at the point where the command is to take effect.

2. Type an upper case "I."

3. Type the command number for the command to be used, as shown in **Table 9-1**. Always use two digits for the command number (**&%I05**).

4. Type a comma.

5. Type the value representing the desired selection. No spaces are allowed. A space or invalid character in a command causes the Print Server to ignore the command and resume printing from the point the error occurred.

6. A space or control character (that is, NL, FF, CR, LF) signals the end of the download command.

7. Multiple commands can be chained together by using a slash (/) or backslash (\) to separate the commands (no spaces allowed). For example, to set the True Print Complete (Command 25) to ON (Value 1), and the Default Code Page (Command 30) to Canadian/French (Value 0260), and save the command, type:

```
&%I25,1/30,0260/99,0
```

Alphabetical Listing of Host Download Commands

The following table shows the host download commands for the IPDS-enabled Print Server and corresponding command numbers in alphabetical order:

Table 9-1. Host Download Commands

Description	Command Number
Compression Ratio	41
Code Page Version	31
Default Code Page (Host Language)	30
Default Font	32
Font Mapping	34
Font Strings	33
Horizontal Margin Offset	42
Host Port Initialization String	04
Input Tray Mapping	50
Output Tray Mapping	52
Overlay Stored in Printer Memory	24
Paper Size	51
Print Self-Test	98
Restore Factory Defaults	98
Restore Previous Settings	98
Save All Current Settings	99
Text Compression	40
True Print Complete	25
Vertical Margin Offset	43

Description of Host Download Commands

- An asterisk (*) identifies a factory-default setting.

- Invalid commands will be ignored (the last valid setting will be unchanged).

COMMAND 04: HOST PORT INITIALIZATION STRING

Stores a twinax port initialization string (up to 25 hex pairs) in the Print Server's permanent memory. This string will be sent to the printer every time a twinax job is printed. The string will be sent AFTER the print server has reconfigured the printer for host printing. However, formatting instructions sent with the host data generally override this setting.

Value	Description
(ab cd..)	up to 25 ASCII hex bytes defining the string embedded in ()
( )	deletes unit string

Example: &%I04,(1B 26 6C 38 44) sets LPI to 8LPI

COMMAND 24: STORE OVERLAY IN PRINTER MEMORY

The Print Server will store overlays in its own memory. When it receives an IPDS command that activates that overlay, the overlay is converted to PCL commands and sent on to the printer to be printed with the accompanying text that the AS/400 sends. This method sends the overlay down to the printer for each page printed.

   You may also convert the overlay to a PCL macro that is stored in the printer's memory. When an IPDS command is received that activates that overlay, the Print Server passes a start macro command on to the printer. This method is faster because that Print Server needs to send one command at the beginning of the print job to activate the macro.

NOTE

There is a possibility that another print job coming from the shared printer port could delete or replace the overlay's macro. If this is the case, you may want to keep the overlay stored in the Print Server.

Value	Description
0*	The overlay is stored and activated from the Print Server.
1	The overlay is sent to the printer for storage and activated there.

Example: &%I24,1 causes the Print Server to convert the overlay to a PCL macro and sends it on to the printer for storage. When an IPDS command is received to activate the overlay, the Print Server sends on a macro start command to the printer for that specific overlay.

COMMAND 25: TRUE PRINT COMPLETE

Determines if the Print Server reports a print complete to the host after a page has actually been printed, or if the print complete message is sent as soon as the printer has started processing the page of the host print job. Setting **True Print Complete** to **ON** will cause the printing process to slow down.

Value	Description
0	True Print Complete is OFF.
1	True Print Complete is ON

Example: &%I25,1 causes the Print Server to post a "print complete" message to the host when the page is actually printed.

COMMAND 30: DEFAULT CODE PAGE (HOST LANGUAGE)

Selects the default code page (EBCDIC) used in the EBCDIC-to-ASCII conversion. These code pages are resident in the print server:

Table 9-2. Code Pages Resident in the Print Server

Value	Description
0037*	English (US), Canadian/Bilingual
0260	Canadian French
0273	Austrian/German
0274	Belgium
0275	Brazilian
0276	Canadian French
0277	Danish/Norwegian
0278	Finnish/Swedish
0280	Italian
0281	Japanese/English
0282	Portuguese
0284	Spanish/Spanish Speaking
0285	English (UK)
0286	Austrian/German (alt)
0287	Danish/Norwegian (alt)
0288	Finnish/Swedish (alt)
0289	Spanish (alt)
0290	Japanese/Katakana
0297	French
0500	Int'l Set 5, Swiss Bilingual

Example: &%I30,0500 selects Code Page 500, Int'l Set5, to be the default code page for EBCDIC to ASCII conversion.

COMMAND 31: CODE PAGE VERSION

Selects which code page version will be used if more than one is available.

Value	Description
0*	Version 0
1	Version 1

Example: &%I31,1 selects version 1

COMMAND 32: DEFAULT FONT

Selects which font will be loaded/mapped by the Print Server when the host requests the "default font." The default font can be any font from the list in **Appendix E** or any other downloadable font supported by the AS/400. Some of the IPDS fonts reside directly on the print server and are downloaded to the attached printer when requested. Other IPDS fonts are mapped to printer resident fonts. Refer to **Appendix E** for more information. Also check Command 33 for related information.

Value	Description
XXXXX	FGID number of fonts listed in **Appendix E** or downloadable font.

Example: &%I32,00019 selects OCR-A (FGID#00019) to be the default font.

COMMAND 33: FONT STRINGS

Assigns a valid font ID to a font. The first number (0 to 9) is one of 10 available strings, the second number (0 to 65535) is the host font number. The characters shown in parentheses are sent to the printer when the host font number is received.   Refer to **Appendix E** for a list of supported/valid font numbers. Refer to the printer's users' guide or the documentation accompanying the font cartridge/SIMM/DIMM/Softfont for a list of available fonts and their respective strings. Use the **<** character to indicate the escape character.

Value	Description
0 to 9,	One of ten available strings
0 to 65535	Host font number
(ASCII Char)	Up to 25 ASCII characters representing the desired font

Example: &%I33,3,751(<(12U<(s0p12h10v1s3b6T)

This Host Download command selects the third font string to be font #751 and selects for an HP LaserJet or Lexmark Laser Printer:

12U	= code page 850
0p	= fixed spacing
12h	= 12 pitch
10v	= 10 point
1s	= italic
3b	= bold
6T	= letter gothic

COMMAND 34: FONT MAPPING

Selects how IPDS font commands from the host are mapped to printer-resident PCL fonts. Refer to **Appendix E** for a detailed list of font mappings. "Best Fit" maps the IPDS font to a printer resident font that most closely resembles the original IPDS font. "4028/43XX Compatible" maps the IPDS font like an IBM 4028/43XX series printer would (including font substitutions). "3812/16 Compatible" maps the IPDS font like an IBM 3812/16 printer would.

NOTE

After changing the font mapping, you need to power OFF the Print Server and then ON again to activate the new selection.

Value	Description
0	Best Fit
1*	4028/43XX Compatible
2	3812/16 Compatible

Example: &%I34,1 Configures the IPDS Print Server to map IPDS fonts to PCL fonts that most closely represent fonts an IBM 4028/43XX printer would have printed.

For example, when the IBM host requests font 204 (IPDS: Matrix Gothic 13 CPI), "Best Fit" would have mapped FGID 204 to a Letter Gothic 16 CPI with adjusted spacing to most closely resemble the requested Matrix Gothic 13 font.

An IBM 4028/43XX printer, however, would have substituted this font with a Courier 15 CPI font. By selecting "4028/43XX Compatible," the Print Server will also map the requested FGID 204 to a Courier 15 CPI font.

COMMAND 40: TEXT COMPRESSION

Determines the direction of compression of host text data to fit the logical page into the printable area of the physical page. The compression ratio is set through Command 41: Compression Ratio.

NOTE

Compressing AFP/IPDS documents containing images, graphics or bar codes in addition to text may cause alignment problems, since only text is compressed.

Value	Description
0*	No Compression
1	Compress LPI (vertical compression)
2	Compress LPI and CPI (vertical and horizontal compression)

Example: &%I40,1 causes the Print Server to compress all text data coming from the host vertically (LPI).

COMMAND 41: COMPRESSION RATIO

Determines the percentage of compression of host text data to fit the logical page into the printable area of the physical page. This command only takes affect if Command 40: Text Compression is set to 1 (Compress LPI) or 2 (Compress LPI and CPI).

Value	Description
00 to 99	0 to 99%
05*	5% (default)

Example: &%I41,50 causes the Print Server to compress all text data coming from the host by 50% in the direction specified through Command 40.

COMMAND 42: HORIZONTAL MARGIN OFFSET

Selects the horizontal offset of the logical page on the physical page in $\frac{1}{60}$ of an inch. If parts of the logical page containing data are moved off the physical page, this data will not print.

NOTE

The default values of Command 42 and 43 align the logical page with the top left hand corner of the physical page. Since laser printers generally have a non-printable area of approx. ¼ inch around the outside of the physical page, host data that falls within this ¼ inch area would be lost. To remedy this, you may want to adjust the margin offsets by the value 15 (15/60=1/4): &%I42,15/I43,15.

Value	Description
-127 to 127	$\frac{-127}{60}$ to $\frac{127}{60}$ of inch
0*	no offset (default)

Example: &%I42,-60 causes the Print Server to move the logical page 1 $(\frac{60}{60})$ inch to the left.

COMMAND 43: VERTICAL MARGIN OFFSET

Selects the vertical offset of the logical page on the physical page in $\frac{1}{60}$ of an inch. If parts of the logical page containing data are moved off the physical page, this data will not print!

Please also read the NOTE in Command 42 above.

Value	Description
-127 to 127	$\frac{-127}{60}$ to $\frac{127}{60}$ of inch
0*	no offset (default)

Example: &%I43,-60 causes the Print Server to move the logical page 1 $(\frac{60}{60})$ inch towards the top of the page.

COMMAND 50: INPUT TRAY MAPPING

The Print Server currently supports 4 input trays. The IBM drawer IDs and the default PCL command IDs are shown below.

Typical IBM AS/400 Drawer Assignments		Ref #	PCL Input Tray ID*
IBM Drawer ID or OfficeVision/400		**(XX)**	**(YY)**
01	Paper Drawer 1	01	01
02	Paper Drawer 2	04	04
65	Envelope Feed	03	03
100	Manual Feed	02	02

Value	Description
xx, yy	**xx** is the reference number for the IBM drawer ID; **yy** is the numeric value representing the PCL printer's input tray ID (00 to 99).

Example: &%I50,01,02 causes the Print Server to pull a sheet of paper from the printer's manual feed tray when it receives an IBM drawer ID of 2.

*NOTE

The PCL input tray IDs shown above are the defaults for the Print Server. These PCL input tray IDs will vary based upon the model of PCL printer. See your printer's reference manual for the proper input tray ID to be remapped.

COMMAND 51: PAPER SIZE

Make sure to turn the Print Server OFF and ON again after sending this command. Selects the paper size used in each supported tray. A paper size cannot be assigned to the envelope feeder.

Value	Description
xx,yy	**xx** is the number representing the IBM paper drawer ID (see COMMAND 50; **yy** identifies the selected paper size according to the table below; default mappings are: Tray00-Letter, Tray01-Letter, Tray 99-Letter;

yy-value	Description
00	US-Letter
01	US-Legal
02	A4
03	US-11x17
04	A4

Example: &%I51,00,02 causes the printer to recognize that A4 paper will be used when an IBM drawer ID of 00 is received.

COMMAND 52: OUTPUT TRAY MAPPING

The Print Server will allow you to select which printer output tray you would like to direct the printed pages. This is done by matching the IBM printer output tray ID to the PCL ID for the desired output tray in the printer.

Value	Description
aa,bb	**aa** is the number of the IBM output paper tray ID (01 to 10); **bb** is the numeric value representing the printer's output tray (00 to 99).

Example: &%I52,03,02 causes the Print Server to direct the printer to send the printed pages to the printer's ID 02 output tray when the Print Server receives an IBM output printer tray ID 03 instruction.

NOTE

The Print Server will send the same ID number to the printer that it receives from the AS/400 unless the IBM output paper tray ID has been remapped using this command. Only IBM output trays 01 to 10 can be remapped. The other remaining output tray IDs (11 to 256) will be passed on as received.

COMMAND 98: RESTORE DEFAULTS OR PRINT SELF-TEST

Restores the factory-default configuration selections (except for settings set through the DIP switches and the Default Code Page (Command 30)). Also prints out a copy of the active configuration selections, or restores the most recent permanently saved configuration selections.

Value	Description
0	Restores factory defaults
1	Prints out active configuration selections (This is also a self test of the Print Server)
2	Restores most recent permanently saved configuration settings

Example: &%I98,1 prints out the active setup selections.

COMMAND 99: SAVE ALL CURRENT SETTINGS

Saves all current settings specified through host download commands into the permanent memory of the Print Server.

Value	Description
0	Saves all current settings.

Example: &%I99,0 saves all current settings

10. Troubleshooting

This chapter provides instructions for troubleshooting of printing problems you may encounter when operating the Print Server.

- Software/Firmware Updates, **Section 10.1**

- Diagnostic Tests, **Section 10.2**

- EBCDIC Hex Dump, **Section 10.3**

- ASCII Hex Dump, **Section 10.4**

- Troubleshooting Guide, **Section 10.5**

- SNA (APPC) Printing, **Section 10.5.1**

- TCP/IP Printing, **Section 10.5.2**

- TN5250e Printing, **Section 10.5.3**

- TN5250e Connection Status Message, **Section 10.5.4**

- IPDS Printing, **Section 10.5.5**

- Hardware Problems, **Section 10.5.6**

- Restoring Factory Defaults, **Section 10.6**

10.1 Software/Firmware Updates

The latest versions of the Print Server's bootcode and operating firmware as well as the latest version of the PrintControl utility are posted on the FTP site.

1. From your internet browser, select the following URL:

   ftp://ftp.iocorp.com/ftp/

2. Select the appropriate print server directory.

3. The new software/firmware is available in the following files:

Filename	Description
F5450xxx.exe	Operating Firmware for the 3-Port Multiprotocol Print Server
B5450xxx.exe	Bootcode for the 3-Port Multiprotocol Print Server
PCUxxx.exe	PrintControl setup utility

For other Print Servers, the file names are similar (that is, the firmware for the 1-Port Multiprotocol Print Server is F5430xxx.exe and so on).

4. Follow the instructions of the readme.txt file (located in the Print Server directory) to download the files you need from the FTP site and install them on your PC (the PrintControl file) or on the Print Server (the bootcode and firmware files).

10.2 Diagnostic Tests

PRINT SERVER SELF-TEST

The Print Server will automatically generate a one-page self-test print out every time it is powered up or reset. By default the Print Server will print this self-test page on the printer attached to LPT1. However, this can be overridden by selecting a different port through the PrintControl utility (see below).

A more detailed self-test showing the various 5250 printer emulation parameters can be printed by pressing the Print Server's Mode button.

Selecting a Printer to Print the Configuration Report (Self-Test):

1. If you haven't already done so, start the PrintControl utility.

2. Double-click on the target print server from the displayed list.

3. Click on the **Physical Port** you want the self-test page to print to.

4. Check the **Configuration Report** box.

5. Click on the **Apply Changes** button.

Printing a Self-Test Using the Print Server Mode Button

1. Press the Print Server's **Mode** button once. The right orange LED will go ON. After the comprehensive self-test prints, the LED will go OFF.

10.3 EBCDIC Hex Dump

An EBCDIC Hex Dump or Buffer Dump can be useful to diagnose problems when printing native (EBCDIC) AS/400 data.

The EBCDIC hex data is printed on a grid corresponding to the data's position in the buffer. If the hex data represents a printable character, that character is printed below the hex data.

The EBCDIC Hex Dump can be started for all print sessions through the Print Server's **Mode** button or for only one IBM printer session through the PrintControl utility or Host Download Command 42.

NOTE

To ensure that all relevant data from the AS/400 is captured, you should end and restart the Writer on your AS/400 before sending the print job.

10.3.1 STARTING EBCDIC HEX DUMP THROUGH THE MODE BUTTON

1. Press the Print Server's **Mode** button twice. The left orange LED will go ON. After about 3 seconds the Print Server is in EBCDIC Hex Dump mode.

To end the hex dump, push the **Mode** button two more times to return it into the **Operating** position (that is, both LEDs are OFF).

10.3.2 STARTING EBCDIC HEX DUMP THROUGH THE PRINTCONTROL UTILITY

1. If you haven't already done so, start the PrintControl utility.

2. Double-click on the target print server from the displayed list.

3. Click on the SCS port associated with the printer you want to print the hex dump on. Remember, on the Print Server, SCS ports are linked to physical ports in the following manner:

To configure the printer attached to the Print Server's physical port	Select this SOS logical port
LPT1	SCS1
LPT2	SCS2
COM1	SCS3

4. In the right column titled "Object Information," click on **Advanced**.

5. In the left column, click on **Troubleshooting**.

6. In the right column, set EBCDIC Hex Dump to **Start**.

7. Press **Return**.

8. Press **Apply Changes**.

To end the hex dump, simply reset the Print Server (click on the Reset button in the PrintControl tool bar), or repeat steps 1 through 8 selecting Stop in step 6.

10.3.3 STARTING EBCDIC HEX DUMP THROUGH HOST DOWNLOAD COMMAND

1. On the AS/400 command prompt, or from within an AS/400 document or report, type the following:

   `&%Z42,1`

   where `&%` represent the active Command Pass-Thru delimiters,

   `Z` is the Command Identifier,

   `42` is the Host Download or Reference number,

   `1` is the value that causes hex printing to **start**.

2. Send the screen, document, or report containing the above command to the target printer.

To end the hex dump, simply reset the Print Server (click on the **Reset** button in the PrintControl tool bar) or power OFF the Print Server.

10.4 ASCII Hex Dump

You can use an ASCII Hex Dump to diagnose problems when printing native (EBCDIC) AS/400 data. The Print Server first converts incoming EBCDIC data into ASCII and then prints the data as ASCII hex.

You can start the ASCII Hex Dump for all print sessions through the Print Server's Mode button or for only one IBM printer session through the PrintControl utility or through Host Download Command 43.

NOTE

To ensure that all relevant data from the AS/400 is captured, end and restart the Writer on your AS/400 before sending the print job.

10.4.1 STARTING ASCII HEX DUMP THROUGH THE MODE BUTTON

Press the Print Server's Mode button three times. Both orange LEDs will go ON. After about 3 seconds the Print Server is in ASCII Hex Dump mode.

To end the Hex Dump, push the **Mode** button once more to return it into the **Operating** position (that is, both LEDs are OFF).

10.4.2 STARTING ASCII HEX DUMP THROUGH THE PRINTCONTROL UTILITY

1. If you haven't already done so, start the PrintControl utility.

2. Double-click on the target print server from the displayed list.

3. Click on the SCS port associated with the printer you want to print the hex dump on. Remember, on the Print Server, SCS ports are linked to physical ports in the following manner:

To configure the printer attached to the Print Server's physical port	Select this SOS logical port
LPT1	SCS1
LPT2	SCS2
COM1	SCS3

4. In the right column titled "Object Information," click on **Advanced**.

5. In the left column, click on **Troubleshooting**.

6. In the right column, set ASCII Hex Dump to **Start**.

7. Press **Return**.

8. Press **Apply Changes**.

To end the hex dump, simply reset the Print Server (click on the **Reset** button in the PrintControl tool bar), or repeat steps 1 through 8, selecting **Stop** in step 6.

10.4.3 STARTING ASCII HEX DUMP THROUGH HOST DOWNLOAD COMMAND

1. On the AS/400 command prompt, or from within an AS/400 document or report, type the following:

   ```
   &%Z43,1
   ```

   where

&% represent the active Command Pass-Thru delimiters,

Z is the Command Identifier,

43 is the Host Download or Reference number,

1 is the value that causes hex printing to start.

2. Send the screen, document, or report containing the above command to the target printer.

To end the hex dump, send the command **&%Z43,0** to the target printer, reset the Print Server (click on the **Reset** button in the PrintControl tool bar), or power OFF the Print Server.

10.5 Troubleshooting Guide

10.5.1 SNA (APPC) PRINTING

Problem: Print Server does not auto configure to the AS/400.

Possible Resolutions:

1. Double check that you have entered the correct parameters into the PrintControl screen.

2. Verify that the AS/400 is set to **auto configure**. Use the **WRKSYSVAL** command to change settings.

    a.1. On the AS/400 command line, type DSPSYSVAL SYSVAL(QAUTOCFG) and press <**ENTER**>.

    a.2. The **Auto configure device** parameter should be set to **1=On**.

    b.1. On the AS/400 command line, type

        DSPSYSVAL SYSVAL(QAUTORMT) and press <ENTER>.

    b.2. The **Auto configure remote controller** parameter should be set to **1=On**.

    c.1. On the AS/400 command line, type DSPSYSVAL SYSVAL(QAUTOVRT) and press <**ENTER**>.

    c.2. The **Number of devices to auto configure** should be large enough to account for all virtual (APPC) devices on your network. If you are unsure, you may want to increase this number.

d.1. On the AS/400 command line, type WRKLIND and press <ENTER>.

d.2. Enter a **5** (to display, or **2** to change) in front of the line that the 3-Port Multiprotocol Print Server is attached to.

d.3. Press <**ENTER**> several times until **Autocreate controller** is displayed in the lower section of the menu options.

d.4. Verify that the **Autocreate controller** parameter is set to ***Yes**.

3. Display the QSYSOPR messages for additional information. On the AS/400 command line, type DSPMSG QSYSOPR and press <**ENTER**>.

Problem: When resetting the Print Server while an AnyNet session is (even just partially) established, the RMT and/or PRT devices generally do not come back into VARY ON mode.

Resolution: Follow this procedure when resetting the Print Server in an AnyNet environment:

1. End the Writer on the AS/400 command line: type endwtr <printer name> and press <**ENTER**>.

2. VARY OFF the PRT and RMT device (wrkdevd <printer name>, **8, 2** [for PRT device] and **2** [for RMT device], <**Enter**>).

3. End all TCP/IP sessions associated with the Print Server (wrktcpsts, **3**, scroll to where the Print Server TCP/IP address is displayed [at least once!], select **4**, <**Enter**>).

4. VARY ON the RMT and then the PRT devices (wrkdvd <printer name>, **8**, **1** [for PRT device], **1** [for RMT device], <**Enter**>).

5. The RMT and PRT device are now in VARY ON PENDING mode.

6. Reset the Print Server through the PrintControl utility (**R** button on first screen) or by cycling power on the Print Server.

10.5.2 TCP/IP PRINTING

Problem: Print jobs are preceded by a banner (header) page and/or followed by a trailer page and/or a blank page.

Possible Resolution A: Follow this procedure to select/deselect banner and/or trailer page options on the Print Server.

1. Start the PrintControl utility and open the device configuration window for the desired Print Server.

2. Click on the button associated with the TCP/IP logical port specified in the host's remote output queue (**TCP1** for LPT1, **TCP2** for LPT2, **TCP3** for COM1).

3. From the available options, check one or more of the following:

   • No banner (header) page—if you want to turn off the automatic printing of banner or header pages at the beginning of every TCP/IP print job.

   • No trailer page—if you want to turn off the automatic printing of trailer pages at the end of every TCP/IP print job.

   • No blank page—if your printer sends a blank page at the end of every TCP/IP print job and you want to suppress this.

Possible Resolution B:

   Add one of the following appendices to the Remote Output Queue and/or to the "Name of printer on that machine/server" in Windows NT (see **Section 4.8**) specified on your TCP/IP host. Note that these appendices can be added to TCP/IP logical ports (TCP1, TCP2, or TCP3) as well as physical ports (LPT1, LPT2, and COM1) specified as the Remote Output Queue.

_nb   If you want to turn off the automatic printing of banner or header pages at the beginning of every TCP/IP print job.

_nt   If you want to turn off the automatic printing of trailer pages at the end of every TCP/IP print job.

_nff   If your printer sends a blank page at the end of every TCP/IP print job and you want to suppress this.

Example: Specifying a Remote Output Queue (also "Name of printer on that machine/server" in Windows NT) of:

    TCP2_nb_nt_nff

would suppress the banner (header) page, the trailer page, and a blank page when printing from this TCP/IP host to a printer attached to the Print Server's LPT2 port.

10.5.3 TN5250E PRINTING

Problem: The AS/400 assigns a 3812 printer device with a name of QPADEV*nnnn* (where *nnnn* is a 4-digit number).

Possible Resolutions: If you leave the printer name blank when configuring the TN5250e object in the PrintControl utility, the AS/400 will create a 3812 device but will give the printer the name of QPADEV*nnnn*, with *nnnn* being a 4-digit number. However, each time the print server connects to the host, the *nnnn* number for the printer may be different. This may cause problems where a specific printer name is used in specifying the location of printed output. We do not recommend that you let the AS/400 create the printer name.

Problem: The AS/400 assigns a VT100 display device with a name of QPADEV*nnnn* (where *nnnn* is a 4-digit number).

Possible Resolutions: The AS/400 Telnet server is not up to the most current version and does not support TN5250e printing. Install the proper PTFs (See **Appendix D**). Also make certain to have installed the most recent version of Client Access (Client Access for Windows 95/NT V3R1M3 or newer, or Client Access Enhanced for Windows 3.1 V3R1).

Problem: The writer is in a writing status, but no printing is occurring and there are no messages on the AS/400. This usually occurs when communication has been lost with the host.

Solution:

1. End the writer.

2. Vary off the device.

3. Reset the LAN Print Server. This will re-establish the connection and printing will resume.

Problem: The printer device is in Vary On pending state.

Solution:

1. End the Telnet session by using the AS/400 TCPADM command. At the command line, type GO TCPADM, take selection "**7**", then "**3**", find the IP address for the Print Server, then execute option "**4**" (End of Session).

2. Restart the TN5250e session on the Print Server by using either one of the following alternatives:

a. Ping the Printer Server, or

b. Cycle power on the Print Server.

3. If the connection status message does not indicate a successful Telnet session has been established, you may need to change the name of the printer device on the Print Server. This occurs because the AS/400 often does not allow the original printer device name to be used until an IPL is performed at the AS/400.

10.5.4 TN5250E CONNECTION STATUS MESSAGE

The print server reports the success or failure of an attempt to communicate with the host by printing a brief connection status message on each attached printer. The connection status message will look somewhat like:

```
AS/400 Host Communication Status:
Connection attempt succeeded
Host system S101256R
Printer name TNPRT00
Status code I902—Session successfully started
```

The message will show whether the connection succeeded or not, the name of the host AS/400 which this print server is connected to, the printer name, and the session status. (If there is no Host or printer name in the message, the host AS/400 did not send that information with the status message.)

The status code (I902) shown in the above example is the normal code indicating successful host communication. The possible values of the status code and suggested actions to take for that status code are as follows:

0101—Host not responding to pings

This message usually indicates one of the following:

• TCP/IP has not been started on the host.

• The host's IP address has not been correctly configured on the print server.

• The print server has not been correctly connected to the LAN.

0102—Host rejected connect to Telnet port

The host answers pings, but rejects a TCP/IP connect attempt, probably because its Telnet server has not been started.

0111—Host Telnet session lost

Usually means that the printer has been varied off at the host. Also if the host has gone down, or if there is a communication (for example, router) failure.

2777—Damaged device description

8902—Device not available

This code appears when the print server attempts to start a session for a printer whose name duplicates the name of a printer already active on the host. In many cases, this status code means that the print server has been powered off and then powered back on within a few minutes.

This code could also mean that a "reset" command has been sent from the PrintControl utility without ending the writer and varying off the printer first. When the print server is turned off, it takes the AS/400 about 10 minutes to determine that the TCP/IP sessions for the printers are no longer active. If the print server restarts while the host shows the old printer sessions still active, requests for new sessions will be rejected with this code. You can recover by doing one of the following:

- Wait 10 minutes before powering the print server back on.

- At the AS/400, manually terminate the old TCP/IP sessions.

- If the print server is configured for automatic 5-minute session start retries (the default), just wait for a successful retry.

- If automatic retries are disabled, use one of the other available methods of initiating a session restart, after a suitable wait.

- Avoid the problem by allowing the print server to end its TCP/IP sessions gracefully before powering it off. Do this by powering-off all attached printers 2 minutes or more before powering off the print server itself.

  8906—Session initiation failed

  8907—Session failure

  8920—Object partially damaged

  8921—Communications error

  8922—Negative response received

8925—Creation of device failed

8928—Change of device failed

8930—Message queue does not exist

8935—Session rejected

8940—Automatic configuration failed or not allowed

E001—No Telnet printer support at host

The operating system on the AS/400 supports only display (not printer) devices in Telnet sessions. Either update your operating system, or reconfigure your print server for a non-Telnet mode of AS/400 communication. See **Appendix D** for listing of PTFs required for Telnet printing support.

I902—Session successfully started

I904—Source system at incompatible release

10.5.5 IPDS PRINTING

Problem: The Print Server will not respond to a Ping.

Possible Resolutions: If you have problems pinging the Print Server:

- Verify the configuration of the AS/400, including the Print Server and any intervening devices such as routers and bridges.

- Verify that the AS/400 line description is varied on, the Print Server is turned on, and that the printer is also turned on and show a status of READY.

- Verify that the AS/400 TCP/IP interface is active.

Problem: PSF/400 terminates when initialized.

Possible Resolutions:

If PSF/400 terminates when you initialize if for IPDS printing and issues a message PQT3603, check for the following error codes:

"**10**" means an incorrect RMTSYS (V3R1 or V3R6) or RMTLOCNAME (V3R2, V3R7, or above) has been specified for the printer.

"**15**" means that PSF/400 timed out waiting for the printer's response. You should check the value you entered for Activation Timer when using WRKAFP2 (V3R1 or V3R6), CRTPSFCFG (V3R2), or CRTDEVPRT (V3R7 or above).

Codes "**20 to 39**" indicate a general communications failure. Make sure all of the components in your network (such as routers) are operational.

Codes "**40 to 59**" indicate a logic error between PSF and the printer control unit. Contact IBM support.

Problem: Spooled print file remains in PND status.

Possible Resolutions:

- Check the output queue with the command `WRKOUTQ OUTQ (queuename)`.

- This typically indicates that PSF/400 is waiting for a response from the printer. This can be verified by displaying the QSPL subsystem, WRKACTJOB SBS(QSPL). If the status of the PDJ job for the printer is **SELW**, then PSF/400 is waiting for a response from the printer. Make sure that the printer is online and in READY status and that all network connections (for example, routers) between the AS/400 and the printer are active.

Problem: Spooled files disappear without printing.

Possible Resolutions: To resolve this problem:

- Check that the correct printer queue name and correct IP address have been used.

- Ping the IP address. If the ping is successful, disconnect the network cable from the Print Server, and ping the address again. If the ping is still successful, there is another printer with that IP address on the network.

Problem: Data is being clipped

Possible Resolution:

- To resolve this problem, you may want to set the PSC (Page Size Control) parameter to ***YES** in the **WRKAFP2** (V3R1 and V3R6) command or in the **CRTPSFCFG** command (V3R2, V3R7 or above).

Problem: Euro symbol is not printing.

Possible Resolution: If you are not able to print the Euro symbol, check the following:

- Make certain that your PCL 5 laser printer has resident in it the most recent version of the Windows 3.1 Latin 1 character set that contains the Euro symbol.

- Make certain that your AS/400 has the latest PTFs installed that support the Euro symbol.

- Make certain that your AS/400 is sending out one of the following Euro Country Extended Code Pages:

Code Page	Description
1140	USA, Canada
1141	Austria, Germany
1142	Denmark, Norway
1143	Finland, Sweden
1144	Italy
1145	Spain, Latin America
1146	UK
1147	France
1148	International

When one of these code pages is sent by the AS/400, the Print Server will automatically convert the AS/400 Euro Country Extended Code Page into the Windows 3.1 Latin 1 (Euro version) character set and send the instruction to the laser printer to print the Euro symbol. Of course, the laser will only print the Euro symbol if the printer has the Windows 3.1 Latin 1 Euro enable character set resident in it.

Problem: Older laser printers will not print IPDS properly.

Possible Resolution: AFP/IPDS printing requires a laser printer that supports PCL 5e.

10.5.6 HARDWARE PROBLEMS

Problem: The Line Link LED does not light.

Possible Resolution:

- Check the cabling and cable connectors.

- Restore factory defaults on printer server.

- Set the 10/100 Switch first to auto-sensing, then either the 10 or 100 selection, depending on the speed of the Ethernet cable attached.

Problem: The Print Server does not appear in the PrintControl utility's List of Print Servers screen.

Possible Resolution:

- Check the cabling and cable connectors.

- Restore factory defaults on printer server.

- Set the 10/100 Switch first to auto-sensing, then either the 10 or 100 selection, depending on the speed of the Ethernet cable attached.

Problem: Both mode lights come on during active use of the print server.

Possible Resolution:

- Power the print server off and then back on.

- Restore the factory defaults.

10.6 Restoring Factory Defaults

Factory defaults can be restored for all of the configuration options or selectively for individual 5250 printer session. To restore factory defaults, refer to the corresponding section below.

10.6.1 RESTORING FACTORY DEFAULTS FOR THE PRINT SERVER USING PRINTCONTROL

1. If you haven't already done so, start the PrintControl software.

2. Select a print server from the displayed list.

3. Click on the **Options** menu and select **Restore Factory Defaults**.

4. Answer the next question with **Yes**.

10.6.2 RESTORING FACTORY DEFAULTS FOR THE PRINT SERVER USING THE MODE BUTTON

1. Locate the **Mode** button in the bottom right-hand corner of the Print Server.

2. Hold down this button for about 20 seconds.

3. Factory defaults were restored successfully when the orange indicator next to the Mode button goes out.

10.6.3 RESTORING FACTORY DEFAULTS FOR A 5250 PRINTER SESSION

1. If you haven't already done so, start the PrintControl software.

2. Double-click on the target print server from the displayed list.

3. Click on the **SCS Logical Port** you want to restore to factory defaults.

4. Click on **Advanced**.

5. Click on the **Factory Defaults** button. The factory-default parameters will be entered in the respective field for the select IBM printer emulation and printer driver.

6. Click on **Return**.

7. Click on **Apply Changes**. Factory defaults will now be restored.

Appendix A. Font (FGID) Reference

The following chart lists the printer-resident fonts and font cartridges that are available along with the font ID number used to select the font. You can use the fonts listed in this Appendix in two ways:

1. Enter the font ID number in the Typestyle/Color menu of OfficeVision/400.

2. Embed the Font ID number preceded by **¬Q** in your host document or report.

Below is a key for the character set in the Symbol column in **Table A-1**:

L1=Latin 1 Euro character set

R8=Roman 8 character set

850=Code Page 850 character set

Table A-1. Font (FGID) Reference

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Line Printer	L1/R8/850	P/L	13.33	8.5	204
Line Printer	L1/R8/850	P/L	15	8.5	223
Line Printer	L1/R8/850	P/L	17.1	8.5	254
Line Printer	L1/R8/850	P/L	19	8.5	281
Courier	L1/R8/850	P/L	10	12	11
Courier Bold	L1/R8/850	P/L	10	12	46
Courier Italic	L1/R8/850	P/L	10	12	18
Courier	L1/R8/850	P/L	12	10	85
Courier Bold	L1/R8/850	P/L	10	10	88
Courier Italic	L1/R8/850	P/L	12	10	89
Letter Gothic	L1/R8/850	P/L	12	12	87
CG Times	L1/R8/850	P/L	Prop.	6	4605
	L1/R8/850	P/L	Prop.	8	4606
	L1/R8/850	P/L	Prop.	10	4607
	L1/R8/850	P/L	Prop.	12	4608
	L1/R8/850	P/L	Prop.	14	4609
	L1/R8/850	P/L	Prop.	18	4611
	L1/R8/850	P/L	Prop.	24	4614
	L1/R8/850	P/L	Prop.	30	4617
CG Times Bold	L1/R8/850	P/L	Prop.	6	4625
	L1/R8/850	P/L	Prop.	8	4626
	L1/R8/850	P/L	Prop.	10	4627
	L1/R8/850	P/L	Prop.	12	4628
	L1/R8/850	P/L	Prop.	14	4629
	L1/R8/850	P/L	Prop.	18	4631
	L1/R8/850	P/L	Prop.	24	4634
	L1/R8/850	P/L	Prop.	30	4637

Table A-1 (continued). Font (FGID) Reference

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
CG Times Italic	L1/R8/850	P/L	Prop.	6	4645
	L1/R8/850	P/L	Prop.	8	4646
	L1/R8/850	P/L	Prop.	10	4647
	L1/R8/850	P/L	Prop.	12	4648
	L1/R8/850	P/L	Prop.	14	4649
	L1/R8/850	P/L	Prop.	18	4651
	L1/R8/850	P/L	Prop.	24	4654
	L1/R8/850	P/L	Prop.	30	4657
CG Times Bold Italic	L1/R8/850	P/L	Prop.	6	4665
	L1/R8/850	P/L	Prop.	8	4666
	L1/R8/850	P/L	Prop.	10	4667
	L1/R8/850	P/L	Prop.	12	4668
	L1/R8/850	P/L	Prop.	14	4669
	L1/R8/850	P/L	Prop.	18	4671
	L1/R8/850	P/L	Prop.	24	4674
	L1/R8/850	P/L	Prop.	30	4677
Univers Medium	L1/R8/850	P/L	Prop.	6	4805
	L1/R8/850	P/L	Prop.	8	4806
	L1/R8/850	P/L	Prop.	10	4807
	L1/R8/850	P/L	Prop.	12	4808
	L1/R8/850	P/L	Prop.	14	4809
	L1/R8/850	P/L	Prop.	18	4811
	L1/R8/850	P/L	Prop.	24	4812
	L1/R8/850	P/L	Prop.	30	4813
Univers Med Italic	L1/R8/850	P/L	Prop.	6	4825
	L1/R8/850	P/L	Prop.	8	4826
	L1/R8/850	P/L	Prop.	10	4827
	L1/R8/850	P/L	Prop.	12	4828
	L1/R8/850	P/L	Prop.	14	4829
	L1/R8/850	P/L	Prop.	18	4831
	L1/R8/850	P/L	Prop.	24	4834
	L1/R8/850	P/L	Prop.	30	4837

Table A-1 (continued). Font (FGID) Reference

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Univers Med Condensed	L1/R8/850	P/L	Prop.	6	4845
	L1/R8/850	P/L	Prop.	8	4846
	L1/R8/850	P/L	Prop.	10	4847
	L1/R8/850	P/L	Prop.	12	4848
	L1/R8/850	P/L	Prop.	14	4849
	L1/R8/850	P/L	Prop.	18	4851
	L1/R8/850	P/L	Prop.	24	4854
	L1/R8/850	P/L	Prop.	30	4857
Univers Med Cond. Italic	L1/R8/850	P/L	Prop.	6	4865
	L1/R8/850	P/L	Prop.	8	4866
	L1/R8/850	P/L	Prop.	10	4867
	L1/R8/850	P/L	Prop.	12	4868
	L1/R8/850	P/L	Prop.	14	4869
	L1/R8/850	P/L	Prop.	18	4871
	L1/R8/850	P/L	Prop.	24	4876
	L1/R8/850	P/L	Prop.	30	4877
Univers Bold	L1/R8/850	P/L	Prop.	6	4905
	L1/R8/850	P/L	Prop.	8	4906
	L1/R8/850	P/L	Prop.	10	4907
	L1/R8/850	P/L	Prop.	12	4908
	L1/R8/850	P/L	Prop.	14	4909
	L1/R8/850	P/L	Prop.	18	4911
	L1/R8/850	P/L	Prop.	24	4914
	L1/R8/850	P/L	Prop.	30	4917
Univers Bold Italic	L1/R8/850	P/L	Prop.	6	4925
	L1/R8/850	P/L	Prop.	8	4926
	L1/R8/850	P/L	Prop.	10	4927
	L1/R8/850	P/L	Prop.	12	4928
	L1/R8/850	P/L	Prop.	14	4929
	L1/R8/850	P/L	Prop.	18	4931
	L1/R8/850	P/L	Prop.	24	4934
	L1/R8/850	P/L	Prop.	30	4937

Table A-1 (continued). Font (FGID) Reference

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Univers Bold	L1/R8/850	P/L	Prop.	6	4945
Condensed	L1/R8/850	P/L	Prop.	8	4946
	L1/R8/850	P/L	Prop.	10	4948
	L1/R8/850	P/L	Prop.	12	4949
	L1/R8/850	P/L	Prop.	18	4951
	L1/R8/850	P/L	Prop.	24	4954
	L1/R8/850	P/L	Prop.	30	4957
Univers Bold	L1/R8/850	P/L	Prop.	6	4965
Cond. Italic	L1/R8/850	P/L	Prop.	8	4966
	L1/R8/850	P/L	Prop.	10	4967
	L1/R8/850	P/L	Prop.	12	4968
	L1/R8/850	P/L	Prop.	14	4969
	L1/R8/850	P/L	Prop.	18	4971
	L1/R8/850	P/L	Prop.	24	4974
	L1/R8/850	P/L	Prop.	30	4977
ITC Zapf Dingbats	14L	P/L	Prop.	6	4985
	14L	P/L	Prop.	8	4986
	14L	P/L	Prop.	10	4987
	14L	P/L	Prop.	12	4988
	14L	P/L	Prop.	14	4989
	14L	P/L	Prop.	18	4991
	14L	P/L	Prop.	24	4994
	14L	P/L	Prop.	30	4997

Table A-2. Optional Fonts as Originally Found in ProCollection Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Line Printer	ASCII	P/L	17.1	8.5	253
Courier Bold	ASCII	P/L	10	12	45
Courier Italic	ASCII	P/L	10	12	17
Courier	ASCII	P/L	12	10	84
Courier Bold	ASCII	P/L	12	10	108
Courier Italic	ASCII	P/L	12	10	92

Table A-2 (continued). Optional Fonts as Originally Found in ProCollection Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Courier	Legal	P	10	12	51
Courier Bold	Legal	P	10	12	52
Courier Italic	Legal	P	10	10	53
Courier	Legal	P	12	10	93
Courier Bold	Legal	P	12	10	94
Courier Italic	Legal	P	12	10	95
Prestige Elite	ASCII	P/L	15	7	220
Prestige Elite	ASCII	P/L	12	10	83
Prestige Elite Bold	ASCII	P/L	12	10	113
Prestige Elite Italic	ASCII	P/L	12	10	114
Prestige Elite	Legal	P	15	7	219
Prestige Elite	Legal	P	12	10	96
Prestige Elite Bold	Legal	P	12	10	98
Prestige Elite Italic	Legal	P	12	10	99
Letter Gothic	ASCII	P/L	27	3.6	291
Letter Gothic	ASCII	P/L	19	6	281
Letter Gothic	ASCII	P/L	17.1	9.5	257
Letter Gothic	ASCII	P/L	12	12	66
Letter Gothic Bold	ASCII	P/L	12	12	69
Letter Gothic Italic	ASCII	P/L	12	12	68
Times Roman	ASCII	P	Prop.	8	163
Times Roman	ASCII	P	Prop.	10	164
Times Roman Bold	ASCII	P	Prop.	10	165
Times Roman Italic	ASCII	P	Prop.	10	166
Times Roman	ASCII	P	Prop.	12	167
Times Roman Bold	ASCII	P	Prop.	12	168
Times Roman Italic	ASCII	P	Prop.	12	169
Times Roman	Legal	P	Prop.	8	173
Times Roman	Legal	P	Prop.	10	174
Times Roman Bold	Legal	P	Prop.	10	175
Times Roman Italic	Legal	P	Prop.	10	176
Times Roman	Legal	P	Prop.	12	177
Times Roman Bold	Legal	P	Prop.	12	178
Times Roman Italic	Legal	P	Prop.	12	179

Table A-2 (continued). Optional Fonts as Originally Found in ProCollection Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Helvetica	ASCII	P	Prop.	10	184
Helvetica Bold	ASCII	P	Prop.	10	185
Helvetica Italic	ASCII	P	Prop.	10	186
Helvetica	ASCII	P	Prop.	12	187
Helvetica Bold	ASCII	P	Prop.	12	188
Helvetica Italic	ASCII	P	Prop.	12	189
Helvetica Bold	ASCII	P	Prop.	14	190
Helvetica Bold	Legal	P	Prop.	14	191

Table A-3. Optional Fonts Originally Found in WordPerfect Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
CG Times	DskTop	P	Prop.	6	4685
CG Times	DskTop	P	Prop.	8	4686
CG Times Bold	DskTop	P	Prop.	8	4706
CG Times Italic	DskTop	P	Prop.	8	4814
CG Times	DskTop	P	Prop.	10	4687
CG Times Bold	DskTop	P	Prop.	10	4707
CG Times Italic	DskTop	P	Prop.	10	4815
CG Times	DskTop	P	Prop.	12	4688
CG Times Bold	DskTop	P	Prop.	12	4708
CG Times Italic	DskTop	P	Prop.	12	4816
CG Times	DskTop	P	Prop.	14	4689
CG Times Bold	DskTop	P	Prop.	14	4709
CG Times Italic	DskTop	P	Prop.	14	4817
CG Times Bold	DskTop	P	Prop.	18	4711
CG Times Bold	DskTop	P	Prop.	24	4714
Univers	DskTop	P	Prop.	14	4789
Univers	DskTop	P	Prop.	18	4791
Univers	DskTop	P	Prop.	24	4794

Table A-3 (continued). Optional Fonts as Found in Microsoft Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Helvetica	L1/R8	P	Prop.	8	34102
Helvetica	L1/R8	P	Prop.	10	34103
Helvetica Bold	L1/R8	P	Prop.	10	34123
Helvetica Italic	L1/R8	P	Prop.	10	34231
Helvetica	L1/R8	P	Prop.	12	34104
Helvetica Bold	L1/R8	P	Prop.	12	34124
Helvetica Italic	L1/R8	P	Prop.	12	34232
Helvetica Bold	L1/R8	P	Prop.	14	34125
TmsRmn	L1/R8	P	Prop.	8	5686
TmsRmn	L1/R8	P	Prop.	10	5687
TmsRmn Bold	L1/R8	P	Prop.	10	5707
TmsRmn Italic	L1/R8	P	Prop.	10	5815
Times Roman	L1/R8	P	Prop.	12	5688
Times Roman Bold	L1/R8	P	Prop.	12	5708
Times Roman Italic	L1/R8	P	Prop.	12	5816
Line Printer	L1/R8	P	Prop.	835	223

Table A-4. Optional Fonts as Originally Found in Polished Worksheet Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Prestige Elite	L1/R8/850	P/L	15	7	221
Prestige Elite	L1/R8/850	P/L	12	10	86
Prestige Elite Bold	L1/R8/850	P/L	12	10	111
Prestige Elite Italic	L1/R8/850	P/L	12	10	112
Prestige Elite	Legal	P/L	15	7	219
Prestige Elite	Legal	P/L	12	10	97
Prestige Elite Bold	Legal	P/L	12	10	98
Prestige Elite Italic	Legal	P/L	12	10	99
Letter Gothic	L1/R8/850	P/L	27	3.6	290
Letter Gothic	L1/R8/850	P/L	12	12	87
Letter Gothic Bold	L1/R8/850	P/L	12	12	110
Letter Gothic Italic	Legal	P/L	27	3.6	292

Table A-4 (continued). Optional Fonts as Originally Found in Polished Worksheet Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Letter Gothic	Legal	P/L	12	12	90
Letter Gothic Bold	Legal	P/L	12	12	107
Letter Gothic Italic	Legal	P/L	12	12	106
Presentation Bold	ASCII	P/L	8.1	16	434
Presentation Bold	Legal	P/L	8.1	16	431

Table A-5. Optional Fonts as Originally Found in Persuasive Presentations Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Letter Gothic	ASCII	P/L	10	14	39
Letter Gothic	Legal	P/L	10	14	38
Presentation Bold	ASCII	P/L	10	14	6
Presentation Bold	Legal	P/L	10	14	7
Presentation Bold	ASCII	P/L	8.1	16	434
Presentation Bold	Legal	P/L	8.1	16	431
Presentation Bold	ASCII	P/L	6.5	18	435
Presentation Bold	Legal	P/L	6.5	18	432
Presentation Bold	ASCII	P/L	5.7	24	436
Presentation Bold	Legal	P/L	5.7	24	433
Helv Outline	ASCII	P/L	Prop.	24	34115
Helv Outline	Legal	P/L	Prop.	24	34116
Serifa	ASCII	P/L	Prop.	24	34215
Serifa	Legal	P/L	Prop.	24	34216
Line Draw	LinDrw	P/L	10	14	31
PC Line Bold	PCLin	P/L	10	14	32

Table A-6. Optional Fonts as Originally Found in Forms, Etc. Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Univers	L1/R8/850	P/L	Prop.	6	33101
Univers	L1/R8/850	P/L	Prop.	8	33102
Univers Bold	L1/R8/850	P/L	Prop.	8	33122
Univers Bold	L1/R8/850	P/L	Prop.	10	33123
Univers Bold	L1/R8/850	P/L	Prop.	12	33124
Univers Bold	L1/R8/850	P/L	Prop.	14	33125
Helv. Cond. Black Bold	TXNum	P/L	Prop.	24	34128
OCR-A	OCR-A	P	10	12	19
Tax Line Draw	Taxlin Drw	P/L	10	12	30

Table A-7. Optional Fonts as Originally Found in Bar Codes and More Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Letter Gothic	L1/R-8	P/L	15	9.5	230
Letter Gothic	L1/R-8	P/L	112	12	87
Letter Gothic	L1/R-8	P/L	10	14	40
OCR-A	OCR-A	P	10	12	19
OCR-B	OCR-B	P	10	12	3
Code 3 of 9	3 of 9	P	8.1	12	60
Code 3 of 9	3 of 9	P	4.6	12	240
EAN/UPC 10 Mil	UPC	P	Prop.	12	170
EAN/UPC 13 Mil bold	UPC	P	Prop.	12	171
USPS Zip	ZIP	P/L	Prop.	12	172
Line Draw	LinDrw	P/L	10	12	33

Table A-8. Optional Fonts as Originally Found in Text Equations Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Prestige Elite	L1/R-8	P	15	7	221
Prestige Elite	L1/R-8	P	17.1	7	256
Prestige Elite	L1/R-8	P	12	10	86
Prestige Elite Bold	L1/R-8	P	12	10	111
Prestige Elite Italic	L1/R-8	P	12	10	112
CG Times	L1/R-8	P	Prop.	8	157
CG Times	L1/R-8	P	Prop.	10	158
CG Times Bold	L1/R-8	P	Prop.	10	159
CG Times Italic	L1/R-8	P	Prop.	10	155

Table A-9. Optional Fonts as Originally Found in Global Text Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
CG Century Schoolbook	L1/R-8/850	P/L	Prop.	8	16950
CG Century Schoolbook	L1/R-8/850	P/L	Prop.	10	16951
CG Century Schlbk Bold	R-8	P/L	Prop.	10	16971
CG Century Schlbk Italic	R-8	P/L	Prop.	10	17079
CG Triumvirate	L1/R8	P/L	Prop.	10	33335
CG Triumvirate Bold	L1/R8	P/L	Prop.	14	33357

Table A-10. Optional Fonts as Originally Found in Pretty Faces Cartridge

Typeface	Symbol	Orient	Pitch	Point	Typestyle No.
Microstyle	ASCII	P	Prop.	18	5910
Microstyle Bold	ASCII	P	Prop.	36	5920
Hobo Medium	ASCII	P	Prop.	30	5930
Hobo Medium	ASCII	P	Prop.	14	5940
Thunderbird	ASCII	P	Prop.	54	5950
Signet Roundhand	ASCII	P	Prop.	18	5960
Signet Roundhand	ASCII	P	Prop.	14	5970
ITC Dingbats	ITC	P	Prop.	36	5980
ITC Dingbats	ITC	P	Prop.	18	5990

Appendix B. HP PCL Resident Scalable Font Numbers

Font	Font ID No.
Letter Gothic	410
Letter Gothic bold	420
Letter Gothic italic	430
Courier	460
Courier bold	470
Courier italic	480
Courier bold italic	490
Symbol	3400
Symbol PS	3450
Wingdings	3500
Dingbats	3600
CG Omega	4919
CG Omega bold	4939
CG Omega italic	5047
CG Omega bold italic	5067
CG Times	5687
CG Times bold	5707
CG Times italic	5815
CG Times bold italic	5835
Arial	6199
Arial bold	6219
Arial italic	6327
Arial bold italic	6347
Garamond Antiqua	8503
Garamond Halbfett	8523
Garamond Kursiv	8631
Garamond Kursiv Halbfett	8651
Coronet	8759
Clarendon condensed	8779
Marigold	8887
Albertus medium	12855
Albertus extra bold	12875
Times New	16951

Font	Font ID No.
Times New bold italic	17099
Antique Olive	33335
Antique Olive bold	33355
Antique Olive italic	33463
Univers medium condensed	33591
Univers bold condensed	33601
Univers medium condensed italic	33719
Univers bold condensed italic	33729
Univers medium	34103
Univers bold	34123
Univers medium italic	34231
Univers bold italic	34251
Helvetica	33103
Helvetica bold	33123
Helvetica Oblique	33231
Helvetica Oblique bold	38251
Helvetica Narrow	31103
Helvetica Narrow bold	31123
Helvetica Narrow Oblique bold	31251
Palatino Roman	6099
Palatino bold	6119
Palatino italic	6227
Palatino bold italic	6247
ITC Avant Garde Gothic Book	32591
ITC Avant Garde Gothic Demi	32601
ITC Avant Garde Gothic Book Oblique	32719
ITC Avant Garde Gothic Demi Oblique	32729
ITC Bookman Light	4909
ITC Bookman Demi	4929
ITC Bookman Light italic	5037
ITC Bookman Demi italic	5057
New Century Schoolbook Roman	16941
New Century Schoolbook bold	16961
New Century Schoolbook italic	17069
New Century Schoolbook bold italic	17089

Font	Font ID No.
3812 Font Numbers that use the CG Times Typeface	
Sonoran-Serif	751
Sonoran-Serif	1051
Sonoran-Serif bold	1053
Sonoran-Serif italic	1056
Sonoran-Serif	1351
Sonoran-Serif bold	1653
Sonoran-Serif bold	2103

Appendix C. Serial Port Pinout

Pin Number	Specification	Data IN to the Box	Data OUT of the Box
1	DCD	←	
2	RXD	←	
3	TXD		→
4	DTR		→
5	GND (ground)		
6	DSR	←	
7	RTS		→
8	CTS	←	
9	RI	←	

Appendix D. OS/400 Versions That Support Telnet

The following is a list of the necessary PTFs that support TN5250e. This list is based upon IBM APAR# II11226 dated November 6, 1998. Newer PTFs may be available—check with IBM for an up-to-date listing.

Version	Product	PTF Required
Version 4 Release 3 Mod 0:	5769TC1 5769999 5769SS1	SF55398 MF21682 SF51877
Version 4 Release 2 Mod 0:	5769TC1 5769999 5769SS1	SF47715 & SF49539 MF19784 SF49336, SF47792, SF47400, & SF48804
Version 4 Release 1 Mod 0:	5769TC1 5769999 5769SS1	SF49568 & SF47714 MF20046 SF49335
Version 3 Release 7 Mod 0:	5716TC1 5716999 5716SS1	SF47713 & SF49569 MF19931 SF47406 & SF49317
Version 3 Release 2 Mod 0:	5763TC1 5763999 5763SS1	SF50008 & SF47712 MF19563 SF49121 & SF50345

To determine what version of OS/400 is running on your AS/400, enter at the AS/400 command line, either the **DSPLICKEY** or the **GO LICPGM** command (then press **F13**, take option **10**).

To determine if your AS/400 has these PTFs installed and actively running, use the following steps:

1. At the AS/400 command prompt, type

   DSPPTF

2. Press **PF4** to provide the list.

3. Type in the product number, press <**Enter**>.

4. Scroll down to select the desired PTF. The PTF status should be temporarily applied, permanently applied, or superceded.

Appendix E. IPDS Fonts

The Print Server generally maps IPDS fonts requested from the host to PCL fonts resident in the printer. The following table shows how IPDS fonts are mapped to PCL fonts depending on which "Font Mapping" parameter is active. When the pitch of the PCL font is not identical to the pitch of the original IPDS font, the Print Server causes the spacing between the characters to be adjusted to produce comparable print output.

IBM FGID	Name	Best Fit		4028/43xx Compatible			3812/16 Compatible	
		CPI/pt		PCL Font	CPI/pt		PCL Font	CPI/pt
0003	OCR B	10 CPI		Resident in Interface				
0005	Rhetoric	10 CPI		Letter Gothic	10 CPI		Letter Gothic	10 CPI
0011	Courier	10 CPI		Courier	10 CPI		Courier	10 CPI
0012	Prestige Pica	10 CPI		Courier	10CPI		Courier	10 CPI
0013	Artisan	10 CPI		Courier	10CPI		Courier	10 CPI
0018	Courier italic	10 CPI		Courier italic	10 CPI		Courier italic	10 CPI
0019	OCR A	10 CPI		Resident interface				
0020	Pica	10 CPI		Courier	10 CPI		Courier	10 CPI
0026	Matrix Gothic	10 CPI		Courier	10 CPI		Courier	10 CPI
0030	Math Symbol	10 CPI		Courier	10 CPI		Courier	10 CPI
0031	Aviv	10 CPI		Courier	10 CPI		Courier	10 CPI
0038	Orator bold	10 CPI		Letter Gothic bold	10 CPI		Courier bold	10 CPI	Letter Gothic bold	10 CPI
0039	Gothic bold	10 CPI		Letter Gothic bold	12 CPI		Courier bold	10 CPI	Letter Gothic bold	12 CPI
0040	Gothic	10 CPI		Letter Gothic	12 CPI		Courier	10 CPI	Letter Gothic	12 CPI
0041	Roman	10 CPI		Letter Gothic	12 CPI		Courier	10 CPI	Letter Gothic	12 CPI
0042	Serif Text	10 CPI		Letter Gothic	12 CPI		Courier	10 CPI	Letter Gothic	12 CPI
0043	Serif Italic	10 CPI		Letter Gothic italic	12 CPI		Courier italic	10 CPI	Letter Gothic italic	12 CPI
0044	Katakana Gothic	10 CPI		Letter Gothic	10 CPI		Courier	10 CPI	Letter Gothic	10 CPI

IBM FGID	Name	Best Fit CPI/pt	4028/43xx Compatible PCL Font	4028/43xx Compatible CPI/pt	3812/16 Compatible PCL Font	3812/16 Compatible CPI/pt
0046	Courier bold	10 CPI	Courier bold	10 CPI	Courier bold	10 CPI
0049	Shalom	10 CPI	Courier	10 CPI	Letter Gothic	10 CPI
0050	Shalom bold	10 CPI	Courier bold	10 CPI	Courier	10 CPI
0051	Matrix Gothic	10 CPI	Courier	10 CPI	Letter Gothic	10 CPI
0052	Courier	10 CPI	Courier	10 CPI	Courier	10 CPI
0055	Aviv bold	10 CPI	Courier bold	10 CPI	Courier bold	10 CPI
0066	Gothic	12 CPI	Courier	14 CPI	Letter Gothic	14 CPI
0068	Gothic italic	12 CPI	Courier italic	14 CPI	Letter Gothic italic	14 CPI
0069	Gothic bold	12 CPI	Courier bold	14 CPI	Letter Gothic bold	14 CPI
0070	Serif Text	12 CPI	Courier	12 CPI	Letter Gothic	12 CPI
0071	Serif italic	12 CPI	Courier italic	12 CPI	Letter Gothic italic	12 CPI
0072	Serif bold	12 CPI	Courier bold	12 CPI	Letter Gothic bold	12 CPI
0076	APL/TN	12 CPI	Courier	12 CPI	Courier	12 CPI
0080	Math Symbol	12 CPI	Courier	12 CPI	Courier	12 CPI
0084	Script	12 CPI	Courier	12 CPI		12 CPI

IBM FGID	Name	Best Fit		4028/43xx Compatible		3812/16 Compatible	
		CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font
0085	Courier	12 CPI	Courier	12 CPI	Courier	12 CPI	Courier
0086	Prestige Elite	12 CPI	Courier	12 CPI	Courier	12 CPI	Courier
0087	Letter Gothic	12 CPI	Resident in Interface	12 CPI	Courier	12 CPI	Resident in Interface
0091	Light italic	12 CPI	Letter Gothic italic	12 CPI	Courier italic	12 CPI	Courier italic
0092	Courier italic	12 CPI	Courier italic	12 CPI	Courier italic	12 CPI	Courier
0098	Shalom	12 CPI	Letter Gothic	12 CPI	Courier	12 CPI	Courier
0099	Aviv	12 CPI	Letter Gothic	12 CPI	Courier	12 CPI	Courier
0101	Shalom bold	12 CPI	Courier bold	12 CPI	Courier bold	12 CPI	Courier bold
0102	Aviv bold	12 CPI	Courier bold	12 CPI	Courier bold	12 CPI	Courier bold
0110	Letter Gothic bold	12 CPI	Resident in Interface	12 CPI	Courier bold	12 CPI	Resident in Interface
0111	Prestige Elite bold	12 CPI	Courier bold	12 CPI	Courier bold	12 CPI	Courier bold
0112	Prestige Elite italic	12 CPI	Courier italic	12 CPI	Courier italic	12 CPI	Courier italic
0155	Boldface italic	10 Pt	Times New italic	10 Pt	Times New	11 Pt	Times New italic
0158	Modern	11 Pt	Times New	11 Pt			Times New
0159	Boldface	11 Pt	Times New bold	11 Pt	Times New	11 Pt	Times New bold
0160	Essay	10 Pt	Arial	11 Pt	Courier	11 Pt	Arial

IBM FGID	Best Fit			4028/43xx Compatible		3812/16 Compatible		
	Name	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
0162	Essay italic	10 Pt	Arial italic	11 Pt	Courier	11 Pt	Arial italic	11 Pt
0163	Essay bold	10 Pt	Arial bold	11 Pt	Times New	11 Pt	Arial bold	11 Pt
0164	Prestige	12 Pt	Courier	12 Pt	Courier	11 Pt	Arial	11 Pt
0167	Barak	10 Pt	Times New	11 Pt	Courier	11 Pt	Times New	11 Pt
0168	Barak bold	10 Pt	Times New bold	11 Pt	Times New	11 Pt	Times New bold	11 Pt
0173	Essay light	10 Pt	Arial light	11 Pt	Courier	11 Pt	Courier	11 Pt
0175	Document	12 Pt	Times New	11 Pt	Courier	11 Pt	Times New	11 Pt
0178	Barak	7 Pt	Times New	7 Pt	Letter Gothic	20 CPI	Times New bold	11 Pt
0179	Barak bold	7 Pt	Times New bold	7 Pt	Letter Gothic	20 CPI	Times New bold	11 Pt
0180	Barak	9 Pt	Times New	9 Pt	Courier	15 CPI	Times New bold	11 Pt
0181	Barak bold	9 Pt	Times New bold	9 Pt	Courier	15 CPI	Times New bold	11 Pt
0182	Barak	22 Pt	Times New	22 Pt	Courier	10 CPI	Times New bold	11 Pt
0183	Barak bold	22 CPI	Times New bold	22 CPI	Courier bold	10 CPI	Times New bold	11 CPI
0204	Gothic Text	13.3 CPI	Letter Gothic	13.3 CPI	Courier	15 CPI	Letter Gothic	13.3 CPI
0211	Shalom	15 CPI	Letter Gothic	15 CPI	Courier	15 CPI	Letter Gothic	15 CPI

IBM FGID	Name	Best Fit		4028/43xx Compatible		3812/16 Compatible		
		CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
0212	Shalom bold	15 CPI	Courier bold	15 CPI	Courier	15 CPI	Courier	15 CPI
0221	Prestige Elite italic	15 CPI	Gothic	15 CPI	Gothic	15 CPI	Gothic	15 CPI
0222	Gothic	15 CPI	Letter Gothic	15 CPI	Courier	15 CPI		
0223	Courier		Courier	15 CPI	Courier	15 CPI	Courier	15 CPI
0225	Math Symbol	15 CPI	Courier	12 CPI	Courier	15 CPI	Courier	12 CPI
0226	Sahlom	15 CPI	Letter Gothic	15 CPI	Courier	15 CPI	Letter Gothic	16.7 CPI
0229	Serif Text	15 CPI	Courier	15 CPI	Courier	15 CPI	Courier	15 CPI
0230	Gothic	15 CPI	Letter Gothic	16.7 CPI	Courier	15 CPI	Letter Gothic	16.7 CPI
0234	Shalom bold	15 CPI	Letter Gothic bold	16.7 CPI	Courier	15 CPI	Letter Gothic bold	16.7 CPI
0244	Courier	5 CPI	Courier light	8 CPI	Courier	10 CPI	Courier light	8 CPI
0245	Courier bold	5 CPI	Courier bold	8 CPI	Courier bold	10 CPI	Courier bold	8 CPI
0247	Shalom bold	17 CPI	Courier bold	17 CPI	Courier	17.1 CPI	Courier bold	17 CPI
0248	Shalom	17 CPI	Courier	17 CPI	Courier	17.1 CPI	Courier	17.1 CPI
0252	Courier	17 CPI	Courier	14 CPI	Courier	17.1 CPI	Courier	14 CPI
0253	Courier bold	17.1 CPI	Courier bold	14 CPI	Courier	17.1 CPI	Courier bold	14 CPI
0254	Courier	17.1 CPI	Courier	17.1 CPI	Courier	17.1 CPI	Courier	14 CPI
0256	Prestige	17.1 CPI	Courier	17.1 CPI	Courier	17.1 CPI	Courier	14 CPI
0281	Letter Gothic	20 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI
0282	Aviv	20 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI
0290	Letter Gothic	27 CPI	Letter Gothic	27 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI

IBM FGID	Best Fit			4028/43xx Compatible		3812/16 Compatible		
	Name	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
0416	Courier	Scalable			Courier	Scalable		
0420	Courier bold	Scalable			Courier bold	Scalable		
0424	Courier italic	Scalable			Courier italic	Scalable		
0428	Courier italic bold	Scalable			Courier italic bold	Scalable		
0751	Sonoran Serif	8 Pt	CG Times	8 Pt	CG Times	8 Pt	CG Times	8 Pt
0752	Naseem	8 Pt	CG Times	8 Pt	Courier	12 Pt	Letter Gothic	20 CPI
0753	Naseem bold	8 Pt	CG Times bold	8 Pt	Courier	12 CPI	Letter Gothic	20 CPI
0754	Naseem bold	10 Pt	CG Times	10 Pt	Courier	12 CPI	Courier	12 CPI
0755	Naseem bold	14 Pt	CG Times	14 Pt	Courier	12 CPI	Courier	10 CPI
0756	Naseem italic	8 Pt	CG Times italic	8 Pt	Courier	12 CPI	Letter Gothic	20 CPI
0757	Naseem italic bold	8 Pt	CG Times italic bold	8 Pt	Courier	12 CPI	Letter Gothic	20 CPI
0758	Naseem italic bold	10 Pt	CG Times italic bold	10 Pt	Courier	12 CPI	Courier	12 CPI
0759	Naseem italic bold	14 Pt	CG Times italic bold	14 Pt	Courier	12 CPI	Courier	10 CPI
0760	Times Roman	6 Pt	CG Times	6 Pt	CG Times	6 Pt	Letter Gothic	27 CPI
0761	Times Roman bold	12 Pt	CG Times bold	12 Pt	CG Times bold	12 Pt	Letter Gothic	20 CPI

IBM FGID	Best Fit			4028/43xx Compatible		3812/16 Compatible		
	Name	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
0762	Times Roman bold	14 Pt	CG Times bold	14 Pt	CG Times bold	14 Pt	Letter Gothic	16.7 CPI
0763	Times Roman italic	12 Pt	CG Times italic	12 Pt	CG Times italic	12 Pt	Letter Gothic	20 CPI
0764	Times Roman italic bold	10 Pt	CG Times bold italic	10 Pt	Letter Gothic	10 Pt	Letter Gothic	27 CPI
0765	Times Roman italic bold	12 Pt	CG Times bold italic	12 Pt	Letter Gothic	12 Pt	Letter Gothic	20 CPI
1051	Sonoran Serif	10 Pt	CG Times	10 Pt	CG Times	10 Pt	CG Times	11 Pt.
1053	Sonoran Serif bold	10 Pt	CG Times	10 Pt	CG Times bold	10 Pt	CG Times bold	11 Pt
1056	Sonoran Serif italic	10 Pt	CG Times italic	10 Pt	CG Times italic	10.5 Pt	CG Times italic	11 Pt
1351	Sonoran Serif	12 Pt	CG Times	12 Pt	CG Times	12 Pt	CG Times	13 Pt
1653	Sonoran Serif bold	16 Pt	CG Times bold	16 Pt	CG Times bold	16 Pt	CG Times bold	16 Pt
1803	Sonoran Serif bold	18 Pt	CG Times bold	18 Pt	CG Times bold	18 Pt	CG Times bold	12 CPI
2103	Sonoran Serif bold	24 Pt	CG Times bold	24 Pt	CG Times bold	24 Pt	CG Times bold	22 Pt
2304	Helvetica	Scalable			Arial	Scalable		
2305	Helvetica bold	Scalable			Arial bold	Scalable		

IBM FGID	Name	Best Fit CPI/pt	Best Fit PCL Font	4028/43xx Compatible CPI/pt	4028/43xx Compatible PCL Font	3812/16 Compatible CPI/pt	3812/16 Compatible PCL Font	3812/16 Compatible CPI/pt
2306	Helvetica italic	Scalable			Arial italic	Scalable		
2307	Helvetica italic bold	Scalable			Arial italic bold	Scalable		
2308	Times New Roman	Scalable			Times New	Scalable		
2309	Times New Roman bold	Scalable			Times New bold	Scalable		
2310	Times New Roman italic	Scalable			Times New italic	Scalable		
2311	Times New Roman italic	Scalable			Times New italic bold	Scalable		
4407	Sonoran Serif med.	6 Pt	CG Times	6 Pt				
4427	Sonoran Serif bold	9 Pt	CG Times bold	9 Pt				
4535	Sonoran Serif italic	9 CPI	CG Times italic	9 CPI				
4555	Sonoran Serif italic bold	10 CPI	CG Times italic bold	10 CPI				
5067	Goudy bold italic	10 Pt	CG Times bold	10 CPI	CG Times bold	11 Pt	CG Times bold	11 Pt

IBM FGID	Name	Best Fit		4028/43xx Compatible		3812/16 Compatible		
		CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
5687	Sonoran Serif med.	8 CPI	CG Times	8 CPI	CG Times	8 CPI	CG Times	8 CPI
5707	Times Roman bold	12 CPI	CG Times bold	15.75 CPI	CG Times bold	15.75 CPI		
5815	Times Roman italic	12 CPI	CG Times italic	12 CPI	CG Times italic	12 CPI		
5835	Times Roman italic bold	10 CPI	CG Times bold italic	10 CPI	CG Times bold italic	10 CPI		
16951	Sonoran Serif med.	12 CPI	CG Times	12 CPI		12 CPI		
16971	Sonoran Serif med bold	12 CPI	CG Times bold	12 CPI				
17079	Sonoran Serif med italic	12 CPI	CG Times italic	12 CPI				
17099	Sonoran Serif med italic bold	12 CPI	CG Times italic bold	12 CPI				

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