

# ***Xerox DocuPrint 96/4635/180/2000 Series NPS/IPS***

***Installation Planning Guide***

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Changes are periodically made to this document. Changes, technical inaccuracies, and typographic errors will be corrected in subsequent editions.

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# Table of contents

<b>Safety</b> .....	<b>ix</b>
Laser safety .....	ix
Ozone information: U. S. only .....	x
Operation safety: U. S. ....	x
Operation safety: Europe .....	xi
Warning markings .....	xi
Electrical supply .....	xii
Ventilation .....	xii
Operator accessible areas .....	xii
Maintenance .....	xiii
Before cleaning your product .....	xiii
CE mark: Europe only .....	xiii
Radio and telecommunications equipment directive (Europe only) .....	xiv
For further information .....	xv
<b>Introduction</b> .....	<b>xvii</b>
About this guide .....	xvii
Contents .....	xvii
Conventions .....	xviii
Notice .....	xix
<b>1. System overview</b> .....	<b>1-1</b>
Functional overview of the NPS/IPS .....	1-1
Throughput speed .....	1-2
Resolution .....	1-2
System components overview .....	1-3
Connectivity configurations .....	1-3
NPS/IPS concurrent printing .....	1-4
Document Feeding and Finishing Architecture (DFA) .....	1-4
System components overview .....	1-4
Connectivity configurations .....	1-5
NPS/IPS concurrent printing .....	1-5
Document Feeding and Finishing Architecture (DFA) .....	1-5
IPDS environment .....	1-5
Host environments .....	1-5
Channel interface board and channel cable connector box— channel-attached systems only .....	1-8

Host Channel Unit (HCU)—channel-attached systems only . . .	1-9
IPDS data stream . . . . .	1-9
Network PDL printing environment . . . . .	1-10
Networks . . . . .	1-11
Ethernet LAN . . . . .	1-11
Token Ring . . . . .	1-11
Multiple network devices . . . . .	1-11
Network client components . . . . .	1-12
Supported client hardware and operating systems . . . .	1-12
Client networking software . . . . .	1-13
Responsibilities . . . . .	1-13
Sixth Sense . . . . .	1-14
<b>2. Controller components and options . . . . .</b>	<b>2-1</b>
Printer controller components . . . . .	2-1
Sun Blade 1000 workstation . . . . .	2-1
Sun Ultra 60 workstation . . . . .	2-5
Printer controller software and fonts . . . . .	2-7
<b>3. Printer components and options . . . . .</b>	<b>3-1</b>
Printer components . . . . .	3-1
Printer configurations . . . . .	3-8
Paper paths . . . . .	3-10
<b>4. Preparing for installation . . . . .</b>	<b>4-1</b>
Responsibilities . . . . .	4-1
Xerox responsibilities . . . . .	4-1
Customer responsibilities . . . . .	4-2
Installation planning checklist . . . . .	4-4
NPS/IPS network installation checklist . . . . .	4-9
Novell network information . . . . .	4-12
DocuPrint as a print server (PSERVER) . . . . .	4-12
DocuPrint NPS/IPS as a remote printer (RPRINTER) . .	4-13
Connectivity requirements . . . . .	4-15
Ethernet specifications . . . . .	4-15
Token Ring specifications . . . . .	4-16
Channel-attached specifications . . . . .	4-16
<b>5. Controller specifications and requirements . . . . .</b>	<b>5-1</b>
Power requirements . . . . .	5-1
Outlet configurations . . . . .	5-2
Environmental specifications . . . . .	5-3
Space requirements . . . . .	5-3
Printer controller placement . . . . .	5-3
Controller hardware specifications and requirements summary . . . . .	5-8

---

<b>6. Printer specifications and requirements</b> . . . . .	<b>6-1</b>
Power requirements . . . . .	6-1
Outlet configurations . . . . .	6-2
Printer outlet voltages—60 Hz . . . . .	6-2
Printer outlet voltages—50 Hz . . . . .	6-3
Environmental specifications . . . . .	6-5
Space requirements . . . . .	6-6
Printer placement . . . . .	6-7
Bypass transport specifications . . . . .	6-12
Configuration diagrams with bypass transport . . . . .	6-17
Space planning guidelines . . . . .	6-19
Clearance space requirements . . . . .	6-20
Shared space . . . . .	6-20
Floor leveling . . . . .	6-24
Delivery access requirements . . . . .	6-24
Turning radius . . . . .	6-25
Printer hardware specifications and requirements summary . . . . .	6-28
Space planning templates . . . . .	6-31
<b>7. System connections</b> . . . . .	<b>7-1</b>
Cable lengths . . . . .	7-1
Cable locations . . . . .	7-2
<b>8. Installation</b> . . . . .	<b>8-1</b>
Installation process . . . . .	8-1
Your responsibilities . . . . .	8-2
Defining the IPS printer to the host . . . . .	8-3
Software licensing . . . . .	8-4
Ongoing maintenance . . . . .	8-4
Routine maintenance . . . . .	8-5
Meter reading and reporting . . . . .	8-5
<b>A. Supplies</b> . . . . .	<b>A-1</b>
Paper and other throughput stocks . . . . .	A-1
Selecting paper . . . . .	A-1
Paper width and printer performance . . . . .	A-3
Paper care . . . . .	A-9
Other supplies . . . . .	A-12
Dry ink . . . . .	A-12
Fuser agent . . . . .	A-13
Developer . . . . .	A-13
Diskettes . . . . .	A-13
Cartridge tapes . . . . .	A-14
Fonts . . . . .	A-14
MICR tools . . . . .	A-15
MICR Positioning and Dimension Gauge . . . . .	A-15

MICR comparator .....	A-15
Consumable supplies tables .....	A-16
Paper and special stocks tables .....	A-16
Complete supplies list—96/4635/180 printers .....	A-21
Ordering supplies .....	A-23
<b>B. Xerox support services .....</b>	<b>B-1</b>
Xerox Customer Service Support Center .....	B-1
Xerox Printing Systems Customer Support Center .....	B-2
Xerox Customer Documentation Catalog .....	B-3
Xerox Documentation and Software Services (XDSS) .....	B-3
Operator training .....	B-4
Xerox Customer Education .....	B-4
Xerox Font Center .....	B-5
<b>C. Related publications .....</b>	<b>C-1</b>
Xerox documents .....	C-1
IBM reference manuals .....	C-2
<b>D. DocuPrint NPS/IPS on a Novell network .....</b>	<b>D-1</b>
Novell NetWare overview .....	D-1
Print queues .....	D-1
Queue to printer relationships .....	D-2
PCONSOLE .....	D-2
Print server (PSERVER) .....	D-3
Job parameters .....	D-4
Using Novell forms to specify virtual printers .....	D-4
Remote printer (RPRINTER) .....	D-5
DocuPrint NPS/IPS as a print server or as a remote printer .....	D-5
Choosing a Print Server or Remote Printer Configuration .....	D-5
Novell configuration .....	D-8
Configuring DocuPrint as a PSERVER .....	D-8
Configuring DocuPrint as an RPRINTER .....	D-10
Supporting DocuPrint NPS/IPS on the file server .....	D-12
<b>E. Defining the channel-attached printer to the host .....</b>	<b>E-1</b>
MVS parameters .....	E-1
Infoprint Manager procedures for Windows NT and Windows 2000 .....	E-4
Infoprint Manager procedures for AIX .....	E-5
VM sample definitions .....	E-6
VSE sample definitions .....	E-7
<b>F. Defining the printer to the host: TCP/IP attachment .....</b>	<b>F-1</b>
MVS or OS/390 parameters .....	F-1
Software prerequisites – MVS .....	F-1
Network configurations – MVS .....	F-2

---

Configuration steps – MVS .....	F-2
Correcting for printer performance issues – MVS .....	F-19
References – MVS .....	F-20
AS/400 parameters .....	F-21
Software prerequisites – AS/400 .....	F-21
Network configurations – AS/400 .....	F-21
Configuration steps – AS/400 .....	F-22
Correcting for printer performance issues – AS/400 .....	F-28
References – AS/400 .....	F-28
Infoprint Manager procedures for Windows NT and Windows 2000 ..	F-29
Infoprint Manager procedures for AIX .....	F-30
<b>Glossary .....</b>	<b>1</b>



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# Safety

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## Laser safety

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### WARNING

Adjustments, use of controls, or performance of procedures other than those specified herein may result in hazardous light exposure.

The Xerox DocuPrint printers are certified to comply with the performance standards of the U.S. Department of Health, Education, and Welfare for Class 1 laser products. Class 1 laser products do not emit hazardous radiation. The DocuPrint printers do not emit hazardous radiation because the laser beam is completely enclosed during all modes of customer operation.

The laser danger labels on the system are for Xerox service representatives and are on or near panels or shields that must be removed with a tool.

**DO NOT REMOVE LABELED PANELS OR PANELS NEAR LABELS. ONLY XEROX SERVICE REPRESENTATIVES HAVE ACCESS TO THESE PANELS.**

**DANGER**

**LASER RADIATION WHEN OPEN  
AVOID DIRECT EXPOSURE TO BEAM**

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## **Ozone information: U. S. only**

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This product produces ozone during normal operation. The amount of ozone produced depends on copy volume. Ozone is heavier than air. The environmental parameters specified in the Xerox installation instructions ensure that concentration levels are within safe limits. If you need additional information concerning ozone, call 1-800-828-6571 to request the Xerox publication 600P83222, *OZONE*.

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## **Operation safety: U. S.**

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Your Xerox equipment and supplies have been designed and tested to meet strict safety requirements. They have been approved by safety agencies, and they comply with environmental standards. Please observe the following precautions to ensure your continued safety.

### **WARNING**

**Improper connection of the equipment grounding conductor may result in risk of electrical shock.**

- Always connect equipment to a properly grounded electrical outlet. If in doubt, have the outlet checked by a qualified electrician.
- Never use a ground adapter plug to connect equipment to an electrical outlet that lacks a ground connection terminal.
- Always place equipment on a solid support surface with adequate strength for its weight.
- Always use materials and supplies specifically designed for your Xerox equipment. Use of unsuitable materials may result in poor performance and may create a hazardous situation.
- Never move either the printer or the printer controller without first contacting Xerox for approval.
- Never attempt any maintenance that is not specifically described in this documentation.
- Never remove any covers or guards that are fastened with screws. There are no operator-serviceable areas within these covers.
- Never override electrical or mechanical interlocks.

- Never use supplies or cleaning materials for other than their intended purposes. Keep all materials out of the reach of children.
- Never operate the equipment if you notice unusual noises or odors. Disconnect the power cord from the electrical outlet and call service to correct the problem.

If you need any additional safety information concerning the equipment or materials Xerox supplies, call Xerox Product Safety at the following toll-free number in the United States:

**1-800-828-6571**

For customers outside the United States, contact your local Xerox representative or operating company.

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## Operation safety: Europe

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This Xerox product and supplies are manufactured, tested and certified to strict safety regulations, electromagnetic regulations and established environmental standards.

Any unauthorised alteration, which may include the addition of new functions or connection of external devices, may impact the product certification.

Please contact your Xerox representative for more information.

## Warning markings

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All warning instructions marked on or supplied with the product should be followed.



This WARNING alerts users to areas of the product where there is the possibility of personal damage.



This WARNING alerts users to areas of the product where there are heated surfaces, which should not be touched.

## Electrical supply

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This product shall be operated from the type of electrical supply indicated on the product's data plate label. If you are not sure that your electrical supply meets the requirements, please consult your local power company for advice.



This product must be connected to a protective earth circuit. This product is supplied with a plug that has a protective earth pin. This plug will fit only into an earthed electrical outlet. This is a safety feature. Always connect equipment to a properly grounded electrical outlet. If in doubt, have the outlet checked by a qualified electrician.

To disconnect all electrical power to the product, the disconnect device is the power cord. Remove the plug from the electrical outlet.

## Ventilation

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Slots and opening in the enclosure of the product are provided for ventilation. Do not block or cover the ventilation vents, as this could result in the product overheating.

This product should not be placed in a built-in installation unless proper ventilation is provided, please contact your Xerox representative for advice.

Never push objects of any kind into the ventilation vents of the product.

## Operator accessible areas

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This product has been designed to restrict operator access to safe areas only. Operator access to hazardous areas is restricted with covers or guards, which would require a tool to remove. Never remove these covers or guards.

## Maintenance

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Any operator product maintenance procedures will be described in the user documentation supplied with the product. Do not carry out any maintenance on the product, which is not described in the customer documentation.

## Before cleaning your product

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Before cleaning this product, unplug the product from the electrical outlet. Always use materials specifically designated for this product, the use of other materials may result in poor performance and may create a hazardous situation. Do not use aerosol cleaners, they may be flammable under certain circumstances.

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## CE mark: Europe only

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

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

March 9, 1999: Council Directive 99/5/EC, on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

A full declaration of conformity, defining the relevant directives and referenced standards, can be obtained from your Xerox representative.

In order to allow this equipment to operate in proximity to Industrial, Scientific and Medical (ISM) equipment, the external radiation for the ISM equipment may have to be limited or special mitigation measures taken.

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

Shielded interface cables must be used with this product to maintain compliance with Council Directive 89/36/EEC.

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## Radio and telecommunications equipment directive (Europe only)

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### **Certification to 1999/5/EC Radio Equipment and Telecommunications Terminal Equipment Directive:**

This Xerox product has been self-certified by Xerox for pan-European single terminal connection to the analog public switched telephone network (PSTN) in accordance with Directive 1999/5/EC.

The product has been designed to work with the national PSTNs and compatible PBXs of the following countries:

Austria	Germany	Luxembourg	Sweden
Belgium	Greece	Netherlands	Switzerland
Denmark	Iceland	Norway	United Kingdom
Finland	Ireland	Portugal	
France	Italy	Spain	

In the event of problems, contact your local Xerox representative in the first instance.

This product has been tested to, and is compliant with, TBR21, a specification for terminal equipment for use on analog switched telephone networks in the European Economic area.

The product may be configured to be compatible with other country networks. Please contact your Xerox representative if your product needs to be reconnected to a network in another country. This product has no user-adjustable settings.

*NOTE: Although this product can use either loop disconnect (pulse) or DTMF (tone) signaling, it should be set to use DTMF signaling. DTMF signaling provides reliable and faster call setup.*

Modification or connection to external control software, or to external control apparatus not authorized by Xerox, invalidates its certification.

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## **For further information**

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For more information on Environment, Health and Safety in relation to this Xerox product and supplies, please contact the following customer help lines:

Europe:+44 1707 353434

USA:1 800 8286571

Canada:1 800 8286571



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# Introduction

This guide helps you prepare for delivery and installation of your new Xerox DocuPrint NPS/IPS printing system.

*NOTE: You may be using the DocuPrint NPS/IPS software extension on a DocuPrint 2000 EPS system. The 2000 Series printer models are the 100, 135, 155, and 180. These printers are comparable in capabilities to the DocuPrint NPS/IPS models 96, 4635, and 180.*

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## About this guide

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This guide is intended for the person responsible for coordinating the installation of the DocuPrint printer at your site. It lists the tasks you must complete before installation can begin, as well as your responsibilities during the installation.

Before using this guide, become familiar with its contents and conventions.

## Contents

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This guide contains the following:

- Chapter 1, "System overview," provides an overview of the printing system.
- Chapter 2, "Controller components and options," describes system controller hardware, software, and options of your printing system.
- Chapter 3, "Printer components and options," describes printer components, configurations, and options.
- Chapter 4, "Preparing for installation," provides a checklist of tasks that must be accomplished before the installation. It also explains connectivity requirements for transporting documents from the host or client to the DocuPrint printing system.

- Chapter 5, "Controller specifications and requirements," describes power, environmental, and space requirements for the system controller.
- Chapter 6, "Printer specifications and requirements," describes power, environmental, and space requirements for the printer. Space planning guidelines and diagrams are provided to help you set up the work area.
- Chapter 7, "System connections," provides cable requirements for your printing system.
- Chapter 8, "Installation," describes the activities that occur during installation. It also describes ongoing maintenance activities.
- Appendix A, "Supplies," describes how to select, store, and use supplies for the DocuPrint printing system. It also provides a list of consumable supplies you can order.
- Appendix B, "Xerox support services," explains how to utilize available Xerox support services.
- Appendix C, "Related publications," lists other Xerox documents that are part of this publication set.
- Appendix D, "DocuPrint NPS/IPS on a Novell network," describes some of the considerations to make before the installation of DocuPrint on a Novell network.
- Appendix E, "Defining the channel-attached printer to the host," provides explanations and sample printer parameters for defining your channel-attached printer to your host.
- Appendix F, "Defining the printer to the host: TCP/IP attachment," provides instructions, prerequisites, and sample printer parameters for defining your TCP/IP-attached printer to your host.

A glossary and index are provided at the back of the guide.

## Conventions

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This guide uses the following conventions:

- **All caps and angle brackets:** Within procedures, the names of keys are shown in all caps within angle brackets (for example, press <ENTER>).
- **Angle brackets:** Variable information, or the position of a specified argument in the command syntax, appears in angle brackets (for example, List Fonts <Pattern>).

- **Bold:** Within procedures, text and numbers that you enter are shown in bold (for example, enter **privilege operator**).
- **The word “enter” within procedures:** The two-step process of keying in data and pressing <ENTER> (for example, enter **y**).
- **Italics:** Document and library names are shown in italics (for example, the *Xerox DocuPrint NPS/IPS Guide to Managing Print Jobs*).
- **Quotation marks:** Keywords you can enter as arguments appear in quotes (for example, “USLetter”).
- **Vertical bars:** Alternatives to specified arguments are separated by vertical bars (for example, Set Time <Time | Remote Host Name | IP Address>).

*NOTE: Notes are hints that help you perform a task or understand the text.*

#### **CAUTION**

*Cautions alert you to an action that could damage hardware or software.*

#### **WARNING**

**Warnings alert you to conditions that may affect the safety of people.**

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## **Notice**

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This publication may contain descriptions of concepts and features not currently available for your Xerox printing system. Consult your Xerox sales representative or your operating system software program description for additional information.



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# 1. System overview

This chapter provides an overview of the features and functions of the Xerox DocuPrint NPS/IPS.

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## Functional overview of the NPS/IPS

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The NPS/IPS printers support the processing and printing of PDL and ASCII jobs from network workstations, as well as IPDS jobs from an IBM host. Supported PDL formats are PostScript levels 1 and 2, HP PCL 5e, and TIFF.

Your organization may print only IPDS jobs, network PDL jobs, or jobs from both environments.

DocuPrint 96, 4635, 180, and the 2000 Series NPS/IPS printers support:

- Printing at a rated speed of up to 96 ppm (96), or 135 ppm (4635), or 180 ppm (180) in 600 dpi (see “Resolution” section later in this chapter for more information)
- Printing simplex and duplex
- Processing and printing of network PDL jobs and IPDS jobs without soft boot to switch modes
- Multiple weights, sizes and types of paper (refer to the “Supplies” appendix for details)
- Ordered sets of pre-collated variable stock
- Optional module for enhanced finishing and output to third-party finishing devices
- Optional high-capacity feeder/stackers
- Sixth Sense, a diagnostic tool that provides system assessment and problem analysis.
- Support printing of check applications that require MICR technology (MICR printers only).

## Throughput speed

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The 96, 4635 and 180 NPS/IPS can print at the following speeds, using stocks 8 by 10 inches / 203 by 254 mm or larger:

- **96 and 96 MICR:** Up to 96 impressions per minute
- **4635 and 4635 MICR:** Up to 135 impressions per minute
- **180 and 180 MICR:** Up to 180 impressions per minute.

### With small paper sizes

When you use the smaller papers, such as 7 by 10 inches / 178 by 254 mm or B4, with the 7 by 10-inch paper option kit, the throughput rates increase:

- **4635/4635 MICR:** Up to 154 impressions per minute
- **180/180 MICR:** Up to 206 impressions per minute

*NOTE: The 7 by 10-inch kit is not available on the 96 IPS.*

### Monthly print volume

The monthly print volumes for these systems are:

- **96:** Up to 3 million impressions
- **4635:** Up to 4 million impressions
- **180:** Up to 6 million impressions

## Resolution

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The DocuPrint 96/4635/180 provides high print quality at 600 dpi resolution. It can receive data at 240, 300, or 600 dpi.

The following table shows how data streams of different resolutions are interpolated.

Table 1-1. **Data stream conversion**

Printer	Incoming input resolution of document		
	240 dpi data	300 dpi data	600 dpi data
<b>180 NPS/IPS</b>	Interpolated by printer to 600 x 1920 dpi	Interpolated by printer to 600 x 2400 dpi	Print at 600 x 600 dpi
<b>96/4635 NPS/IPS</b>	Converted by controller to 300 or 600 dpi, then interpolated by printer to 600 dpi	Interpolated by printer to 600 x 600 dpi	Print at 600 x 600 dpi

*NOTE: For more information on specifying appropriate resolution settings, refer to the Guide to Managing Print Jobs and the Guide to Configuring and Managing the System. For IPDS printing, refer to the Solutions Guide for IPDS printing.*

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## System components overview

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<b>DocuPrint NPS/IPS</b>	The entire DocuPrint NPS/IPS system includes the printer (also known as an IOT or print engine), printer controller, printer interface, and all appropriate software. “DocuPrint printer” or “printer” refers to the base printer engine (IOT) only, without the printer controller and interface.
<b>Xerox-supplied printer controller</b>	The printer controller includes a processor, DVD-ROM (or CD-ROM) drive, diskette drive, keyboard, mouse, and a monitor. The printer controller accepts the print job from the client workstation or host, converts the files into page images, and sends the page images to the printer. The user interface at the printer controller allows you to perform tasks such as monitoring job status, prioritizing jobs, and configuring the system.
<b>Xerox-supplied printer interface</b>	The printer interface cables provide high-speed data transport and communication between the printer controller and the printer.
<b>Xerox-supplied DocuPrint printer</b>	The printer accepts data from the printer controller and prints the document according to the print options specified by the user. The printer also provides optional paper stacking and collating.

## Connectivity configurations

---

The NPS/IPS can process network PDL and IPDS jobs concurrently.

To support the submission of jobs from a variety of hosts, configuration possibilities include:

- The same Token Ring or Ethernet connection can be used for both IPDS and Postscript/PCL.
- Both a Token Ring card and an Ethernet card can reside in the Sun workstation controller, with one being used for IPDS and the other for PostScript/PCL.

- Bus and tag attachment through the channel interface board or through the Host Channel Unit (HCU) can be used for IPDS jobs from a channel-attached host; Token Ring or Ethernet connection can be used for jobs submitted over the network.

### **NPS/IPS concurrent printing**

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The Xerox NPS/IPS can receive a variety of data streams including IPDS, PostScript Levels 1 and 2, PCL 5e, TIFF, and ASCII. The system automatically senses the type of job and processes it appropriately.

When your system is printing IPDS jobs, it can accept network PDL data streams in the background. When network PDL jobs are printing, only one IPDS job can be queued.

### **Document Feeding and Finishing Architecture (DFA)**

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#### **System components overview**

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##### **DocuPrint NPS/IPS**

The entire DocuPrint NPS/IPS system includes the printer (also known as an IOT or print engine), printer controller, printer interface, and all appropriate software. “DocuPrint printer” or “printer” refers to the base printer engine (IOT) only, without the printer controller and interface.

##### **Xerox-supplied printer controller**

The printer controller includes a processor, DVD-ROM (or CD-ROM) drive, diskette drive, keyboard, mouse, and a monitor. The printer controller accepts the print job from the client workstation or host, converts the files into page images, and sends the page images to the printer. The user interface at the printer controller allows you to perform tasks such as monitoring job status, prioritizing jobs, and configuring the system.

##### **Xerox-supplied printer interface**

The printer interface cables provide high-speed data transport and communication between the printer controller and the printer.

##### **Xerox-supplied DocuPrint printer**

The printer accepts data from the printer controller and prints the document according to the print options specified by the user. The printer also provides optional paper stitching and stacking.

### **Connectivity configurations**

The NPS/IPS can process network PDL and IPDS jobs concurrently.

To support the submission of jobs from a variety of hosts, configuration possibilities include:

- The same Token Ring or Ethernet connection can be used for both IPDS and Postscript/PCL.
- Both a Token Ring card and an Ethernet card can reside in the Sun workstation controller, with one being used for IPDS and the other for PostScript/PCL.
- Bus and tag attachment through the channel interface can be used for IPDS jobs from a channel-attached host; Token Ring or Ethernet connection can be used for jobs submitted over the network.

### **NPS/IPS concurrent printing**

The Xerox NPS/IPS can receive a variety of data streams including IPDS, PostScript Levels 1 and 2, PCL 5c, PCL 5e, TIFF, and ASCII. The system automatically senses the type of job and processes it appropriately.

When your system is printing IPDS jobs, it can accept network PDL data streams in the background. When network PDL jobs are printing, only one IPDS job can be queued.

### **Document Feeding and Finishing Architecture (DFA)**

The Document Feeding and Finishing Architecture (DFA) on the NPS/IPS supports all third-party finishing devices currently validated for the LCDS (J11) printers (DFA is not supported on the 4850). The bypass transport option is required for in-line finishing devices.

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## **IPDS environment**

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### **Host environments**

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The system emulates an IBM AFP Group 3 page printer with the Advanced Function Image and Graphics (AFIG) option and can print in all the following PSF environments:

- MVS

- VM (channel-attached only)
- VSE (channel-attached only)
- OS/2
- OS/400 (with TCP/IP only)
- AIX

*NOTE: Although PSF/VSE does not support TCP/IP directly, a printing system with PSF/2, PSF/6000, or InfoPrint Manager can attach to a PSF/VSE system and the PSF/2, PSF/6000, or InfoPrint Manager can furnish the TCP/IP support for the printer.*

*NOTE: There is no minimum host operating system software level required. The minimum PSF level needed to support full color is v.3.2.*

The NPS/IPS can be set up to receive data from the IBM host in one of two ways:

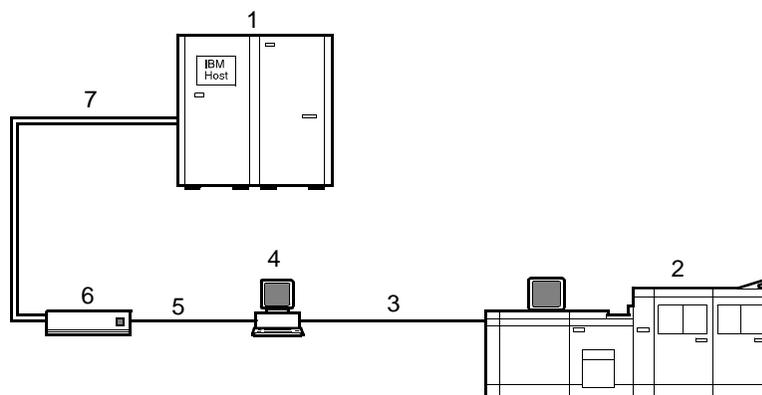
- Through a bus and tag channel connection.

*NOTE: If your system will be channel-attached, the printer controller requires an additional component—either a channel interface board and channel cable connector box, or a Host Channel Unit (HCU) that serves as an interface between the IBM host and the printer controller.*

- Through a Token Ring or Ethernet interface using TCP/IP.

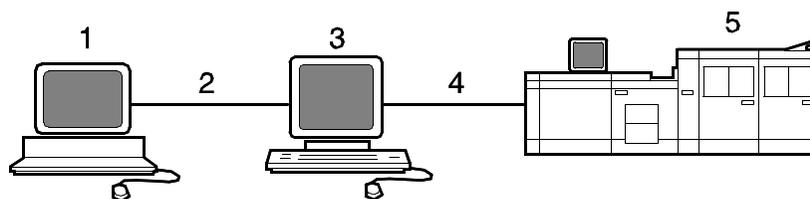
*NOTE: Your system supports only one other connectivity option in addition to Ethernet. For example, Ethernet and channel connection or Ethernet and Token Ring.*

*NOTE: A transmission rate of at least 16 megabits per second should be used with a Token Ring interface. (Overall performance depends on network traffic and job density.)*



**Figure 1-1. Printing system: channel-attached configuration**

1. Host system (PC or mainframe)
2. Printer
3. Printer interface cables
4. Printer controller
5. Internal channel cable
6. Host Channel Unit (HCU)
7. Bus and tag cables



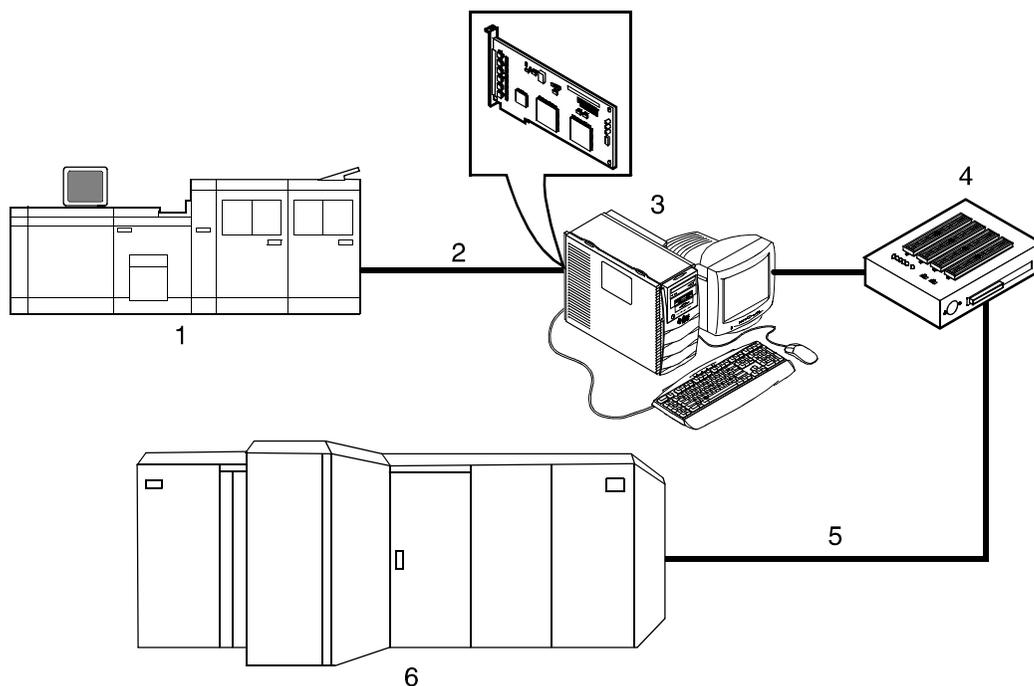
**Figure 1-2. Printing system: TCP/IP configuration**

1. Host system (PC or mainframe)
2. Interface network (Ethernet or Token Ring)
3. Printer controller
4. Printer interface cables
5. Printer

For information on the various printer configuration options, refer to the “Printer components and options” chapter of this guide.

### Channel interface board and channel cable connector box—channel-attached systems only

The channel interface board, connected to a control unit, handles all IPDS communications and handshaking with PSF on the host when the NPS/IPS is receiving data over a channel. (It is not used when the NPS/IPS is printing data using TCP/IP.)



**Figure 1-3. Channel interface board and connector box**

1. Printer
2. Printer control and video cable
3. Printer controller with channel interface board
4. Channel cable connector box
5. Channel cables
6. Host system

*NOTE: The customer is responsible for obtaining, stringing, and maintenance of the bus and tag cables. The bus and tag cables must be fully populated cable sets.*

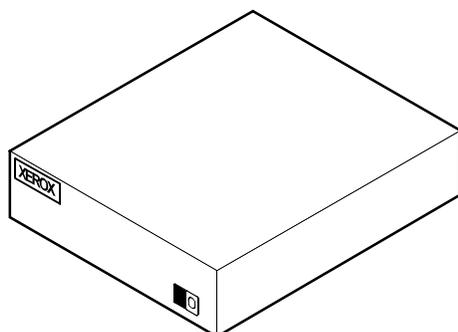
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## Host Channel Unit (HCU)—channel-attached systems only

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Your system may use a Host Channel Unit (HCU) for channel connection to a host for IPDS printing.

The HCU handles all IPDS communications and handshaking with PSF on the host when the system is receiving data over a channel. It is not used when the system is printing data using TCP/IP.



**Figure 1-4. Host Channel Unit (HCU)**

The front panel of the HCU provides a single-digit LED display that enables you to monitor power-up and offline status, and alerts you to error conditions.

The back panel of the HCU has a power switch and outlet, bus and tag cable input and bypass connectors, and a dual serial port.

*NOTE: The customer is responsible for obtaining, stringing, and maintenance of the bus and tag cables. The bus and tag cables must be fully populated cable sets.*

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## IPDS data stream

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All IPDS resources (print data sets, page definitions, form definitions, page segments, fonts, and overlays) that are supported by the IBM 3825 and 3827 printers are supported by the Xerox software. Additionally, the data towers that are supported within the AFP environment by the IBM 3825 and IBM 3827 printers are fully supported by the software. Data towers supported are:

- **IM Image IMD1**
- **FOCA:** Font Object Content Architecture

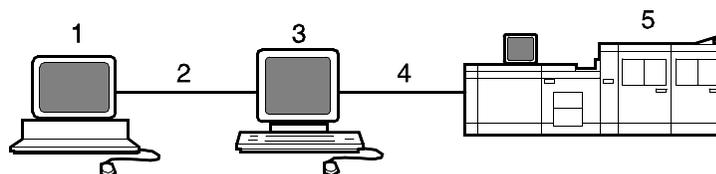
- **MO:DCA-P:** Mixed Object Document Content Architecture for Presentation
- **PTOCA PT1, PT2, and PT3:** Presentation Text Object Content Architecture
- **IOCA:** Image Object Content Architecture
- **GOCA:** Graphics Object Content Architecture
- **BCOCA:** Bar code Object Content Architecture
- **OL1:** Overlay One
- **PS1:** Page Segment One
- **Line mode data streams**

Each of the data objects follow the same object rule of containing delimiting fields with structured fields describing each object.

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## Network PDL printing environment

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**Figure 1-5. DocuPrint printer system components**

1. **Customer-supplied client PC or workstation**
2. **Customer-supplied network**
3. **Xerox-supplied printer controller**
4. **Xerox-supplied printer interface**
5. **DocuPrint printer**

**Customer-supplied client PC or workstation**

Users create their documents at the networked client PCs or workstations using software applications that generate PDL output. When ready to print, users submit the documents to the printer controller.

**Customer-supplied network**

The customer needs to supply one or more of the following networks:

- Ethernet local area network (LAN) running TCP/IP, AppleTalk, or Novell NetWare network protocol.
- Token Ring running TCP/IP, Novell, or AppleTalk network protocol.

## **Networks**

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Both network client workstations and the IBM host can communicate with the controller over a network.

### **Ethernet LAN**

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Users of networked client workstations may send print jobs to the DocuPrint NPS/IPS printer over the Ethernet LAN using TCP/IP, AppleTalk using EtherTalk Link Access Protocol (ELAP), or Novell NetWare 3.1x as the network protocol.

Regardless of printing or transmission protocol, the Ethernet connection to the printer controller must be

compatible with the Institute of Electrical and Electronics Engineers (IEEE) 802.3 standard.

### **Token Ring**

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Users of network client workstations may send print jobs to the printer over Token Ring network using TCP/IP, Novell 3.x, or AppleTalk network protocol.

Regardless of printing transmission protocol, the Token Ring connection to the printer controller must be compatible with the Institute of Electrical and Electronics Engineers (IEEE) 802.5 standard.

### **Multiple network devices**

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Multiple network devices may be installed on the same controller. The default network device that ships with your controller is a 100 Mbit Ethernet connection. You may install other network devices by installing additional network cards, provided each card has a unique network to which it connects. For example, if you use a Token Ring network connection, you have the option of using the default Ethernet device as a secondary network.

If you choose to install multiple network devices on your controller, the following parameters apply:

- You must select a primary network device and designate any others as secondary. The primary network device does not have to be the default Ethernet device that ships with your controller; it can be any of the network devices installed.
- You must run the TCP/IP protocol on the primary network device. You may also run TCP/IP on other network devices. For each network device running TCP/IP, you must specify a unique IP address and IP netmask. For the primary network device, you must specify the HostName and router IP address. The HostName for any secondary devices is created from the name chosen for the primary device.

*NOTE: You may not use the controller as an IP router. Consequently, the router IP address must be on the primary network devices network only.*

- You may run the AppleTalk protocol on only one network device. The network device on which AppleTalk is run does not have to be the primary network device.
- You may run Novell protocols on only the primary network device.

### **Network client components**

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To send print jobs to the NPS/IPS printer, the customer needs to provide the proper client hardware as well as operating system and network software.

#### **Supported client hardware and operating systems**

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Xerox NPS/IPS supports the following types of networked client workstations and operating systems:

- Sun workstation running a Sun or Linux operating system
- PC running MS-DOS 6.2 and Microsoft Windows 95, 98, NT, 4.0, 2000, and ME using Ethernet with TCP/IP or Novell NetWare 3.11 and 3.12.

*NOTE: Customers using Novell 4.1 must set the “Bindery Emulation Mode” to be backwards compatible with Novell 3.11 and 3.12.*

- IBM RS/6000 running IBM AIX, version 4.1
- HP/Apollo running HP-UX, version 10.01
- DECStation 5000/200 running DEC Ultrix, version 4.3

- Apple Macintosh, System 7.x or 8.x, using AppleTalk through EtherTalk, phase 1 or 2
- Any system that supports RFC-1179 lpr/lpd

NPS/IPS software may be compatible with workstation models and software versions other than those listed above.

### **Client networking software**

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TCP/IP networking software, Novell, or Apple Macintosh Printer Access Protocol (PAP) networking software must be installed on your client workstations. This software provides network communication with the printer controller, which allows you to submit print jobs and check job status.

To submit jobs, you need a driver, a job submission client like XDS or the Xerox client software, or lpr capability.

*NOTE: The printing options available to a client user vary according to the networking software loaded on the client workstation.*

For additional information on submitting jobs from a client workstation, refer to the *Guide to Submitting Jobs from the Client*.

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## **Responsibilities**

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It is your responsibility to supply, install, and maintain hardware and software on any PC, Unix workstation, or Macintosh system used to generate documents for printing on the DocuPrint printers. You are also responsible for obtaining, installing, and maintaining the required Ethernet LAN or Token Ring network, transceivers, cables, and connectors.

Xerox is responsible for the physical installation and service of the printer and printer controller hardware and software components. You have the general responsibility for the site of ensuring that the right personnel, supplies, and that network hardware and software is available. Refer to the "Preparing for installation" chapter of this guide for a detailed description of the shared responsibilities of the customer and of Xerox.

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## Sixth Sense

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Sixth Sense is a unique suite of diagnostic tools that allows Xerox customer service engineers, analysts, and consultants to serve customers more effectively.

Sixth Sense is intended to automate and expedite the range of service-related support functions. Sixth Sense is a tool that enables Xerox to provide benchmark service support. Xerox customers benefit from the ability to bring broader support to focus more quickly.

For example, Sixth Sense can allow the Service Representative to repeatedly "preview" the condition of the system prior to an actual site visit. This may provide the ability to determine the correct part or piece of information to have on hand when the site visit is made.

Sixth Sense is a no charge feature available to customers through Xerox Service. The customer need only provide an analog phone line for use by the Sixth Sense modem connection. For those customers unable to dedicate a phone line to the Sixth Sense connection, three and five port phone share devices are available for purchase.

To take advantage of Sixth Sense, the customer needs to:

- Request Sixth Sense enablement through Xerox Service
- Provide an analog phone line
- If necessary, purchase an optional phone share device.

More information about the Sixth Sense can be found in the *Troubleshooting Guide* for your system.

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## 2. Controller components and options

The printer controller provides the printer with print data and commands, and receives status information from the printer. This chapter describes the components and options available for the controller.

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### Printer controller components

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The printer controller consists of a specially-configured Sun workstation and uses proprietary Xerox hardware, firmware, and software.

Your system may use one of two platforms for the printer controller:

- Sun Blade 1000
- Sun Ultra 60 workstation

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#### Sun Blade 1000 workstation

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The printer controller is based on the Sun Blade 1000, a workstation with a high-performance architecture for complex processing tasks. It contains the following hardware components:

- Processor (system unit) containing the following:
  - Two UltraSPARC III 750 Mhz central processing unit (CPU) modules
  - 4 GB memory (four 1 GB Dual In-line Memory Modules, or DIMMs)
  - 36 GB hard disk drive
  - DVD-ROM drive
  - 3.5 inch diskette drive
- Keyboard and mouse
- Monitor

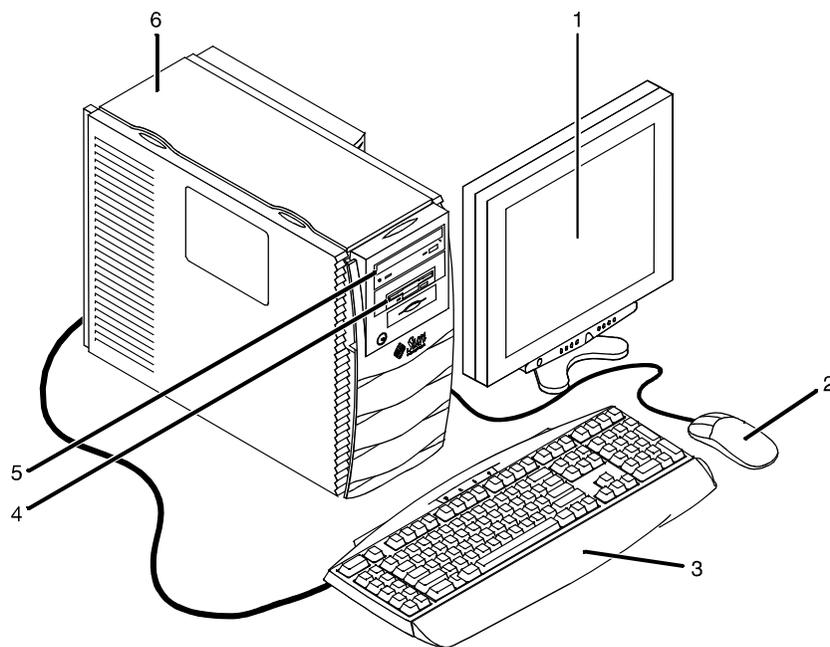
- Optional Token Ring board
- Two printer controller Interface (PCI) boards installed in the processor to interface with the print engine.

**Optional components**

For channel connection to a host for IPDS printing, the system may use a channel interface board that is connected to a channel cable connector box.

An external 4 mm tape drive is available and recommended for backing up site files. A typical color calibration file is 1.5 MB.

A second internal 36 GB hard disk drive is optional, as are two additional external disks.



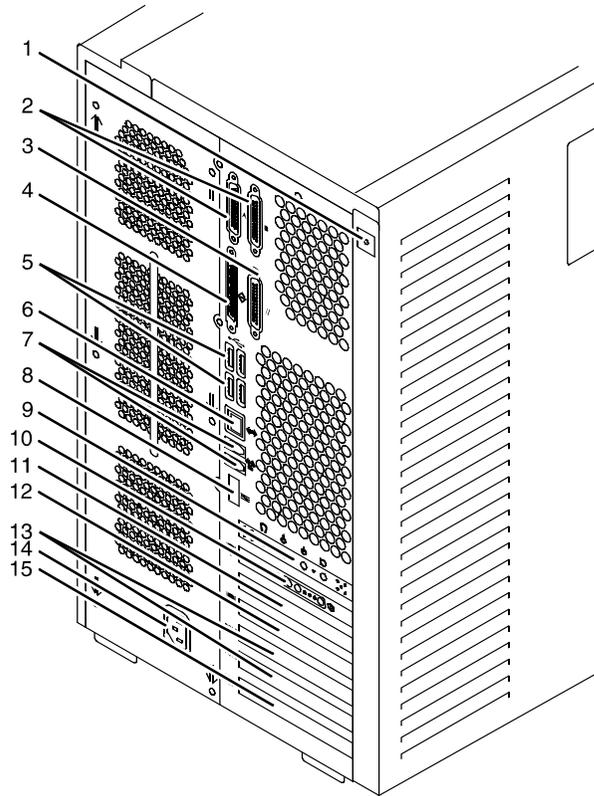
**Figure 2-1. Components of the printer controller**

1. Monitor
2. Mouse
3. Keyboard
4. Diskette drive
5. DVD-ROM drive
6. Processor

**Processor**

The central processing unit contains the memory, internal disk drive, a graphics board, a DVD-ROM drive, a diskette drive, power receptacle and outlet, connectors and ports.

- **Memory:** Four 1 GB Dual In-line Memory Modules, or DIMMs are provided as a standard feature of the processor.
- **Hard disk drive:** A 36 GB primary disk drive is provided as a standard feature of the processor. The operating system, the NPS/IPS application, and any queued print jobs are stored on the internal disk. This disk cannot be used to store other applications or data except as directed by your service representative.
- **Graphics board:** The Creator-3D series 3 graphics board is provided as a standard feature of the processor.
- **Diskette drive:** Diskettes inserted into a diskette drive are used to install fonts and to load files to, and back up files from, the internal disk drive. The diskette drive uses industry standard 3.5 inch, 1.44 MB, double-sided, high-density diskettes.
- **DVD-ROM drive:** The DVD-ROM drive is a high density, read-only, optical laser storage device used for loading the NPS/IPS operating system and other files. The CD-ROM drive is located in the processor above the diskette drive.
- **Back panel:** The back panel of the processor has a power receptacle and outlet, connectors, connector openings, and ports. The following figure shows the back panel of the controller.



**Figure 2-2. Back panel of the printer controller**

1. Access panel lock block
2. Serial connectors A and B, DB-25
3. Parallel connector
4. SCSI connector
5. Universal serial bus (USB) connectors
6. Twisted-pair Ethernet (TPE) connector
7. IEEE 1394 connectors
8. Fibre Channel-Arbitrated Loop (FC-AL) connector
9. Audio module headphones, line-in, line-out, and microphone connectors
10. Graphics card / video connector (frame buffer 0)
11. PCI card slot 4
12. Graphics card / video connector (frame buffer not used)
13. PCI card slots 3 and 2
14. Power connector
15. PCI card slot 1

- Keyboard** The keyboard consists of alphanumeric keys similar to a typewriter, symbols and special character keys, an extended character set, and function keys. You can use the keyboard to make selections, and to enter commands that control functions such as requesting sample prints, or shutting down the system.
- Mouse** Use the mouse to select, move, or resize windows.
- Display monitor** The 18.1-inch LCD monitor allows you to interact with the printer and to monitor its interaction with the various components. During a print job, printer error messages may display to notify you of any unexpected conditions.

*NOTE: For information on channel-attached systems, refer to the chapter, "IPDS printing environment".*

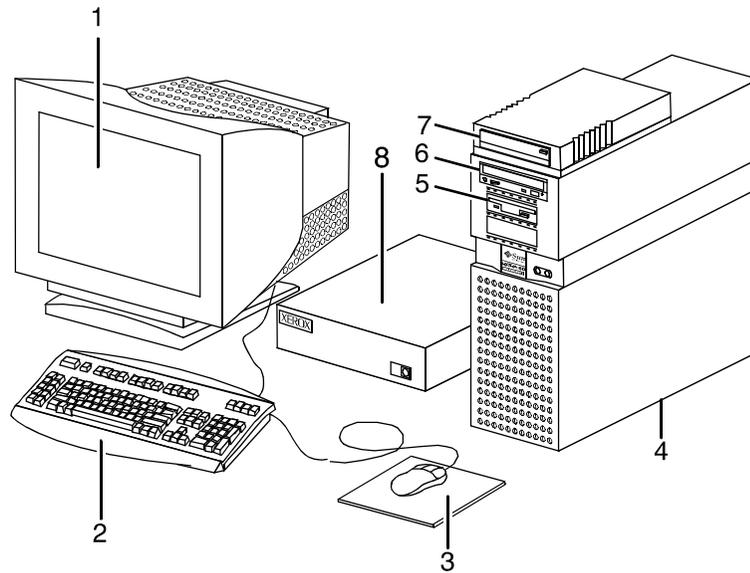
*NOTE: Printer controller hardware configurations are subject to upgrade.*

### **Sun Ultra 60 workstation**

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A PCIM2 card for the Sun Ultra 60 is installed in the processor. The printer cable is connected to the processor. In addition, the processor contains the connectivity boards for Ethernet and optional Token Ring. The disk stores the operating system, the system software, and any buffered pages.

- Optional components** For channel connection to a host for IPDS printing, the system may use an HCU.
- An external 4 mm tape drive is available and recommended for backing up site files. A typical color calibration file is 1.5 MB.



**Figure 2-3. Printer controller components (Sun Ultra 60)**

1. Monitor
2. Keyboard
3. Mouse
4. Processor
5. Diskette drive
6. CD-ROM
7. Optional cartridge tape drive
8. Optional HCU

**Processor** The central processing unit contains the memory, internal disk drive, a CD-ROM drive, a diskette drive, power receptacle and outlet, connectors and ports.

- **Diskette drive:** The floppy disk drive is located in the processor. It uses industry standard 3.5 inch, 1.44-MB, double-sided, high-density floppy disks. This disk drive is not an input source for print jobs or for any other data or application. It is reserved exclusively for use by a service representative to update software and to store files.
- **CD-ROM:** The CD-ROM drive, located in the processor above the diskette drive, is a high-density, read-only, optical laser storage device used for loading the software, fonts and other files.

- **Cartridge tape drive:** The Sun Ultra 60 offers an optional 8 GB, 4 mm external SCSI cartridge tape drive. Unlike the diskette and CD drives, this tape drive is not an input source for print jobs or for any other data or application. It provides the service representative with another means of loading system maintenance files or saving diagnostic information.

- Keyboard** The keyboard consists of alphanumeric keys similar to a typewriter, symbols and special character keys, an extended character set, and function keys. You can use the keyboard to make selections, and to enter commands that control functions such as requesting sample prints, or shutting down the system.
- Mouse** The mouse is another main method of communicating with the printer.
- Display monitor** The display monitor has a high-resolution color screen, which displays the user interface screen.

*NOTE: For information on channel-attached systems, refer to the chapter, "IPDS printing environment".*

*NOTE: Printer controller hardware configurations are subject to upgrade.*

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## Printer controller software and fonts

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The installation of printer controller software is performed by your service representative once all the hardware components are in place and properly connected. The following is a summary of major software components installed on the printer controller:

- Xerox printer controller software
  - UNIX Sun operating system

*NOTE: The Sun operating system used on the controller is based on the standard Sun operating system; however, it has been customized for use with the Xerox printer controller. Therefore, not all standard Sun operating system features are available.*

- DocuPrint Print Service Software including software components for the user interface, IOT driver, decomposers, Job Pool Manager, and other operating system utilities.
- Xerox Client Software
  - Xerox client protocol software (print command); can be downloaded to client workstations or PCs as a means of submitting jobs.
- Adobe Type 1 PostScript fonts
  - Courier (Courier, Bold, Oblique, Bold Oblique)
  - Helvetica (Helvetica, Bold, Oblique, Bold Oblique, Light, Light Oblique, Black, Black Oblique Condensed, Condensed Oblique, Condensed Bold, Condensed Bold Oblique Narrow, Narrow Bold, Narrow Oblique, Narrow Bold Oblique)
  - ITC AvantGarde Gothic (Book, Book Oblique, Demi, Demi Oblique)
  - ITC Bookman (Demi, Demi Italic, Light, Light Italic)
  - ITC Garamond (Light, Light Italic, Bold, Bold Italic)
  - ITC Korinna (Korinna, Kursiv Regular, Bold, Kursive Bold)
  - ITC Zapf Chancery (Medium Italic)
  - ITC Zapf Dingbats (Medium)
  - New Century Schoolbook (Roman, Bold, Italic, Bold Italic)
  - Palatino (Roman, Bold, Italic, Bold Italic)
  - Symbol (Medium)
  - Times (Roman, Bold, Italic, Bold Italic)

Using font installation commands, you can load other Type 1 PostScript fonts in \*.PFB file format from a MS-DOS-formatted, 3.5-inch diskette or CD-ROM or DVD-ROM. Refer to the *Guide to Configuring and Managing the System* for more information on the font installation commands. Type 1 and Type 3 PostScript fonts can also be downloaded with a print job.

- PCL fonts: Intellifont (scalable)
  - CG Times (Medium, Italic, Bold, Bold Italic)
  - Universe (Medium, Italic, Bold, Bold Italic)
  - Universe Condensed (Medium, Italic, Bold, Bold Italic)

- Courier (Medium, Italic, Bold, Bold Italic)
- Letter Gothic (Medium, Italic, Bold)
- Albertus [Medium (semi-bold), Extra Bold]
- Antique Olive (Medium, Italic, Bold)
- Clarendon Condensed (Bold)
- Coronet (Medium Italic)
- Garamond [Antique (medium), Kursiv (Italic), Halbfett (Bold), Kursiv Halbfett (Bold Italic)]
- Marigold (Medium)
- CG Omega (Medium, Italic, Bold, Bold Italic)
- PCL fonts: Truetype (scalable)
  - Arial (Medium, Italic, Bold, Bold Italic)
  - Times new Roman (Medium, Italic, Bold, Bold Italic)
  - Symbol (Medium)
  - Wingdings (Medium)
- PCL fonts: Bitmap
  - Line Printer (16.67 pitch / 8.5 point medium)

*NOTE: The resident fonts are used for PostScript and PCL printing.*



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### 3. Printer components and options

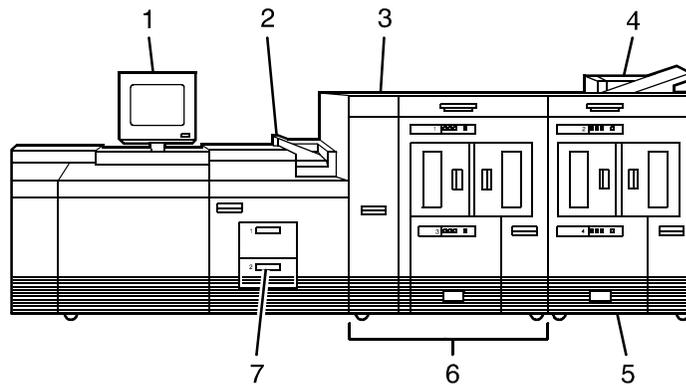
The printer processes the electronic data and images received from the controller and produces the printed output. This chapter describes the components and options available for the printer.

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#### Printer components

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The components of the 4635 and 180 NPS/IPS base printer are shown in the following figure. The 96 NPS/IPS standard printer configuration has one inverter feeder/stacker module, with the option of adding a second feeder/stacker module as shown.



**Figure 3-1. DocuPrint 96, 4635, and 180 printer components**

1. Printer console
2. Sample tray
3. Attention light
4. Purge tray
5. Feeder/stacker module
6. Feeder/stacker module with inverter
7. Processor feeder trays

*NOTE: The DocuPrint MICR NPS/IPS models utilize the same hardware and operating system as the non-MICR NPS/IPS models. However, the Image Development systems have been modified to enable MICR font reproduction.*

**Processor feeder trays**

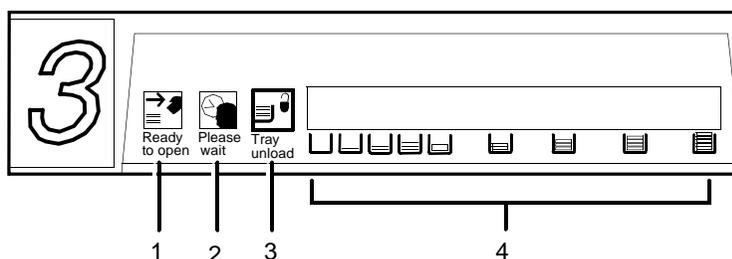
Two processor feeder trays are located in the main part of the printer:

- The main tray (tray 1) holds up to 1100 sheets of 20 pound or 80 gsm (grams per square meter) paper.
- The auxiliary tray (tray 2) holds up to 600 sheets of 20 pound or 80 gsm paper.

Each tray can handle paper from 8 x 10 inches/203 x 254 mm to 9.02 x 14.33 inches/230 x 364 mm.

**Feeder tray control panels**

Each processor feeder tray and HCF tray has a control panel consisting of a button, indicators, and paper level displays.



**Figure 3-2. Feeder tray control panel**

1. Ready to Open indicator
2. Please Wait indicator
3. Tray Unlock button
4. Paper Level indicators

**1. Ready to Open indicator**

This indicator glows when paper can be added to the tray.

**2. Please Wait indicator**

This indicator shows that the tray is in motion. It is lit when the Tray Unlock button is pressed, when the tray is being lowered, or when the tray is being raised. The indicator goes off when the tray elevator reaches its destination.

### 3. Tray Unlock button

You can use this button any time the Please Wait indicator is off.

- If the tray is in use when this button is pressed, the feed selection changes to the backup tray if one exists. Otherwise, printing stops.
- If the tray is in use and selected as a backup tray, pressing this button causes the tray elevator to lower and the tray is no longer available for auto switching.
- If the tray elevator is in the raised position and the tray is not in use or selected as a backup tray, pressing this button causes the elevator to lower with no effect on printing operations.

### 4. Paper Level indicators

These indicators display the approximate quantity of paper within the tray. The display shows paper by quarter reams up to one ream, and then by full reams. The green indicator light appears above the Paper Level indicator which shows the amount of paper in the tray.

#### **7 by 10 inch / 178 by 254 mm enablement**

The optional 7 by 10 inch enablement feature allows your DocuPrint 4635 and 180 NPS/IPS to print on paper sized from 7 by 10 inches / 178 by 254 mm to 9.02 by 14.33 inches / 230 by 364 mm.

*NOTE: The 7 by 10 inch enablement feature is not available on the DocuPrint 96 NPS/IPS.*

#### **Inverter**

The inverter is part of the inverter feeder/stacker module. It allows for proper collation of the print job. It directs printed output to the sample tray, when required. It also directs output to optional third-party finishing devices in the proper orientation.

#### **High-capacity feeder**

There is a high-capacity feeder (HCF) tray located in the bottom half of each feeder/stacker module (trays 3, 4, 5 and 6, depending on the number of feeder/stacker modules installed).

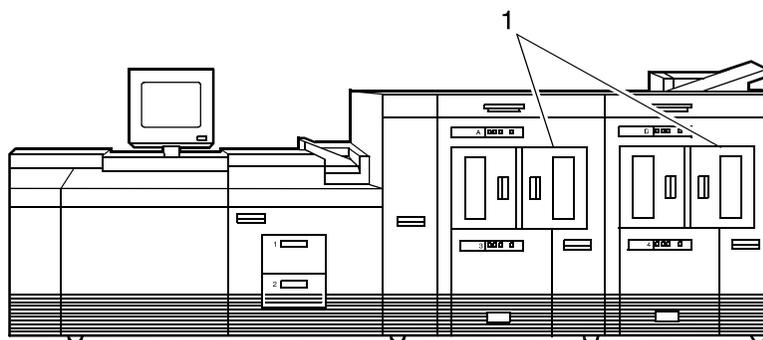
Each HCF tray can hold up to 2600 sheets of 20 pound or 80 gsm paper.

*NOTE: When configured, each HCF tray can handle paper sized from 7 by 10 inches / 178 by 254 mm to 17 by 14.33 inches / 432 by 364 mm. To feed papers smaller than 8 inches / 203.2 mm, an optional 7 by 10 inch enablement kit must be installed. 17-inch/ 432 mm paper can be fed only short edge first.*

An elevator moves the tray up or down when it is in use. The HCF trays have Paper Level switches which detect the position of the elevator to determine the fullness of the tray. Paper Size switches detect the size of the paper loaded in the trays.

### **High-capacity stacker**

The 4635 and 180 NPS/IPS printers can contain up to four high-capacity stacker (HCS) bins as part of the feeder/stacker modules (stacker bins A, B, C and D). The 96 NPS/IPS printer can contain up to two high-capacity stacker (HCS) bins as part of the feeder/stacker modules (stacker bins A and B).

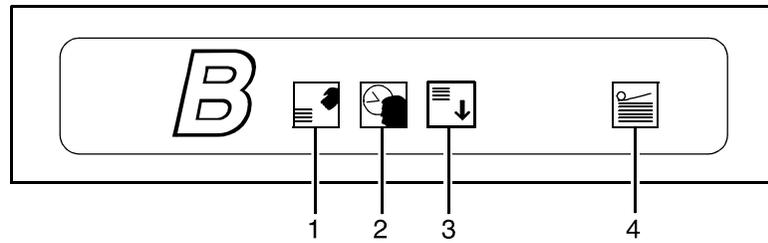


**Figure 3-3. High-capacity stackers**

Each HCS can hold 2500 sheets of 20 pound or 80 gsm paper stacked on the bin platform.

*NOTE: For large paper sizes such as 11 by 17 inches or A3, there is a stack limit of about 1500 sheets. This limit is needed to keep the total weight of the stack within safe limits for unloading and lifting.*

A stacking elevator maintains the paper at the proper level for stacking and lowers the stack for unloading. There is an offset mechanism that offsets printed sets toward the front or back of the HCS bin. Each HCS bin has unlinked double doors to provide you with easy, yet safe, access for unloading paper from the printer.



**Figure 3-4. High-capacity stacker bin control panel**

**1. Ready to Unload indicator**

When this indicator glows, you can remove printed sheets from the stacker bin.

**2. Please Wait indicator**

When this indicator glows, the elevator is in motion. This indicator goes off when the platform reaches its destination.

**3. Bin Unload button**

Pressing this button causes the bin elevator to lower. If the bin is in use and is part of a STACKER GROUP combination, the printed pages begin stacking in the other stacker bin. If the bin is not in use, there is no effect on printing operations.

If this is the only bin in a STACKER GROUP, printing will stop.

**4. In Use indicator**

When this indicator glows, the bin is selected to receive the next printed sheet.

**Purge tray** The purge tray is located on top of the feeder/stacker module. Aborted sheets (for example, damaged sheets or sheets cleared after a paper jam) are sent to this tray. The purge tray can hold up to 100 sheets of paper.

**Attention light** An attention light is mounted on top of the inverter module. The attention light signals when the printer requires operator attention:

- **Off:** No printer problems exist that require your attention.
- **Steady light:** A situation exists that needs your attention (such as low dry ink condition).
- **Flashing:** The printer has stopped and requires your attention immediately.

*NOTE: When the attention light starts flashing, an explanatory message appears on the printer console display. A similar message appears on the printer controller screen.*

**Sample button** The Sample button on the 180, 4635, or 96 printer duplicates one of the sheets in the paper path and delivers it to the sample tray. This sheet can be used to check quality and alignment while printing. The button is disabled for MICR printers.

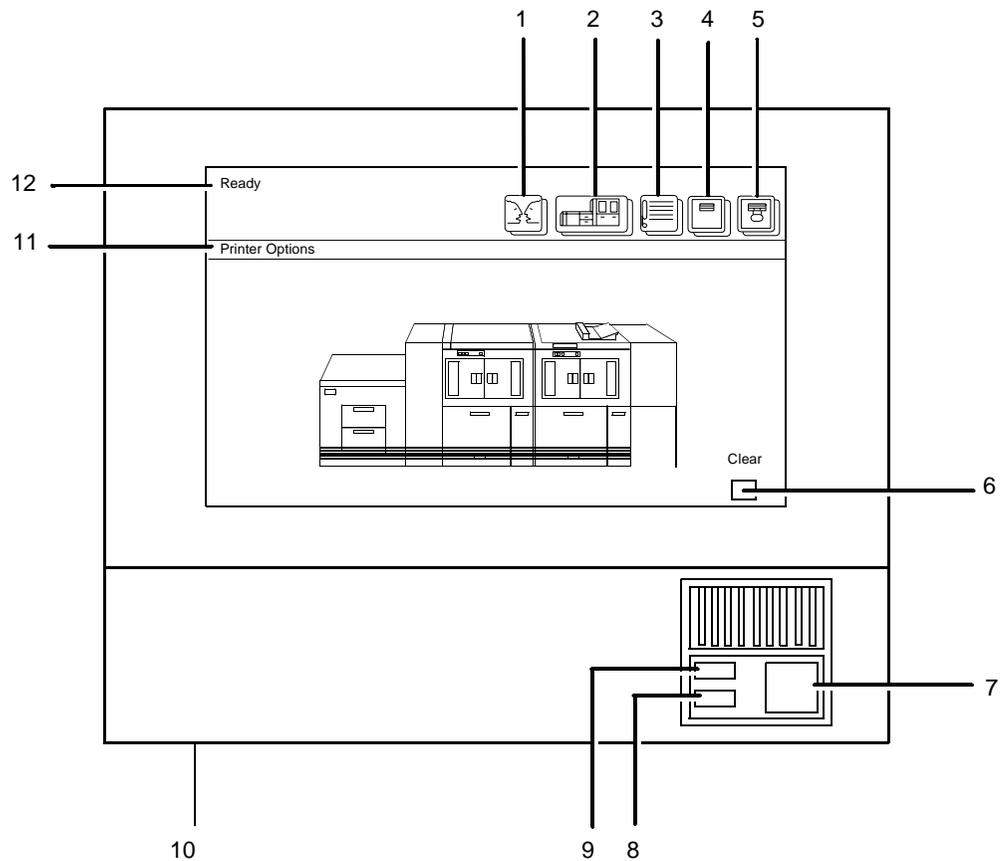
**Sample tray** The sample tray located on top of the printer holds up to 100 sheets of paper. It receives output such as transparencies, sample prints or system files, and waste sheets that cannot be sent to the purge tray.

**Printer console** The printer console is the color monitor located on top of the printer. It contains message areas and graphic displays that alert you to paper jams and other fault conditions, such as low toner. The printer console also contains buttons that allow you to control certain functions of the printer, such as continuing an interrupted job, without returning to the printer controller.

The printer console has the following features:

- Local controls and displays for jam clearance, paper loading/unloading, and diagnostics/service (used by the service representative). Two types of messages are displayed on the printer console: fault messages, which relate to printer malfunctions, and information messages, which relate to printer conditions such as low dry ink.
- Touch-sensitive areas that allow you to select options by touching the printer console screen. A tone sounds when you touch one of these areas.
- Printer alarm consisting of three beeps, repeated for ten seconds. The alarm is generated by any event that stops the printer.

The alarm stops after three cycles or as soon as you start to clear the fault condition (for example, when you open doors or covers specified in the clearance instructions). You can stop the alarm by pressing one of the printer console buttons or by selecting a function through the touch screen.



**Figure 3-5. Printer console**

1. Language icon
2. Printer icon
3. Fault List icon
4. Tools icon
5. Guarded Tools icon (not available on the 96 NPS)
6. Clear button
7. Continue button
8. Stop button
9. Sample button
10. Brightness control thumbwheel
11. Icon area
12. Message area

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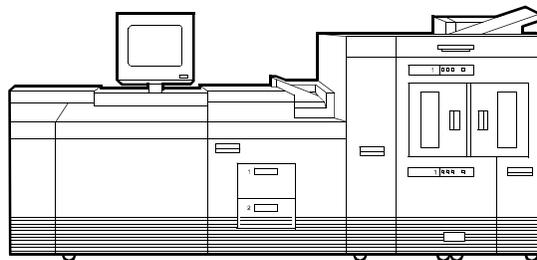
## Printer configurations

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The DocuPrint 96 NPS/IPS base system is configured with one inverter feeder/stacker module; one additional feeder/stacker module is optional. Input enablement and bypass transport devices can also be used.

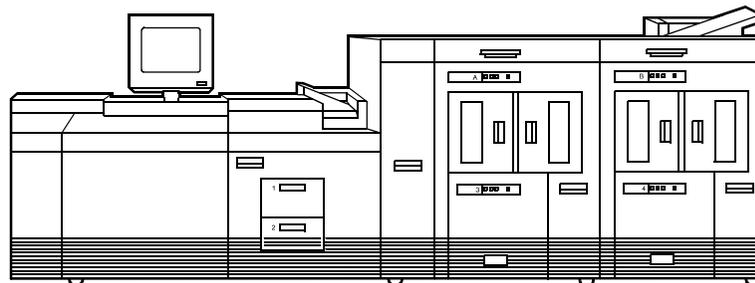
*NOTE: The input enablement and bypass transport devices are offered as optional components. These options allow you to customize your printer for increased efficiency and specialized applications, such as roll feed and finishing devices. The middle feeder/stackers are also optional for the 4636 and 180 NPS/IPS.*

The DocuPrint 96, 4635, and 180 NPS/IPS are available in the following configurations, some of which may include the bypass transport and/or Input Enablement kit.

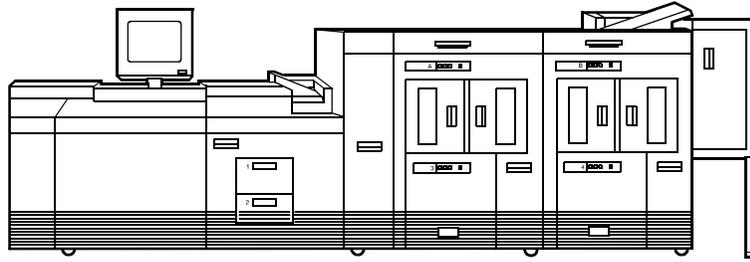


**Figure 3-6. DP 96 NPS/IPS: Printer + inverter feeder/stacker**

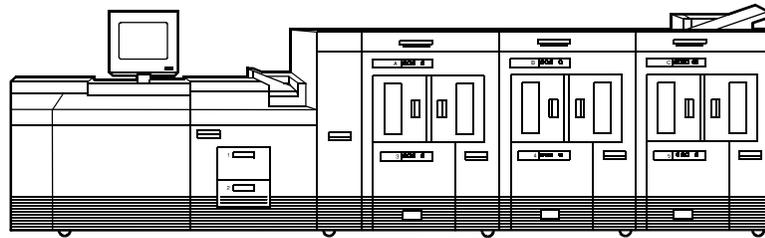
The DocuPrint 4635 and 180 are available in the configurations shown in the following figures.



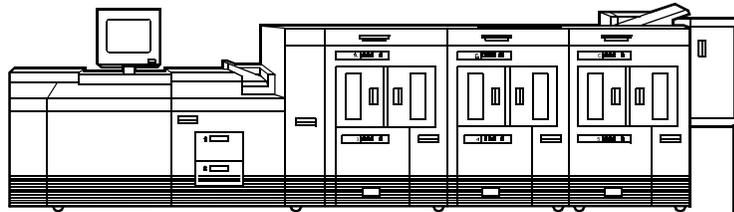
**Figure 3-7. Printer + inverter feeder/stacker + feeder/stacker**



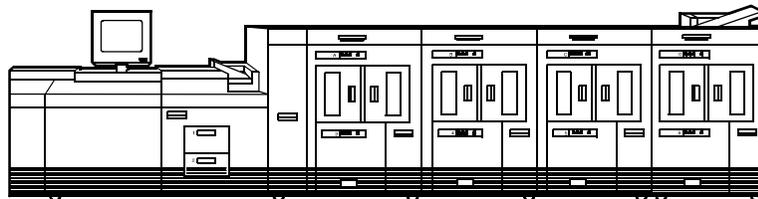
**Figure 3-8. Printer + inverter feeder/stacker + feeder/stacker + feeder/stacker + bypass transport**



**Figure 3-9. Printer + inverter feeder/stacker + feeder/stacker + feeder/stacker**



**Figure 3-10. Printer + inverter feeder/stacker + feeder/stacker + feeder/stacker + bypass transport**



**Figure 3-11. Printer + inverted feeder/stacker + feeder/stacker + feeder/stacker + feeder/stacker**

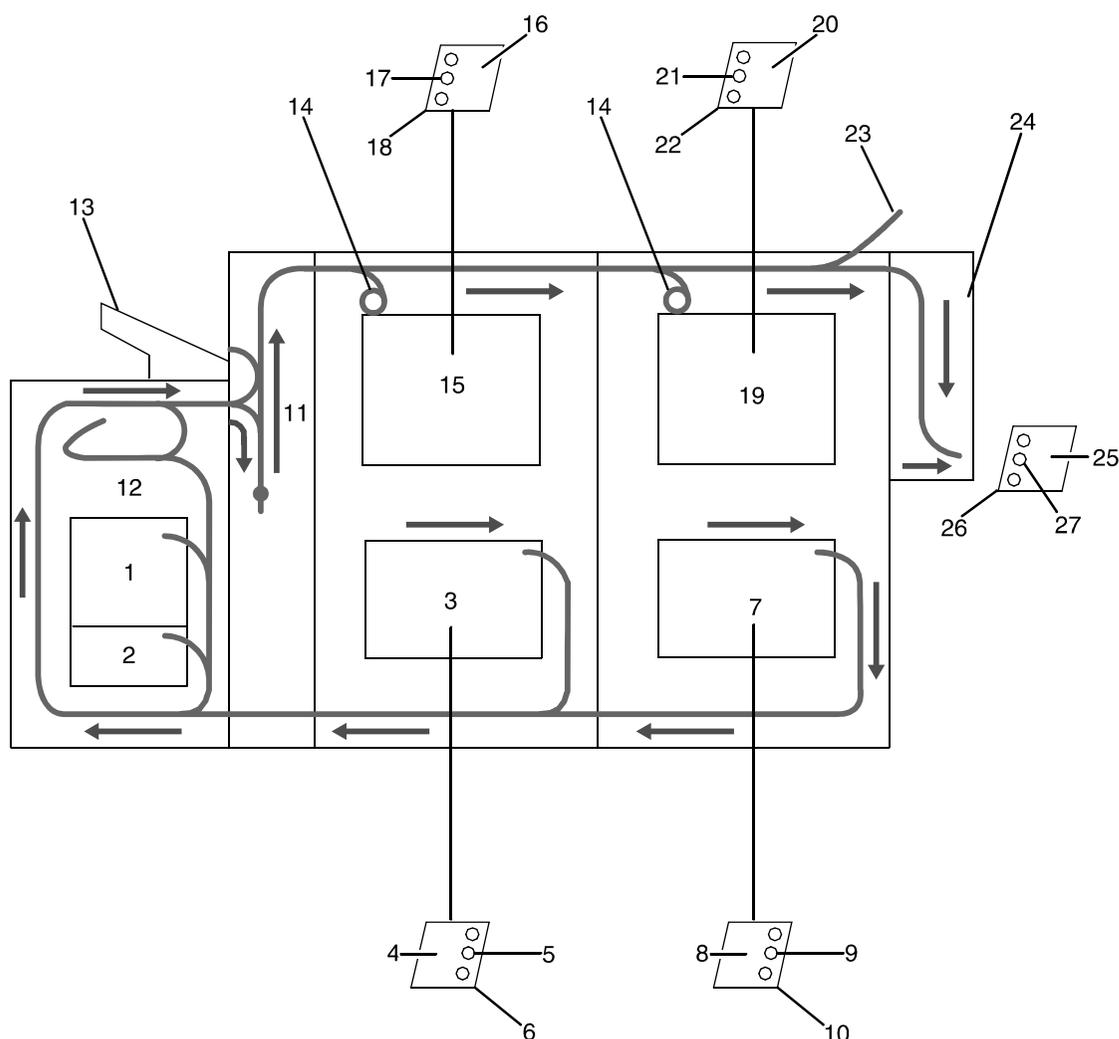
*NOTE: The bypass transport device is not available for this configuration four feeder/stacker modules). The Input Enablement kit is available for this configuration on the 180 NPS/IPS only.*

## Paper paths

The paper path is the route that materials (paper, transparencies, labels, and so on) follow through the printer from the feeder trays to the output trays.

### Paper path through the printer

The following figure illustrates the entire printer paper path.

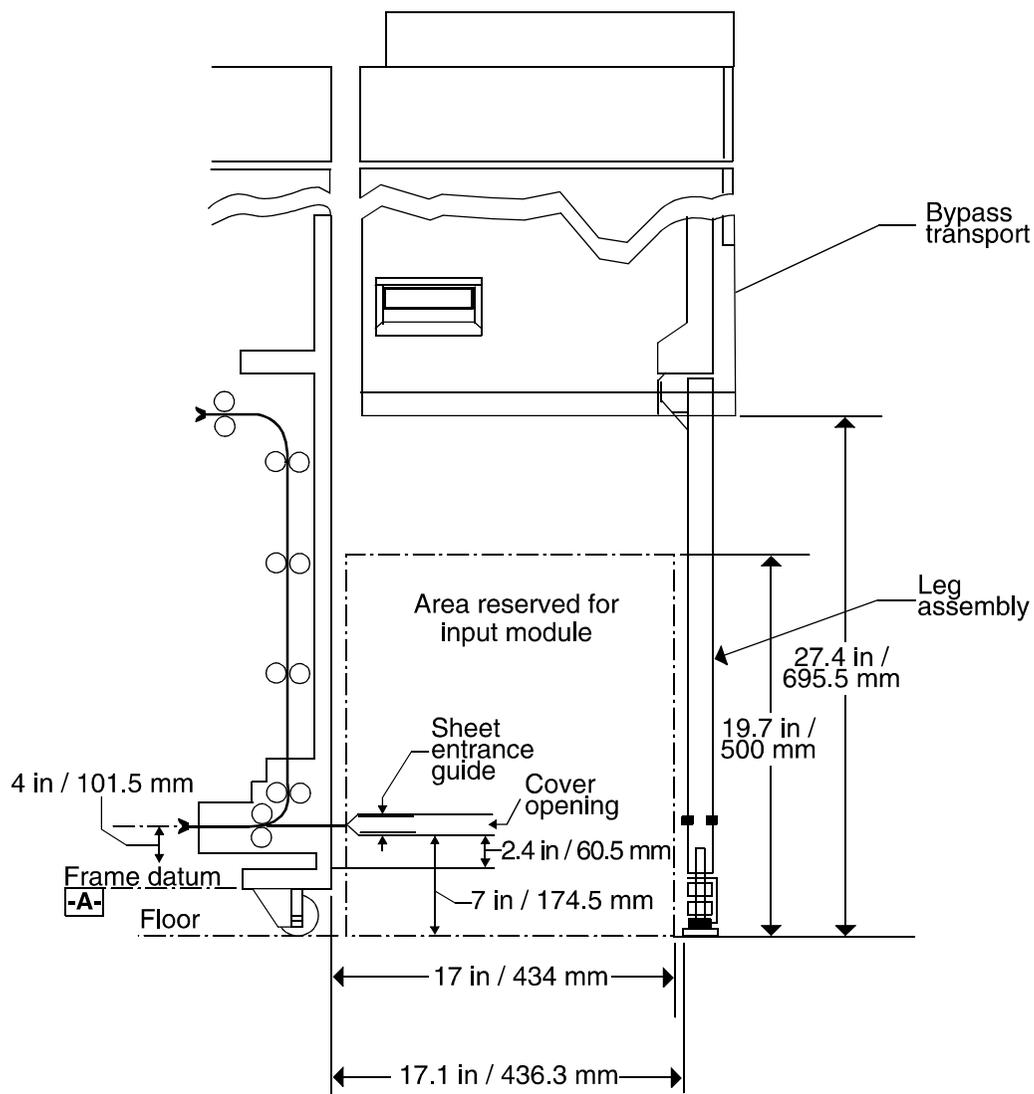


**Figure 3-12. Route of paper through 96/4635/180 printer**

1. Processor feeder tray 1
2. Processor feeder tray 2
3. High-capacity feeder tray 3
4. Side 1 of sheet leaving feeder tray
5. Drilled holes (on right edge)
6. Origin 0,0: portrait feeder tray 4
7. High-capacity feeder tray 4
8. Side 1 of sheet leaving feeder tray
9. Drilled holes (on right edge)
10. Origin 0,0: portrait feeder tray 4
11. Inverter
12. Duplex inverter
13. Sample tray
14. Disk inversion
15. High-capacity stacker bin A
16. Side 2 of sheet stacked in bin
17. Drilled holes (on left edge)
18. Origin 0,0: portrait orientation
19. High-capacity stacker bin B
20. Side 2 of sheet stacked in bin
21. Drilled holes (on left edge)
22. Origin 0,0: portrait orientation
23. Purge tray
24. Bypass transport
25. Side 2 of sheet passing through bypass transport
26. Drilled holes (on left edge)
27. Origin 0,0: portrait orientation

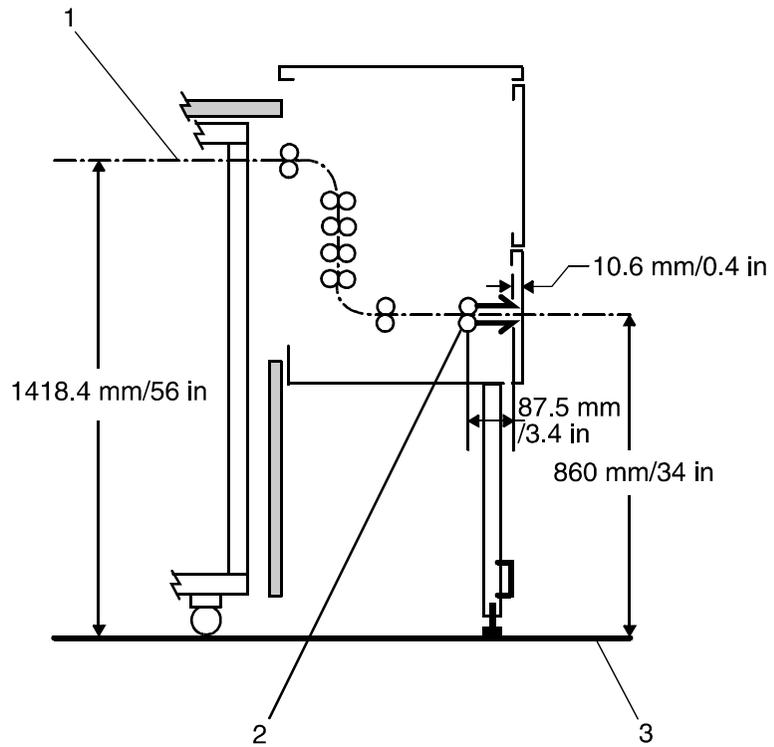
**Input enablement paper path**

The following figure shows the paper path and the dimensions of the input enablement area from a printer front view. The input enablement kit option supports third-party feeding devices.



**Figure 3-13. Input enablement paper path and dimensions**

The following figure shows the dimensions of the bypass transport portion of the paper path.



**Figure 3-14. Bypass transport dimensions**



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## 4. Preparing for installation

This chapter assists you in preparing for the installation of your Xerox DocuPrint 96/4635/180 NPS/IPS and 96/4635/180 MICR NPS/IPS.

Preparing for installation is a responsibility shared by personnel at your site and Xerox. Your service representatives are available to discuss installation issues and to assist you in completing the site installation tasks.

Before installation, you must select and prepare an appropriate location for the printing system and order supplies. This chapter helps you accomplish these tasks by providing the following information:

- A summary of your responsibilities and those of your Xerox service representative
- Connectivity requirements for setting up the NPS/IPS to receive data from the IBM host
- A checklist of installation planning activities.

For information on controller power and space requirements, refer to the “Controller specifications and requirements” chapter of this guide. For facts about printer power and space requirements, refer to the “Printer specifications and requirements” chapter of this guide.

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### Responsibilities

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This section describes your site responsibilities and the responsibilities of your service representatives. Included are some joint responsibilities.

#### **Xerox responsibilities**

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This section lists the responsibilities of the service representatives and system analysts before, during, and after installation:

- **Site selection**
  - Assist in site selection
  - Inspect and approve the site.
- **Installation**
  - Schedule the delivery of the hardware
  - Monitor installation activities
  - Assist you in ordering any supplies required
  - Configure system parameters
  - Assist with the configuration of input and output profiles for use with third-party finishing devices
  - Install the DocuPrint system
  - Install optional Sixth Sense hardware and software.
- **Training**
  - Provide initial operator training
  - Provide information and assistance in registering for Xerox Customer Education classes or obtaining tutorials.
- **Service**
  - Review preventive maintenance schedules and service call procedures
  - Provide ongoing maintenance
  - Assist in resolving hardware and software problems.

### **Customer responsibilities**

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Your responsibilities prior to, during, and after installation of the DocuPrint NPS/IPS system are to schedule and monitor your installation activities. Refer to the “DocuPrint NPS/IPS installation planning checklist” and the “Network preinstallation checklist” in this chapter for a complete list of responsibilities.

Refer to the “Xerox support services” appendix for information on services designed to support you prior to, during, and after your installation.

- **Site personnel**
  - Identify the person (or persons) at your site who will be the primary interface with Xerox.

- After the installation of your DocuPrint NPS/IPS, there are a few ongoing tasks that must be performed. These tasks may include all or some of the following:
  - Meter reading and reporting
  - Overseeing routine maintenance
  - Placing service calls for hardware problems
  - Ordering additional documentation, software, or fonts
  - Arranging additional operator training
  - Maintaining an adequate inventory of consumable supplies.

It is your responsibility to designate a person (or persons) to perform these tasks.

- **Operator and Administrator training**

- Select personnel for Operator and Administrator training.
- Set up a training schedule.

- **Site preparation**

- Select and prepare the site for DocuPrint NPS/IPS system installation including proper power, air conditioning, and work space.
- Convert any host-resident fonts to 300 dots per inch (dpi). This conversion is required for DocuPrint 96/4635 MICR NPS/IPS.
- Plan and schedule installation activities.
- For channel-attached systems: Provide your host channel address to your Xerox representative.
- Install the necessary network connections required to connect client workstations to the printer controller. Refer to the “Network preinstallation checklist” in this chapter.
- Install Ethernet or Token Ring to system location.
- Obtain the necessary interfaces, cables, transceivers, etc.  
*NOTE: You are responsible for obtaining, stringing, and maintaining fully-populated bus and tag cables for channel-attached systems.*
- Sysgen your host to print to an AFP Type1, Group 3 printer. Refer to your IBM documentation for further information.

- Provide a list of the stocks you want in your default input tray configuration.
- Review the *NPS/IPS Installation Planning Guide* thoroughly.
- Have the required parameters defined for configuring PSF to print on the NPS/IPS. Refer to the “Defining the channel attached printer to the host” or the “Defining the printer to the host: TCP/IP attachment” appendix of this guide for examples and explanations of these parameters.
- **Client workstations:** Make sure all client workstations that will be submitting print jobs have the proper hardware, operating system, and networking software supported by the DocuPrint system as client platforms.
- **Training**
  - Select the personnel to undergo operator training.
  - Set up the operator training schedules.
- **Applications**
  - Work with your Xerox system analyst to determine requirements for the initial applications.
  - In a mixed environment, where there is a variety of printing systems, discuss print quality differences with your service representative.

Make sure that your system specialists are familiar with the operating system software specific to your IPS; operating system software is not the same for all laser printing systems. If your system specialists are familiar with one of these operating systems and you are converting to or adding another, they should be aware of the differences.

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## Installation planning checklist

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To aid you in installation planning of the DocuPrint NPS/IPS, this section provides a checklist, listing tasks you and your service representative need to complete in the weeks before installation. If you have questions about any of these activities, contact your sales or service representative.

Use the timeframes in this checklist as guidelines. It is best to consult your suppliers to determine the exact lead times they require.

**Table 4-1. DocuPrint NPS/IPS installation planning checklist**

Week	Activity	Reference	Responsibility	Date completed
-4	<ul style="list-style-type: none"> <li>• Select location for DocuPrint system.</li> <li>• Identify networked client workstations to be used. Make sure the hardware, operating systems, and networking software are supported by the DocuPrint NPS/IPS.</li> <li>• In the United States, sign up with Xerox Documentation and Software Services. Order additional documentation, if needed.</li> <li>• In the United States, register for Xerox Customer Education classes, if needed.</li> </ul>	Chapters 5 and 6	Customer	_____
		Chapter 4 and Appendix D	Customer	_____
		Appendix B	Customer	_____
		Appendix B	Customer and Xerox	_____



**Table 4-1. DocuPrint NPS/IPS installation planning checklist (Continued)**

Week	Activity	Reference	Responsibility	Date completed
-2	<ul style="list-style-type: none"> <li>• Inspect and approve site.</li> <li>• Order consumable supplies.</li> <li>• Minimum supplies needed for installation:               <ul style="list-style-type: none"> <li>– Paper (2 cartons)</li> <li>– Developer (1 carton)</li> <li>– Fuser agent (2 cartons)</li> <li>– Dry ink for DocuPrint 96/4635/180 NPS/IPS (1 carton black)</li> <li>– Dry ink for DocuPrint 96/4635 MICR NPS/IPS (1 carton black)</li> </ul> </li> </ul> <p>After installation, you will need to establish a procedure for ordering supplies according to your ongoing production requirements.</p>	Chapter 4, Appendix A and sales rep	Xerox Customer and Xerox	<p>_____</p> <p>_____</p>
-1	<ul style="list-style-type: none"> <li>• Schedule operator training.</li> <li>• Define parameters needed to configure PSF for connectivity to the NPS/IPS printer.</li> </ul>	Systems analyst	Customer and Xerox	<p>_____</p>

**Table 4-1. DocuPrint NPS/IPS installation planning checklist (Continued)**

Week	Activity	Reference	Responsibility	Date completed
Install	<ul style="list-style-type: none"> <li>• Ensure supplies are available.</li> <li>• Ensure system administrators are available during software installation.</li> <li>• Provide preinstallation checklist and network address of print server (or host file containing this information) to Xerox personnel. Also, designate two client workstations if applicable, for Xerox client software installation.</li> <li>• Provide host channel address and channel unit address (if printing via channel).</li> <li>• Provide host IP address.</li> <li>• Sysgen your host to print to an AFP Type 1, Group 3 printer.</li> <li>• Set up Data Transfer Mode.</li> <li>• Install DocuPrint system hardware and software.</li> <li>• Load Xerox client software on client workstations.</li> <li>• Have operators available for training.</li> <li>• Check documentation and software kits for completeness.</li> <li>• Have test jobs ready to run.</li> <li>• Provide stocks needed for default input configuration.</li> <li>• Provide parameters needed to configure PSF for connectivity to the NPS/IPS printer.</li> </ul>	<p>Chapter 4 and Appendix A</p> <p>Chapter 4</p> <p><i>Guide to Configuring and Managing the System</i></p> <p>Appendix B</p> <p><b>TBD</b></p>	<p>Customer Customer</p> <p>Customer</p> <p>Xerox Customer Customer</p> <p>Customer</p> <p>Customer Customer</p> <p>Customer</p>	<p>_____</p>
Post-install	<ul style="list-style-type: none"> <li>• Become familiar with support services available.</li> <li>• Establish supplies ordering procedure.</li> <li>• Provide ongoing printer controller and DocuPrint printer maintenance.</li> <li>• Adjust the printer alignment and magnification.</li> <li>• Order additional documentation, as necessary.</li> </ul>	<p>Appendix B</p> <p>Appendix A</p> <p><i>Guide to Performing Routine Maintenance</i></p> <p>Appendix B</p>	<p>Customer</p> <p>Customer</p> <p>Customer and Xerox</p> <p>Xerox</p> <p>Customer</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

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## NPS/IPS network installation checklist

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The DocuPrint NPS/IPS system is installed and configured by your service representative. The service representative needs certain information about your network environment to complete the DocuPrint printer controller software installation. Use the “Network preinstallation checklist” table in this chapter to gather the necessary information for the installation.

Some of the items in the checklist may not apply to your environment. Fill in those items that you know may apply, and refer to your network administrator for information, if necessary.

*NOTE: If you are installing the DocuPrint NPS/IPS in a Novell NetWare environment, refer to this chapter and your Novell network NPS/IPS administrator to assist you in completing the checklist in the “Network preinstallation checklist” table.*

The information you may need to provide is defined as follows:

- Hostname** A unique name that designates a node on the network. You may use up to 32 characters: upper and lower case alpha (a-z and A-Z), integers (0-9), and hyphens (-). The name you choose may be the same as the printer name.
- IP address** Series of four integers between 0 and 255 separated by a period, such as 192.9.200.1, to create an IP address for the DocuPrint system. (Do not use all zeros or designate 255 for all integers when assigning an IP address.)
- You must assign a unique, valid IP address for each TCP/IP network to which the NPS/IPS is attached.
- NOTE: To avoid routing problems that will slow down the controller, the IP addresses you assign must belong on different TCP/IP subnets, as determined by the IP subnet netmask.*
- If you are not on a TCP/IP network, use the Xerox-supplied IP address value (192.9.200.1), or the IP address value assigned by your network administrator.
- IP netmask** Series of four integers between 0 and 255 separated by a period, such as 255.255.255.0 to create an IP netmask. (Do not use all zeros or designate 255 for all integers when assigning an IP netmask, and do not use the IP address value.)

- If you are on a TCP/IP network, assign a valid IP netmask.
- If you are not on a TCP/IP network and you used the Xerox-supplied IP address value (192.9.200.1), use 255.255.255.0 for the IP netmask.

**IP broadcast address**

Series of four integers between 0 and 255 separated by a period, such as 255.255.255.0, to create an IP broadcast address. (Do not use the IP address value.)

- If you are on a TCP/IP network, assign a valid IP broadcast address.
- If you are not on a TCP/IP network, use the Xerox-supplied IP broadcast address value (255.255.252.0), which is a plus (+) sign.

**Default router**

Series of four integers between 0 and 255 separated by a period, such as 188.9.234.1, to specify a default router. Most TCP/IP networks broadcast routing information.

**CAUTION**

*Specify a default router only if your network does not specify broadcast routing information.*

- If the TCP/IP network does not broadcast routing information, specify an IP address of an existing router that is on the same subnet as the DocuPrint.
- If you are not on a TCP/IP network, specify the default of NONE.

**Superuser password (UNIX root password)**

Select a password to prevent unauthorized access to your superuser account. You can select a series of any ASCII characters, except those that your UNIX system interprets in a special way. Passwords have no limits on the number of characters, but the system uses only the first eight characters to administer password security. The password selection you make is case sensitive to the system.

## CAUTION

*Select a password that cannot be easily obtained by others to avoid unauthorized access to your account. This is not the same password used for Operator or Administrator functions.*

<b>AppleTalk network information</b>	<p>If the DocuPrint NPS/IPS is installed in an AppleTalk network environment, indicate whether your AppleTalk network is phase 1 or 2. Also, indicate the AppleTalk zone name you want the DocuPrint to locate. The zone name must be the same name as the existing zone used on the network to which the DocuPrint is attached. In addition, you must specify the network device on which AppleTalk runs.</p> <p><i>NOTE: Do not use the ampersand (“&amp;”) in the zone name to avoid conflict with UNIX expressions. If the ampersand character must be used, enter “\&amp;” instead.</i></p>
<b>Accounting information</b>	<p>Indicate whether to set an interval on the system to automatically purge accounting information. If accounting information is not purged manually or automatically, the system disk can reach storage limits. To keep your system running at optimum speed, you need to periodically purge accounting data.</p>
<b>Xerox client software</b>	<p>Indicate whether you have Xerox client software installed, and are supporting Xerox clients on the network.</p>
<b>lpr and lpd</b>	<p>Indicate whether to enable client use of lpr and lpd job submission and status commands.</p>
<b>UNIX command tool</b>	<p>Indicate whether to have a UNIX command tool available for use in the background menu.</p>
<b>Retry count</b>	<p>Determine whether the DocuPrint NPS/IPS system supports a print production environment, or whether the system remains unattended. Once you determine the environment the DocuPrint NPS/IPS supports, you must decide the number of attempts the system makes to print a job before a sequencer restart causes the job to be held for intervention.</p> <ul style="list-style-type: none"><li>• If the DocuPrint NPS/IPS supports a print production environment, you may want to specify a large number or zero as the number of attempts the system makes to retry a print job. (Zero indicates an infinite number of retries.)</li></ul>

- If the DocuPrint NPS/IPS is unattended, you may want to specify only one or two retries to print a job.

### **Novell network information**

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The Novell network information you provide to your service representative is based on whether you configure the DocuPrint as a print server or a remote printer. Refer to this chapter and your Novell network administrator for assistance, if necessary.

#### **DocuPrint as a print server (PSEVER)**

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Provide the following information to the service representative if you configure DocuPrint NPS/IPS as a print server on the Novell network (for further information, refer to the “Installation process” section in the “Installation” chapter of this guide):

- **Novell file server name:** Indicates the name of the file server that the DocuPrint NPS/IPS services. The file server must have the appropriate print server definition and the queue to be serviced.
- **Print server name:** Indicates the name used by the DocuPrint NPS/IPS print server. A print server definition with this name must exist on the file server that the DocuPrint NPS/IPS services. A single printer (type Remote Other/Unknown) must be defined for this print server and the queue (refer to the queue name below).
- **Password for the print server:** Refers to a password you may have added in the print server definition (using PCONSOLE). It is not necessary to add a password to a print server, and there is no default password.
- **Queue name to service:** Refers to the name of the queue from which the DocuPrint print server accepts jobs. The queue must be defined on the file server that the DocuPrint NPS/IPS services. The single printer that must be defined for the print server (as stated above) must also be defined to service the specified queue.
- **Form names:** Distinct form names for DocuPrint NPS/IPS that map to the DocuPrint virtual printer names.

## **DocuPrint NPS/IPS as a remote printer (RPRINTER)**

Provide the following information to the service representative if you configure DocuPrint NPS/IPS as a remote printer on the Novell network (for further information, refer to the “Installation process” section in the “Installation” chapter of this guide):

- **Novell print server name:** Indicates the name of the print server to which the DocuPrint NPS/IPS will connect. An advertising print server with this name must be running on the Novell internet.
- **Printer names to service:** Refers to the name or names of the printers defined for the Novell print server. Virtual printers should be defined with these names after DocuPrint NPS/IPS installation is complete. These printers should be defined as type Remote Other/Unknown.

<b>IPX internal network number</b>	Specify the network number for the internal IPX network in the DocuPrint server. This number must be globally unique within the NetWare internet to which the DocuPrint NPS/IPS is connected. (Do not assign a number that is used by other machines to which the DocuPrint NPS/IPS will be connected.)
<b>LAN network number</b>	Specify the network number for the cabling system to which the DocuPrint NPS/IPS is connected, for example the Ethernet or Token Ring segment.
<b>Network framing type</b>	Specify the network framing type used for IPX/SPX communication by DocuPrint NPS/IPS. There are eight options: <ul style="list-style-type: none"><li>• ETHERNET__II</li><li>• ETHERNET__802.3</li><li>• ETHERNET__802.2</li><li>• ETHERNET__SNAP</li><li>• TOKENRING</li><li>• TOKENRING__SNAP</li><li>• FDDI</li><li>• FDDI__SNAP.</li></ul>

Choose a framing type used by the file server that communicates with DocuPrint NPS/IPS. If you are using print server or remote printer, and have the DocuPrint NPS/IPS communicate with a different machine for each, then choose a framing type that is used by both of the machines.

If you are installing a new Novell network using Ethernet, it is recommended that you choose the ETHERNET\_\_II framing type for the file server and the DocuPrint NPS/IPS. If you are using Token Ring and the Novell server has both TOKENRING and TOKEN RING\_SNAP enabled, use TOKENRING on the DocuPrint NPS/IPS. For FDDI networks running Novell, it is recommended that you choose the FDDI framing type.

**Table 4-2. Network preinstallation checklist**

Network Information	Information you supply
Hostname	
IP address for primary net device	
IP netmask for primary net device	
IP address for secondary net device #1 (if applicable)	
IP netmask for secondary net device #1 (if applicable)	
IP address for secondary net device #2 (if applicable)	
IP netmask for secondary net device #2 (if applicable)	
IP address for secondary net device #3 (if applicable)	
IP netmask for secondary net device #3 (if applicable)	
Primary network device	
Default router	
Secondary network devices (if applicable)	
Superuser password	
Accounting information	
Xerox client software	
lpr and lpd	
UNIX command tool	
Retry count	

**Table 4-3. Novell preinstallation checklist**

<b>Novell Network Information</b>	<b>Information you supply</b>
Novell network information (DocuPrint NPS/IPS as a print server) Novell file server name Print server name Password for the print server Queue name to service Form names	
Novell network information (DocuPrint NPS/IPS as a remote printer) Novell print server name Printer names to service	
IPX internal network number	
LAN network number	
Ethernet framing type (ETHERNET__II, 802.3, 802.2, or SNAP; TOKENRING or TOKENRING_SNAP)	

**Table 4-4. AppleTalk preinstallation checklist**

<b>AppleTalk Network Information</b>	<b>Information you supply</b>
AppleTalk Phase 1 or 2	
AppleTalk zone name	
Network device used for the AppleTalk protocol	

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## **Connectivity requirements**

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A Token Ring network or an Ethernet local area network (LAN) running Transmission Control Protocol/Internet Protocol (TCP/IP), AppleTalk, or Novell NetWare software is a network communications system, which can be used as an alternative to the channel-attached configuration in which data is transmitted via bus and tag cables and the HCU. This network communication system is used to transport documents from the client workstation to the printer.

### **Ethernet specifications**

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**Reviewers: Should we keep the second or the third paragraph below?**

The Ethernet connection to the printer controller processor must be compatible with the Institute of Electrical and Electronics Engineers (IEEE) 802.3

standard.

The Ethernet interface on the processor is a 10Mb/sec twisted pair standard (10BaseT and 100BaseT). The MII (for UltraSPARC) Coax Ethernet is enabled with an adapter cable.

The Ethernet interface on the printer controller processor is a 10Mb/sec twisted pair standard (10BaseT and 100BaseT). Attachment Unit Interface (AUI) Coax Ethernet is enabled with an adapter cable.

Work with your system administrator to assess what type of network you have and what modifications need to be made to supply an Ethernet connector to the printer controller processor.

### **Token Ring specifications**

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The Token Ring connection must be compatible with the IEEE 802.3 standard. The printer controller processor has a 4 MB/16 MB Token Ring interface (16 MB is preferred).

### **Channel-attached specifications**

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For an online configuration with an IBM host system, the following cables must be available:

- Bus and tag cables (bus in, bus out, tag in, tag out)
- Terminators (if necessary, due to location on channel).

For your convenience, it is possible to order the bus and tag cables for the printer through Xerox on a purchase-only basis. Contact your Xerox sales representative for current pricing and order information.

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## 5. Controller specifications and requirements

This chapter provides power and space requirements for your DocuPrint NPS/IPS printer controller. It also provides controller environmental specifications.

For facts about printer power and space requirements, refer to the “Printer specifications and requirements” chapter of this guide.

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### Power requirements

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Your DocuPrint NPS/IPS controller has important power requirements that must be accommodated. These requirements are summarized in the table below.

For details on printer power requirements, refer to the “Printer specifications and requirements” chapter of this guide.

**Table 5-1. NPS/IPS controller**

<b>Sun Blade 1000 or Sun Ultra 60 printer controller</b>	<b>Voltage</b>	<b>Amp service</b>	<b>KVA rating</b>	<b>NEMA</b>
60 HZ electrical requirements	100 to 240 VAC	15 amp	0.4 KVA	5-15R
50 HZ electrical requirements	100 to 240 VAC	15 amp	0.4 KVA	N/A

Agency certification: UL 478 and 1950, IEC 950, CSA 22.2 #220-1986, FCC (Class A), and VDE 0871 (Class A).

## Outlet configurations

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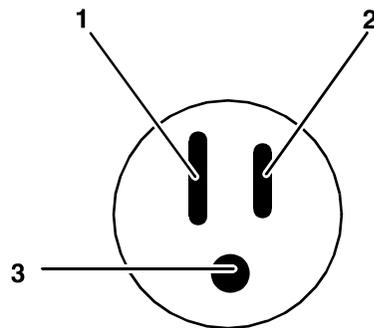
This section discusses specifications for system outlets and the required wall outlet configurations for the USA/Canada and internationally.

*NOTE: All power outlets must be dedicated to this equipment. When determining the electrical connections for your printing system, make sure that:*

- *Each power cord has a separate circuit*
- *The printer power cord configurations match your receptacle*
- *Your electrical outlets are within the required specifications.*

**50 Hz systems:** *Ensure that power connections are per local codes/regulations.*

The following figure shows a 60 Hz American and Canadian wall outlet in which to plug the printer controller.



**Figure 5-1. 60 Hz wall outlet**

1. AC Neutral
2. AC Hot (ACH)
3. Earth Ground (GND)

The required American and Canadian wall outlet voltage is 100 to 120 VAC between AC hot and neutral, and between AC hot and GND. The voltage is less than three VAC between GND and neutral.

Refer to the 60 Hz and 50 Hz controller electrical requirements tables earlier in this chapter for a description of the power specifications for the controller.

## WARNING

To reduce the risk of electrical shock, do not plug components into any other type of power system. Contract your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your work area.

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## Environmental specifications

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The environmental requirements for the DocuPrint NPS/IPS controller are all satisfied by the printer module. Refer to the “Printer specifications and requirements” chapter of this guide.

**Table 5-2. Heat dissipation specifications for the DocuPrint NPS/IPS controller**

Heat dissipation	
Processor/ monitor	1,100 BTU per hour
HCU	408 BTU per hour

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## Space requirements

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This section provides recommendations for placement of printer controller hardware components.

For printer component space requirements, refer to the “Printer specifications and requirements” chapter of this guide. Contact your service representative if you have questions not specifically addressed in this guide.

### Printer controller placement

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You should consider the following factors when deciding where to place the DocuPrint printer controller:

- Adequate work space and service clearance around the equipment
- Proximity to electrical and network connectors
- Security of the work area. You may need to place the system in an area where you can restrict access to it.

You must supply a table or desk as a work surface for the printer controller, and the HCU if this is part of the system configuration. The top of the table must provide at least 36 by 36 inches / 91 by 91 cm of space for each component, to allow enough space for the components and cables, as well as for service access.

Refer to the “Printer controller specifications and requirements” summary table at the end of this chapter to make sure the tables you supply can support the weight of the printer controller hardware elements, and that they are suitable for the intended use.

### **WARNING**

**The printer controller must be positioned within the line-of-sight of the printer for safety purposes while servicing the equipment.**

### **CAUTION**

*Position the table at least 6 inches / 15.2 cm from the wall. Make sure the printer controller processor is at least 12 inches / 30.4 cm from the wall. Do not put the processor on the NPS/IPS printer.*

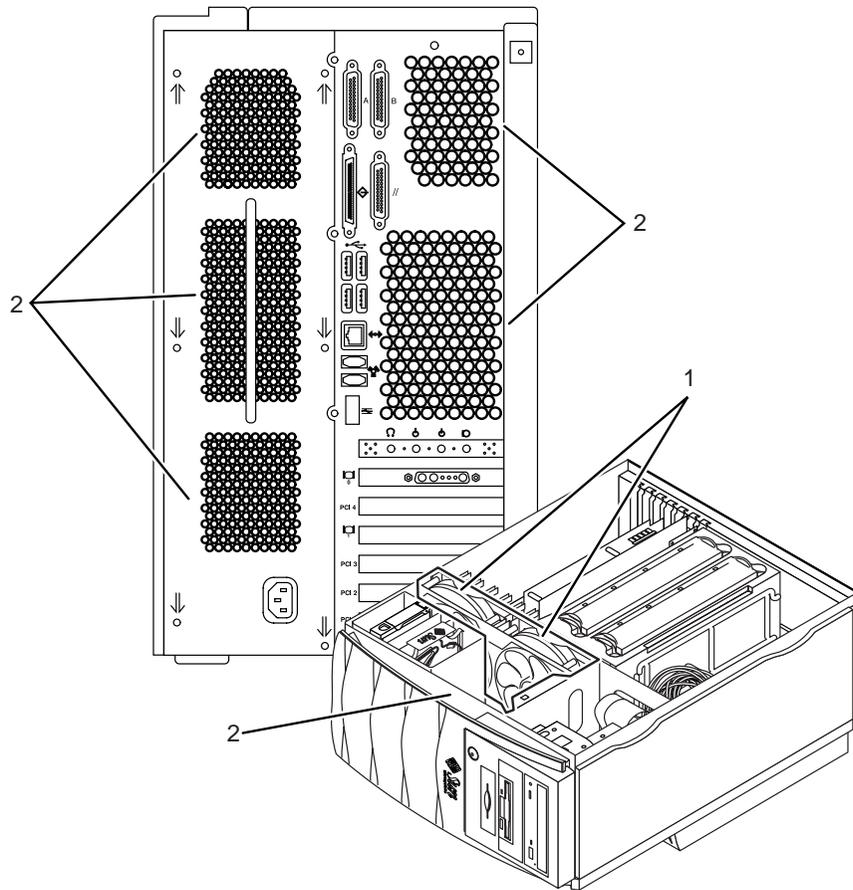
### **Sun Blade 1000 workstation placement**

Following are guidelines for placement of the Sun Blade 1000 workstation components of the printer controller.

#### **Do:**

- Place the monitor and processor on a desk or table top, separate from the printer.
- Keep the processor in an upright, vertical position.
- Allow at least 6 inches / 152 mm of unobstructed space at the front and rear of the processor, so the fan and vents are not blocked.

The following illustration shows the fans and vent locations on the front and back of the controller.



**Figure 5-2. Sun Blade 1000 fan and vent locations to keep clear**

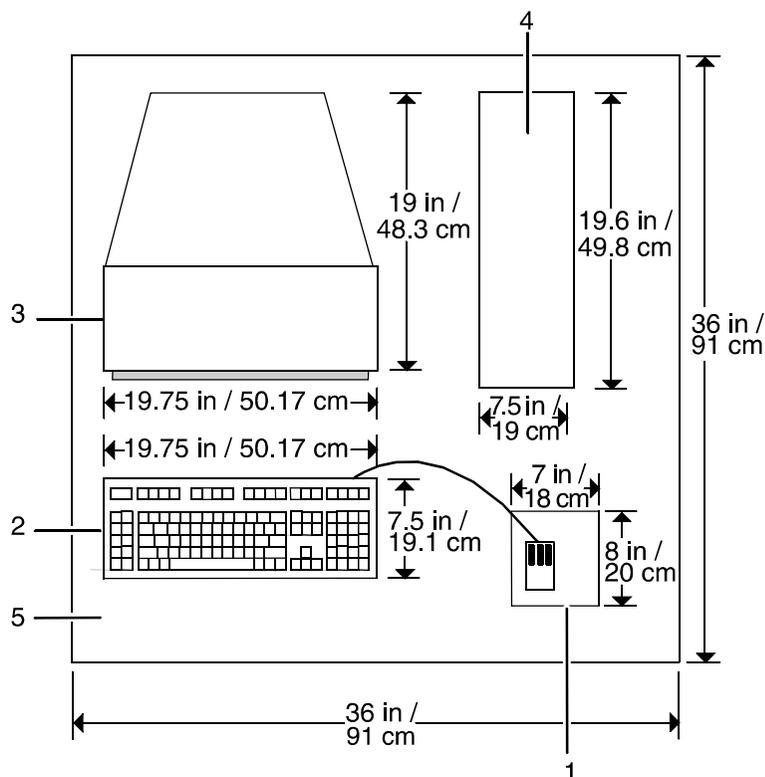
1. Vents inside the processor
2. Vents in front and back of processor

**Do not:**

- Do not place the controller monitor on top of the processor.
- Do not allow any piece of equipment to blow warm air into the air intake vents of the processor.
- Do not place the processor on its side, or in any other position but the upright, vertical position.
- Do not place the processor or monitor on top of the printer.

**Sun Ultra 60 workstation placement**

Following are guidelines for placement of the Sun Ultra 60 workstation components of the printer controller.



**Figure 5-3. Sun Ultra 60 printer controller hardware**

1. Mouse and mouse pad
2. Keyboard
3. Monitor
4. Processor
5. Table

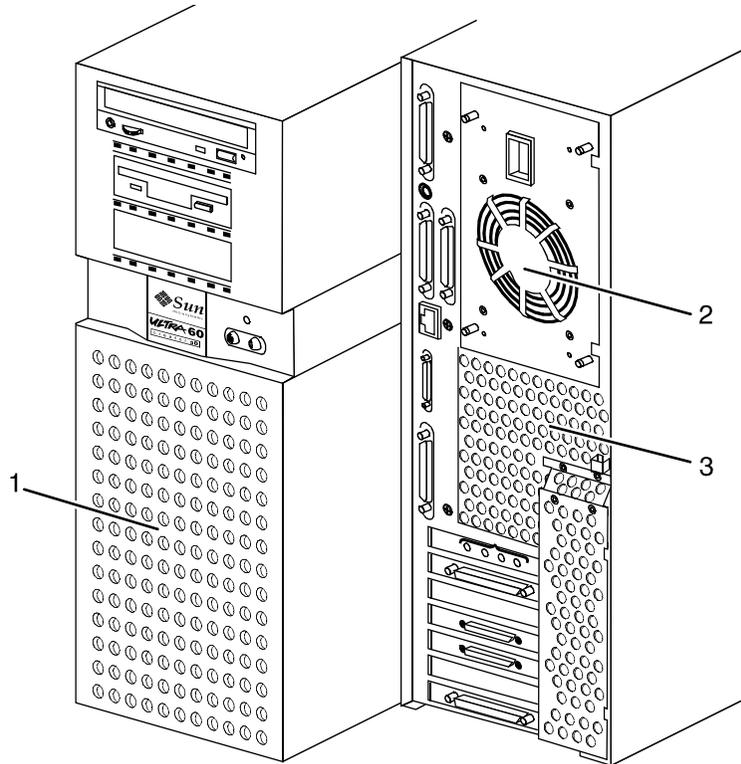
To ensure consistent performance and avoid any damage to equipment, follow these rules for placing the components of the Sun Ultra 60 controller.

**Do:**

- Place the monitor and processor on a desk or table top, separate from the printer. The monitor should be placed beside the processor, on the same surface. (The cartridge tape drive may be placed on top of the processor.)
- Keep the processor in an upright, vertical position as illustrated below.

- Allow at least 6 inches / 152 mm of unobstructed space at the front and rear of the processor, so the fan and vents are not blocked.

The following illustration shows fan and vent locations on the front and back of the controller.



**Figure 5-4. Sun Ultra 60 fan and vent locations to keep clear**

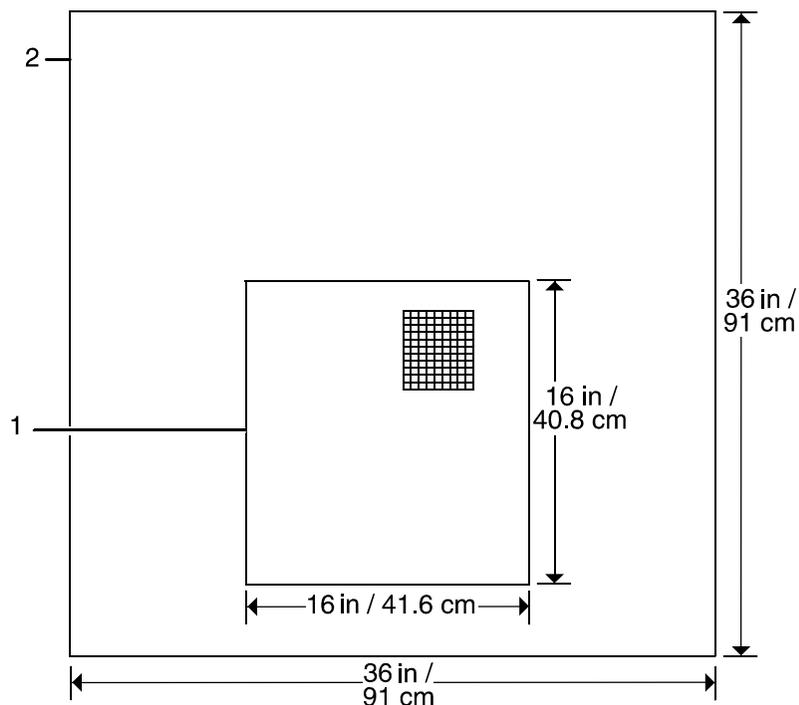
1. Vent in front of processor
2. Fan in back of processor
3. Vent in back of processor

**Do not:**

- Do not place the controller monitor on top of the processor.
- Do not allow any piece of equipment to blow warm air into the air intake vents of the processor.
- Do not place the processor on its side, or in any other position but the upright, vertical position shown in the previous figure.
- Do not place the processor or monitor on top of the printer.

**HCU placement  
(channel-attached  
systems only)**

The following shows the recommended HCU hardware placement, for channel-attached systems that do not use the Groupe Set board.



**Figure 5-5. HCU hardware (for channel-attached systems)**

1. HCU
2. Table

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**Controller hardware specifications and requirements summary**

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The following table summarizes the specifications and electrical requirements of your DocuPrint NPS/IPS printer controller hardware components.

For a summary of printer hardware specifications and requirements, refer to the “Printer specifications and requirements” chapter of this guide. Contact your service representative if you have questions not specifically addressed in this guide.

Table 5-3. DocuPrint NPS/IPS printer controller specifications and power requirements: Sun Blade 1000

Device	Dimensions (depth, width, height)	Weight	Heat dissipation	Power requirements	Cable lengths
Processor	d=25 in. / 63.5 cm w=10 in. / 25.4 cm h=17.75 in. / 45.1 cm	70 lbs. / 31.8 kgs	1,100 BTU per hour	<b>60 Hz:</b> 100 to 240 VAC, 15 amp, 0.4 KVA, 5-15 NEMA  <b>50 Hz:</b> 100 to 240 VAC, 15 amp, 0.4 KVA	Power: 8 ft. / 2.4 m  Interface to printer: 20 ft. / 6.1 m usable length
Monitor	d=10 in. / 25.4 cm w=17.5 in. / 44.5 cm h=18.5 in. / 47 cm	18 lbs. / 8.2 kg	408 BTU per hour	100-120 ~ VAC, 1 phase, 50-60 Hz, 3.0 amp, 0.4 KVA  200-240 ~ VAC, 1 phase, 50-60 Hz, 2.0 amp, 0.4 KVA	Video cable to processor: 46 in. / 1.17 m
4 mm cartridge tape drive	d=12.25 in. / 31 cm w=7.5 in. / 19 cm h=2.75 in. / 7 cm	8 lbs. / 6.6 kg	---	100-120/200-240 VAC, 0.8/0.4 amp, 47-63 Hz	SCSI cable to processor or additional SCSI device: 28 in. / 71 cm
Keyboard	d=7.5 in. / 19.1 cm w=20 in. / 50.8 cm	2 lbs. / 1kg	---	---	72 in. / 1.8 m
Mouse	d=3 in. / 8 cm w=4 in. / 10 cm h=2 in. / 5 cm	0.3 lbs. / 0.14 kg	---	---	25 in. / 63 cm
Channel interface board and channel cable connector box (channel attached systems only)	d=9.7 in. / 24.6 cm w=27.1 in. / 68.8 cm	---	---	100 to 240 VAC, 15 amp, 0.4 KVA	Bus and tag cables must conform to host system requirements (200 gray cable to 400 ft. blue cable / 66.7 to 133.3 m) and accommodate system setup.  Cable from board to box: 3 ft / 91.5 cm

## Controller specifications and requirements

Table 5-4. DocuPrint NPS/IPS printer controller specifications and power requirements:  
Sun Ultra 60

Device	Dimensions (depth, width, height)	Weight	Heat dissipation	Power requirements	Cable lengths
Processor	d=17.5 in. / 44.5 cm w=17.5 in. / 44.5 cm h= 5 in. / 12.7 cm	27 lbs. / 12.7 kgs	1,100 BTU per hours	<b>60 Hz:</b> 100 to 240 VAC, 15 amp, 0.4 KVA, 5-15 NEMA  <b>50 Hz:</b> 100 to 240 VAC, 15 amp, 0.4 KVA	Power: 8 ft. / 2.4 m  Interface to printer:  20 ft. / 6.1 m usable length
Monitor	d=21 in. / 53.3 cm w=19 in. / 48.3 cm h=21 in. / 53.3 cm	61 lbs. / 27.7 kg	408 BTU per hour	100-120 ~ VAC, 1 phase, 50-60 Hz, 3.0 amp, 0.4 KVA  200-240 ~ VAC, 1 phase, 50-60 Hz, 2.0 amp, 0.4 KVA	Video cable to processor:  46 in. / 1.17 m
4 mm cartridge tape drive	d=12.25 in. / 31 cm w=7.5 in. / 19 cm h=2.75 in. / 7 cm	8 lbs. / 6.6 kg	---	100-120/200-240 VAC, 0.8/0.4 amp, 47-63 Hz	SCSI cable to processor or additional SCSI device:  28 in. / 71 cm
Keyboard	d=7.5 in. / 19.1 cm w=20 in. / 50.8 cm	2 lbs. / 1kg	---	---	72 in. / 1.8 m
Mouse	d=3 in. / 8 cm w=4 in. / 10 cm h=2 in. / 5 cm	0.3 lbs. / 0.14 kg	---	---	25 in. / 63 cm
Host Channel Unit (HCU) (channel- attached systems only)	d=15 in. / 40.8 cm w= 16 in. / 41.6 cm h=5 in. / 12.6 cm	26 lbs. 10 oz. / 12.4 kgs	---	120 VAC within 6 feet; 120 volt at 2 amps or 240 volt at 1 amp	Bus and tag cables must conform to host system requirements (200 gray cable to 400 ft. blue cable / 66.7 to 133.3 m) and accommodate system setup.
Channel interface board and channel cable connector box (channel attached systems only)	d=9.7 in. / 24.6 cm w= 27.1 in. / 68.8 cm	---	---	100 to 240 VAC, 15 amp, 0.4 KVA	Cable from board to box: 3 ft / 91.5 cm

## 6. Printer specifications and requirements

This chapter provides power and space requirements for your 96/4635/180 printer. It also provides printer environmental specifications.

For facts about controller power and space requirements, refer to the “Controller specifications and requirements” chapter of this guide.

### Power requirements

Your 96/4635/180 printer has important power requirements that must be accommodated. These requirements are summarized in the table below. For further details on power requirements, refer to the voltage charts and wiring diagrams that follow.

For details on controller power requirements, refer to the “Controller specifications and requirements” chapter of this guide.

Table 6-1. Printer electrical requirements

	Printer	Voltage	Amp. service	KVA rating	NEMA
Printer — 60 Hz (U. S. and Canada)	<b>180</b> (Dual cords)	120/240 VAC or 120/208 VAC (Cord 1)	50 amp (Cord 1)	<b>Operating:</b> 7.3 + .75 per middle module stacker	14-50R (Cord 1)
		120/240 VAC or 120/208 VAC (Cord 2)	30 amp (Cord 2)		14-30R (Cord 2)
	96/4635	120/240 VAC or 120/208 VAC	50 amp	<b>Operating:</b> 7.3 + .75 per middle module stacker	14-50R
Printer— 50 Hz DELTA	<b>180</b> <b>4635</b> <b>96</b>	220, 230, 240 VAC (3 phase, 4 wire)	30 amp	Consult local service rep.	
<b>WYE</b> <b>(Star)</b>	180 <b>4635</b> <b>96</b>	380, 400, 415 VAC (3 phase, 5 wire)	20 amp	Consult local service rep.	

Agency certification: UL 478 and 1950, IEC 950, CE Mark, CSA 22.2 #220-1986, FCC (Class A), and VDE 0871 (Class A).

### Outlet configurations

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This section discusses specifications for system outlets and the required wall outlet configurations for the USA / Canada and internationally.

*NOTE: All power outlets must be dedicated to this equipment. When determining the electrical connections for your printer, make sure that:*

- *Each power cord has a separate circuit*
- *The printer power cord configurations match your receptacle*
- *Your electrical outlets are within the required specifications.*

50 Hz systems: Ensure that power connections are per local codes/regulations.

### Printer outlet voltages—60 Hz

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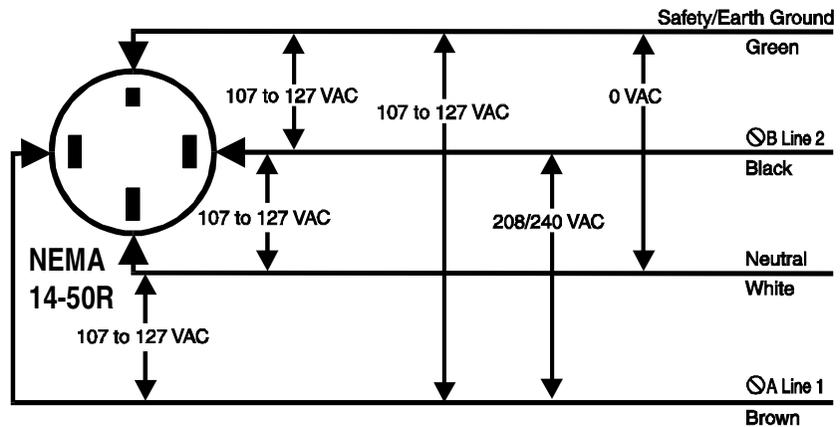
The following table shows the voltages for the outlets on your printing system. All power outlets must have a dedicated circuit for each system equipment piece. Make sure each power cord has a separate circuit.

Table 6-2. **Printer (60 Hz) voltage requirements at power outlet**

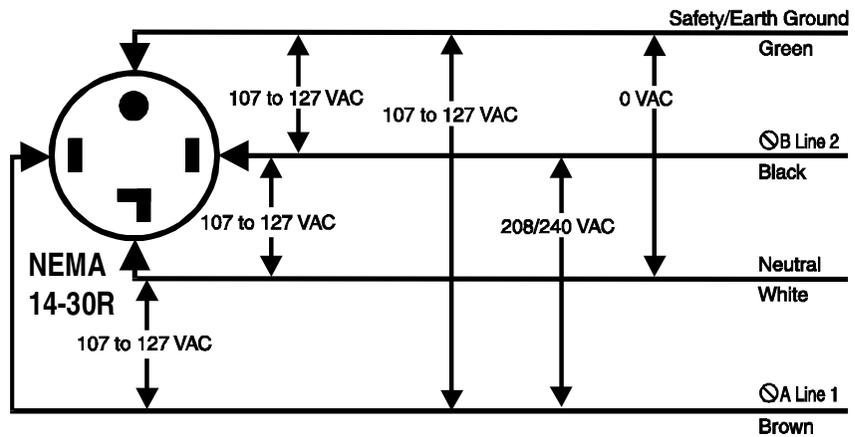
Service outlet configuration	Measurement of wiring	Nominal	Range
4 Wire	Line 1 to neutral	120 V RMS	107-127 V RMS
4 Wire	Line 2 to neutral	120 V RMS	107-127 V RMS
4 Wire	Neutral to ground	0	0-10 V RMS
4 Wire	Line 1 to line 2	208 V RMS	182-220 V RMS
4 Wire	Line 1 to line 2	240 V RMS	210-254 V RMS

#### **Printer power outlet/cord voltage configurations—60 Hz**

The following figures shows the 60 Hz power outlet configuration for 50 amp NEMA 14-50R (96, 4635, and 180) and 30 amp NEMA 14-30R (180 only). Voltage to ground is shown for troubleshooting purposes.



**Figure 6-1. 60 Hz power configuration—50 amp (96/4635/180)**



**Figure 6-2. 60 Hz power configuration - 30 amp (180 only)**

### Printer outlet voltages—50 Hz

All power outlets must have a dedicated circuit for each system equipment piece. Make sure each power cord has a separate circuit.

*NOTE: Consult with your service representative to determine the type of plug and receptacle to be used for your 50 Hz system.*

**DELTA configurations—  
50 Hz**

For 50 Hz DELTA configurations, measure the DELTA connection voltages at the power source.

**Table 6-3. Printer (50 Hz) DELTA voltage**

Service outlet configuration	Measurement	Nominal	Range
4 Wire 220 V	Line 1 to line 2	220 V RMS	198-242 V RMS
4 Wire 220 V	Line 2 to line 3	220 V RMS	198-242 V RMS
4 Wire 220 V	Line 1 to line 3	220 V RMS	198-242 V RMS
4 Wire 230 V	Line 1 to line 2	230 V RMS	207-253 V RMS
4 Wire 230 V	Line 2 to line 3	230 V RMS	207-253 V RMS
4 Wire 230 V	Line 1 to line 3	230 V RMS	207-253 V RMS
5 Wire 240 V	Line 1 to line 2	240 V RMS	216-264 V RMS
5 Wire 240 V	Line 2 to line 3	240 V RMS	216-264 V RMS
5 Wire 240 V	Line 1 to line 3	240 V RMS	216-264 V RMS

**WYE (or Star) configurations—  
50 Hz**

For the 50 Hz WYE configuration, measure the WYE or Star connection voltages at the power source.

**Table 6-4. Printer (50 Hz) WYE (Star) 415 voltage**

Service outlet configuration	Measurement	Nominal	Range
5 Wire 415 V	Line 1 to line 2	415 V RMS	374-457 V RMS
5 Wire 415 V	Line 2 to line 3	415 V RMS	374-457 V RMS
5 Wire 415 V	Line 1 to line 3	415 V RMS	374-457 V RMS
5 Wire 415 V	Line 1 to neutral	240 V RMS	216-264 V RMS
5 Wire 415 V	Line 2 to neutral	240 V RMS	216-264 V RMS
5 Wire 415 V	Line 3 to neutral	240 V RMS	216-264 V RMS

The following lists the 50 Hz WYE/Star printer outlet information for 380 and 400 volts.

**Table 6-5. Printer (50 Hz) WYE (Star) 380 and 400 voltage**

Service outlet configuration	Measurement	Nominal	Range
5 Wire 380 V	Line 1 to line 2	380 V RMS	342-419 V RMS
5 Wire 380 V	Line 2 to line 3	380 V RMS	342-419 V RMS
5 Wire 380 V	Line 1 to line 3	380 V RMS	342-419 V RMS

Table 6-5. **Printer (50 Hz) WYE (Star) 380 and 400 voltage (Continued)**

Service outlet configuration	Measurement	Nominal	Range
5 Wire 380 V	Line 1 to neutral	220 V RMS	198-242 V RMS
5 Wire 380 V	Line 2 to neutral	220 V RMS	198-242 V RMS
5 Wire 380 V	Line 3 to neutral	220 V RMS	198-242 V RMS
5 Wire 400 V	Line 1 to line 2	400 V RMS	358-438 V RMS
5 Wire 400 V	Line 2 to line 3	400 V RMS	358-438 V RMS
5 Wire 400 V	Line 1 to line 3	400 V RMS	358-438 V RMS
5 Wire 400 V	Line 1 to neutral	230 V RMS	207-253 V RMS
5 Wire 400 V	Line 2 to neutral	230 V RMS	207-253 V RMS
5 Wire 400 V	Line 3 to neutral	230 V RMS	207-253 V RMS

**Printer power outlet/cord voltage configurations—  
50 Hz**

For 50 Hz systems outlet/power cord configurations, consult your local service representative to determine the type of plug and receptacle to use.

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## Environmental specifications

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When you select a site location for your DocuPrint printer, avoid environments with extreme variations in temperature and other hazards, such as excessive dust or humidity. Recommended environmental ranges for the work area are as follows:

Table 6-6. **Environmental specifications for 96/4635/180 printers**

Condition	Range
Operating temperature:	Recommended: 68° F to 76° F / 20° C to 24° C  Minimum: 50° F / 10° C Maximum: 85° F / 29° C
Humidity:	Recommended: 45% ±10%  Minimum: 30% Maximum: 65%
Altitude:	Normal: Up to 6,000 feet / 1,830 m above sea level  Maximum: 9,000 feet / 2,743 m above sea level.

Table 6-6. Environmental specifications for 96/4635/180 printers

Condition	Range
Heat dissipation:	
<b>96 and 4635 (2-stacker system)</b>	<b>Operating:</b> 28,140 BTU/hour <b>Standby:</b> 4,454 BTU/hour <b>Energy Saver:</b> 2,700 BTU/hour
<b>180 (2-stacker system)</b>	Operating: 32,770 BTU/hour Standby: 4,454 BTU/hour Energy Saver: 2,700 BTU/hour
Audible noise:	Operating: Continuous: 82 dB(A) Impulse: 82 dB(A)  Standby: Continuous: 52 dB(A) Impulse: N/A

## Space requirements

You should consider the following factors when deciding where to place the printing system hardware components:

- Adequate work space and service clearance around the equipment
- Proximity to electrical and network connectors
- Security of the work area. You may need to place the system in an area where you can restrict access to it. This may be important if your personnel need to print confidential documents or if you are concerned with unauthorized usage.

Dimensions and weights of the printer components are listed in this section, along with diagrams, to help you visualize the sizes and total space requirements.

*NOTE: There must be a 78-inch / 198-cm vertical clearance throughout the entire area. Your printer must be installed in a fixed location with a minimum clearance space of 36 inches / 91.4 cm around all sides of each piece of equipment for access by service personnel. In addition, there must be 50 inches / 126.9 cm clearance space in front of the printer.*

For information on clearance space and other space planning considerations, refer to the “Space planning guidelines” section of this chapter. Contact your service representative if you have questions not specifically addressed in this guide.

## Printer placement

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The following configurations are available for the Xerox 96/4635/180 printers:

- Printer + inverter feeder/stacker (96 only)
- Printer + inverter feeder/stacker + feeder/stacker
- Printer + inverter feeder/stacker + feeder/stacker + feeder/stacker (4635 and 180 only)
- Printer + inverter feeder/stacker + feeder/stacker + feeder/stacker + feeder/stacker (4635 and 180 only).

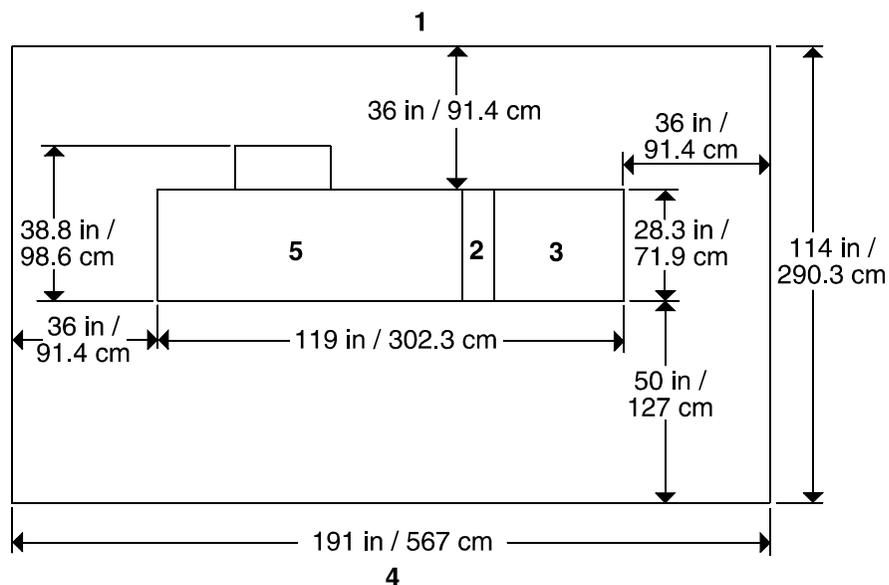
Measurements and a top-view diagram for each of these configurations is provided on the following pages.

### **96 printer with inverter feeder/stacker only**

The dimensions of the printer with the inverter feeder/stacker-only configuration are as follows:

Dimension	Specifications
Width:	119 inches / 302.3 cm
Depth:	38.8 inches / 98.6 cm
Height:	59.6 inches / 151.3 cm
Total weight:	1404 pounds / 6370 kg
Total space requirement:	191 by 114 inches / 567 by 290.3 cm

The following illustrates a top view of the space requirements for the printer with an inverter feeder/stacker-only configuration.



**Figure 6-3. 96 printer with inverter feeder/stacker configuration**

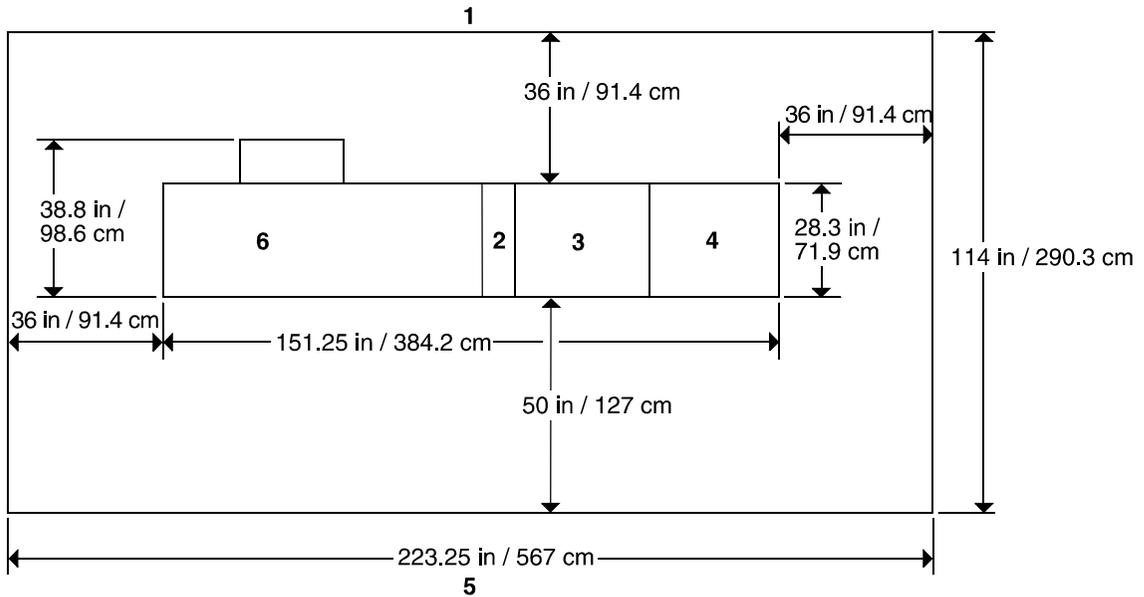
1. Back of system
2. Inverter
3. Feeder/stacker
4. Front of system
5. Printer

**96/4635/180 printer with inverter feeder/stacker and one feeder/stacker**

The dimensions of the printer with the inverter feeder/stacker and feeder/stacker are as follows:

Dimension	Specifications
Width:	151.25 inches / 384.2 cm
Depth:	38.8 inches / 98.6 cm
Height:	59.6 inches / 151.3 cm
Total weight:	2,588 pounds / 1174.9 kg
Total space requirement:	223.25 by 114 inches / 567 by 290.3 cm

The following illustrates a top view of the space requirements for the printer with an inverter feeder/stacker and one feeder/stacker.



**Figure 6-4. 96/4635/180 printer with inverter feeder/stacker + feeder/stacker configuration**

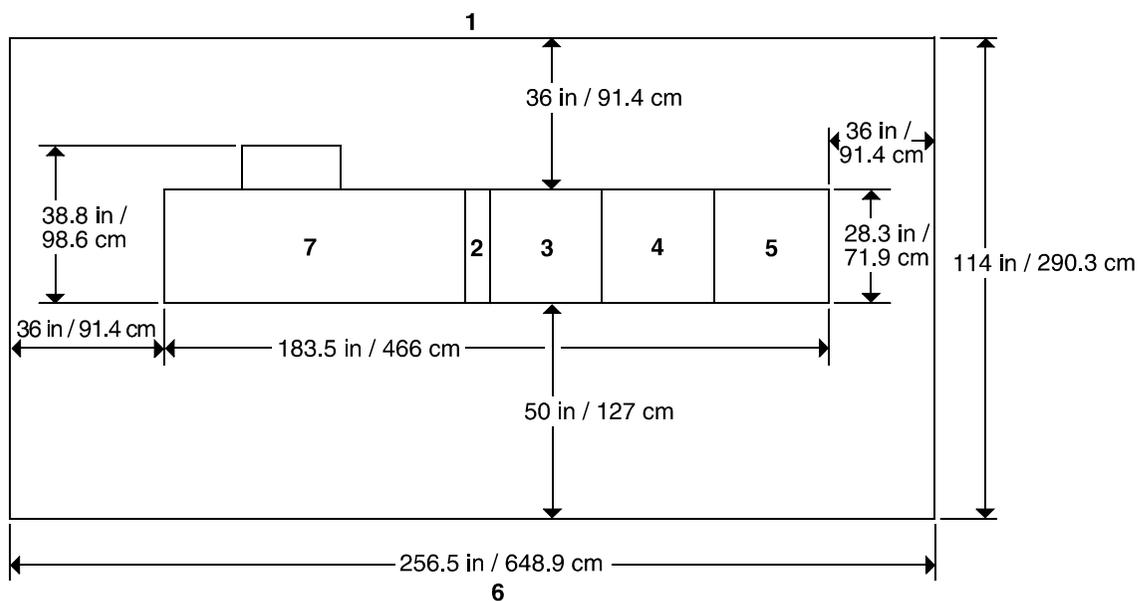
1. Back of system
2. Inverter
3. Feeder/stacker
4. Feeder/stacker
5. Front of system
6. Printer

**4635/180 printer with inverter feeder/stacker and two feeder/stackers**

The dimensions of the printer with the inverter feeder/stacker, and two feeder/stackers are as follows:

Dimension	Specifications
Width:	183.50 inches / 466.1 cm
Depth:	38.8 inches / 98.6 cm
Height:	59.6 inches / 151.3 cm
Total weight:	3,109 pounds / 1,411.9 kg
Total space requirement:	256.5 by 114 inches / 648.9 by 290.3 cm

The following illustrates a top view of the space requirements for the printer with an inverter feeder/stacker and two feeder/stackers.



**Figure 6-5. 4635/180 printer with inverter feeder/stacker + feeder/stacker + feeder/stacker**

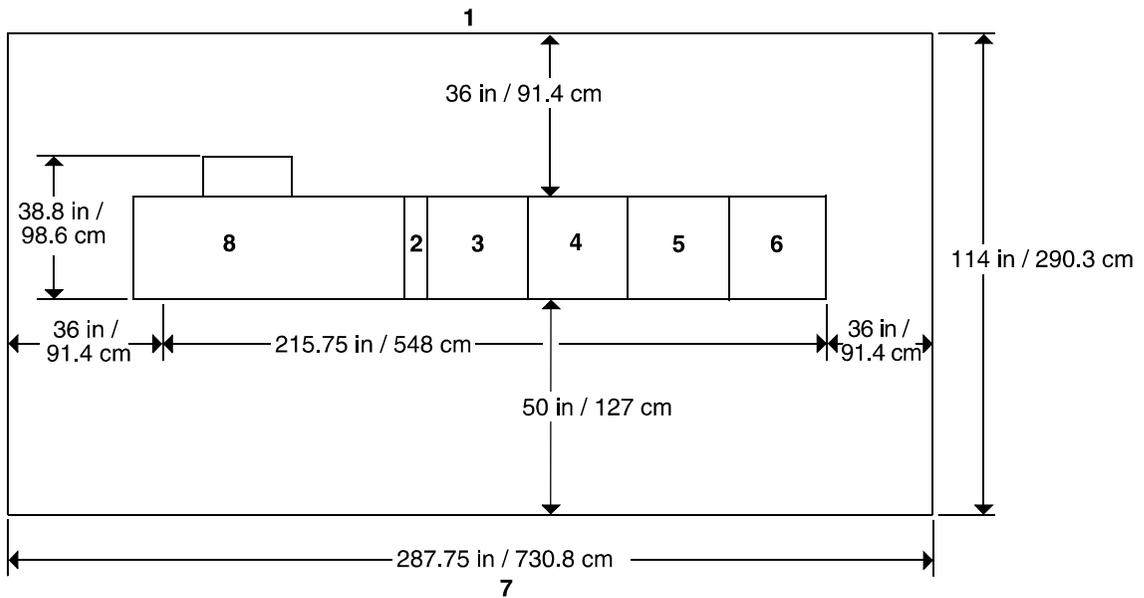
1. Back of system
2. Inverter
3. Feeder/stacker
4. Feeder/stacker
5. Feeder/stacker
6. Front of system
7. Printer

**4635/180 printer with inverter feeder/stacker and three feeder/stackers**

The dimensions of the printer with the inverter feeder/stacker and three feeder/stackers are as follows:

Dimension	Specifications
Width:	215.75 inches / 548 cm
Depth:	38.8 inches / 98.6 cm
Height:	59.6 inches / 151.3 cm
Total weight:	3,630 pounds / 1,648.9 kg
Total space requirement:	287.75 by 114 inches / 730.8 by 290.3 mm

The following illustrates a top view of the space requirements for the printer with a dual feeder and stitcher/stacker configuration.



**Figure 6-6. 4635/180 printer with inverter feeder/stacker + feeder/stacker + feeder/stacker + feeder/stacker configuration**

1. Back of system
2. Inverter
3. Feeder/stacker
4. Feeder/stacker
5. Feeder/stacker
6. Feeder/stacker
7. Front of system
8. Printer

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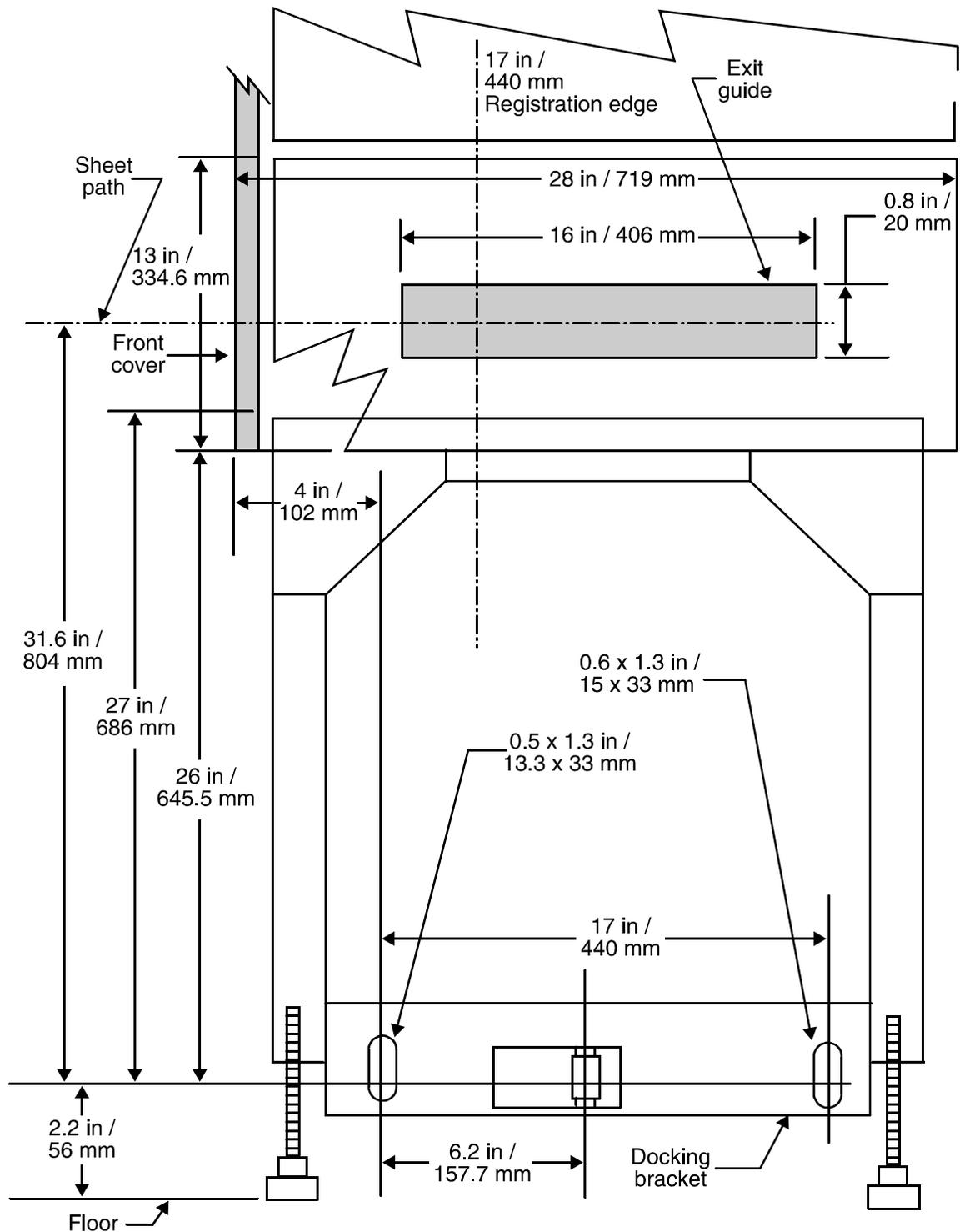
## Bypass transport specifications

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The bypass transport option enables you to add a third-party finishing device to your 96, 4635, or 180 printer. The bypass transport is installed by your service representative and remains permanently in place. You should not attempt to remove or reinstall it. The following is supported by the bypass transport:

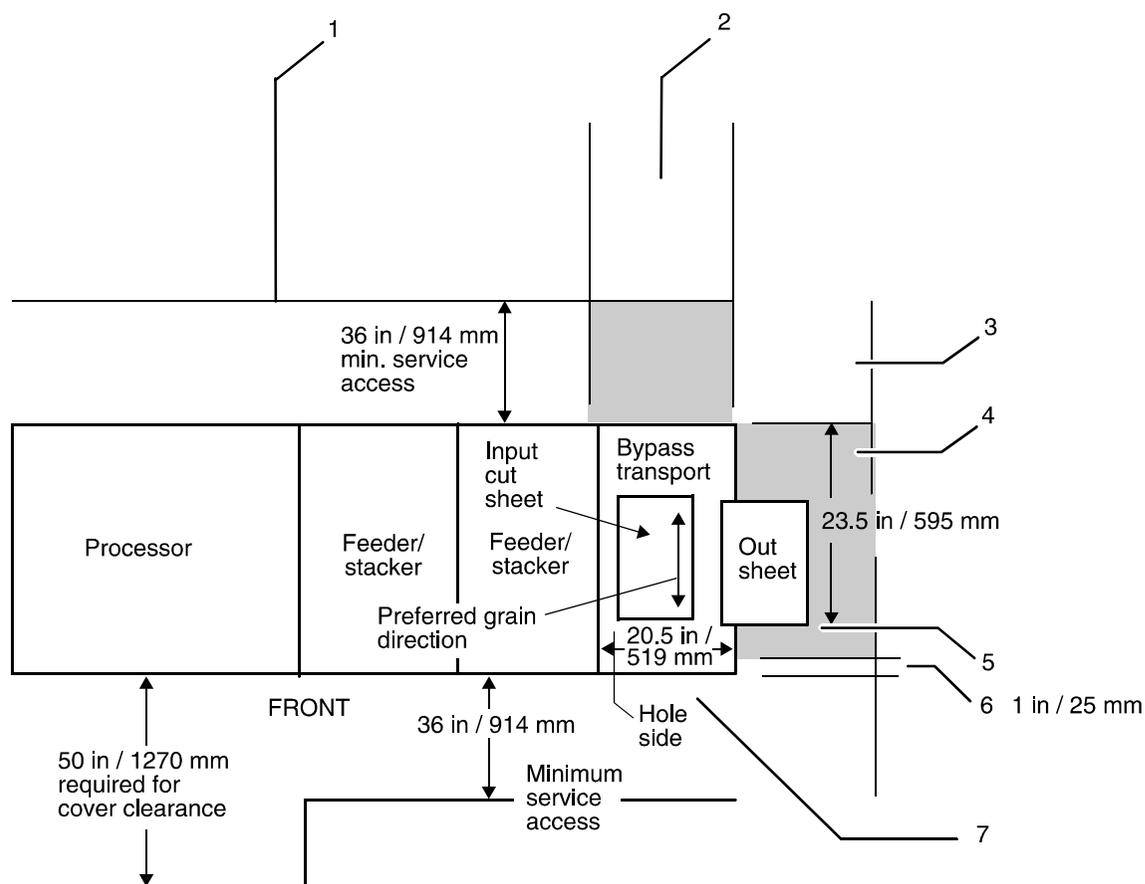
- **Paper size and weight:** You can use all of the paper sizes and weights supported on the 96/4635/180 in the bypass transport.
- **Sheet exit orientation:** 1 to N (the same order in which sheets are fed from the printer), delivered face down.
- **Maximum throughput speed:** The bypass transport for the 96 and 135 printer supports throughput speeds of up to 139 ppm (pages per minute). The 180 bypass transport supports speeds up to 180 ppm. (These rates are based on stocks up to 9 by 14.33 / 229 by 364 mm in length.)
- **Sheet exit height:** 34 inches / 86 cm above the floor.

**Dimensions** The following figure shows the dimensions of the bypass transport in millimeters and inches from the right end view.



**Figure 6-7. Bypass transport dimensions**

**Service access** The following figure provides space planning information and service access requirements for the bypass transport from a top view.



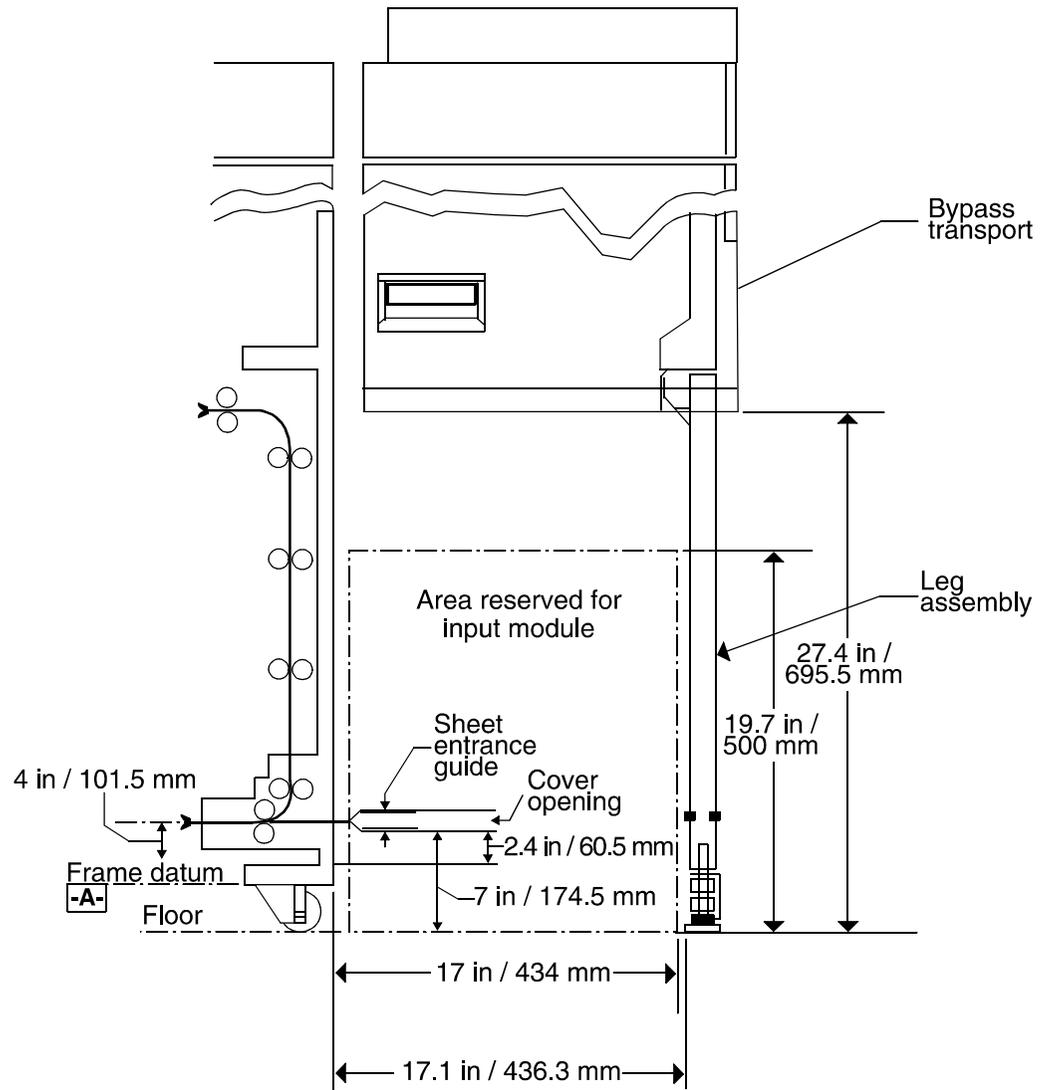
**Figure 6-8. Bypass transport space planning diagram**

1. Recommended third-party feeder hardware attaches at rear of 96/4635/180 printer.
2. Expected third-party input paper feed path
3. Neutral area, to remain unoccupied
4. Shaded areas at rear and right side of the bypass transport require third-party input/output devices to be undockable from the feeder/stacker or the bypass transport.
5. Register edge of the output sheet
6. Third-party hardware must not extend more than 1 inch / 25 mm beyond bypass transport front cover line for correct front door access.
7. Bypass transport / input enablement jam clearance space is required.



**Input enablement dimensions**

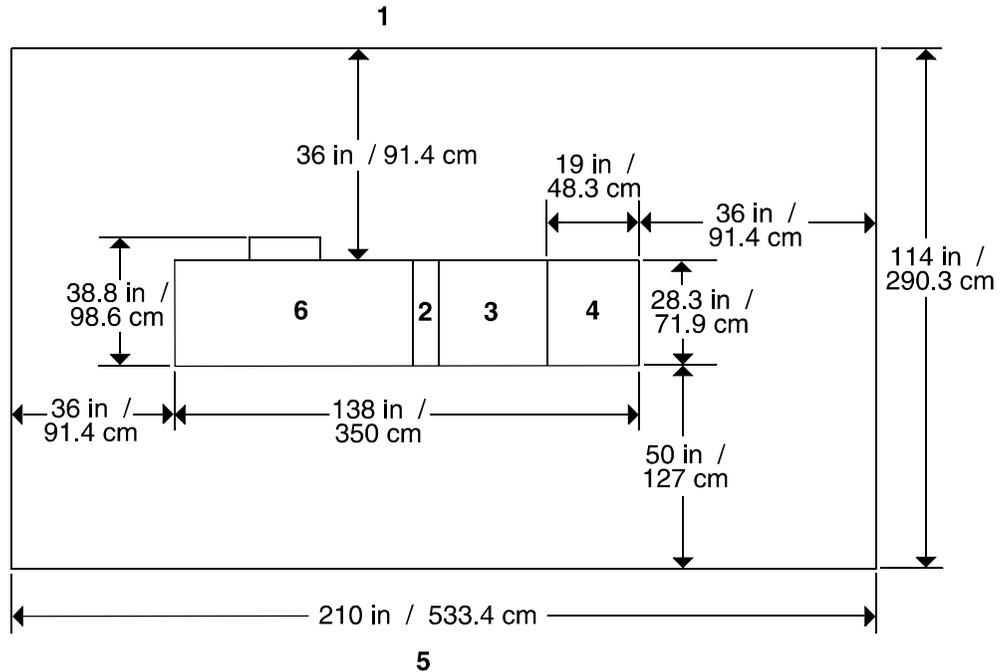
The following figure shows the paper path and the dimensions of the input enablement area from a printer front view. The input enablement kit supports third-party feeding devices.



**Figure 6-10. Input enablement paper path and dimensions**

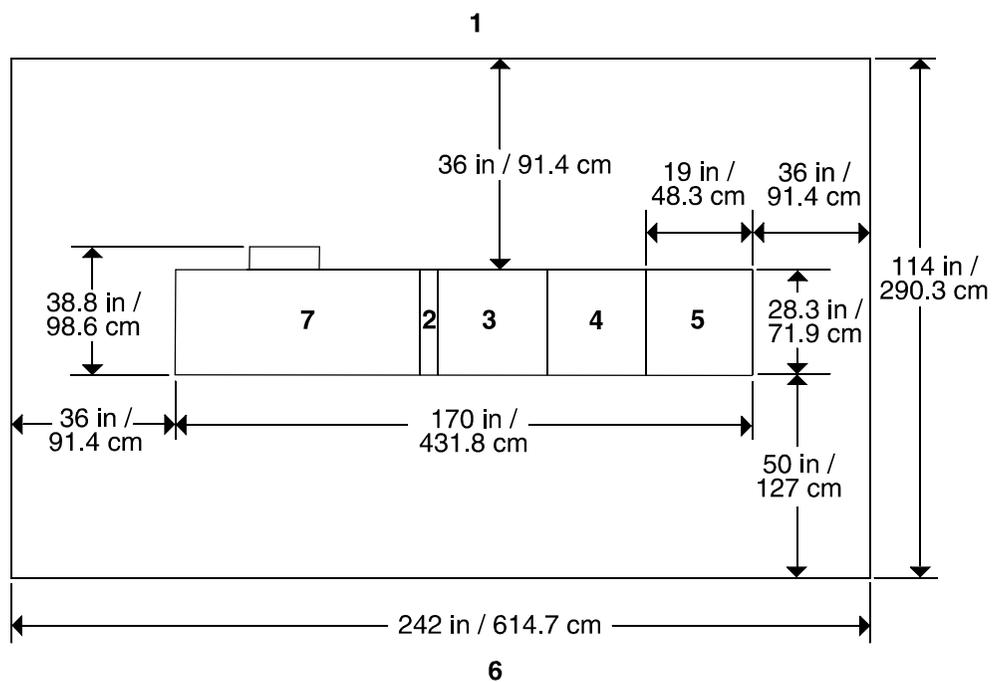
## Configuration diagrams with bypass transport

The following diagrams show the dimensions and space requirements of the 96, 4635, and 180 with a bypass transport. These diagrams represent top views of the components, surrounded by the minimum access space requirements on all sides.



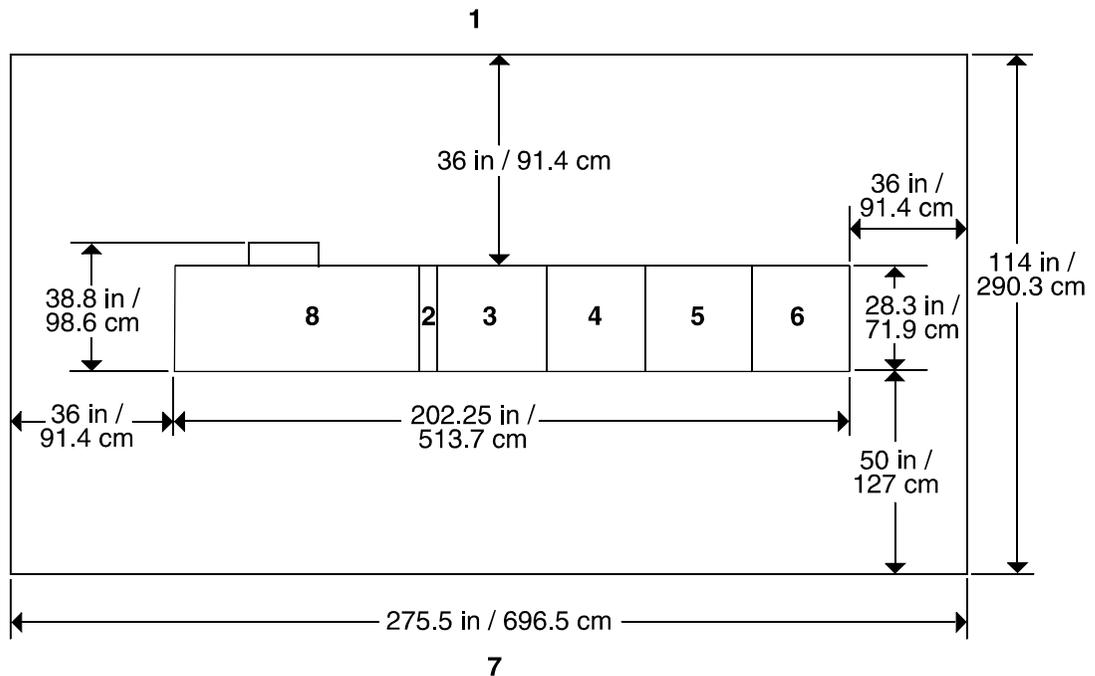
**Figure 6-11. 96 printer—inverter feeder/stacker-only configuration with bypass transport**

1. Back of system
2. Inverter
3. Feeder/stacker
4. Bypass transport
5. Front of system
6. Printer



**Figure 6-12. 96/4635/180 printer—inverter feeder/stacker + feeder/stacker configuration with bypass transport**

1. Back of system
2. Inverter
3. Feeder/stacker
4. Feeder/stacker
5. Bypass transport
6. Front of system
7. Printer



**Figure 6-13. 4635/180 printer—inverter feeder/stacker + feeder/stacker + feeder/stacker configuration with bypass transport**

1. Back of system
2. Inverter
3. Feeder/stacker
4. Feeder/stacker
5. Feeder/stacker
6. Bypass transport
7. Front of system
8. Printer

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## Space planning guidelines

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When determining your space requirements and planning for shared space between your printers, it is important to consider all of the components you plan to install.

To ensure all of the space requirements are met, it is important to work with your Xerox representative.

Before installation, you must consider the following:

- Clearance space requirements where you intend to install the printer
- Recommended cable lengths and locations (refer to the “System connections” chapter of this guide for more information)
- Delivery access requirements
- Floor leveling.

### **Clearance space requirements**

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The printer must be installed in a fixed location that provides the following clearance space:

- 36 inches / 91.4 cm on all sides of each component
- 24 inches / 61 cm of exclusive operator area in front of each component
- 78 inches / 198 cm of vertical clearance throughout the entire area.

*NOTE: There must be a total of 50 inches / 126.9 cm of clearance space in front of the printer.*

### **Shared space**

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It is best to provide the full amount of clearance space around the hardware components. Your environment may require you to use shared space between components, such as between the printer and the printer controller or between the printer and another Xerox printing system. You can share the 36-inch / 91.4 cm clearance space around each component, as long as you follow these rules:

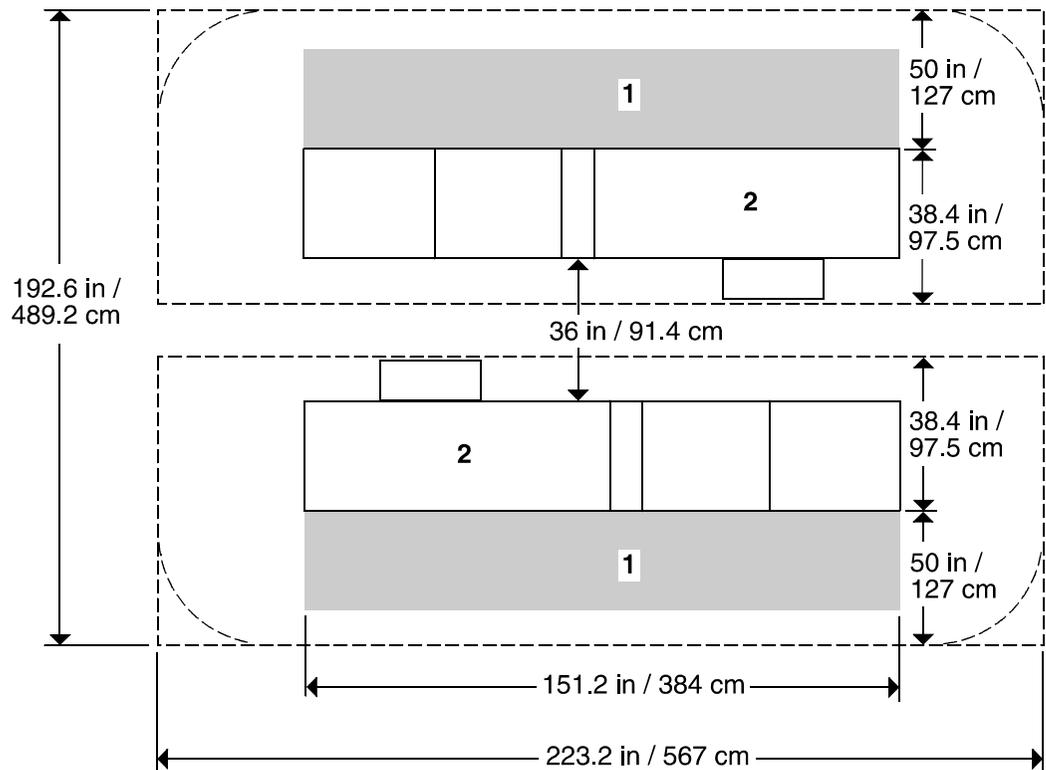
- Space may be shared only with other Xerox equipment.
- Components may share the 36-inch / 91.4 cm general service clearance areas, but they may not share the 24-inch / 61 cm operator area in front of each component.
- There must be 78 inches / 198 cm of vertical clearance throughout the entire area.

*NOTE: Finishers attached to your bypass transport and feeders attached to your DocuPrint 4635, 96, or 180 printer through the input enablement device may occupy shared space with Xerox equipment. However, they must be removable to allow servicing of the DocuPrint 4635, 96, or 180 printer feeders and stackers. Consult with your Xerox representative to ensure all the requirements are met.*

The following figures illustrate three possible configurations of shared space.

**Back-to-back shared space**

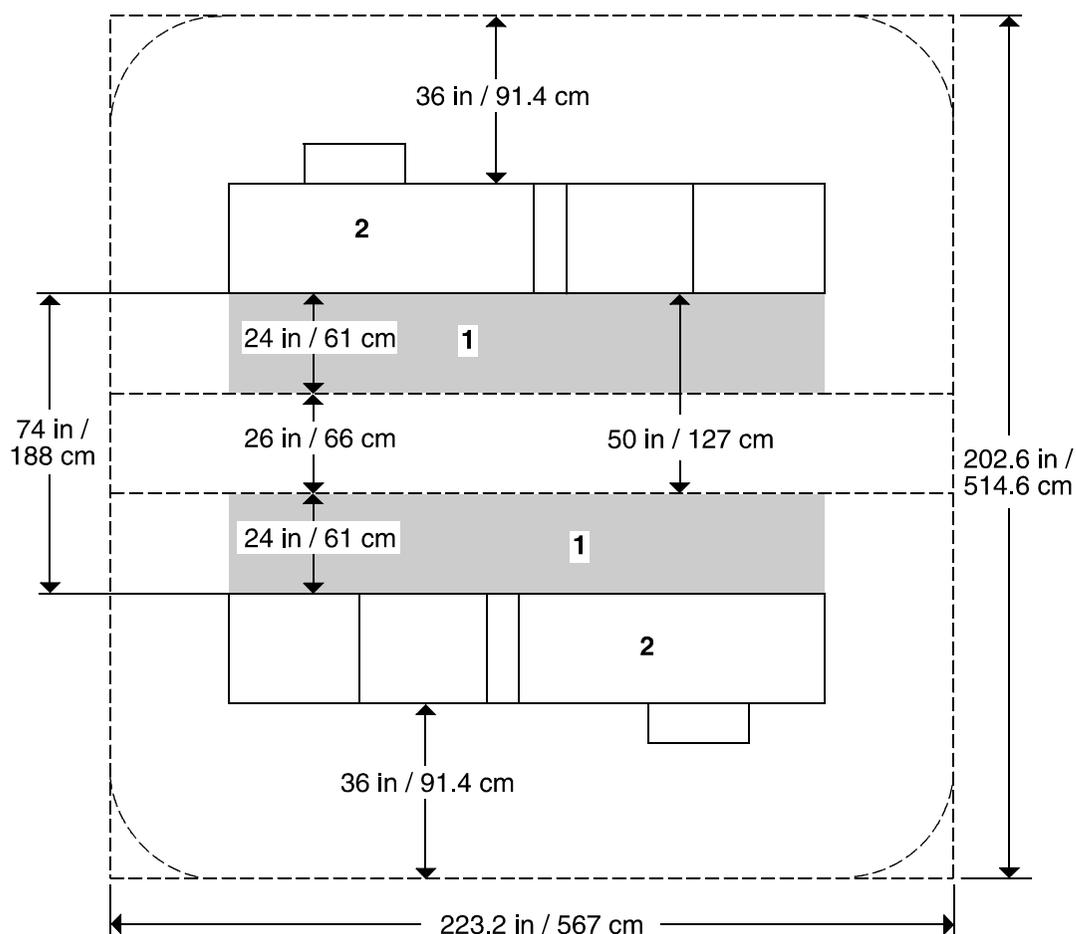
The figure below illustrates the two printers placed in a back-to-back position. This allows them to share the entire 36 inches / 91.4 cm of general service space.



**Figure 6-14. Back-to-back shared service area space**

- 1. Operator area
- 2. Printer

**Face-to-face shared space** The following figure shows the two printers facing each other. The printers share 12 inches / 30.5 cm of the general service space, but not the exclusive operator area in front of each printer. Therefore, the printers should be separated by 24 inches / 61 cm, plus 24 inches / 61 cm, plus 12 inches / 30.5 cm. This allows for the entire operator space for each printer, plus the shared general service area of 12 inches / 30.5 cm.

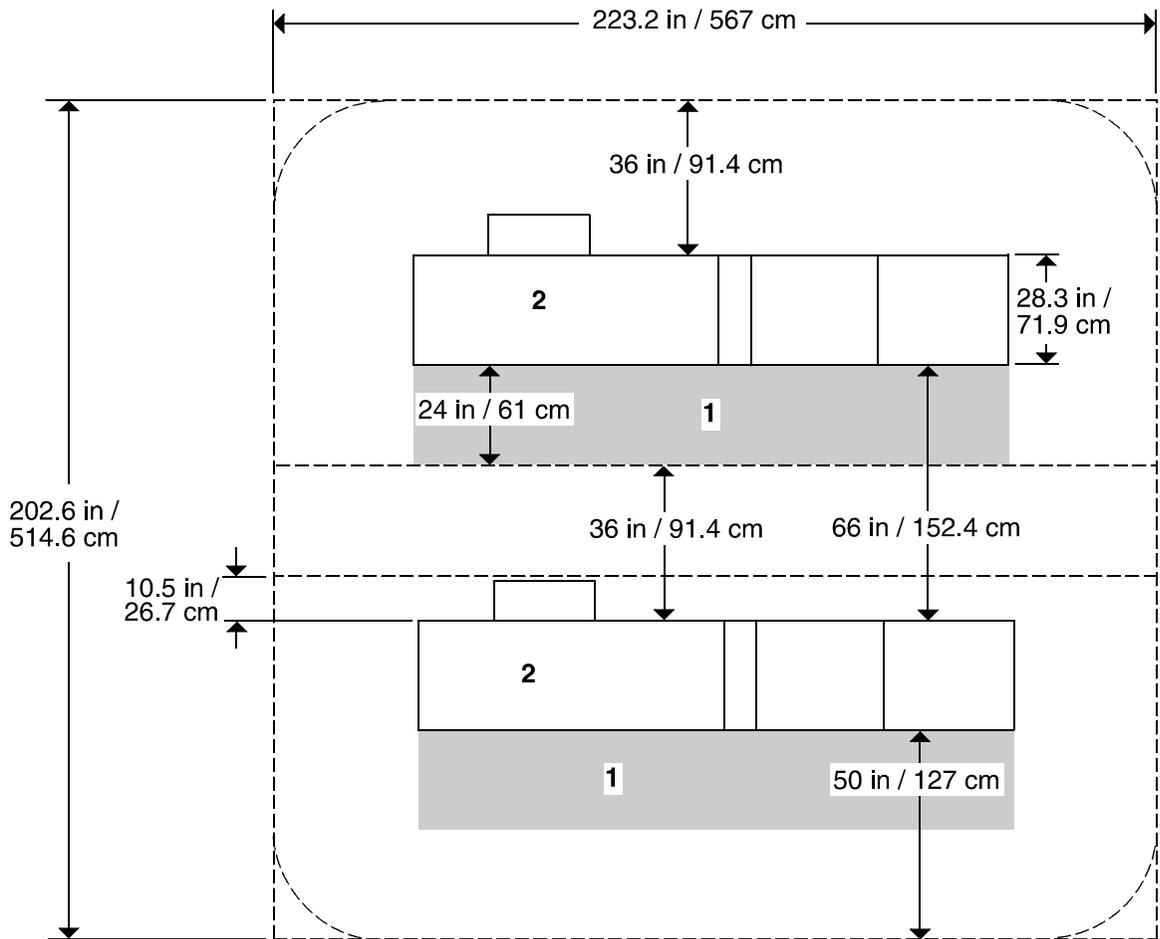


**Figure 6-15. Face-to-face shared service area space**

1. Operator area
2. Printer

**Face-to-back shared space**

The following figure shows the two printers arranged with one facing the back of the other. Between them is 60 inches / 152.4 cm of space. This allows for 24 inches / 61 cm of operator space in front of the printer facing toward the other, plus 36 inches / 91.4 cm of service space behind the printer facing away from the other.



**Figure 6-16. Face-to-back shared space**

- 1. Operator area
- 2. Printer

## Floor leveling

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For proper operation, the printer must be perfectly level. On floors less than two degrees out of level, installation personnel use a leveling kit to level the machine.

*NOTE: The printer will not function properly on floors more than two degrees out of level.*

If the floor is more than two degrees out of level, this condition cannot be corrected by the leveling kit. Another suitable location must be found for the printer to be installed properly.

For your reference, two degrees represents a height discrepancy of approximately 3.8 inches / 9.6 cm measured at the casters with the printer tilting from left to right, or approximately 0.7 inches / 1.8 cm with the printer tilting from back to front.

If you move the printer unit after its initial installation, it is your responsibility to make sure that the printer can be leveled properly. If you do not have the leveling kit (the printer in its initial location did not require it), and you need one to level the printer in a new location, contact your Xerox site representative to obtain one.

## Delivery access requirements

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It is easy to overlook the path required to move the equipment from the truck to the operation site. To determine access, ask the following questions:

- Does the equipment need to go up stairs?
- Do you have an elevator, if the equipment is to be located above the first floor?
- Is the elevator large enough for the equipment?
- How wide are the hallways and doorways?
- Do you have a loading dock or a specific door to which the equipment should be delivered?

You need to review these issues prior to, or at the time of, the site inspection conducted by your service representative.

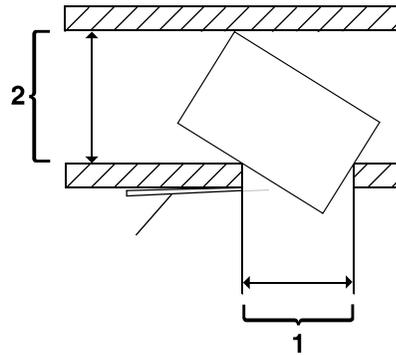
The equipment dimensions are specified earlier in this chapter, so it is easy to determine whether your hallways and doorways are wide enough to permit access.

## Turning radius

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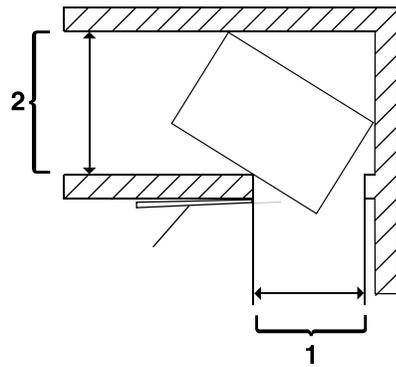
You must also consider the width of the passageway when the equipment must negotiate a corner, whether into a room, an elevator, or another passageway.

There are L-shaped turns and T-shaped turns. The diagrams and the tables that follow show the minimum space required to maneuver through the turns.



**Figure 6-17. T-shaped turn**

1. Passage A
2. Passage B



**Figure 6-18. L-shaped turn**

1. Passage A
2. Passage B

**Using the turning radius tables**

To use the tables:

1. Measure the minimum width of the passage or doorway you need to use. This is Passage A.
2. Find that number (or the next higher number) in the turning radius table and read across to the corresponding minimum value for Passage B, depending on the type of turn the equipment must negotiate.

**Turning radius for printer with separated components**

The 96, 4635 or 180 is delivered with the printer, inverter feeder/stacker, and each feeder/stacker as separate modules. If necessary, the printer can be separated into two pieces for ease in moving. The larger of the two parts contains the xerographic system; the smaller of the parts (the paper handling module, or PHM) contains paper trays 1 and 2. Do not confuse these two parts of the printer with the inverter and feeder/stacker modules, which have their own turning requirements.

The following table lists the turning requirements for the printer without the PHM (separated).

Table 6-7. **Turning radius for printer (separated)**

Passage or doorway A width	Minimum passage B width
29 inches / 73.7 cm	74.5 inches / 189.2 cm
30 inches / 76.2 cm	64.5 inches / 163.8 cm
31 inches / 78.7 cm	62 inches / 157.5 cm
32 inches / 81.3 cm	59.5 inches / 151.1 cm
34 inches / 86.4 cm	56 inches / 142.2 cm
36 inches / 91.4 cm	53 inches / 134.6 cm
38 inches / 96.5 cm	50 inches / 127 cm
40 inches / 101.6 cm	48 inches / 121.9 cm
42 inches / 106.7 cm	45.5 inches / 115.6 cm

The following table lists the turning requirements for the printer if it is upended for easier moving or stair-climbing. This table reflects requirements for the printer separated from the PHM.

Table 6-8. **Turning radius for printer (separated and upended on dolly)**

Passage or doorway A width	Minimum passage B width
30 inches / 76.2 cm	49 inches / 124.5 cm
31 inches / 78.7 cm	43 inches / 109.2 cm
32 inches / 81.3 cm	41 inches / 104.1 cm

Table 6-8. **Turning radius for printer (separated and upended on dolly)**

Passage or doorway A width	Minimum passage B width
34 inches / 86.4 cm	37.5 inches / 95.3 cm
36 inches / 91.4 cm	35 inches / 88.9 cm
38 inches / 96.5 cm	33.5 inches / 85.1 cm
40 inches / 101.6 cm	32 inches / 81.3 cm
42 inches / 106.7 cm	31 inches / 78.7 cm

**Turning radius for unseparated printer components**

The following table lists the turning requirements for the printer when attached to the paper handling module (not separated).

Table 6-9. **Turning radius for printer (not separated)**

Passage or doorway A width	Minimum passage B width
29 inches / 73.6 cm	83 inches / 210.8 cm
30 inches / 76.2 cm	76 inches / 193 cm
31 inches / 78.7 cm	73 inches / 185.4 cm
32 inches / 81.3 cm	70.5 inches / 179.1 cm
34 inches / 86.4 cm	66.5 inches / 169 cm
36 inches / 91.4 cm	63.5 inches / 161.3 cm
38 inches / 96.5 cm	61.5 inches / 156.2 cm
40 inches / 1,01.6 cm	58 inches / 147.3 cm
42 inches / 1,06.7 cm	55 inches / 139.7 cm

**Turning radii for feeder/stacker modules**

The following table lists the turning requirements for the inverter feeder/stacker module.

Table 6-10. **Turning radius for inverter feeder/stacker module**

Passage or doorway A width	Minimum passage B width
29 inches / 73.7 cm	43 inches / 109.2 cm
30 inches / 76.2 cm	41 inches / 104.1 cm
31 inches / 78.7 cm	40 inches / 101.6 cm
32 inches / 81.3 cm	38 inches / 96.5 cm
33 inches / 83.8 cm	37 inches / 94 cm
34 inches / 86.4 cm	36 inches / 91.4 cm
35 inches / 88.9 cm	35 inches / 88.9 cm
36 inches / 91.4 cm	34 inches / 86.4 cm
37 inches / 94 cm	33 inches / 83.8 cm

Table 6-10. **Turning radius for inverter feeder/stacker module (Continued)**

Passage or doorway A width	Minimum passage B width
38 inches / 96.5 cm	32 inches / 81.3 cm
39 inches / 99.1 cm	31 inches / 78.7 cm
40 inches / 101.6 cm	31 inches / 78.7 cm
41 inches / 104.1 cm	30 inches / 76.2 cm
42 inches / 106.7 cm	29 inches / 73.7 cm
43 inches / 109.2 cm	29 inches / 73.7 cm

*NOTE: These turning figures are based on inverter/feeder/stacker dimensions of 28 inches / 711 mm by 42 inches / 1,067 mm.*

The following table lists the turning requirements for the feeder/stacker module.

Table 6-11. **Turning radius for feeder/stacker module**

Passage or doorway A width	Minimum passage B width
29 inches / 73.7 cm	33 inches / 83.8 cm
30 inches / 76.2 cm	32 inches / 81.3 cm
31 inches / 78.7 cm	31 inches / 78.7 cm
32 inches / 81.3 cm	30 inches / 76.2 cm
33 inches / 83.8 cm	29 inches / 73.7 cm

*NOTE: These turning figures are based on inverter/feeder/stacker dimensions of 28 inches / 71.1 cm by 32.25 inches / 81.9 cm.*

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## Printer hardware specifications and requirements summary

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The following table summarizes the specifications and electrical requirements of your printer hardware components.

For a summary of controller hardware specifications and requirements, refer to the “Controller specifications and requirements” chapter of this guide. Contact your service representative if you have questions not specifically addressed in this guide.

Table 6-12. **Printer specifications and power requirements—96/4635/180**

Device	Dimensions (depth, width, height)	Weight	Heat dissipation	Power requirements
<b>96 printer:</b> Inverter feeder / stacker only	d=38.8 in. / 98.6 cm w=119 in./ 302.3 cm h= 59.6 in. / 151.3 cm Total space required (+ access): 191 in. <b>w</b> by 114 in. <b>d</b> / 567 cm <b>w</b> by 290.3 cm <b>d</b>	1925 lbs. / 874 kg	<b>Operating:</b> 28,140 BTU per hour <b>Standby:</b> 4,454 BTU per hour	<b>60 Hz:</b> 120/208 VAC (182 V to 220 V), KVA 7.3 (operating) Power cord: 50 amp, NEMA 14-50R 50 Hz: Consult your local service representative.
<b>96/4635/180 printer:</b> Inverter feeder / stacker + feeder / stacker	d=38.8 in. / 98.6 cm w=151.2 in./ 384 cm h= 59.6 in. / 151.3 cm Total space required (+ access): 223.25 in. <b>w</b> by 114 in. <b>d</b> / 567 cm w by 290.3 cm d	2,588 lbs. / 1,174.9 kg	<b>96/4635:</b> <b>Operating:</b> 28,140 BTU per hour <b>Standby:</b> 4,454 BTU per hour <b>Energy Saver:</b> 2,700 BTU per hour <b>180:</b> <b>Operating:</b> 32,770 BTU per hour <b>Standby:</b> 4,454 BTU per hour <b>Energy Saver:</b> 2,700 BTU per hour	<b>60 Hz:</b> <b>96/4635:</b> 120/240 VAC or 120/208 VAC; 50 amp service; NEMA L14-50R; KVA 7.3 (operating) 180: 120/208 VAC (182 V to 220 V), KVA 7.3 (operating) Cord 1: 50 amp, NEMA 14-50R Cord 2: 30 amp, NEMA 14-30R 50 Hz: Consult your local service representative.

Table 6-12. **Printer specifications and power requirements—96/4635/180 (Continued)**

Device	Dimensions (depth, width, height)	Weight	Heat dissipation	Power requirements
<b>4635/180 printer:</b> Inverter feeder / stacker + two feeder / stackers	d=38.8 in. / 98.6 cm w=183.5 in./ 466.1cm h=59.6. in. / 151.3 cm Total space required (+ access): 256.5 in. <b>w</b> by 114 in. <b>d</b> /  648.9 cm <b>w</b> by 290.3 cm <b>d</b>	3,109 lbs. / 1,411.9 kg	<b>4635:</b> <b>Operating:</b> 28,140 BTU per hour <b>Standby:</b> 4,454 BTU per hour <b>Energy Saver:</b> 2,700 BTU per hour  <b>180:</b> <b>Operating:</b> 32,770 BTU per hour <b>Standby:</b> 4,454 BTU per hour <b>Energy Saver:</b> 2,700 BTU per hour	<b>60 Hz:</b> <b>4635:</b> 120/240 VAC or 120/208 VAC; 50 amp service; NEMA 14-50R, KVA 8.1 (operating)  180: 120/208 VAC (182 V to 220 V), KVA 8.1 (operating) Cord 1: 50 amp, NEMA 14-50R Cord 2: 30 amp, NEMA 14-30R 50 Hz: Consult your local service rep.
<b>4635/180 printer:</b> Inverter feeder / stacker + three feeder / stackers	d=38.8 in. / 98.6 cm w=216 in. / 730.8 cm h=59.6 in. / 151.3 cm Total space required (+ access): 287.75 in. <b>w</b> by 114 in. <b>d</b> /  730.8 cm <b>w</b> by 290.3 cm <b>d</b>	3,630 lbs. / 1,648.9 kg	<b>4635:</b> <b>Operating:</b> 28,140 BTU per hour <b>Standby:</b> 4,454 BTU per hour <b>Energy Saver:</b> 2,700 BTU per hour  <b>180:</b> <b>Operating:</b> 32,770 BTU per hour <b>Standby:</b> 4,454 BTU per hour <b>Energy Saver:</b> 2,700 BTU per hour	<b>60 Hz:</b> <b>4635:</b> 120/240 VAC or 120/208 VAC; 50 amp service; NEMA 14-50R, KVA 8.8 (operating)  <b>180:</b> 120/208 VAC (182 V to 220 V), KVA 8.8 (operating) Cord 1: 50 amp, NEMA 14-50R Cord 2: 30 amp, NEMA 14-30R 50 Hz: Consult your local service rep.
<b>Bypass transport</b>	d=28.3 in. / 71.9 cm w=20.4 in. / 51.9 cm h=56.1 in. / 142.5 cm	176 lbs. / 80 kg	---	---

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## Space planning templates

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The dimensions and space requirements for your printer components are provided earlier in this chapter. The space planning templates are designed to simplify the space planning process by helping you to create a floor plan for your base components, particularly if you have shared clearance space.

The easiest way to use the space planning templates is to move the templates around on the grid located at the end of this section and determine the optimum placement for your printer components. Make sure to consider other pieces of equipment, such as cabinets, tables, and optional equipment when planning your space. Your customer support representative can help you plan space for additional components.

The templates are to scale with the grid; each square is equal to 12 by 12 inches/30.5 by 30.5 cm. The curved dotted lines in the corners of the space perimeters indicate the corners that may be rounded off while still maintaining the required clearance space.

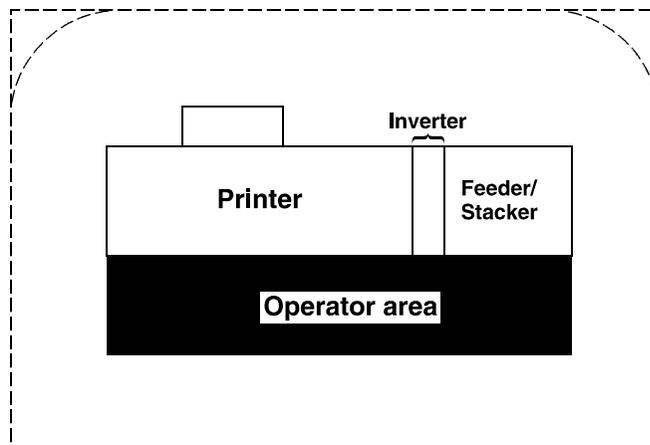
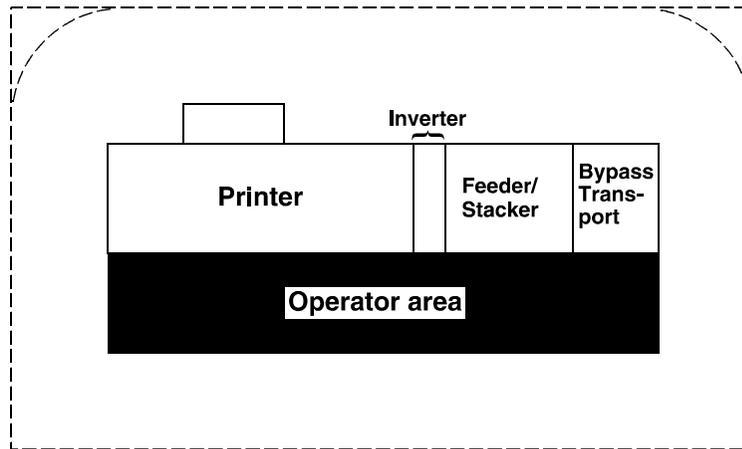
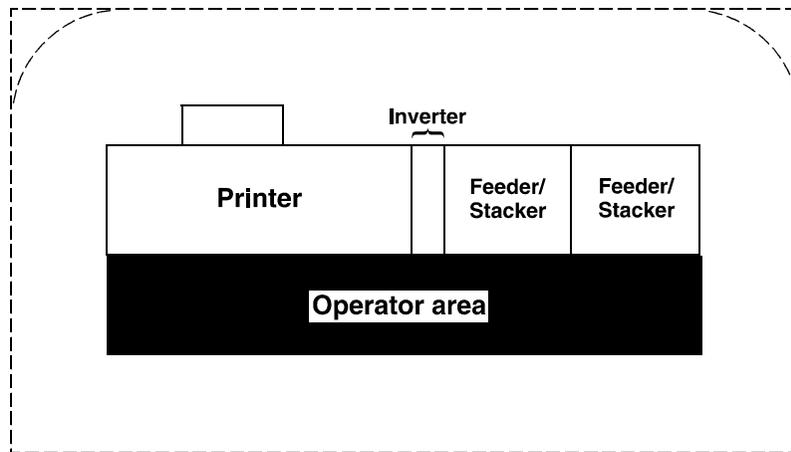
There are a number of factors to keep in mind when planning your site, including the following:

- Clearance space requirements
- Cable length.

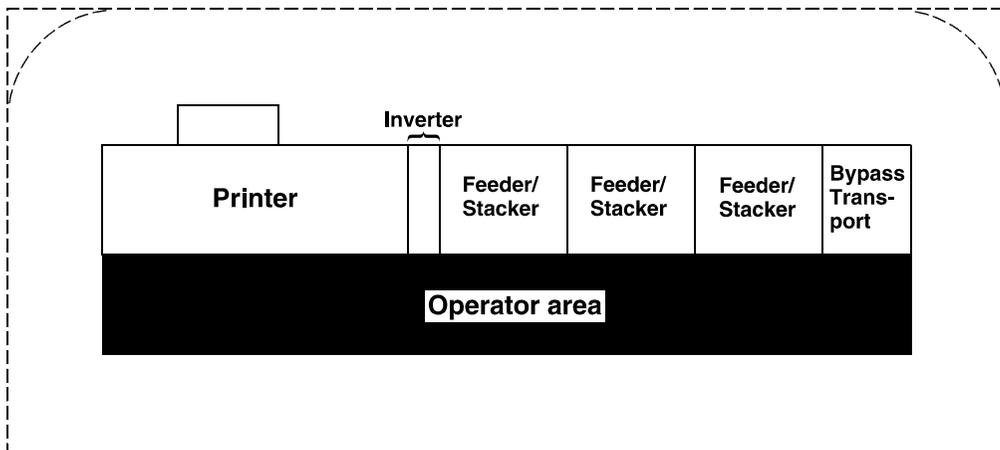
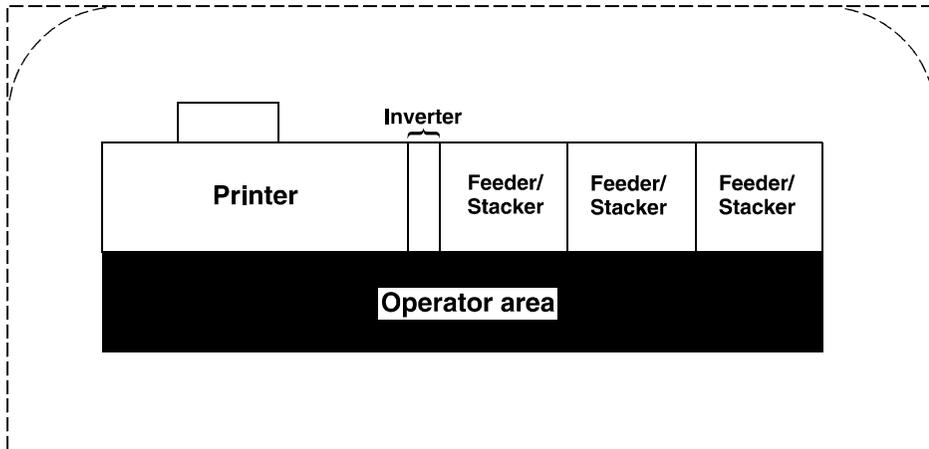
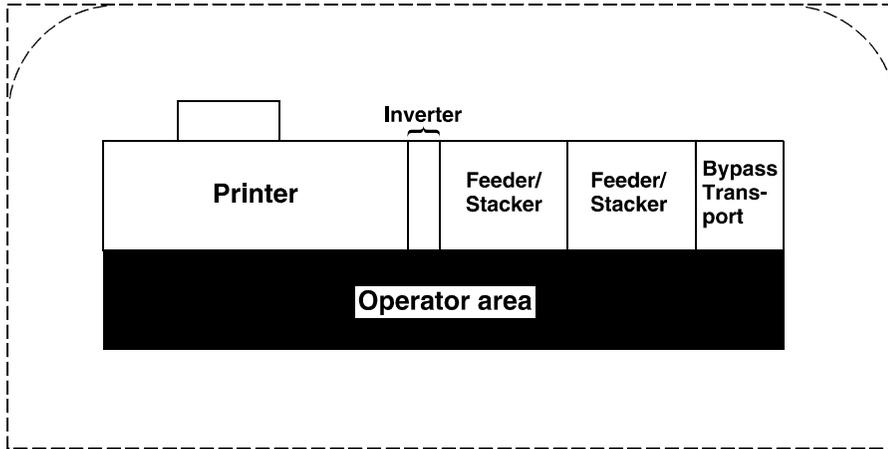
Refer to these sections in this manual when considering the various factors involved in planning the appropriate location for your printing system.

When determining your space requirements, remember to consider all of the components you plan to have installed. If you have a bypass transport or input enablement device option on your printing system, you should contact the sales representatives for the company from which you purchased your finishers and feeders, as well as your Xerox representative, to ensure that all of your space requirements are met.

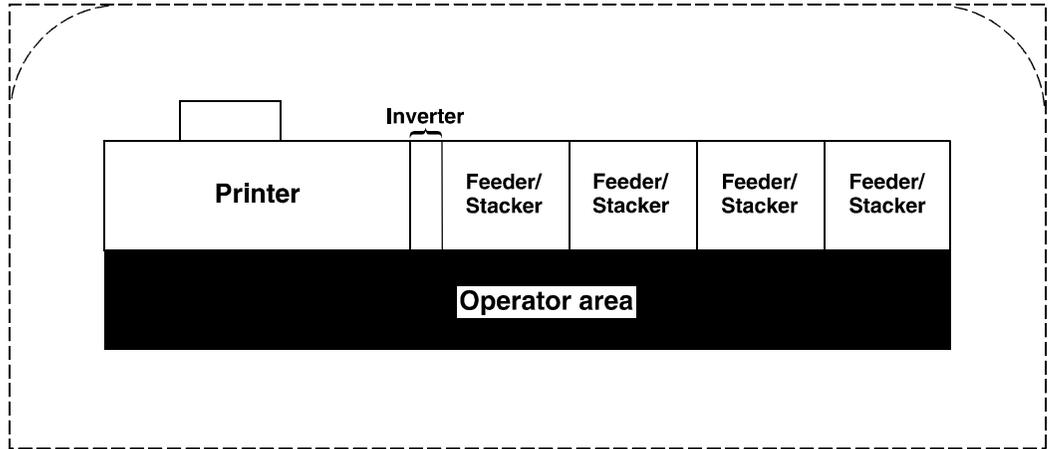














# GRID PATTERN

1/4 inch represents one foot

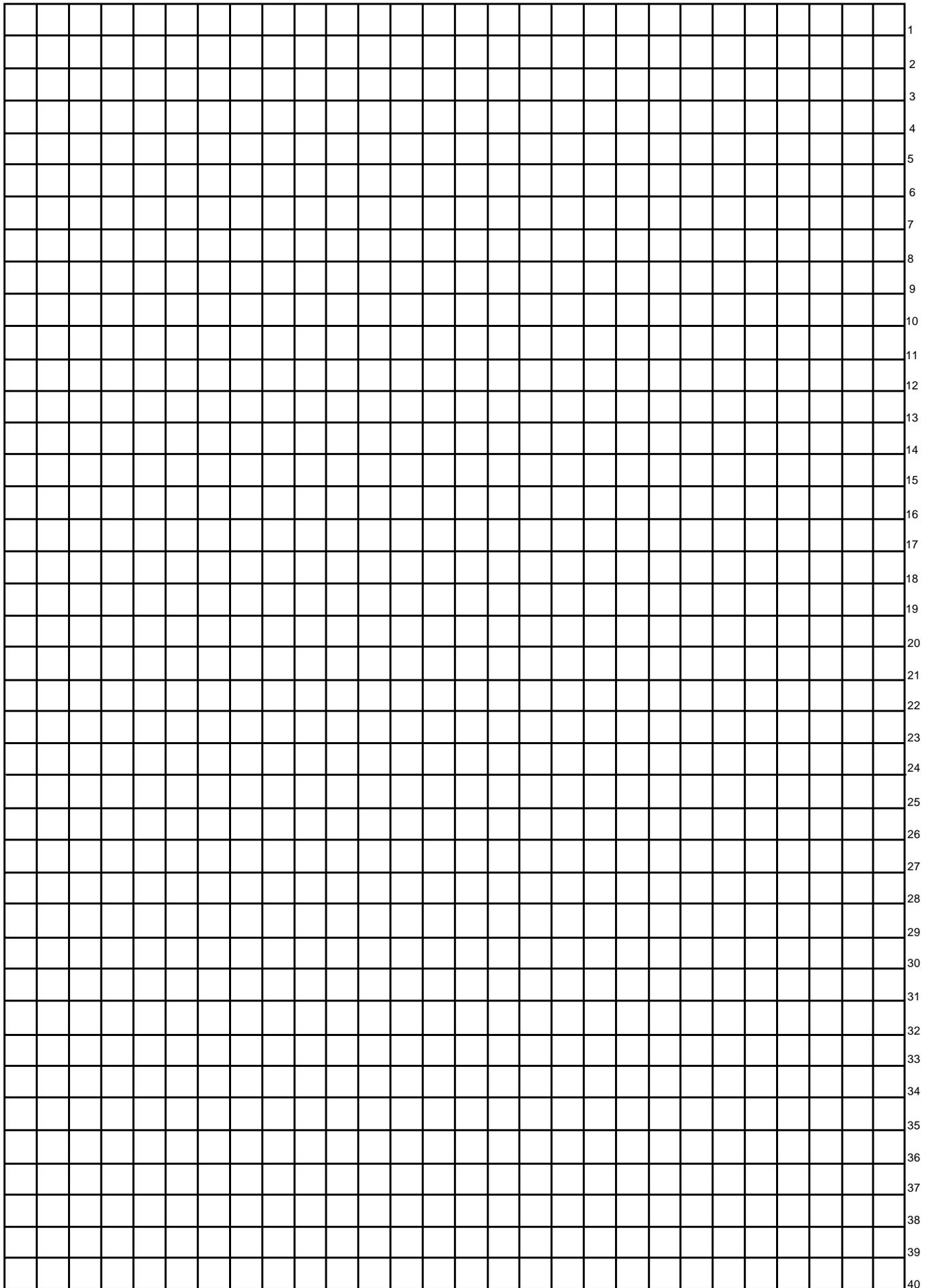
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## 7. System connections

This chapter provides cable requirements for your 96/4635/180 system. To ensure all of your cable requirements are met, it is important to work with your Xerox representative.

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### Cable lengths

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Cable lengths are important considerations in planning your layout, as components can be separated only up to the length of the data interface cables that connect them.

Cables supplied with the printer are of sufficient length to meet the needs of most installations. Some of these cables are specific lengths to conform to engineering and safety standards.

**Data cables** The printer components can be separated up to the length of the data interface cables that connect them. The printer and controller are connected by a 20-foot / 6.1 meter data cable.

**Power cables** The 96/4635/180 power cable lengths are as follows:  
Table 7-1. **Power cable lengths**

Power cable	Length
Printer controller	8 feet / 2.1 m
Printer	15 feet / 4.4 m

#### WARNING

**Using an inappropriate alternate cable may degrade the performance of your equipment and may also be hazardous.**

*NOTE: Cable length loss must be factored in if equipment is installed in a raised-floor environment. You should also consider that part of the length of a cable is routed inside the equipment to connect with interior power or data receptacles.*

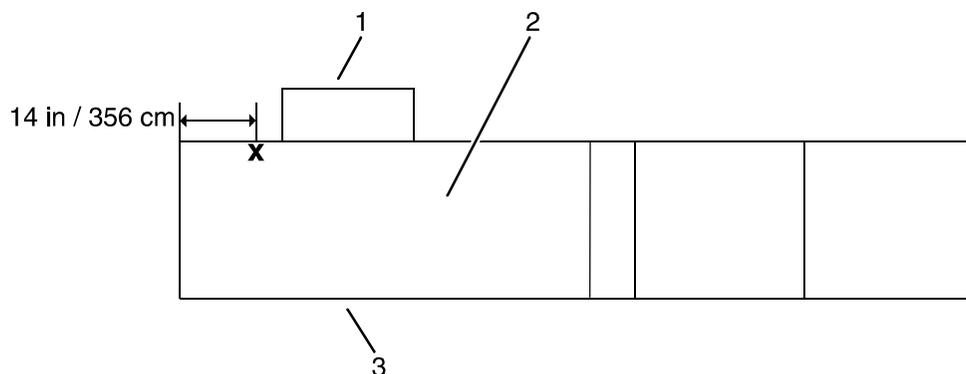
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## Cable locations

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To run the cables beneath the flooring effectively, it is necessary to know where the cables enter and exit the printer. The following diagrams show those locations (marked with an X).

All power cords attach to the back of the printer. Listed below are the distances of the printer power cord attachments from the left end of the printer as you face it.



**Figure 7-1. 96/4635/180 cable enter/exit location (top view)**

- **180 power cord attachments:** distance from end of printer:
  - **Cord 1:** 36 inches / 914 mm (with ELCI)
  - **Cord 2:** 23 inches / 584 mm (with ELCI)
- **96 and 4635:** distance from end of printer—14 inches / 356 mm

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## 8. Installation

This chapter describes the activities performed by you and Xerox during the installation of the Xerox DocuPrint 96/4635/180 NPS/IPS and Xerox DocuPrint 96/4635/180 MICR NPS/IPS hardware and software components. Before installation can begin, you must complete the tasks described in the “Preparing for installation” chapter of this guide.

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### Installation process

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Xerox is responsible for the physical installation of the DocuPrint NPS/IPS hardware components and the software.

For customers outside the United States, contact your local Xerox representative or operating company for your specific installation process.

The installation process can take one or several days to complete. Equipment, software kits, and documentation kits may all arrive in one day, or over the course of several days. When all of the necessary items are in place, Xerox personnel will complete the installation of the DocuPrint NPS/IPS components.

In the United States, the steps in the installation process typically occur in the following order:

1. Xerox personnel installs all NPS/IPS printer hardware and connects the printer controller to your network through the Ethernet, Token Ring, and FDDI connector you supply. This process takes approximately four hours if all the necessary network and electrical connectors are in place.
2. Xerox personnel places the system online.
3. Xerox personnel loads printer controller software on the Printer Controller (approximately 1.5 hours).

4. Xerox personnel downloads Xerox client software if applicable, on one client workstation to validate the installation (15 minutes). Software is downloaded on another client workstation as part of training conducted by your systems analyst. All other client software installations are your responsibility. Refer to the *Xerox DocuPrint NPS/IPS Guide to Configuring and Managing the System* for more information.

If your site uses third-party Transmission Control Protocol/Internet Protocol (TCP/IP) lpr networking software, refer to the *Xerox DocuPrint NPS/IPS Guide to Configuring and Managing the System* for information on modifying the printcap file.

5. Xerox personnel tests the system and runs sample jobs (30 minutes).
6. Xerox personnel conducts initial operations training (2 to 4 hours).
7. Xerox personnel reviews preventive maintenance schedules and service call procedures.

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## Your responsibilities

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Xerox is responsible for the physical installation of the printer components and for loading the software and applications. You have the general site responsibility of ensuring that the right personnel, supplies, and network information are available.

At the time of installation, you should do the following:

- Make sure that your system administrator is available during the loading of software.
- For software loading purposes, be prepared to provide Xerox personnel with network information from the preinstallation checklist. Refer to the “Setting up the work area” chapter of this guide for specifics regarding network information.
- Designate two client workstations for downloading Xerox client software if applicable: one for initial system validation and another for use in operator training provided by your systems analyst.
- Check the documentation and software kits with their packing lists for completeness.

- Load Xerox client software on any additional client workstations.

Remember that you are responsible for supplying, installing, and maintaining your client workstations and the Token Ring network or Ethernet local area network (LAN) that connects them with the Printer Controller. You are also responsible for the Ethernet, Token Ring, and FDDI connectors required for your system.

- Have test jobs ready to run.
- Have the necessary parameters defined to configure PSF for connectivity to your IPS printer.
- Have list of stocks you want used for your default input tray configuration.
- Have your operators available for training.
- Sysgen your host to print to an AFP1-type printer. Refer to the IBM ITSC Distributing AFP Printing from a Host System (#GG24-4493) documentation for further information.
- If your system will be channel-attached, make available a bus and tag connection from the host system as follows:
  - AS/400 requires a Barr/AFD or PS/2 with a channel card.
  - RS/6000 requires a channel card for IPS connectivity.
  - PS/2 requires a channel card for IPS connectivity.

Refer to the installation planning checklist in the “Setting up the work area” chapter of this guide for a complete list of responsibilities.

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## **Defining the IPS printer to the host**

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Prior to installation of your DocuPrint NPS/IPS, your host system must be configured to communicate with and print on the DocuPrint NPS/IPS. This requires defining several printer parameters to your host. The required information and configuration procedures differ according to your connectivity type (channel or TCP/IP), and your host and PSF environment. You will need to provide these parameters to your Xerox representative on installation day.

There are two appendices in this guide which provide printer configuration procedures and the parameters you must define in order to configure PSF to make a connection with your DocuPrint NPS/IPS. One appendix discusses channel-attached environments; the other appendix provides information for environments in which the printer uses TCP/IP to communicate via Ethernet or Token Ring. Parameters are given for MVS mainframes, AS/400, RS/6000 running AIX, and PS/2 or other personal computers running OS/2.

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## Software licensing

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When a DocuPrint NPS/IPS is purchased, the owner needs to receive a license to use the operating system software. Once a user calls in with a host ID, (Sun SPARC/Ultra host ID), the user receives a license string. Refer to the “Setting up the printer controller” chapter of the *Guide to Configuring and Managing the System* (section titled “Loading the NPS/IPS software license text stream”).

This license is enabled by entering a 20-character authorization text string at the printer controller keyboard. Your Xerox service representative obtains this license text string for you and enters it when your printer is installed.

Until this license string is entered, your printer cannot receive data from the host to print. You can power on and boot the system, and perform all offline tasks such as setting up input and output configurations, but the printer remains in Disabled mode and cannot print.

Although your service representative usually does this for you, you also can enter your license string, by selecting NPS/IPS Authorization Enablement from the Administration pulldown menu on the NPS/IPS main window. Refer to your , “Setting up the printer controller” chapter, for the procedure. *NPS/IPS Guide to Configuring and Managing the System*

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## Ongoing maintenance

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After the installation of your Xerox DocuPrint NPS, there are a few ongoing tasks that must be performed. These tasks may include the following:

- Maintaining an adequate inventory of consumable supplies
- Overseeing routine maintenance and meter reporting
- Arranging for additional operator training
- Ordering additional fonts
- Ordering additional documentation
- Placing service calls for hardware problems
- Obtaining assistance in solving software-related problems.

As installation coordinator, it is your responsibility to designate the staff members responsible for these tasks.

## **Routine maintenance**

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A number of routine maintenance tasks must be performed to ensure maximum efficiency of your printer. These tasks include:

- Adding standard dry ink to your printer
- Adding MICR dry ink to your 96/4635/180 MICR NPS/IPS
- Adding fuser lubricant
- Replacing the dry ink and developer waste containers
- Cleaning the exterior surfaces of the system.

Step-by-step instructions for performing these tasks are contained in your *Guide to Performing Routine Maintenance*. You need to decide how many operators will be responsible for performing these tasks. Most maintenance tasks are covered in the initial operator training provided shortly after installation.

*NOTE: Only operators who have completed the Xerox Advanced Customer Training (ACT) or eXcellerate courses or equivalent advanced customer training can replace stitcher wire. Refer to the "Xerox support services" appendix of this guide for additional information on training.*

## **Meter reading and reporting**

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As print jobs are processed, the printer controller accumulates, saves, and maintains usage data.

During the last five working days of each month, you need to review and transmit the data to Xerox for billing purposes. Refer to your *Guide to Performing Routine Maintenance* for complete instructions on how to report meter readings.



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## A. Supplies

This appendix provides information and specifications for the media you use with your Xerox DocuPrint 96, 4635, or 180 printer. Instructions for ordering supplies are also provided.

Consumable supplies (those that are depleted during operation of the system), such as paper, dry ink, developer, fuser agent, etc., must be ordered for your printer. It is important that an adequate supply of these items be on hand for installation, and that your supply be maintained afterwards.

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### Paper and other throughput stocks

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The success of any print run is greatly dependent on the proper selection, care, and handling of the stock used.

#### Selecting paper

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You need to select your paper carefully. If you do not use the proper paper, you increase the probability of paper jams and misfeeds. The stocks you use must meet the specifications set forth by Xerox for operability in the printer. For additional information about paper specifications, refer to *Helpful Facts about Paper*, delivered with your printer.

#### Acceptable paper stocks and sizes

Your 96, 4635 or 180 printer accepts the following standard size cut-sheet papers:

- 7 by 10 inches / 178 by 254 mm (with 7-inch kit option)
- B5: 7.17 by 10.12 inches / 182 by 257 mm (with 7-inch option)
- US Letter: 8.5 by 11 inches / 216 by 279 mm
- US Legal: 8.5 by 14 inches / 216 by 356 mm
- A4: 8.27 by 11.69 inches / 210 by 297 mm
- B4 (European): 9.84 by 13.89 inches / 250 by 353 mm

- JIS B4 (Japanese): 10.12 by 14.33 inches / 257 by 364 mm
- US Ledger/US Tabloid: 11 by 17 inches / 279 by 432 mm
- A3: 11.69 by 16.54 inches / 297 by 420 mm.

**Recommended weight and grade:**

Use a good quality, xerographic-grade paper. For best results, use paper that is 20-pound or 80 gsm (grams per square meter) bond, xerographic grade. Xerox 4024 Dual Purpose Paper provides optimal performance in the printer. Refer to the consumable supplies table later in this appendix.

Use paper within these parameters:

- Lightest: 16-pound or 65 gsm bond
- Heaviest: 110-pound or 200-gsm index.

*NOTE: It is recommended that you use 24-pound paper with MICR applications, or paper specified by your local banking regulatory authority.*

**Characteristics**

The paper stock should have the following characteristics:

- Low moisture content (a paper-to-moisture ratio below 5.7 percent). Paper with higher moisture content may curl and jam.
- Smooth surface
- Moisture-resistant wrapping
- No defects (bent edges, uneven surfaces)
- Grain long (parallel with the long side of paper).

Paper is usually fed into the printer with the long side as the leading edge (except 11 by 17-inch or A3 paper). When you purchase paper, buy long-grain paper. Make sure the grain is parallel with the long side (long-grain) for the most reliable feeding and stacking.

**Special stocks**

Following are some guidelines for choosing and using special materials:

- **Labels:** Must be the type designed for high-speed printers and must meet the specifications described in the section above. Loading instructions are printed on all paper trays.

Use only the processor feeding trays (trays 1 and 2) for labels. Load labels in the tray with the label side up.

You can direct printed labels to any output tray. Be sure the printed labels are stacked *face up* in the output tray, to avoid ink offsetting and jams due to delamination.

- **Transparencies:** Must be the type designed for high-speed printers and must meet the specifications described in the section above. Loading instructions are printed on all paper trays.

Load transparencies with the opaque strip to the right. All printed transparencies are delivered to the sample tray.

As long as they meet your printer paper specifications, you can also use the following stocks.

- **Tinted paper:** Available in a variety of colors, it has many uses, including calling attention to certain printed material, separating special sections, or dividing chapters of a report.
- **Preprinted paper:** May be letterhead, forms, or logos.
- **Predrilled paper:** Has a varying number of holes for use in binders or binder rings. Before loading predrilled paper, fan it to remove loose plugs that could cause paper jams. Load predrilled paper in the printer with holes to the right.
- **Perforated paper**
- **Pre-cut or full-cut tabs**
- **Carbonless paper**

### **Paper width and printer performance**

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The width of the paper you use for your print job is directly related to the rate at which the 96, 4635, and 180 printer can print a job. The rate at which a job prints is the throughput speed and is measured in pages per minute (ppm). You will want to keep in mind the following information on the relationship of paper width to printer performance, when selecting paper for your applications.

The printer operates in different pitch modes. The pitch mode the printer uses for a specific print job is based on the paper size on which that job is printed. The following tables list the pitch mode boundary values, paper widths, and related printing speeds supported on the 96/4635/180 printer. These charts show that the shorter the paper width, the higher the pitch mode and the faster the throughput speed—higher pages per minute (ppm) rate. (“Pages per minute” is synonymous with “impressions per minute.”)

Table A-1. **Throughput data: 96 printer**

Pitch	Paper width	Speed
5	7.4 to 12.12 in. / 188 to 308 mm	96 ppm
4	12.12 to 15.31 in. / 308 to 389 mm	77 ppm
3	15.31 to 17 in. / 389 to 432 mm	58 ppm

Table A-2. **Throughput data: 4635 printer**

Pitch	Paper width	Speed
8	7 to 7.4 in. / 178 to 188 mm	154 ppm
7	7.4 to 9.01 in. / 188 to 229 mm	135 ppm
6	9.01 to 10.19 in. / 229 to 259 mm	116 ppm
5	10.19 to 12.12 in. / 259 to 308 mm	96 ppm
4	12.12 to 15.31 in. / 308 to 389 mm	77 ppm
3	15.31 to 17 in. / 389 to 432 mm	58 ppm

Table A-3. **Throughput data: 180 printer**

Pitch	Paper width	Speed
8	7 to 7.4 in. / 178 to 188 mm	206 ppm
7	7.4 to 9.01 in. / 188 to 229 mm	180 ppm
6	9.01 to 10.19 in. / 229 to 259 mm	154 ppm
5	10.19 to 12.12 in. / 259 to 308 mm	128 ppm
4	12.12 to 15.31 in. / 308 to 389 mm	103 ppm
3	15.31 to 17 in. / 389 to 432 mm	77 ppm

When the printing speed appears to degrade, you may be able to improve it by running the print job in a higher pitch mode.

**Paper size/pitch  
mode minimum  
and maximum**

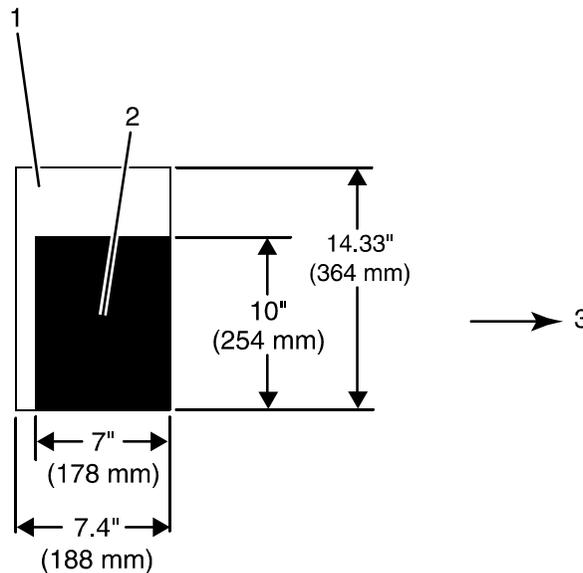
The illustrations in this section show the pitch modes in which you can operate with the smallest and largest size papers supported by the 96/4635/180 printer.

### Using small paper sizes in 8-pitch mode:

Printing in 8-pitch mode provides the highest throughput speed available—up to 154 ppm for the 4635 printer and up to 206 ppm for the 180 printer. (The 96 printer does not support 8-pitch mode.) However, you should keep the following in mind when you select the paper you want to use for this mode:

- Paper sizes smaller than 8 inches / 203 mm are supported only when the optional 7-inch paper kit is installed on the printer.
- The leading edge of any paper used in the printer cannot be less than 10 inches / 254 mm long.

The following figure illustrates the maximum and minimum paper sizes supported in 8-pitch mode.



**Figure A-1. 8-pitch mode paper sizes (4635 and 180 only)**

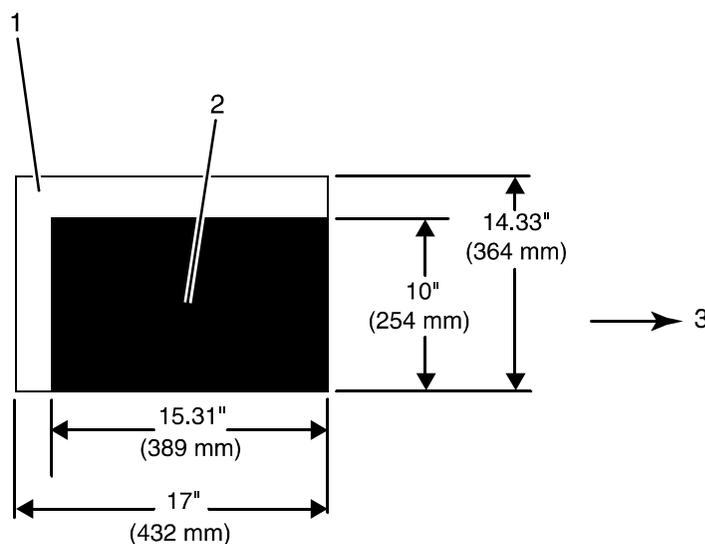
1. Maximum paper size for 8 pitch mode
2. Minimum paper size for 8 pitch mode
3. Travel direction of sheets out of paper tray

### Using large paper sizes in 3-pitch mode:

Large paper sizes—widths of 15.31 to 17 inches / 389 to 432 mm—are supported only in 3-pitch mode and must feed short edge first. These paper sizes slow down the throughput speed (as shown in tables above).

*NOTE: The 96/4635/180 printer can support 14 by 17-inch / 356 by 432 mm, 20 pound or 80 gsm paper stock in 3-pitch mode. However, printing performance is not guaranteed for all types of paper of this size. Heavy (110-pound / 200 gsm) and light (16-pound / 60 gsm) large papers can cause jams throughout the system and are not recommended.*

The following figure illustrates the maximum and minimum paper sizes supported in 3-pitch mode.



**Figure A-2. 3-pitch mode paper sizes**

1. Maximum paper size for 3 pitch mode
2. Minimum paper size for 3 pitch mode
3. Travel direction of sheets out of paper tray

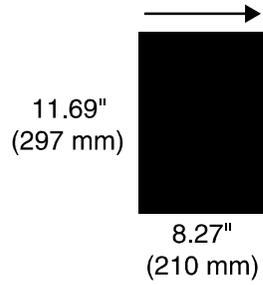
**Feed direction for some standard paper sizes**

Currently, 14 inches / 356 mm is the maximum paper length supported for long edge feeding (5 to 8 pitch mode). Any papers with long edges greater than this (such as 11 by 17 inch / 279 by 432 mm paper) must be loaded for short edge feeding (3 or 4 pitch mode).

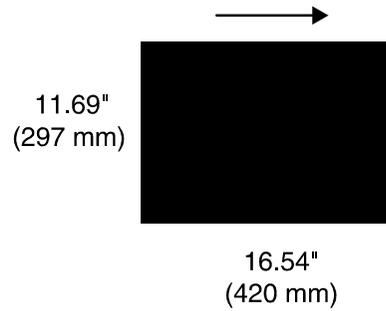
The following figures illustrate how some of the supported standard paper sizes, in various pitch modes, feed through the printer.

**European papers:**

The following diagrams show how A4 and A3 paper sizes feed through the printer.



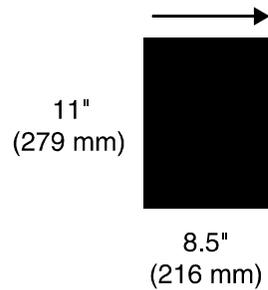
**Figure A-3. A4 / 210 by 297 mm paper feeding (long edge feed)**



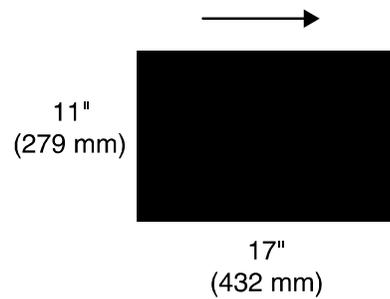
**Figure A-4. A3 / 297 by 420 mm paper feeding (short edge feed)**

**US papers**

The following diagrams show how US Letter and US Ledger (or US Tabloid) paper sizes feed through the printer.



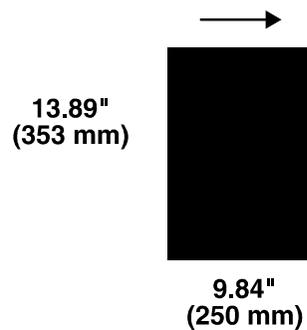
**Figure A-5. US Letter / 8.5 by 11 inch paper feeding (long edge feed)**



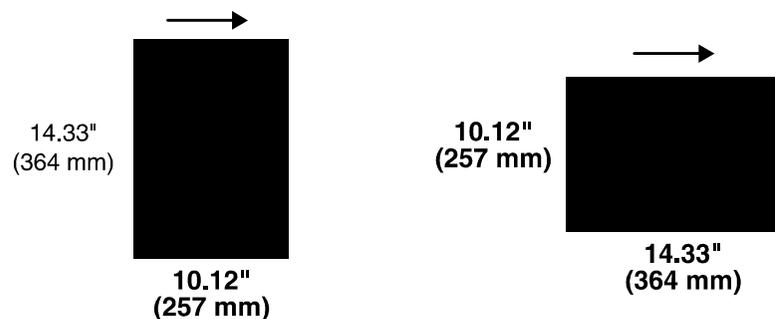
**Figure A-6. US Ledger or US Tabloid (11 by 17 inch) paper feeding (short edge feed)**

### B4 papers

There are two sizes of B4 paper—European or ISO (9.84 by 13.89 inches / 250 by 353 mm) and Japanese or JIS B4 (14.33 by 10.12 inches / 364 by 257 mm). European B4 feeds long edge first, while JIS B4 feeds *either* long edge or short edge first.



**Figure A-7. B4 / 250 by 353 mm paper feeding (long edge feed)**



**Figure A-8. JIS B4 / 257 by 364 mm paper feeding (long edge feed and short edge feed)**

## Paper care

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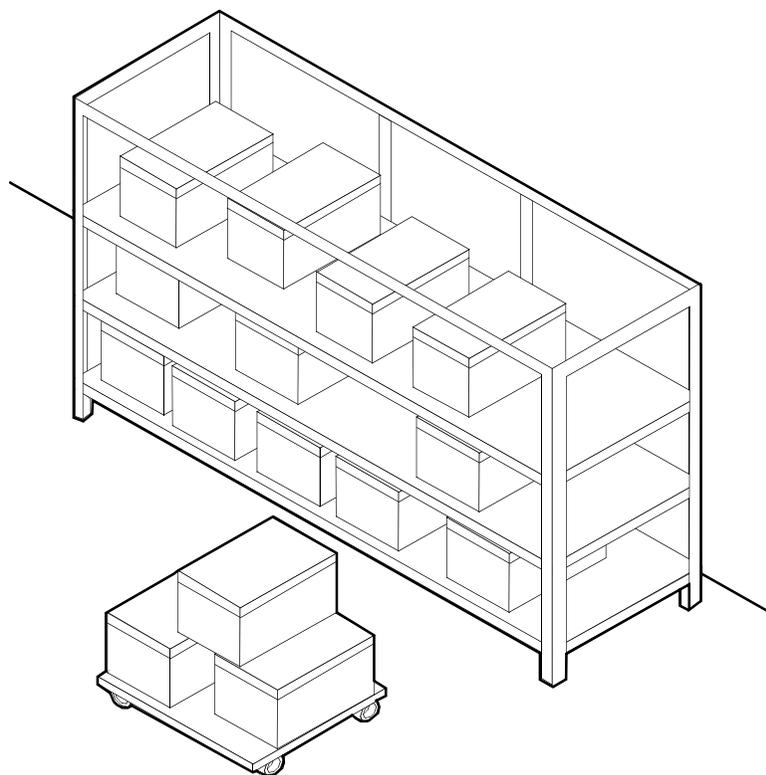
Once you have purchased your paper, you must be sure it is stored and conditioned properly, so that it performs optimally in the printer with a minimum of jams.

**Storing paper** Paper has a tendency to curl under the heat that is present inside xerographic equipment. To minimize the amount of curling, use paper with low moisture content. Paper with excessive moisture content has a tendency to jam because of the greater curl. The maximum recommended moisture content is 5.7 percent.

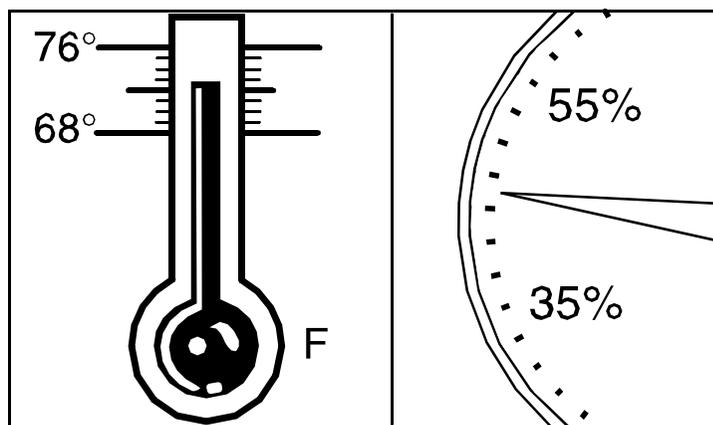
Keep these points in mind when preparing your paper storage area:

- Store paper in its own wrapper; do not leave it unwrapped or where it can be damaged by dampness or heat.
- Store paper on a flat surface and not on its side or edge.
- Store reams of paper in a closed cabinet.
- Always store paper in a cool, dry area. Store on pallets or shelves, not on the floor.
- Plan ahead and keep at least a day's supply of paper in the same area as the printer to allow environmental stabilization prior to printing.

For more detailed information on paper for Xerox printers, refer to *Helpful Facts about Paper*, provided with your printer.



**Figure A-9. Storing paper correctly**



**Figure A-10. Recommended temperature and humidity for paper storage**

**Conditioning paper**

Because temperature and humidity affect paper performance in the printer, you need to condition paper before using it. To do this, store paper for a specified length of time in the same type of environment as your printer.

The length of time you should condition your paper depends on the amount of paper and the difference between the storage and operating temperatures.

Use the following chart to determine the length of time needed to condition stacked cartons of paper.

*NOTE: The numbers in the top two rows indicate the temperature difference between the storage area and the operating environment, not actual room temperatures.*

**Table A-4. Paper conditioning: Recommended temperature differences between storage and operating areas**

Temperature differences between storage and operating areas							
Fahrenheit							
10°	15°	20°	25°	30°	40°	50°	
Centigrade							
5.5°	8.5°	11°	13°	17°	22°	28°	
Cartons	Hours						
1	4	8	11	14	17	24	34
5	5	9	12	15	18	25	35
10	8	14	18	22	27	38	51
20	11	16	23	28	35	48	67
40	14	19	26	32	38	54	75

**Example:** (See the shaded rows in the table above.) If you want to move ten cartons of paper from a storage area with a temperature of 90 oF to an operating area with a temperature of 75 oF (a 15o difference), you should do so at least 14 hours before using the paper.

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## Other supplies

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This section describes the supplies other than paper that are necessary for installation and afterward. Your sales representative will help you place your initial supply order.

### Dry ink

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Dry ink (also called toner) is the black powder which forms the image on the printed page. There are three cartridges of dry ink in each carton. You should keep at least one extra cartridge on hand at all times. The disposable cartridges are easily changed with no mess. The consumption rate of Xerox dry ink is approximately one cartridge per 60,000 pages. Use only dry ink that is specified for use in the 96, 4635, or 180 printer, as described in the consumable supplies table.

#### **MICR dry ink**

MICR dry ink is the magnetic black powder which forms the image on the printed MICR document. There are three cartridges of MICR dry ink in each carton. The consumption rate of Xerox MICR dry ink is approximately one cartridge per 60,000 pages. Use only MICR dry ink in your 96/4635/180 MICR printer. The dry ink used with the 96/4635/180 MICR system is designed for MICR printing and does not function well when used in non-MICR systems. The same procedure used for non-MICR printing systems is used to add the dry ink to the 96/4635/180 MICR printer.

*NOTE: Dry ink (toner) yields are based on 7% area coverage. Your yield may vary, depending on coverage.*

## CAUTION

*Use only MICR dry ink in the 96/4635/180 MICR printer. Do not use standard dry ink. MICR dry ink cannot be reused.*

### Fuser agent

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Fuser agent (the lubricant for the printer fuser) is a consumable item required by the 96/4635/180 printers. You should keep at least two boxes (each box contains one bottle) on hand for installation by the service representative. The consumption rate of Xerox fuser agent is approximately one bottle per 250,000 pages. For product information, refer to the consumable supplies table in this appendix.

### Developer

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Developer is not consumed by the printer but does have an effective life of approximately 1,000,000 pages per carton (600,000 per carton for MICR developer). Both kinds of developer are guaranteed by Xerox for 600,000 pages per carton. Developer is a required item and must be kept on hand.

Use only the developer specified for use in your 96, 4635, or 180 printer.

## CAUTION

*The 96/4635/180 MICR printers require a different developer, with a different part number, from the developer used in the standard 96/4635/180 printer. Be sure you use only designated MICR developer in the 96/4635/180 MICR printers.*

The developer is changed by your service representative. For product information, refer to the consumable supplies table in this appendix.

### Diskettes

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Diskettes are optional items that provide loading and backup of fonts, forms, and user files to and from the printing system. The processor accepts 3.5-inch, 1.44 MB, double-sided, high density diskettes.

### **Cartridge tapes**

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The optional 4 mm cartridge tape drive uses 5 GB or 8 GB tapes. The optional quarter-inch cartridge (QIC) tape drive uses 150 MB QIC tapes.

### **Fonts**

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Data can be printed on DocuPrint printers in many sizes and type styles called fonts. A font is a character set which has unique characteristics, such as type style, size, weight, orientation (portrait, landscape, inverse portrait, and inverse landscape), character spacing (fixed and proportional), line spacing, and postures (Roman, italic, and so forth).

There are three classifications of fonts:

- Standard fonts
- Licensed fonts
- Custom fonts.

<b>Standard fonts</b>	A library of 51 fonts is provided with your printer's operating system software.
<b>Licensed fonts</b>	Additional fonts may be ordered from your local Xerox Font Center.
<b>Custom fonts</b>	Custom fonts and graphic images such as company logos and signatures can be digitized by the Xerox Font Center for use on your printer.
<b>Receiving fonts</b>	Fonts are received on a diskette from your local Xerox Font Center.

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## MICR tools

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You can use the following tools to determine whether the MICR output is printing within MICR specifications:

- MICR Positioning and Dimension Gauge.
- 8 Power (X) Comparator with MICR grid.

*NOTE: You should use the Custom Transfer Assist Blade to ensure acceptable MICR line quality on all MICR printing systems that use nonstandard paper sizes.*

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### MICR Positioning and Dimension Gauge

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The MICR Positioning and Dimension Gauge (part number 600T80025) consists of a thin sheet of flexible plastic attached to the bottom of a piece of hard thick plastic. The gauge is provided in a kit that includes a small magnifying glass.

To use the gauge, place the printed output between the two pieces of plastic. This allows you to compare the MICR output elements against industry standard output. Using this process, you can verify the character spacing, check the horizontal and vertical alignment, and look for spots and voids.

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### MICR comparator

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You use the eight power (X) comparator with MICR grid to compare the characters on the MICR output to industry standard output.

The comparator is an optical tool that magnifies each character eight times. It has a built-in scale that measures the size of the MICR characters and checks for spots and voids (deletions).

Keep the following in mind when using the 8 Power (X) Comparator with MICR grid:

- Patterned paper can cause viewing problems. You should use white paper when you perform quality evaluations.
- The quality of the MICR output may vary, depending on the type of paper you use.
- Handle the comparator with care. The grid is printed on the bottom and may be damaged or worn off in time.

You can use the comparator with transmitted or reflected light.

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## Consumable supplies tables

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A number of supplies are available from Xerox for your DocuPrint printer. Use the following tables to help determine your supply needs.

*NOTE: Customers in the U. S. may use the part numbers in these tables to order supplies. Customers outside the U. S. should contact their local service organization for part numbers.*

### Paper and special stocks tables

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The following tables list all throughput stocks available for the 96/4635/180 printers, with size, order number, and a brief description for each.

Table A-5. **Stocks list for 96/4635/180 printers**

Item	Description	Part number
<b>Paper</b>	Xerox paper quantities are 10 reams (5,000 sheets) to a carton unless otherwise noted below.	
8.5 x 11 inch	4024 Dual Purpose Paper	3R721
A4	4024 Dual Purpose Paper	3R2594
8.5 x 14 inch	4024 Dual Purpose Paper	3R727
8.5 x 11 inch	4024 Dual Purpose Paper, 3-hole	3R723
8.5 x 11 inch	4024 Dual Purpose Paper, 3-hole*	3R2193
8.5 x 11 inch	4024 Dual Purpose Paper, 4-hole	3R1983
8.5 x 11 inch	4024 Dual Purpose Paper, 4-hole*	3R3008
8.5 x 11 inch	4024 Dual Purpose Paper, 7-hole	3R1984
8.5 x 11 inch	4024 Dual Purpose Paper, 7-hole*	3R3010
8.5 x 11 inch	4024 Smooth	3R2675
8.5 x 14 inch	4024 Smooth	3R2677
8.5 x 11 inch	4200 Dual Purpose Paper	3R2047
8.5 x 14 inch	4200 Dual Purpose Paper	3R2051
8.5 x 11 inch	4200 Dual Purpose Paper, 3-hole	3R2641
8.5 x 11 inch	4200 Dual Purpose Paper, 4-hole	3R3012
* 5/16-inch drilled holes		
** Rainbow pack contains 750 sheets each of blue and yellow, 500 sheets each of green and pink, and 250 sheets each of buff, gray, goldenrod, and ivory.		

Table A-5. **Stocks list for 96/4635/180 printers (Continued)**

Item	Description	Part number
8.5 x 11 inch	4200 Dual Purpose Paper, 7-hole	3R3014
8.5 x 11 inch	Dual Purpose Colors—Blue	3R3052
8.5 x 11 inch	Dual Purpose Colors—Blue, 3-hole	3R3068
8.5 x 14 inch	Dual Purpose Colors—Blue, 3-hole	3R3084
8.5 x 11 inch	Dual Purpose Colors—Green	3R3056
8.5 x 11 inch	Dual Purpose Colors—Green, 3-hole	3R3072
8.5 x 14 inch	Dual Purpose Colors—Green	3R3088
8.5 x 11 inch	Dual Purpose Colors—Pink	3R3058
8.5 x 11 inch	Dual Purpose Colors—Pink, 3-hole	3R3074
8.5 x 14 inch	Dual Purpose Colors—Pink	3R3090
8.5 x 11 inch	Dual Purpose Colors—Yellow	3R3054
8.5 x 11 inch	Dual Purpose Colors—Yellow, 3-hole	3R3070
8.5 x 14 inch	Dual Purpose Colors—Yellow	3R3086
8.5 x 11 inch	Dual Purpose Colors—Buff	3R3060
8.5 x 11 inch	Dual Purpose Colors—Buff, 3-hole	3R3076
8.5 x 14 inch	Dual Purpose Colors—Buff	3R3092
8.5 x 11 inch	Dual Purpose Colors—Goldenrod	3R3062
8.5 x 11 inch	Dual Purpose Colors—Goldenrod, 3-hole	3R3078
8.5 x 14 inch	Dual Purpose Colors—Goldenrod	3R3094
8.5 x 11 inch	Dual Purpose Colors—Ivory	3R3064
8.5 x 11 inch	Dual Purpose Colors—Ivory, 3-hole	3R3080
8.5 x 14 inch	Dual Purpose Colors—Ivory	3R3096
8.5 x 11 inch	Dual Purpose Colors—Gray	3R3066
8.5 x 11 inch	Dual Purpose Colors—Gray, 3-hole	3R3802
8.5 x 14 inch	Dual Purpose Colors—Gray	3R3098
8.5 x 11 inch**	Dual Purpose Colors, Rainbow Pack—35,000 sheets per carton**	3R3107
8.5 x 11 inch	10 Series Dual Purpose Paper	3R2950
8.5 x 11 inch	10 Series Dual Purpose Paper, 3-hole	3R2952
8.5 x 11 inch	10 Series Dual Purpose Paper, 3-hole*	3R3016
* 5/16-inch drilled holes		
** Rainbow pack contains 750 sheets each of blue and yellow, 500 sheets each of green and pink, and 250 sheets each of buff, gray, goldenrod, and ivory.		

Table A-5. **Stocks list for 96/4635/180 printers (Continued)**

Item	Description	Part number
8.5 x 14 inch	10 Series Dual Purpose Paper	3R2954
8.5 x 11 inch	10 Series Smooth	3R54
8.5 x 14 inch	10 Series Smooth	3R83
8.5 x 11 inch	4024 Dual Purpose, reinforced 3-hole*	3R2057
A3	4024 Dual Purpose paper	3R91721
A3	4024 Dual Purpose paper	3R2594
9.5 x 11 inch	65-pound divider white 2,500 sheets per carton	3R3428
11 x 17 inch	4024 Dual Purpose Paper 2500 sheets per cartons	3R729
11 x 17 inch	4024 Dual Purpose Paper, 7-hole* 2500 sheets per cartons	3R3074
<b>Transparencies</b>	Xerox transparencies are packaged 100 sheets to a box.	
8.5 x 11 inch	Clear, with a white strip on the edge	3R2780
8.5 x 11 inch	Clear, with removable strip	3R3108
8.5 x 11 inch	Clear, high speed, with paper backing	3R3028
<b>Labels (Gummed)</b>	Xerox labels are packaged 100 sheets to a box.	
8.5 x 11 inch	33 labels per sheet	3R3139
8.5 x 11 inch	6 labels per sheet	3R3146
8.5 x 11 inch	Custom form (uncut)	Contact Xerox Supplies Order Service
8.5 x 11 inch	1-up label	3R4476
8.5 x 11 inch	1-up label	3R4475
8.5 x 11 inch	1-up label	3R4474
* 5/16-inch drilled holes		
** Rainbow pack contains 750 sheets each of blue and yellow, 500 sheets each of green and pink, and 250 sheets each of buff, gray, goldenrod, and ivory.		

Table A-5. **Stocks list for 96/4635/180 printers (Continued)**

Item	Description	Part number
<b>Tab stock</b>	Xerox tab stock is packaged in 5-tab sets. 250 sheets per carton.	
	Straight collated singles (forward, top down):	
	• Non-drilled 90-pound, Index white	3R4417
	• Non-drilled 90-pound, blue	3R4425
• Three-hole 90-pound, Index white	3R4418	
• Three-hole 90-pound, blue	3R4426	
	Reverse collated singles (bottom up):	
	• Non-drilled 90-pound, Index white	3R4415
	• Three-hole 90-pound, Index white	3R4416
<b>Cover stock</b>	Xerox cover stock is packaged 2,500 sheets per carton.	
8.5" x 11"	65-pound, blue	3R3044
8.5" x 11"	65-pound, white	3R3041
<p>* 5/16-inch drilled holes</p> <p>** Rainbow pack contains 750 sheets each of blue and yellow, 500 sheets each of green and pink, and 250 sheets each of buff, gray, goldenrod, and ivory.</p>		

Table A-6. Carbonless stocks for 96/4635/180 printers

Size	Parts	Sequence	Sheets	Sheets per carton	Sets per carton	Cartons per pallet	Part number
8.5 in. x 11 in. *	2	Reverse/ Straight	Alternating CB-White CF-Canary	5000	2500	40	3R4225
	2	Straight/ Double	Alternating CB-White CB-White CF-Canary CF-Canary	5000	2500	40	3R4226
	2	Reverse/ Straight	Alternating CB-White CF-Pink	5000	2500	40	3R4227
	3	Straight	Alternating CB-White CFB-Canary	5010	1670	40	3R4230
	3	Straight/ Double	Alternating CB-White CB-White CFB-Canary CFB-Canary CF-Pink CF-Pink	5010	1670	40	3R4231
	4	Straight	Alternating CB-White CFB-Canary CFB-Pink CF-Goldenrod	5000	1250	40	3R4235
	N/A	N/A	CB-White	5000	N/A	40	3R4236
	N/A	N/A	CFB-White	5000	N/A	40	3R4238
	N/A	N/A	CFB-Canary	5000	N/A	40	3R4239
	N/A	N/A	CFB-Pink	5000	N/A	40	3R4240
	N/A	N/A	CF-White	5000	N/A	40	3R4242
	N/A	N/A	CF-Canary	5000	N/A	40	3R4243
	N/A	N/A	CF-Pink	5000	N/A	40	3R4244
N/A	N/A	CF-Goldenrod	5000	N/A	40	3R4245	

\* All papers are packaged 500 sheets per ream, with 10 reams per carton. Each ream contains only complete carbonless sets (i.e., 501 sheets in a three-part ream for 167 sets).

Table A-6. Carbonless stocks for 96/4635/180 printers (Continued)

Size	Parts	Sequence	Sheets	Sheets per carton	Sets per carton	Cartons per pallet	Part number
8.5 in. x 14 in.*	2	Reverse/ Straight	Alternating CB-White CF-Canary	5000	2500	30	3R4228
	3	Straight	Alternating CB-White CFB-Canary CF-Pink	5010	1670	30	3R4233
	N/A	N/A	CB-White	5000	N/A	30	3R4237
	N/A	N/A	CFB-Canary	5000	N/A	30	3R4241
	N/A	N/A	CF-Canary	5000	N/A	30	3R4246
	N/A	N/A	CF-Pink	5000	N/A	30	3R4247
	N/A	N/A					

\* All papers are packaged 500 sheets per ream, with 10 reams per carton. Each ream contains only complete carbonless sets (i.e., 501 sheets in a three-part ream for 167 sets).

### Complete supplies list—96/4635/180 printers

The following table lists the supplies in addition to paper that are available for your printer. Use this table to help you determine your supplies needs.

Table A-7. Complete supplies list for 96/4635/180

Item	Description	Part number	Items/ carton	Expected yield / carton
<b>Dry ink</b>	Consumption rate is approximately one cartridge per 60,000 pages.	6R206	3/carton	180,000 pages/carton <i>NOTE: Dry ink (toner) yields are based on 7% area coverage. Your yield may vary, depending on coverage.</i>
<b>Dry ink, MICR</b>	Packaged 3 cartridges per carton. Consumption rate is approximately one cartridge per 60,000 pages.	6R819	3/carton	180,000 pages/carton
<b>Dry ink waste bottle</b>		93K460		

Table A-7. Complete supplies list for 96/4635/180 (Continued)

Item	Description	Part number	Items/ carton	Expected yield / carton
<b>Developer</b>	Packaged 2 bottles per carton. Effective life is approximately one carton per 1,000,000 pages. (2 bottles required for replacement.)	5R161	2/carton	1,000,000 pages/ carton
<b>Developer, MICR</b>	Packaged 2 bottles per carton. Effective life is approximately one carton per 600,000 pages. (2 bottles required for replacement.)	5R573	2/carton	600,000 pages/carton
<b>Fuser agent</b>	Packaged 1 bottle per carton. Consumption rate is approximately one bottle per 250,000 pages.	8R2955	1/carton	250,000 pages/bottle
<b>Cleaning supplies</b>	Foam-tipped swabs	99P87256		
	Lint-free towels	35P2163		
	Magnetic head cleaning kit. Packaged 2 diskettes per box.	8R3811		
	1/4-inch cartridge head cleaning kit	9R88432		
	Hub and Transport Cleaner	99P87486		
	4 mm cartridge drive head cleaning kit	9R01189		
<b>Diskettes</b>	3.5-inch, 1.44 MB, double-sided, high density diskettes. Packaged 10 diskettes per box.	8R7683	10/box	
<b>Cartridge tapes</b>	1/4-inch (26-track) blank cartridge tape (QIC), 150MB 4mm blank cartridge tape, 5GB 4mm blank cartridge tape, 8GB	9R84168 9R01190 109R00314		

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## Ordering supplies

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To avoid unnecessary downtime, always have an adequate amount of the necessary supplies. To do this, you need to establish a procedure for checking and ordering supplies. A supplies checklist is provided at the end of this chapter to help you with this task. It lists the supplies needed for the printer and contains a column for you to enter the date when you want to place the order and a column to record the date of the actual order. The consumable supplies table, above, contains a list of Xerox supplies available for the printer.

It is important that you check your supplies regularly and order before you run out. Plan on approximately five working days for delivery after placing the order. You can make arrangements to receive them sooner in emergency situations.

Your Xerox sales representative can help you submit the initial order of supplies needed for installation. These items include paper, dry ink, MICR dry ink, fuser agent, developer, and MICR developer.

Once your printer volume is established, planning ahead and buying Xerox supplies in quantity can save you money. Your Xerox supply specialists can help you. There are two centers available to assist you:

- To order Xerox paper, transparencies, labels, dry ink, MICR dry ink, developer, MICR developer, fuser agent, cartridge tapes, and diskettes, call the Xerox Supply Center at 1-800-822-2200, weekdays between 7:30 a.m. and 6:00 p.m., Pacific time.

If you prefer, you may mail orders to the following address:

Xerox Corporation  
P. O. Box 25075  
Santa Ana, CA 92799-5075

- To order cleaning supplies, call the Xerox Customer Parts and Product Support Center at 1-800-828-5881, weekdays between 5:30 a.m. and 5:00 p.m., Pacific time, (U.S. only).

You may also mail cleaning supply orders to the following address:

Xerox Corporation  
 Parts Marketing Center  
 Building 214-07S  
 P. O. Box 1020  
 Webster, NY 14580

Please provide the following information when placing orders:

- Your customer number (provided by your Xerox sales representative)
- Your printer model
- Your supply order, including the following information:
  - Item name
  - Part number
  - Quantity desired
  - If your company requires a purchase order for payment of an invoice, you need to provide the purchase order number to Xerox at the time you place the order.

The following table is a checklist you can use to keep track of the supplies you order.

Table A-8. **Supplies checklist for 96/4635/180 printer**

<b>Checklist: Supplies</b>				
Use this checklist to help record the supplies you require, the date on which the order should be placed, and the actual date of the order.				
Item	Description and part number	Quantity	Date to order	Date ordered
<b>Paper</b>				
<b>Transparencies</b>				

Table A-8. **Supplies checklist for 96/4635/180 printer (Continued)**

<b>Checklist: Supplies</b> Use this checklist to help record the supplies you require, the date on which the order should be placed, and the actual date of the order.				
Item	Description and part number	Quantity	Date to order	Date ordered
<b>Labels</b>				
<b>Dry ink</b>				
<b>MICR dry ink</b>				
<b>Developer</b>				
<b>MICR developer</b>				
<b>Fuser agent</b>				
<b>Floppy disks</b>				
<b>Cleaning supplies</b>				



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## **B. Xerox support services**

Xerox provides many services in support of your laser printing system. This appendix contains information on the following services:

- Xerox Customer Service Support Center
- Xerox Printing Systems Customer Support Center
- *Xerox Customer Documentation Catalog*
- Xerox Documentation and Software Services (XDSS)
- Operator training
- Xerox Customer Education
- Xerox Font Center.

Prior to installation, your sales representative is available to answer your questions about products, services, or billing. In the U. S., however, if you need assistance in resolving application-related problems or questions, call the Xerox Printing Systems Customer Support Center (refer to the following section of this chapter). Your systems analyst is also available to assist you with applications development.

*NOTE: For customers outside the United States, contact your local Xerox representative or operating company for information on available support services.*

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### **Xerox Customer Service Support Center**

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The Xerox Customer Service Support Center provides regular maintenance care for your printer as well as any necessary repairs. Call the Service Support Center if your printer has a hardware-related problem such as poor print quality, repeated paper jams, or connectivity problems.

Before calling your Customer Service Support Center, make sure you have tried the corrective actions described in your operator guide. If a problem persists, gather the necessary information and call your customer service support center.

In the United States, call the following number to report DocuPrint hardware or software problems:

**1-800-821-2797**

*NOTE: This phone number is attached to your printer at installation time.*

Before contacting service, make note of the following:

- Status code numbers and messages which appear on the keyboard/display
- Status messages which appear on the printer control console
- Indicator lights that are lit.

Your call is answered by a representative, who asks you for the model number and the serial number for your printing system, and for the following:

- Serial number for your printing system
- Your name
- Company name
- System condition or status.

Give this information to a customer service representative, who will call you back to help you resolve the problem over the phone, or to give you an estimated time of arrival.

Xerox support personnel may use the Sixth Sense feature to access controller information via modem from a remote location.

More information about Sixth Sense can be found in the *Troubleshooting Guide*.

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## **Xerox Printing Systems Customer Support Center**

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The Xerox Printing Systems Customer Support Center is available to address your application problems or to direct you to the appropriate documentation.

The key to effective use of the Xerox Printing Systems Customer Support Center is correct identification of the problem. Before calling the center, it is helpful to have the following information available:

- The correct name of your system, such as the Xerox DocuPrint NPS/IPS, and the model, for example, 4635.

- A list of any error messages
- An explanation of how output is different from what was expected
- An assessment of whether the symptoms follow a pattern or occur randomly
- A list of special conditions that may have caused the problem:
  - New applications
  - Changes made to the software
  - Recent service performed
  - Previous conditions under which the application has printed properly.

To contact the Xerox Printing Systems Customer Support Center, call: **1-310-333-0501** (U. S. only), between the hours of 5:00 a.m. and 5:00 p.m., Pacific time.

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## **Xerox Customer Documentation Catalog**

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Detailed information on documentation for DocuPrint printers and other Xerox products is contained in the *Xerox Customer Documentation Catalog*. The catalog includes a brief description of each item and its cost.

Once you are on the mailing list, updated catalogs are sent to you automatically. You may call Xerox Documentation and Software Services (XDSS) to request a catalog. Refer to the following section for further information.

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## **Xerox Documentation and Software Services (XDSS)**

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XDSS offers a variety of services that can be customized to meet your documentation needs.

XDSS distributes the documents you need to facilitate the installation and use of the DocuPrint printer, other Xerox printers, and associated software.

XDSS will also send you a *Xerox Customer Documentation Catalog* free of charge upon request. To order documents or request a *Xerox Customer Documentation Catalog*, call XDSS at **1-800-327-9753**, between the hours of 6:00 a.m. and 5:00 p.m., Pacific time (U. S. only).

XDSS representatives will explain the services available, answer your questions, and take orders for documentation.

XDSS also has a web page from which you can order customer documentation and/or obtain a catalog. Its address is:

**<http://www.XDSS.com>**

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## **Operator training**

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Operator training is conducted at your location by your Xerox system analyst or other identified representative, shortly after the printer is installed. Training takes two to four hours, depending on the system configuration. It includes hands-on practice running basic jobs, performing routine maintenance, and solving problems. Determine the number of operators you want to attend the initial training and schedule training dates and times through your Xerox sales representative.

Additional training classes, such as Advanced Customer Training (ACT) for operators, teach advanced service and maintenance skills. Your sales representative can give you information on availability of ACT training.

A variety of classes and workshops are available through Xerox Customer Education (refer to the following section).

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## **Xerox Customer Education**

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Xerox offers classes and tutorial documents on various topics relating to printing systems and document production. For information about Xerox training courses, or to receive a catalog, call Xerox Customer Education at **1-800-445-5554** (U. S. only). Customer Education has a web page where you can obtain additional information. Its address is:

**<http://xww.dsss.world.xerox.com/CustomerEd>**

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## Xerox Font Center

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The Xerox Font Center can send you samples and catalogs of the fonts available for your printer.

To receive font samples, obtain price information, obtain technical support, or order licensed or custom fonts, call **1-800-445-FONT**

**(-3668)** between 6:00 a.m and 5:00 p.m. Pacific time (U. S. only).

For technical support regarding fonts (such as installing fonts or solving font usage problems), call **1-800-521-8324**.



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## C. Related publications

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### Xerox documents

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The Xerox DocuPrint NPS/IPS documentation set includes the documents listed below.

- *Guide to Configuring and Managing the System*
- *Guide to Managing Print Jobs*
- *Guide to Performing Routine Maintenance*
- *Guide to Submitting Jobs from the Client*
- *Guide to Using Page Description Languages*
- *Installation Planning Guide*
- *System Overview Guide*
- *Troubleshooting Guide*
- *Solutions Guide for IPDS Printing*
- *Decomposition Service and Tools Guide*
- *Glossary*
- *Master Index*
- *Generic MICR Fundamentals Guide*
- *Customer Information Quick Reference Card*
- *Printer Controller Commands Quick Reference Card*
- *Operator Quick Reference Card*
- *Submitting your Jobs from Macintosh Quick Reference Card*
- *Submitting your Jobs from UNIX & DOS Quick Reference Card*
- *Submitting your Jobs from Windows NT 4.0 (QuickPrint) Quick Reference Card*
- *Submitting your Jobs Using Windows NT 4.0 Drivers Quick Reference Card*

The documentation set also includes an electronic version, the DocuPrint NPS/IPS Interactive Customer Documentation CD.

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## IBM reference manuals

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If you require further information about the various AFP products and system architectures, refer to these IBM publications. Note that the publication numbers shown are current as of the date this document was published. For the most current publication numbers, contact IBM.

- *Guide to Advanced Function Presentation* (G544-3876-00) contains a comprehensive overview of AFP and AFP concepts.
- *Mixed Object Document Content Architecture Reference* (SC31-6802-04) describes the functions and elements that make up MO:DCA data streams.
- *Page Printer Formatting Aid/370: User's Guide* (S544-5284-03) contains information about the PPFA product that is used to create AFP page definitions and form definitions.
- *Page Printer Formatting Aid/370: Command Quick Reference* (G544-3701-04) provides general information about Page Printer Formatting Aid/370 (PPFA/370). It contains information on program invocation, symbolic information, syntax rules, and the command syntax for the PPFA/370 commands.
- *Overlay Generation Language/370 User's Guide and Reference* (S544-3702-03) summarizes the basic information required to define and to generate an overlay using the IBM Overlay Generation Language/370 (OGL/ 370) licensed program. It also includes information on program invocation (in MVS, VSE, and VM), symbolics, syntax rules, and the command syntax for the OGL/370 commands.
- *The Continuing Evolution of Advanced Function Printing* (by Howarth and Plate, IBM Systems Journal, VOL 32, NO 4, 1993) traces the continuing evolution of AFP, its usage, and how it addresses the presentation requirements of businesses in the 1990s.
- *Advanced Function Printing-From Print to Presentation* (G321-5528-00), describes some of the software products and how they use the architecture. It also describes possible future directions for AFP and related technologies.

- *Advanced Function Presentation: Printer Summary* (G544-3135-10) contains detailed characteristics of IBM's page printers.
- *Advanced Function Presentation Workbench for Windows: Using the Viewer Application* (G544-3813-00) contains information about using this product with the AFP application programming interface.
- *Advanced Function Presentation Conversion and Indexing Facility: Application Programming Guide* (G544-3824-01) contains information about using the AFP Conversion and Indexing Facility (ACIF).
- *Advanced Function Presentation: Programming Guide and Reference* (S544-3884-01) contains information about using the AFP application programming interface.
- *Distributing AFP Printing from a Host System* (GG24-4493-00) explains the different ways of distributing print jobs from a host system to remote sites.
- *AFP Printing in an IBM Cross-System Environment* (GG24-3765-00) explains how to print AFP documents in a multiple host environment and how to handle resources in the different the environments.
- *Intelligent Printer Data Stream Reference* (S544-3417-05) describes the functions and composition of elements sent to printers that support the IPDS architecture.
- *Bar Code Object Content Architecture Reference* (S544-3766-02) describes the functions and services associated with Bar Code Object Content Architecture (BCOCA).
- *Font Object Content Architecture Reference* (S544-3285-03) describes the functions and services associated with Font Object Content Architecture (FOCA).
- *Graphics Object Content Architecture Reference* (S544-5498-00) describes the functions and services associated with Graphics Object Content Architecture (GOCA).
- *Image Object Content Architecture Reference* (SC31-6805-04) describes the functions and services associated with Image Object Content Architecture (IOCA).
- *Presentation Text Object Content Architecture Reference* (SC31-6803-02) describes the functions and services associated with Presentation Text Object Content Architecture (PTOCA).

- *Print Service Facility/MVS: Application Programming Guide* (S544-3673-03) provides information about using PSF in an MVS environment.
- *Print Service Facility/VM: Application Programming Guide* (S544-3677-00) provides information about using PSF in a VM environment.
- *Print Service Facility/VSE: Application Programming Guide* (S544-3666-01) provides information about using PSF in a VSE environment.
- *Print Service Facility/2: Getting Started* (G544-3767-01) provides the basic information required for using PSF in an OS/2 environment.
- *IBM AIX Print Service Facility/6000: Print Service Facility for AIX Users* (G544-3814-01) provides information about using PSF for AIX in an RS/6000 environment.
- *AS/400 Information Directory* (GC21-9678-03) provides information on using the AS/400 system.
- *Attachment Configuration Handbook* (30H7322) provides information about attaching your printer to a host system (MVS, VM, VSE, AS/400, PS/2).
- *PSF V3R1 for OS/390: User's Guide* (S544-5630-00) describes the JCL to use and how to use AFP resources such as form definitions, page definitions, color map tables, fonts, and so on.
- *InfoPrint Manager for AIX User's and Operator's Guide* (S544-5596-01) provides syntax for commands and utilities, and detailed information on IPS attributes and values. This publication can be used as a reference for end users, print operators, and administrators.
- *IBM InfoPrint Manager for AIX: PSF Direct* (S544-5486-00) provides information about using InfoPrint Manager for AIX.

Refer to the "Xerox support services" appendix of this guide for information on how to order these and other publications.

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## D. DocuPrint NPS/IPS on a Novell network

This appendix provides a brief overview of Novell NetWare, and describes some of the considerations you must make before the service representative installs DocuPrint NPS/IPS on a Novell network.

*NOTE: This information does not apply to IPDS printing.*

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### Novell NetWare overview

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In a Novell network, clients who connect to the file server are authenticated and maintain an open connection. Communication is through the file server and not client-to-device. Communications are typically on an Ethernet or Token Ring LAN.

Novell NetWare software receives and queues print jobs. It assigns priorities to incoming jobs and tracks information about each job. It sends print jobs to the printer, and contains a series of utilities and menus to set up, manage, and manipulate print queues.

DocuPrint NPS/IPS supports Novell NetWare versions 3.11 and 3.12.

*NOTE: Customers using Novell 4.1 must set the Bindery Emulation Mode to be compatible with Novell 3.12.*

### Print queues

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A print queue is a holding area on the file server where print jobs are stored until a printer is ready. A queue allows multiple users to send jobs to the same printer at the same time. The queue software accepts and tracks jobs to enable users to view, remove, and change values of jobs while they are in the queue.

Each queue has a directory on a hard disk. A print job sent to a queue is stored as a file within that directory. Once the job is printed, the file is removed from the queue directory.

The print queue software maintains a temporary record of information for every print job. The information includes such items as job number, job position in the queue, time the job entered the queue, print server designated to print the job, user ID of the person who submitted the job, and so on. The user can access this information or cancel a job, using PCONSOLE, for each queue.

### **Queue to printer relationships**

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Novell NetWare allows for flexibility in setting up different printing configurations. Multiple queues and printers can be associated in different ways to meet different needs, such as the following:

- One queue to one printer
- Multiple queues to one printer
- One queue to many printers
- Multiple queues to multiple printers.

### **PCONSOLE**

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PCONSOLE is the main Novell utility used for creating, viewing and managing print queues. When you create a queue with PCONSOLE, the Novell software sets up the queue directory and a bindery entry. The bindery is the database of all users, groups, and other defined entities on the NetWare file server.

*NOTE: There is no PCONSOLE access at the DocuPrint NPS/IPS Printer Controller.*

You can perform the following tasks using PCONSOLE:

- Add or remove the following:
  - definitions of file servers serviced by the print server
  - definitions of print queues serviced by the print server
  - definitions of printers for a print server
  - print servers
  - users
  - jobs to and from a queue
  - queues
- View or change job information

- Check or change queue status.

A user or operator can change job values or delete a job while it is still in the Novell queue, and before DocuPrint NPS/IPS starts to receive it. If the user has deleted the job after DocuPrint NPS/IPS begins to receive it, DocuPrint receives the delete action and attempts to cancel the job. Cancellation may fail and the job will partially or completely print.

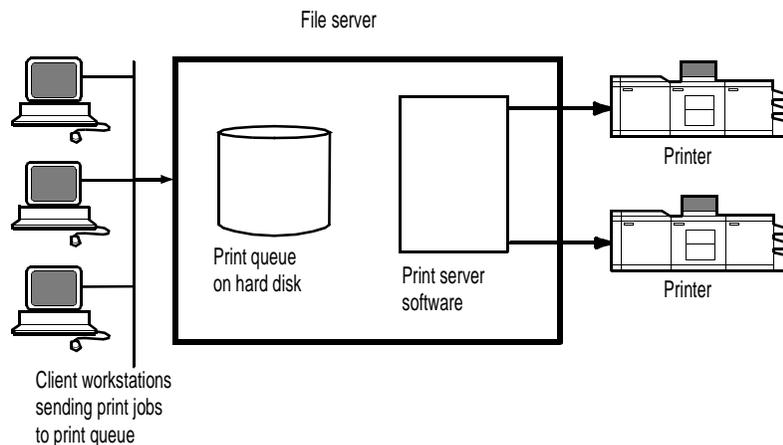
## Print server (PSERVER)

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A Novell print server (PSERVER) is a combination of hardware and software that takes ready-to-print jobs from the print queue and sends them to the printer. The print server software is the link between the print queue and the printer (either local or remote). Only one print server can be running on the file server. Each print server can service up to 16 printers. A print server can also run on a dedicated machine that is not running as a file server.

*NOTE: Although Novell PSERVER can support multiple queues on multiple file servers, DocuPrint NPS/IPS PSERVER does not. It supports one queue on one file server only.*

The print server software scans the print queues to which it is assigned looking for jobs that are ready to print. When it obtains a job from a queue, the print server sends the data to the DocuPrint NPS/IPS through an NCP/IPX connection. Once the job is sent to the printer, the job is deleted from the print queue, and the file removed from the queue directory.



## **Job parameters**

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The following job parameters are affected when the DocuPrint NPS/IPS is configured as a PSERVER:

- Job description is used as the document name
- Copies is used to set the number of copies
- Sender name is set from the user name
- Message is sent to the user when the job finishes printing or is canceled, if you set the Notify flag
- ElideHeaders is set to TRUE if you disable banner
- Form name is used to specify the virtual printer.

## **Using Novell forms to specify virtual printers**

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Novell allows the user to specify a form that has a name, number, length and width.

DocuPrint NPS/IPS uses Novell form names to specify virtual printers.

- If a Novell user wishes to access a given virtual printer, a form with the same name as the virtual printer must be defined by the NetWare administrator. The user must specify that form for the job.
- The Novell system administrator must create form names to match the names of DocuPrint NPS/IPS virtual printers.
- The form name can have a maximum of twelve characters, and the first character must be alphabetic.

If a form name is not used, a virtual printer with the same name as the queue is used.

Forms are defined on the Novell server using the Novell PRINTDEF program. (Use a prefix such as “DP” to distinguish them from other form names.)

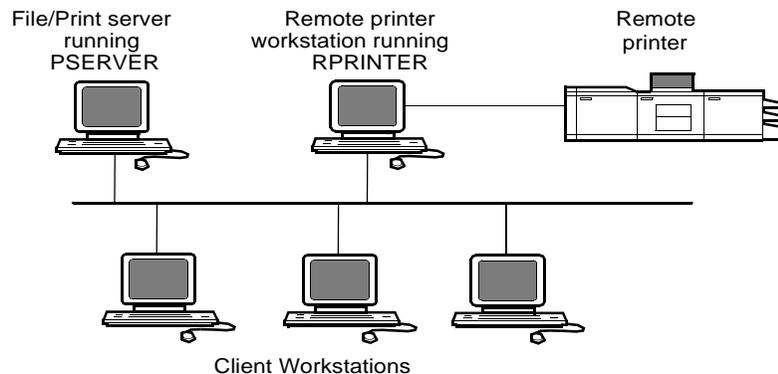
*NOTE: DocuPrint NPS/IPS is not using a form in the Novell sense. It reads the name field of the form specified, and interprets it as a DocuPrint virtual printer. None of the form attributes other than name is read.*

## Remote printer (RPRINTER)

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A Novell remote printer workstation (DocuPrint NPS/IPS Printer Controller) is a vehicle for the print server to move print data to a printer that is not directly connected to the print server. The remote printer software runs on a workstation that connects to a remote printer through a parallel or serial port.

The remote printer software communicates with a print server running print server software. The print server services jobs from the print queue and sends the data over the network through a SPX connection to the RPRINTER. The RPRINTERS are associated with DocuPrint NPS/IPS virtual printers. There can be up to sixteen RPRINTERS on the Novell file server. The RPRINTER does not have access to the queue or the data for a job in the queue. The RPRINTER configuration allows for multiple queues to provide access to the attributes of the associated virtual printers.



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## DocuPrint NPS/IPS as a print server or as a remote printer

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Before installing DocuPrint NPS/IPS on a Novell network, first determine whether you want the DocuPrint to function as a print server, or a remote printer.

### Choosing a Print Server or Remote Printer Configuration

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The following contrasts the Print Server (PSERVER) configuration with the Remote Printer (RPRINTER) configuration for your DocuPrint NPS/IPS.

- The PSERVER configuration uses a licensed connection to a File Server. The RPRINTER configuration connects to a Print Server, and does not require a regular client connection.
- Using the PSERVER configuration, DocuPrint NPS/IPS can obtain job attributes from the Novell Queue.

*NOTE: The RPRINTER configuration can't do this, and this leads to some irregularities, such as no job and submitter names, as well as an inability to select duplex through the submission interface.*

- The setting of the Novell banner pages switch operates successfully using PSERVER (this toggles the ElideHeader attribute).

If Banner Page is requested with RPRINTER, DocuPrint NPS/IPS prints a Novell-generated ASCII banner page as the first page of a job, and will print the entire job as an ASCII file (500 pages could be generated when requesting a banner page regardless of the actual file contents.)

- With PSERVER, multiple copies are requested as a job attribute; DocuPrint NPS/IPS receives only one copy and prints multiple copies.

With RPRINTER, since most remote printers can't understand a request for multiple copies, the Print Server will send the job multiple times to print multiple copies, tying up network and DocuPrint NPS/IPS resources as the file is processed.

- With PSERVER, a DocuPrint NPS/IPS can receive jobs from only one print queue on one File Server, but users can submit jobs to different DocuPrint NPS/IPS virtual printers using Novell forms. The administrator uses the PRINTDEF program to create forms with the same name as DocuPrint NPS/IPS virtual printers. Users then select a virtual printer by selecting a form with the same name using the User Tools program in the NetWare Tools folder of Windows, or the -F option in the DOS CAPTURE command.

With RPRINTER, the Print Server can direct jobs to different virtual printers, from multiple queues, possibly on multiple file servers.

- The PSERVER configuration allows the submitter to determine when printing is complete. Jobs are retained in the Novell queue until DocuPrint NPS/IPS completes printing them. This may fill up the queue in some environments.

The RPRINTER configuration informs the submitter only when the job has been submitted, even though it may print days later.

- PSERVER requires that unencrypted login is enabled on the Novell File Server to which PSERVER connects. Regular Novell clients will still use encrypted passwords.

RPRINTER does not require that unencrypted logins be permitted.

The following table lists the differences between DocuPrint NPS/IPS as a print server or as a remote printer.

**Table D-1. Print server and remote printer differences**

<b>DocuPrint NPS/IPS as a PSERVER</b>	<b>DocuPrint NPS/IPS as an RPRINTER</b>
Functions like a Novell print server.	Functions like a Novell remote printer.
Connects to a Novell file server and consumes a licensed connection.	Connects to a Novell print server without consuming a licensed connection.
Reads the Novell print queue directly and obtains all the job parameters.	Cannot read the Novell print queue; receives only the job data, not the data from the queue entry.
Not necessary for the user to disable the print job banner.	User must disable the banner for each print job. If not disabled, the job prints incorrectly.
No unusual delays in output of print jobs.	May be delays in output of print jobs when jobs are not sent back-to-back. The system views the start of a print job as the end of a previous job.
Services only one queue on one file server.	May service multiple print queues through the Novell print server.
Supports user notification of the end of a print job (completion of printing).	Notifies user only when job submission completes (does not notify user of print completion).
Can send a job ticket that references one file on the Novell file server to which the DocuPrint NPS/IPS is connected.	Cannot reference files on a Novell file server.

---

## Novell configuration

---

Once you decide to configure the DocuPrint NPS/IPS as an RPRINTER or as a PSERVER on your Novell network, there are a number of tasks you must perform.

### Configuring DocuPrint as a PSERVER

---

The following is a summary of the tasks to perform if the DocuPrint NPS/IPS is configured as a PSERVER:

1. Perform the following Novell tasks:
  - a. Sign on to the Novell workstation as a network administrator.

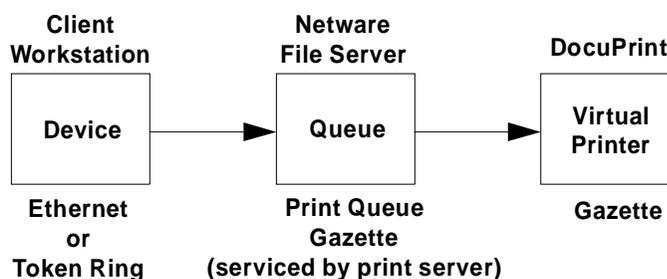
#### CAUTION

*If you use Novell's Quick Setup feature, you must do the following after creating the queue and server:*

- b. From PCONSOLE, create a Printer Queue (for example, Gazette) and a Print Server (for example, PGazette).
      - i. In the definition of the server, choose Printer Setup.
      - ii. Define the printer per the naming convention suggested by NPS/IPS.
      - iii. Select DEFINED ELSEWHERE.
    - c. From the Print Server window, configure a printer for PServer using the Printer Configuration option.
    - d. Enter any name (for example, Gazette) for the printer.
    - e. Select **Remote Other/Unknown type** for the printer and save the information.
    - f. Define the printer in the Queue Service by highlighting the printer name (for example, Gazette) and pressing **Enter**.
    - g. Press the **Insert** key to select the Print Queue (for example, Gazette) you want to bind with PServer (for example, PGazette).
    - h. Save the information.
  2. When configuring NPS/IPS, answer the configuration questions as follows:
    - Remote Printer for Novell Netware -- **<N>**

- Use Print Server for Novell Netware -- <Y>
  - Name of Novell Print Server -- **PGazette**
  - IPX Internal Network Number [**000000##**] (assigned by network administrator)
  - IPX number of Connected LAN [**000000##**] (assigned by network administrator)
  - Token Ring Framing type -- **TOKENRING** (or **TOKENRING\_SNAP**)
3. After installation, change from PSERVER to RPRINTER as follows:
    - a. Sign on to privilege as an administrator.
    - b. Enter **Configure** to specify the printer configuration.
    - c. Select **Option 3**, enter <N> to the **Review All Information** question, and enter **Novell** to review Novell information.
    - d. Enter the following information:
      - Remote Printer for Novell Netware -- <N>
      - Print Server for Novell Netware -- <N>
      - Name of Novell Print Server -- **PGazette**
      - IPX Internal Network Number [**000000##**] (assigned by network administrator)
      - IPX number of Connected LAN [**000000##**] (assigned by network administrator)
      - Token Ring Framing type -- **TOKENRING** (or **TOKENRING\_SNAP**)
    - e. Save all of the options.
  4. Enter **Start All**.
  5. Reboot the NPS/IPS.
  6. Provide all of the required installation parameters identified in the checklist provided in chapter 2 of this guide to your service representative.

In the following illustration, the queue, virtual printer, and specified form are configured with the same name. The user sends a print job that specifies a print queue named Gazette through the Ethernet or Token Ring port to the Gazette queue that is served by the print server. This job is assigned to the Gazette virtual printer on NPS/IPS.



**Figure D-1. DocuPrint NPS/IPS configured as a PSERVER**

### **Configuring DocuPrint as an RPRINTER**

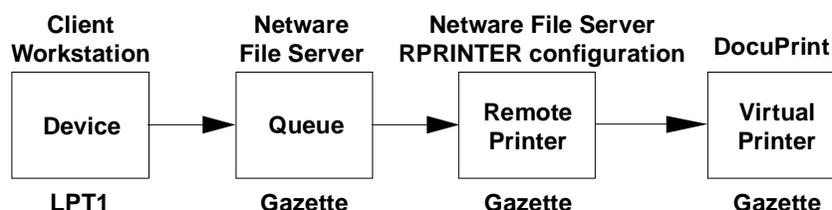
---

The following is a summary of the tasks to perform if you configure the DocuPrint NPS/IPS as an RPRINTER:

1. Perform the following Novell tasks:
  - a. Sign on to the Novell workstation as a network administrator.
  - b. From PCONSOLE, create a Printer Queue (for example, Gazette) and a Print Server (for example, PGazette).
  - c. From the Print Server window, configure a printer for PSERVER using the Printer Configuration option.
  - d. Type any name (for example, Gazette) for the printer. Select **Remote Other/Unknown type** for the printer and save the information.
  - e. Define the printer in the Queue Service by highlighting the printer name (for example, Gazette) and pressing **Enter**.
  - f. Press the **Insert** key to select the Print Queue (for example, Gazette) you want to bind with PSERVER (for example, PGazette).
  - g. Save the information.
2. When configuring NPS/IPS, answer the configuration questions as follows:
  - Remote Printer for Novell Netware -- **<Y>**
  - Use Print Server for Novell Netware -- **<Y>**
  - Name of Novell Print Server -- **PGazette**
  - IPX Internal Network Number **[000000##]** (assigned by network administrator)

- IPX number of Connected LAN [000000##] (assigned by network administrator)
  - Token Ring Framing type -- **TOKENRING** (or **TOKENRING\_SNAP**)
3. After installation, change from PSERVER to RPRINTER as follows:
    - a. Sign on to privilege as an administrator.
    - b. Enter **Configure** to specify the printer configuration.
    - c. Select **Option 3**, enter **<N>** to the **Review All Information** question, and type **Novell** to review Novell information.
    - d. Enter the following information:
      - Remote Printer for Novell Netware -- **<Y>**
      - Use Print Server for Novell Netware -- **<N>**
      - Name of Novell Print Server -- **PGazette**
      - IPX Internal Network Number [000000##] (assigned by network administrator)
      - IPX number of Connected LAN [000000##] (assigned by network administrator)
      - Token Ring Framing type -- **TOKENRING** (or **TOKENRING\_SNAP**)
    - e. Save all of the options.
  4. Enter **Create Virtual Printer Gazette** (must be the same name as the PSERVER printer name).
  5. Enter **Start All**.
  6. Reboot the NPS/IPS.
  7. Perform the following tasks from the Novell server console.
    - a. Type **Load PSERVER PGazette**.
    - b. Make sure the PSERVER window displays and Gazette activates and is waiting for jobs.
  8. Provide all of the required installation parameters identified in the checklist provided in chapter 2 of this guide to your service representative.

In the following illustration, the queue, remote printer, and virtual printer are configured with the same name, and the specified printer is set to print duplex. The user sends a print job through the LPT1 port to a queue named DPDuplex that is sent to the DPDuplex, and assigned to DPDuplex virtual printer.



**Figure D-2. DocuPrint NPS/IPS configured as an RPRINTER**

### **Supporting DocuPrint NPS/IPS on the file server**

---

There are a number of tasks you perform on the file server to support the DocuPrint NPS/IPS as either a print server or a remote printer:

- With DocuPrint NPS/IPS as a PSERVER you must allow unencrypted password login on the file server. Enter the following command at the file server console prompt and in the AUTOEXEC.NCF file:

**set allow unencrypted passwords=on**

*NOTE: Set this command even if you do not establish a print server password. Novell clients that use encrypted passwords are unaffected by this change and will continue to use encrypted passwords.*

- Do not configure the file server to support IPX checksums or NCP packet signatures. Set these options to equal 0 or 1 so that the server performs these options only when the client requests them. The default value is 1.
- Do not set the watchdog interval to less than one minute. Longer intervals may cause the DocuPrint NPS/IPS to be logged out.
- If the print queue contains 250 jobs on a regular basis, set the Maximum File Locks Per Connection to a value greater than 250. The default value is 250.
- Define forms using PRINTDEF with names matching virtual printer names. (Applies only if DocuPrint NPS/IPS is configured as an RPRINTER.)

*NOTE: DocuPrint NPS/IPS supports native connection to Novell 3.12 file servers. However, to run DocuPrint NPS/IPS with Novell 4.X servers, the Novell server must be configured to Bindery Emulation.*



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## E. Defining the channel-attached printer to the host

This appendix contains some explanations and sample printer parameters for defining a channel-attached printer to your host, in each PSF environment.

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### MVS parameters

---

This section gives examples of printer device parameters and definitions in the MVS mainframe environment using PSF/MVS.

#### Printer and PSF definitions

The following shows JES and PSF definitions.

- JES2 definitions

- Functional Subsystem (PSF) Definition

```
FSSDEF(FSS1) PROC=APSWPROC,AUTOSTOP=NO,  
HASPFSSM=HASPFSSM
```

- JES2 Printer Definition

```
PRT (6) FSS=FSS1,MODE=FSS,PRMODE=(LINE,  
PAGE,SOSI1),CLASS=F,UCS=0,SEP=YES,SEPDS=NO,  
CKPTPAGE=100,MARK=YES,UNIT=1E8
```

- PSF definitions

```
//PRT6 CNTL
//PRT6 PRINTDEV FONTDD=*.FONT300,
//    FONT240=*.FONT240,
//    FONT300=*.FONT300,
//    FDEFDD=*.FDEF,
//    PDEFDD=*.PDEF,
//    OVLYDD=*.OLAY,
//    PSEGDD=*.PSEG,
//    JOBHDR=*.JOBHDR,
//    JOBTRLR=*.JOBTLR,
//    DSHDR=*.DSHDR,
//    MESSAGE=*.MSGDS,
//    PAGEDEF=X06483,
//    FORMDEF=A10111,
//    CHARS=(GT15,GT12)
//    PIMSG=(YES,999),
//    DATAACK=BLOCK,
//    BUFNO=29,
//    TRACE=NO
//PRT6 ENDCNTL
```

**Device definitions** The following are examples of MVS hardware configuration definition (HCD) printer definition panels. This defines the physical device.

```
----- Device / Processor Definition -----
----- Define Device / Processor -----

Specify or revise the following values.

Device number . . : 0633          Number of devices . . . . : 1
Device type . . . : AFP1-0
Processor ID . . . : ELSEG1      IBM 3090-280J Located El Segundo

Unit address . . . . . 33 + (Only necessary when different from
                           the last 2 digits of device number)
Time-Out . . . . . Yes (Yes or No)
STADET . . . . . No (Yes or No)

Preferred CHPID . . . . . +
Explicit device candidate list . (Yes or No)

F1=Help   F2=Split   F4=Prompt   F5=Reset   F9=Swap   F12=Cancel

F1=Help   F2=Split   F3=Exit    F4=Prompt   F5=Reset
F6=Previous F7=Backward F8=Forward F9=Swap    F12=Cancel
```

**Figure E-1. MVS hardware configuration definition panels (example 1)**

```

Goto Filter Backup Query Help
----- Change Device Definition -----
Specify or revise the following values.
Device number . . . . . : 0633 (0000-FFFF)
Device type . . . . . : AFP1-0

Serial number . . . . .
Description . . . . . Art Ford

Connected to CUs . 0633

ENTER to continue

F1=Help   F2=Split   F3=Exit   F4=Prompt   F5=Reset   F9=Swap
F12=Cancel

F1=Help   F2=Split   F3=Exit   F4=Prompt   F5=Reset   F7=Backward
F8=Forward F9=Swap   F10=Actions F11=Add   F12=Cancel

```

**Figure E-2. MVS hardware configuration definition panels (example 2)**

```

Define Device Parameters / Features Row 1 of 3
Command ==> Scroll ==> PAGE
Specify or revise the values below.
Configuration ID . : ELSEG1 MVS/ESA Hardware Definitions
Device number . . : 0633 Number of devices : 1
Device type . . . : AFP1-0

Parameter/ Value P Req. Description
Feature
OFFLINE Yes Device considered online or offline at IPL
DYNAMIC Device supports dynamic configuration
BURSTER No Burster-Trimmed-Stacker
*****Bottom of data*****

F1=Help   F2=Split   F4=Prompt   F5=Reset   F7=Backward
F8=Forward F9=Swap   F12=Cancel

```

**Figure E-3. MVS hardware configuration definition panels (example 3)**

For further information on defining your printer, refer to the following IBM documentation.

- *OS/390 Hardware Configuration Definition User's Guide (#SC28-1848)*
- *2/OS Hardware Configuration Definition User's Guide (#SC33-7988)*

---

## Infoprint Manager procedures for Windows NT and Windows 2000

---

This section explains how to access the Create Printer Wizard in the Infoprint Manager Administration GUI, which allows you to create an actual destination (physical printer) using Infoprint Manager for Windows NT and Windows 2000.

To create a channel-attached printer:

1. On the menu bar, click **Printer**, then **Create**, then **PSF**, then **Channel**.

*NOTE: The Channel is not shown in the menu by default. To add it, select **Printer**, then **Add/Remove Menu Items**.*

2. Provide information as prompted by the wizard. For assistance, refer to the Infoprint Manager Administration GUI online help.

*NOTE: From the Model pulldown menu, make sure to select **Infoprint 60** as your printer model.*

3. If you did not enable the printer with the Create Printer Wizard, use the Infoprint Manager Administration GUI to enable it.

For detailed information on the attribute default values set by the wizard, refer to *IBM Infoprint Manager for Windows NT and Windows 2000, Getting Started*.

---

## Infoprint Manager procedures for AIX

---

There are five versions of PSF/6000 or Infoprint Manager for AIX:

- Versions 1.1, 1.2, and 2.1

These earlier versions are called PSF/6000.

- Versions 3.1 and 3.2

These current versions are called Infoprint Manager for AIX.

There are three different methods for creating printers:

- System Management Interface Tool (SMIT)

All five versions of PSF/6000 and Infoprint Manager for AIX support this method.

- Command line interface

All five versions of PSF/6000 and Infoprint Manager for AIX support this method.

- Visual System Management (VSM)

This is a graphical user interface (GUI) supported by Infoprint Manager for AIX versions 3.1 and 3.2 only.

*NOTE: Regardless of the method used, from the Model pulldown menu, make sure to select **Infoprint 60** as your printer model.*

For detailed information on setting the attribute default values using any of these methods, refer to the appropriate section of the document, *IBM Infoprint Manager for AIX, Getting Started*.

---

## VM sample definitions

---

This section gives an example of printer device parameters and definitions for a channel-attached printer in a mainframe VM environment using PSF/VM.

```
CNTLUNIT CUNMBR=632,  
PATH=16,  
PRTOCL=S,  
SHARED=N,  
UNIT=AFP1,  
UNITADD=((32,02))
```

```
IODEVICE CUNMBR=632,  
UNIT=AFP1,  
ADDRESS=(632,02))
```

```
Rdevice 0630-0637 Type AFP
```

For further information, refer the IBM document, *PSF/VM System Programming Guide* (#S544-3680).

---

## VSE sample definitions

---

This section shows sample parameters for a channel-attached printer in a mainframe VSE environment, using PSF/VSE.

```
* $$ JOB JNH=APSTANO,DISP=L,PRI=3,CLASS=B
* $$ LST CLASS=A,DISP=0,PRI=9
// JOB APSTANO
// OPTION NODUMP
// DLBL IMSYS 'IMSYS'
// EXTENT ,SYSWK6
// DLBL IMSYS 'IMSYS'
// EXTENT ,SYSWK6
LIBDEF *,SEARCH=(IMSYS.AFP300,
IMSYS2.PAGELIB,IMSYS2.PARMLIB,IMSYS.PRSABC,
IMSYS.PR$ADA,IMSYS.PR$ADB,IMSYS.PR$DY8,
IMSYS2.COMPAREX,IMSYS2.FONT,IMSYS2.FORMLIB,
PRD2.AFP,IMSYS.PROD,PRD2.AFP240,PRD2.AFP300
// EXEC APTBMEP,SIZE=APTBMEP
X3820 PRINTDEV BUFNO=10
CHARS=GT12
CKPTPAGE=100
DATAACK=BLKCHAR,
FONTPR=NO,
LOGDEST=LOCAL,
MRKFRM=NO,
NOTIFY=YES,
PIMSG=(YES,0),
SETUP=FORMS,
SPBUFFER=8
PAGEDEF=VO6683,
FORMDEF=AUTO,
UNIT=630
```



---

## F. Defining the printer to the host: TCP/IP attachment

This appendix contains instructions, prerequisites, and some sample printer parameters for defining your TCP/IP-attached printer to your host, in each PSF environment.

---

### MVS or OS/390 parameters

---

This section discusses the parameters and procedures required to define a printer to your host, followed by examples of the parameters required for a Token Ring connection using TCP/IP in a MVS environment.

*NOTE: The MVS examples shown are for a Token Ring connection. However, the same parameters will be required for an Ethernet connection using TCP/IP.*

---

### Software prerequisites – MVS

---

On an MVS/ESA or OS/390 host system, you must have the following software to print through PSF on a TCP/IP-attached printer:

- PSF/MVS Version 3, release 2.0, with APAR OW 15599 or later
- MVS Scheduler APAR OW 12236 to support two new PRINTDEV keywords: IPADDR and PORTNO
- TCP/IP Version 3, release 1 or higher, installed and configured on MVS.

You must have these prerequisites installed on your host before you begin the configuration process described in this chapter. Ensure that the manuals for the proper software releases are used.

## **Network configurations – MVS**

---

The printer is supported in all the following configurations, provided that the software prerequisites are installed.

- Basic configuration in which the MVS host is attached to a LAN using a Token Ring or Ethernet network adapter card
- Remote LAN environment in which there are data communication links between the host and the LAN-attached controller
- Configurations in which the LAN with the printer attached is connected to the host-attached controller using LAN devices such as routers
- Environments with intermediate host systems between the MVS host running PSF and the LAN-attached controller.

*NOTE: There may be printer performance and throughput implications with some of these configurations. It is recommended that your network management group be involved with planning this installation.*

## **Configuration steps – MVS**

---

The software configuration process for an MVS or OS/390 environment with TCP/IP consists of six major steps:

### **1. Configure the printer for TCP/IP at the printer controller**

Refer to your *Guide to Configuring and Managing the System* for setting system options.

### **2. Configure the MVS CCU for the MVS host to MVS**

The MVS communications control unit (CCU) could be the 3172, 3174, or 3745 control unit. To configure it to MVS, you can use either a hardware configuration definition (HCD) or an MVS configuration program (MVSCP). If your control unit and LAN are already installed and operational, skip this step.

*NOTE: The AFP1 parameter used when channel-attached IPDS printers are defined is not applicable in this configuration. It is the communications control unit (3172, 3174, or 3745) that is being defined to MVS, not the printer's control unit.*

### 3. Configure the PSF printer in JES2 or JES3

---

This section discusses the procedures for configuring the printer in JES2 or JES3 environments.

#### Configuring in JES2

To configure the PSF printer in JES2, follow these steps:

1. Locate the JES2 initialization dataset in the JES2 Startup JCL Procedure (JES2 PROC). (This is normally kept in SYS1.PROCLIB, although your system may use a different library.)

The JES2 PROC has a DD statement (normally HASPPARM), which points to the initialization dataset. (The location of this statement is SYS1.PARMLIB(JES2PARM); however, you should always verify the location on your own system.)

2. Enter the following required commands in the JES2 initialization dataset to define the PSF functional subsystem (FSS):

- One FSS statement for each PSF functional subsystem
- One PRTnnnn statement for each functional subsystem application (FSA) under control of the FSS. (This can also be specified as PRINTnn or PRINTERn.)

The following table lists the JES2 FSS statement parameters to be defined.

**Table F-1. JES2 FSS statement parameters**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
<b>FSS parameters</b>					
PROC	None	PSF Startup procedure name/	1 to 8-character alphanumeric string	Specifies name of procedure for starting this FSS. Different FSS statements can refer to the same startup procedure	
AUTOSTOP	NO	Installation preferences	YES or NO	Specifies whether FSS address space is stopped automatically if all FSAs under control of the FSS are stopped.	

**Table F-1. JES2 FSS statement parameters (Continued)**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
HASPFSSM	HASPFSSM	JES2 Load module to be loaded into FSS address space	HASPFSSM	Either omit parameter or specify default value of HASPFSSM.	
<b>PRT parameters</b>					
QUEUE	None	Installation output class standards	List of alphanumeric output classes		
COPYMARK	DATASET	Installation preferences	DATASET or JOB or CONSTANT	DATASET: printer will offset-stack or stitch on a dataset boundary. JOB: printer will offset-stack or stitch on a job boundary. CONSTANT: Copymarks are constant; no offset stacking or stitching is done.	
FORMS	None	Forms that will be printed on this printer	1 to 8 form names (each 1 to 8 alphanumeric characters in length)	If WS is F, only output with these form names will be selected for printing on this printer.	
FSS	None	Name of FSS	1 to 8-character alphanumeric string	Required	
MARK	NO	Installation preferences	YES or NO	YES specifies that MARKFORM be created at the end of each job.	
MODE	FSS (if FSS= is coded)	Must be FSS	FSS	MODE=FSS should be specified.	
PRESELECT	YES	Installation preferences	YES or NO	Specifies whether output datasets are preselected for this FSA.	

**Table F-1. JES2 FSS statement parameters (Continued)**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
ROUTECD	None	Installation printer name standards	1 to 4 destination names	If WS if F, only output with these destinations is selected for this printer.	
START	YES	Should be NO for TCP/IP printers.	YES or NO	START=NO should be specified so TCP/IP can be started before the FSS.	
TRKCELL	no	See JES2 SPOOLDEF statement	YES or NO	IBM recommends YES.	
WS	None	Installation preferences	See JES2 Initialization and Tuning Manual.	Consider CL, R, and F. See JES2 Initialization and Tuning Manual for more information.	

Following is an example of the JES2 Initialization Dataset required commands:

**Table F-2. JES2 Initialization Dataset commands example**

FSS (FSS1)	PROC=FSSPROC1,HASPFSSM=HASPFSSM,AUTOSTOP=YES
PRT0001	CLASS=E,FSS=FSS1,MODE=FSS,PRESELCT=YES, START=NO,TRKCELL=YES,WS=(Q)

### **Configuring in JES3**

Follow these steps to configure the PSF printer in JES3:

1. Locate the JES3 initialization dataset (commonly known as Initialization Deck) in the JES3 catalogued JCL Procedure. (This is normally kept in SYS1.PROCLIB, although your system may use a different library.)

The JES3 PROC has a JES3IN DD statement, which points to the initialization dataset. The default initialization deck is in SYS1.SAMPLIB (member JES3IN00); however, you should verify your location by looking at the JES3 procedure.

2. Enter the following required commands in the JES3 initialization deck to define the PSF functional subsystem (FSS):
  - One FSSDEF statement for each PSF functional subsystem

- One DEVICE statement for each functional subsystem application (FSA) under control of the FSS.

The following table lists the JES3 FSS statement parameters to be defined.

**Table F-3. JES3 FSS statement parameters**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
<b>FSSDEF parameters</b>					
FSSNAME	None	Installation preferences	1 to 8-character alphanumeric string	Specifies name of the FSS. (Required parameter)	
MSGDEST	JES	Installation preferences	JES or a destination class name	Specifies the console destination class for FSS messages.	
PNAME	None	Name of the FSS procedure	1 to 8-character alphanumeric string	Specifies the procedure for starting this FSS. (Different FSSDEF statements may refer to same procedure.)	
SYSTEM	Same as specified in JUNIT parameter of DEVICE statement	System ID of system the FSS is to run on.	Valid system ID name	Can also be specified as QUEUE=	
TERM	NO	Installation preferences	YES or NO	YES specifies FSS terminates if JES3 global address space is terminated.	
TYPE		TYPE=WTR must be specified	WTR	Specifies FSS is an output writer. TYPE=WTR must be specified.	
<b>DEVICE parameters</b>					
BURST	YES	Installation preferences	YES or NO ,M	,M specifies MARKFORM, which causes printer to offset-stack or stitch jobs, subject to printer's setting and the COPYMARK parameter.	

**Table F-3. JES3 FSS statement parameters (Continued)**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
COPYMARK	J	Installation preferences	N or J or C	C: printer will offset-stack or stitch on a dataset copy basis. J: Printer is to increment offset stacking or stitching on a job boundary. N: Copymarks are constant, and no offset stacking or stitching is done.	
DGROUP	None	Installation printer destination naming conventions	1 to 8-character alphanumeric string	Specifies destination processed by this FSA (applicable only if D is specified in the WS parameter).	
DTYPE	None	PRTAFP1	PRTAFP1	Required parameter	
DYNAMIC	NO	Installation printer name standards	YES or NO	DYNAMIC=NO should be specified so JES3 will keep FSA active between transmission of datasets.	
FSSNAME	None	Name of FSA in JNAME parameter	1 to 8-character alphanumeric string	Must match value in FSSNAME parameter of FSSDEF statement.	
JNAME	None	FSSNAME parameter of FSSDEF statement	1 to 8-character alphanumeric string	Must match value in FSSNAME parameter of FSSDEF statement.	
JUNIT	ON	See comments.	(Device address, Main, dest class, ON/OFF)	Device address should not be specified for TCP/IP printers. Main is name of processor the FSS is to run on. Dest class is destination class for FSA messages. ON or OFF specifies whether FSA is initially online or offline.	
MODE	None	Must be FSS.	FSS	MODE=FSS must be specified.	

**Table F-3. JES3 FSS statement parameters (Continued)**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
WC	Any class selected	Installation output class standards	List of alphanumeric output classes, each separated by a comma	If CLASS is specified in the Work-selection criterion in the WS parameter, the FSA selects datasets that match values specified here.	
WS		Installation preferences (see note)	Work-selection criterion	Consider CL, R, and F. See Note below and JES3 Initialization and Tuning Reference manual for more information.	

*NOTE: The WS parameter CL specifies that datasets with the same class as the WS parameter should be selected. D specifies that only datasets with the same destination as the DGROUP parameter should be selected. F specifies that JES3 is to pass the forms value specified on the DD or OUTPUT JCL statement to the FSA.*

Following is an example of the JES3 initialization dataset required commands:

**Table F-4. JES3 initialization dataset commands example**

FSSDEF	TYPE=WTR,FSSNAME=FSSTCP1,PNAME=FSSPROC1,SYSTEM=SYS1,TERM=NO
DEVICE	DTYPE=PRTAFT1,JNAME=PRT7,JUNIT=(,SYS1,,OFF),FSSNAME=FSSTCP1, DGROUP=LOCAK, MODE=FSS,PM=(LINE,PAGE,SOSI1),WC=(T),WS=CL,D,F)

## 4. Configure the printer in PSF/MVS

---

Follow these steps to configure the printer in PSF:

1. Locate the PSF startup procedure in the JES3 or JES2 startup JCL procedure. This is normally kept in SYS1.PROCLIB, although your system may use a different library.

The libraries specified by the //PROC00 DD statement normally contains startup procedures for PSF subsystems. The name of the procedure is specified in the initialization dataset (FSS statement PROC parameter in JES2; the FSSDEF statement PNAME parameter in JES3. See the appropriate section in this appendix for clarification).

2. Add a PRINTDEV statement to define the printer in PSF. (See the example below for the general format or the *Print Services Facility for OS/390 Customization* for more information.)

The table below contains descriptions of the PSF parameters which need to be set for the printer.

**Table F-5. PSF/MVS PRINTDEV statement parameters**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
APPLID	None	VTAM APPL statement	1 to 8-character alphanumeric string	Not applicable for TCP/IP-attached printer	
BUFNO		N/A	5 to 100	Not applicable for TCP/IP-attached printer	
FAILURE		Installation preferences	WCONNECT or STOP	If printer is used by other hosts, WCONNECT causes PSF to continuously retry to establish connection with printer.	
FDEFDD	None	Installation preferences	1 to 8-character alphanumeric string	Name of the form definition library DD statement	
FONTDD	None	Installation preferences	1 to 8-character alphanumeric string	Name of font library DD statement. Fonts in this library must match resolution the printer is using.	

**Table F-5. PSF/MVS PRINTDEV statement parameters (Continued)**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
FORMDEF	None	Installation preferences	1 to 6-character alphanumeric string	Name of default FORMDEF for printer	
IPADDR	None	Xerox installation	Valid IP address in dotted decimal format, enclosed in quotes	Example: IPADDR='12.345.676.89'	
JOBHDR	None	Installation preferences	1 to 8-character alphanumeric string	Name of OUTPUT statement that defines form and page definition used to format job header separator pages	
JOBTRLR	None	Installation preferences	1 to 8-character alphanumeric string	Name of OUTPUT statement that defines form and page definition used to format job trailer separator pages	
LOGMODE		N/A		Not applicable for TCP/IP-attached printer	
LUNAME		N/A		Not applicable for TCP/IP-attached printer	
MESSAGE	None	Installation preferences	1 to 8-character alphanumeric string	Identifies OUTPUT statement that specifies form and page definitions used to format and print messages.	
MGMTMODE		Installation preferences	OUTAVAIL or DIALIN or IMMED	OUTAVAIL: Requests that PSF start a communication session with printer only when output is available on JES spool. DIALIN or IMMED: Requests that PSF start a communication session with this printer immediately. PSF then looks for output available on JES spool.	
NPRO		N/A		Not applicable to cut-sheet Xerox printers	

**Table F-5. PSF/MVS PRINTDEV statement parameters (Continued)**

<b>Item description</b>	<b>Default</b>	<b>Source of value</b>	<b>Range of acceptable values</b>	<b>Comments</b>	<b>Your value</b>
OBJCONDD		N/A		Not applicable for TCP/IP-attached printers	
OVLYDD	None			Name of font library DD statement. Fonts in this library must match the resolution the printer is using.	
PAGEDEF	None			Name of default Page Definition for printer	
PDEFDD	None			Name of Page Definition library DD statement	
PIMSG	(YES,16)	Installation preferences	(YES,nnn) or (NO,nnn)	YES: Specifies error messages are always printed. nnn: Specifies maximum number of messages groups generated before job is purged from spool. A value of 0 causes printer to print continuously, regardless of number of errors.	
PORTNO	5001	Controller Set Option command	Valid TCP/IP port number between 5001 and 32767	Applicable only to TCP/IP printers. (Ensure the chosen port number is not in TCP/IP list of reserved port numbers.)	
PSEGDD	None			Name of Page Segment library DD statement. For best results, the images in page segments in this library should match the resolution the printer is using.	

**Table F-5. PSF/MVS PRINTDEV statement parameters (Continued)**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
SETUP	No Setup messages issued	Installation preferences	SETUP=FORMS if specified	If specified, causes JES to issue FORMS setup message when a job prints which has a FORMS specification different from job previously printed. This is recommended where there are multiple paper stocks for use on the printer.	
RELINTV				Not applicable to Xerox cut-sheet printers	
RELMODE	None		IDLE, TIME, or NONE	Not applicable to Xerox cut-sheet printers	
TIMEOUT		Installation preferences	REDRIVE or STOP	REDRIVE: When there is a time-out after period specified in DISCONTV parameter, REDRIVE requests that PSF attempt to drive the printer according to MGMTMODE specification. STOP: Forces operator to restart FSA. Note: REDRIVE is recommended for TCP/IP printers that may be shared with other hosts.	
TRACE	NO		YES or NO	Should be used only for debugging PSF-related problems.	

*NOTE: To specify a TCP/IP address space name other than the default (TCP/IP), code the following EXEC statement in the appropriate PSF writer procedure:*

*STEP01 EXEC PGM=APSPPIEP,*

*PARM=(,,,tcpip\_name), REGION=4096K*

*where tcpip\_name is the name of the TCP/IP address space.*

*If this parameter is not coded, PSF uses the default name, TCPIP. (For a full description of the PARM parameter, refer to Print Services Facility for OS/390 Customization.)*

**Table F-6. PSF/MVS PRINTDEV statement example**

//PRT277 CNTL	
//PRT277 PRINTDEV FONTDD=*.FONT01, /* FONT LIBRARY DD */	
//	OVLYDD=*.OLAY01, /* OVERLAY LIBRARY DD */
//	IPADDR='13.240.160.97', /* PRINTER IP ADDRESS */
//	PORTNO=5005 /* PORT NUMBER */
//	PSEGDD=*.PSEG01, /* SEGMENT LIBRARY DD */
//	PDEFDD=*.PDEF01, /* PAGEDEF LIBRARY DD */
//	FDEFDD=*.FDEF01, /* FORMDEF LIBRARY DD */
//	JOBHDR=*.JOBHDR, /* JOB HEADER SEPARATOR OUTPUT */
//	JOBTRLR=*.JOBTLR, /* JOB TRAILER SEPARATOR OUTPUT */
//	DSHDR=*.DSHDR, /* DATA SET HEADER SEPARATOR */
//	MESSAGE=*.MSGDS, /* MESSAGE DATA SET OUTPUT */
//	BUFNO=29, /* NUMBER OF WRITE DATA BUFFERS */
//	PAGEDEF=X06483, /* DEVICE PAGEDEF DEFAULT */
//	FORMDEF=A10111, /* DEVICE FORMDEF DEFAULT @H3C*/
//	CHARS=(GT15, /* DEVICE */
//	GT12,GT18,GT24), /* DEFAULT FONT SET @H3C*/
//	PIMSG= (YES,999), /* ACCUMULATE DATA SET MESSAGES */
//	DATAACK=BLOCK, /* BLOCK DATA CHECKS */
//	TRACE=NO /* BUILD INTERNAL TRACE @H3C*/
// PRT277 ENDCNTL	

## **5. Configure TCP/IP for MVS for the printer**

*NOTE: The information in this section is for TCP version 3.2 and 3.3. For version 3.4 or later, refer to the appropriate IBM documentation.*

The TCP/IP Profile dataset contains statements that define the parameters used by TCP/IP for MVS address space. The following parameters have special consideration for PSF and the TCP/IP-attached printers.

*NOTE: It is not necessary to define the printer in TCP/IP for MVS, because the printer acts as a conduit from the MVS system to the LAN. However, some settings in the TCP/IP Profile dataset may need to be altered, depending on your current settings.*

**Table F-7. TCP/IP Profile dataset parameters – MVS**

Item description	Default	Source of value	Range of acceptable values	Comments	Your value
DATABUFFERPOOLS IZE Data buffers	160	Installation preferences	7 to nnnn, where nnnn is limited by available virtual storage	Specify at least 160 buffers.	
DATABUFFERPOOLS IZE Buffer size	16384	Installation preferences	8192 49152 12288 65536 16384 98304 24576 131072 28672 196608 32768 262144	Specify a buffer size of at least 32768, if possible.	
SMALLDATABUFFER POOLSIZE	0	Installation preferences	0 to nnnn, where nnnn is limited by available virtual storage	Specify at least 256 small data buffers.	
TINYDATABUFFERP OOLSIZE	0	Installation preferences	0 to nnnn, where nnnn is limited by available virtual storage	Specify at least 256 tiny data buffers.	
KEEPALIVEOPTIONS	Interval 120 sendgarba ge false	Installation preferences		See Notes.	
GATEWAY max_packet_size	Defaultsize is 576	Installation preferences	Can be from 576 to 67108864, but cannot be larger than value specified on LARGEENVELOPEPOOLSIZE statement.	Max packet size parameter should be no greater than 4472 bytes in a 4 Mbps LAN configuration, and 17800 in a 16 Mbps LAN configuration. Default MTU value in printer is 2052.	

## Considerations for configuring TCP/IP for MVS

Following are some considerations for configuring TCP/IP for MVS:

- To specify a TCP/IP address space name other than the default (TCPIP), code the following EXEC statement in the appropriate PSF writer procedure:

```
STEP01 EXEC PGM=APSPPIEP,  
        PARM=(,,,,tcpip_name), REGION=4096K
```

where `tcpip_name` is the name of the TCP/IP address space.

If this parameter is not coded, PSF uses the default name, TCPIP. (For a full description of the PARM parameter, refer to *Print Services Facility/MVS: Diagnosis Guide and Reference*.)

- KEEPALIVEOPTIONS statement: PSF relies on TCP to detect when a connection with the printer is no longer usable. When no data has been exchanged between PSF and its connection partner, TCP sends keep-alive probes to the connection partner periodically. These periodic probes, called keep-alive transmissions, enable TCP to discover when a connection is no longer usable, even if the connection partner is abruptly powered off or is no longer accessible through the network.

The frequency of keep-alive transmissions is controlled by the INTERVAL parameter on the KEEPALIVEOPTIONS statement. The frequency applies to all TCP applications that direct TCP to send keep-alive transmissions. The default frequency is after about two hours of inactivity.

For printing on the NPS/IPS, it is recommended you specify a shorter interval than the default—such as 10 minutes—for the interval between keep-alive transmissions. Also, unless any target host requires that the keep-alive packet contain data, specify SENDGARBAGE FALSE. For example:

```
KEEPALIVEOPTIONS INTERVAL 10 SENDGARBAGE  
FALSE ENDKEEPALIVEOPTIONS
```

If you change any of the values in the TCP/IP profile, restart TCP/IP to pick up the changes.

**Table F-8. TCP/IP Profile dataset statements example – MVS**

ACBPOOLSIZE	1000	
ADDRESSTRANSLATIONPOOLSIZE	1500	
CCBPOOLSIZE	150	
DATABUFFERPOOLSIZE	160	32768
ENVELOPEPOOLSIZE	750	
IPROUTPOOLSIZE	300	
LARGEENVELOPEPOOLSIZE	50	
RCBPOOLSIZE	50	
SCBPOOLSIZE	256	
SKCBPOOLSIZE	256	
SMALLDATABUFFERPOOLSIZE	256	
TCBPOOLSIZE	512	
TINYDATABUFFERPOOLSIZE	256	
UCBPOOLSIZE	100	
KEEPALIVEOPTIONS INTERVAL 10 SENDGARBAGE TRUE ENDKEEPALIVEOPTIONS		
GATEWAY		

; * Network	First hop	Linkname	Packet size	Subnet mask	Subnet value
9	=	BPCLAN	2000	0.255.255.0	0.99.12.0
DEFAULTNET	9.99.12.254	BPCLAN	2000	0.255.255.0	0

**References:** For information about the TCP/IP profile and the statements described in this section, refer to the following publications:

- *TCP/IP for MVS: Customization and Administration Guide*
- *TCP/IP: Performance Tuning Guide*

## **6. Test the printer to ensure it prints from the MVS host**

Test the printer by one of the following methods:

- Send a job from the host through PSF to print on the printer.
- Ping the printer from your MVS host to ensure MVS can establish a connection with the TCP/IP-attached printer.

### **Pinging the printer – MVS**

To ping the printer from the MVS host, enter one of the following commands:

- At your MVS host, enter the following command at the TSO prompt or from the Interactive System Productivity Facility (ISPF), menu 6:

PING ip-address

- Enter the following command from any ISPF command line:

TSO ping ip-address

**ip-address** specifies the internet protocol (IP) address of the printer.

**If the ping is successful:**

**Table F-9. Example of a successful ping – MVS**

```
EZA0458I Ping V3R1: Pinging host 9.99.12.33
```

```
(Use ATTN to interrupt)
```

```
EZA 0463I PING: Ping #1 response took 0.084 seconds.
```

```
Successes so far = 1.
```

*NOTE: A successful ping usually indicates that the MVS system can communicate with the printer. However, you could receive a successful ping even if the IP address of the TCP/IP-attached printer is a duplicate of another IP address.*

If PSF is unable to establish a network connection with the TCP/IP-attached printer, or if PSF output for this printer prints elsewhere, follow these steps to determine whether the IP address of the printer is unique:

1. Power off the printer.
2. Wait at least five minutes for TCP/IP to clear the Address Resolution Protocol (ARP) tables.

*NOTE: If your installation specified a longer interval on the ARPAGE configuration statement in the TCP/IP profile, you may need to wait longer than five minutes. (For information about the ARPAGE statement, refer to the IBM TCP/IP MVS Customization and Administration Guide.)*

3. Enter the ping command again at the MVS system.

If you receive a successful response to the ping command this time, it means there is a duplicate IP address. Consult your network administrator.

**If the ping is unsuccessful:**

**Table F-10. Example of an unsuccessful ping – MVS**

```
EZA0458I Ping V3R1: Pinging host 9.99.12.33
```

```
(Use ATTN to interrupt)
```

```
EZA 0464I PING: Ping #1 timed out
```

If your ping is not successful, verify the following:

- The printer is powered on.
- The cables are properly connected between the printer and the LAN.
- The Network Interface Card (NIC) in the printer is functioning properly. (Consult your Xerox service representative.)
- There is proper connectivity to the Multi-station Access Unit (MAU), if one is being used.
- The IP address used to define the printer in PSF is unique in the TCP/IP network.
- The IP address of the MVS system is unique. If not, consult your network administrator to resolve the address problem.
- The Maximum Transmission Unit (MTU) size of the IP packet for the MVS system is equal to the MTU size of the printer. (For information about the values recommended for the MVS system, see the “GATEWAY” statement in table B-8.)
  - To change the MTU size for the MVS system, change the GATEWAY statement in the MVS TCP/IP profile, and restart TCP/IP to activate the changes.
  - If you are running RouteD, the maximum MTU size is the one specified on the BSDROUTINGPARMS statement (MTU).

- The default MTU value in the printer is 2052. To change the MTU size for the printer, refer to the Sun network software documentation.
- If these items are all in order, consult your network administrator about a possible network problem.

## **Correcting for printer performance issues – MVS**

Should you notice any printer performance problems—e.g., through-put speed degradation, check the areas listed in the following table.

Table F-11. **Components to check for printer performance problems**

MVS	On the MVS system, ensure that both the PSF and TCP/IP address spaces are receiving a high level of service, are at a high dispatching priority, and their datasets and the JES2 spool datasets are on DASD volumes that have low competing activity from other applications and from other DASD volumes on the same path.
Printer	Ensure that the Maximum Transmission Unit size (MTU) is as large as possible. A small MTU size increases the number of packets that are transmitted, allowing greater chances of degradation throughout the network. Increasing the MTU size in both TCP/IP for MVS and in the printer may improve printer performance.
LAN	If the printer is on a LAN that also has a large number of other devices attached to it, the high levels of traffic on the LAN can cause printer speed degradation. Consider moving the printer to a LAN that does not have so much activity on it.
LAN-to-host attachment	If the speed of the link connecting the LAN with the printer attached to the MVS system is slow, this could be a bottleneck. This could be a concern with any configuration in which the LAN-attached controller (i.e., 3745, 3172, or 3174) is not directly channel-attached to the host running PSF. This could occur in a Remote LAN configuration as discussed in the Network Configurations section, earlier in this chapter. Review your network configuration diagrams to look for any potential bottlenecks.

## References – MVS

---

The following IBM documents, referenced in this section, can provide additional information on MVS-to-IPDS printer connectivity.

Table F-12. **MVS reference documentation**

Title	Publication number
<i>MVS Collection Online Library Omnibus Edition</i>	SK2T-0710
<i>OS/390 HCD Planning or MVS/ESA Migration Planning: Dynamic I/O Configuration</i>	GC28-1445
<i>OS/390 HCD User's Guide or MVS/ESA Hardware Configuration: Using the Dialog</i>	SC33-6468
<i>Print Services Facility for OS/390 Customization</i>	S544-5622
<i>TCP/IP for MVS: Customization and Administration Guide</i>	SC31-7134
<i>TCP/IP for MVS: Performance Tuning Guide</i>	SC31-7188
<i>OS/390 JES2 Initialization and Tuning Reference</i>	SC28-1792
<i>OS/390 JES3 Initialization and Tuning Reference</i>	SC28-0073

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## AS/400 parameters

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This section describes the process of configuring an AS/400 system to communicate and print using TCP/IP. This process is applicable to either a Token Ring or an Ethernet LAN.

This information applies to all AS/400 RISC models with OS/400 V3R7 (or higher) installed.

---

### Software prerequisites – AS/400

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The following prerequisite software packages must be installed on your host system before you begin the configuration process described in the following pages. Ensure that you are using the manuals for the proper software releases.

**Table F-13. AS/400 software prerequisites**

OS/400	Licensed program	Description	Product option
V3R7	5716TC1	TCP/IP Connectivity Utilities for AS/400	*BASE
V3R7	5716SS1	OS/400—Print Services Facility/400	N/A
V3R2	5763TC11	TCP/IP Connectivity Utilities/400	N/A
V3R2	5763AF1	Advanced Function Printing Utilities/400	N/A

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### Network configurations – AS/400

---

The printer is supported in all the following types of AS/400 configurations, provided that the software prerequisites are installed.

- Basic configuration in which the AS/400 is attached to a LAN using either a Token Ring or Ethernet network adapter card
- Remote LAN environment in which there are data communication links between the AS/400 and the LAN-attached controller
- Configurations in which the LAN with the printer attached is connected to the host-attached controller using LAN devices such as routers.

*NOTE: There may be printer performance and throughput implications with some of these configurations. It is recommended that your network management group be involved with planning this installation.*

### **Configuration steps – AS/400**

---

Follow these steps to configure your AS/400 to print to a printer connected to the LAN, using TCP/IP.

**Configuration worksheet** The following worksheet will help you in planning the printer installation. It describes the key values which you need to supply when planning the AS/400 configuration. All values on this worksheet must be determined before you begin the printer configuration on the host.

**Table F-14. AS/400 configuration worksheet for NPS/IPS**

Item description	Also known as...	Source	Your value
Device description	DEVDP	This is the name of the printer (writer). An Output Queue of the same name is automatically created. Spool files that you place in this Output Queue are directed to the printer.	
Remote location	RMTLOCNAME	Xerox printer software installation. This is the printer IP address.	
Port number	PORT	Use the Set Option command to set the option IPDSTcpPortNumber. The value 5001 works best for IPDS printers.	
PSF configuration	PSFCFG	Same as Device description	

*NOTE: It is assumed that your AS/400 is connected to the LAN and all the prerequisite software is installed and configured.*

#### **1. Configure the printer for TCP/IP at the printer controller**

---

Refer to the *Guide to Configuring and Managing the System* for the procedure to specify the TCP/IP option.

## 2. Create the PSF/400 configuration

Follow these steps to configure PSF/400 for the printer.

1. At the AS/400, press <F4> to prompt the CRTPSFCFG command.
2. Key in the parameter values as indicated in the figure below. For parameters with \* beside them, refer to the configuration worksheet, earlier in this section.

**Table F-15. Create PSF Configuration screen – AS/400**

Create PSF Configuration (CRTPSFCFG)		
Type choices, press Enter.		
PSF configuration.....	> XEROXIPS	*
Library.....	> QGPL	
User resource library list.	*JOBLIBL	
Device resource library list.... + for more values	*DFT	
IIPDS pass through.....	*NO	
Activate release time.....	*NORDYF	
Release time.....	> *SEC30 or *NOMAX	
Restart timer.....	> *IMMED	
SNA retry count.....	10	
Delay time between SNA retries..	90	
Text 'description'.....	*BLANK	
Additional parameters....		
Blank page.....	*YES	
Page size control.....	*NO	
Resident font.....	*NO	
Resource retention.....	*YES	
Edge orient.....	*NO	
Remote location:		
Name or address.....	> '9.9.999.999'	*
TCP/IP port.....	> 5001	*
TCP/IP activation timer...	170	

### 3. Create the printer device description – AS/400

Follow these steps to create the device description for the printer.

1. At the AS/400, press <F4> to prompt the CRTDEVPRT command.
2. Key in the parameter values as indicated in the appropriate figure below.
  - Table F-16 shows printer description parameters for OS/400 with V3R7 installed.
  - Table F-17 shows parameters for OS/400 with V3R2 installed.

For parameters with \* beside them, refer to the configuration worksheet, earlier in this section.

**Table F-16. Create Device Description (Printer) screen for OS/400 with V3R7 installed**

CREATE DEVICE DESC (PRINTER) (CRTDEVPRT)		
Type choices, press Enter.		
DEVICE DESCRIPTION.....	> XEROXIPS	*
DEVICE CLASS.....	> *LAN	(New to V3R7)
DEVICE TYPE.....	> *IPDS	
DEVICE MODEL.....	> 0	
LAN ATTACHMENT.....	*IP	(New to V3R7)
ADVANCED FUNCTION PRINTING..	*YES	
PORT NUMBER.....	> 5001	*
ONLINE AT IPL.....	*YES	
FONT:		
IDENTIFIER.....	> 11	
POINT SIZE.....	*NONE	
FORM FEED.....	*AUTOCUT	
SEPARATOR DRAWER.....	*FILE	
SEPARATOR PROGRAM.....	*NONE	
LIBRARY.....		
PRINTER ERROR MESSAGE.....	*INQ	
MESSAGE QUEUE.....	QSYSOPR	
LIBRARY.....	*LIBL	

**Table F-16. Create Device Description (Printer) screen for OS/400 with V3R7 installed (Continued)**

ACTIVATION TIMER.....	170	
MAXIMUM PENDING REQUESTS...	6	
PRINT WHILE CONVERTING.....	*YES	
PRINT REQUEST TIMER.....	*NOMAX	
FORM DEFINITION	F1C10110	
LIBRARY.....	*LIBL	
REMOTE LOCATION:		
NAME OR ADDRESS.....	9.9.999.999	*
REMOTE NETWORK IDENTIFIER...	*NETATR	
WORKSTATION CUSTOMIZING OBJECT	*NONE	
LIBRARY.....		
USER-DEFINED OBJECT:		
OBJECT.....	> XEROXIPS	* Same as PSF
LIBRARY.....	> QGPL	configuration
OBJECT TYPE.....	> *PSFCFG	
DATA TRANSFORM PROGRAM.....	*NONE	
LIBRARY.....		
TEXT 'DESCRIPTION'.....	*BLANK	

#### **4. Test the printer connection – AS/400**

Test the printer by one of the following methods to ensure AS/400 is able to make a connection with the printer:

- Send a job from the host through PSF to print.
- Ping the printer from your AS/400 system to ensure the AS/400 can establish a connection with the TCP/IP-attached printer.

**Pinging the printer** To ping the printer to verify a connection can be made, enter the following command on an OS/400 command line:

**PING 'Remote Location'**

'remote location' specifies the internet protocol (IP) address of the printer (refer to the configuration worksheet, earlier in this section).

**If the ping is successful:**

**Table F-17. Example of a successful ping – AS/400**

```
ping 9.9.999.999
Verifying connection to host system LOOPBACK at address 9.9.999.999.
Connection verification 1 took .000 seconds. 1 successful connection verifications.
Connection verification 2 took .000 seconds. 2 successful connection verifications.
Connection verification 3 took .001 seconds. 3 successful connection verifications.
Connection verification 4 took .000 seconds. 4 successful connection verifications.
Connection verification 5 took .000 seconds. 5 successful connection verifications.
Round-trip (in milliseconds) min/avg/max = 0/0/1
Connection verification statistics: 5 of 5 successful (100 %).
```

*NOTE: A successful ping usually indicates that the AS/400 system can communicate with the printer. However, you could receive a successful ping even if the IP address of the TCP/IP-attached printer is a duplicate of another IP address.*

If PSF output for this printer prints elsewhere, follow these steps to determine whether the IP address of the printer is unique:

1. Power off the printer.
2. Wait at least five minutes for TCP/IP to clear the Address Resolution Protocol (ARP) tables.
3. Enter the ping command again at the AS/400 system.
4. If you receive a successful response to the ping command this time, there is a duplicate IP address. Consult your network administrator.

## If the ping is unsuccessful:

**Table F-18. Example of an unsuccessful ping – AS/400**

```
ping 9.9.999.999
Verifying connection to host system TEST at address 9.9.999.999.
No response from host within 10 seconds for connection verification 1.
No response from host within 10 seconds for connection verification 2.
No response from host within 10 seconds for connection verification 3
No response from host within 10 seconds for connection verification 4.
No response from host within 10 seconds for connection verification 5.
Connection verification statistics: 0 of 5 successful (0 %).
```

If your ping is not successful, verify the following:

- The printer is powered on.
- TCP/IP has been started on the AS/400 (command: STRTCP).
- The cables are properly connected between the printer and the LAN.
- The Network Interface Card (NIC) in the printer is functioning properly. (Consult your Xerox service representative.)
- There is proper connectivity to the Multi-station Access Unit (MAU), if one is being used.
- The IP address used to define the printer in PSF is unique in the TCP/IP network.
- The IP address of the AS/400 system is unique. If not, consult your network administrator to resolve the address problem.

### **Correcting for printer performance issues – AS/400**

---

Should you notice any printer performance problems—e.g., throughput speed degradation, check the areas listed in the following table.

**Table F-19. Components to check for printer performance problems**

LAN	If the printer is on a LAN that also has a large number of other devices attached to it, the high levels of traffic on the LAN can cause printer speed degradation. Consider moving the printer to a LAN that does not have so much activity on it.
AS/400 to LAN attachment	If the speed of the link connecting the LAN with the printer attached to the AS/400 system is slow, this could be a bottleneck. Review your network configuration diagrams to look for any potential bottlenecks.

### **References – AS/400**

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The following IBM documents, referenced in this section, can provide additional information on AS/400-to-IPDS printer connectivity.

**Table F-20. Reference documents – AS/400**

<b>Title</b>	<b>Publication number</b>
<i>AS/400 Guide to AFP and PSF</i>	S544-5319
<i>OS/400 Printer Device Programming</i>	SC41-5713
<i>OS/400 TCP/IP Configuration</i>	SC41-5360
<i>OS/400 Work Management</i>	SC41-5306

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## Infoprint Manager procedures for Windows NT and Windows 2000

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This section explains how to access the Create Printer Wizard in the Infoprint Manager Administration GUI, which allows you to create an actual destination (physical printer) using Infoprint Manager for Windows NT and Windows 2000.

To create a PSF TCP/IP printer:

1. On the menu bar, click **Printer**, then **Create**, then **PSF**, then **TCP/IP**.

*NOTE: If the TCP/IP is not shown in the menu, add it by selecting **Printer**, then **Add/Remove Menu Items**.*

2. Provide information as prompted by the wizard. For assistance, refer to the Infoprint Manager Administration GUI online help.

*NOTE: From the Model pulldown menu, make sure to select **Infoprint 60** as your printer model.*

3. If you did not enable the printer with the Create Printer Wizard, use the Infoprint Manager Administration GUI to enable it.

For detailed information on the attribute default values set by the wizard, refer to *IBM Infoprint Manager for Windows NT and Windows 2000, Getting Started*.

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## Infoprint Manager procedures for AIX

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There are five versions of PSF/6000 or Infoprint Manager for AIX:

- Versions 1.1, 1.2, and 2.1

These earlier versions are called PSF/6000.

- Versions 3.1 and 3.2

These current versions are called Infoprint Manager for AIX.

There are three different methods for creating printers:

- System Management Interface Tool (SMIT)

All five versions of PSF/6000 and Infoprint Manager for AIX support this method.

- Command line interface

All five versions of PSF/6000 and Infoprint Manager for AIX support this method.

- Visual System Management (VSM)

This is a graphical user interface (GUI) supported by Infoprint Manager for AIX versions 3.1 and 3.2 only.

*NOTE: Regardless of the method used, from the Model pulldown menu, make sure to select **Infoprint 60** as your printer model.*

For detailed information on setting the attribute default values using any of these methods, refer to the appropriate section of

the document, *IBM Infoprint Manager for AIX, Getting Started*.

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# Glossary

This glossary contains a list of terms for working with the Xerox DocuPrint NPS/IPS printing system, and a definition of each.

- A3** Paper size measuring 297 by 420 mm.
- A4** Paper size measuring 210 by 297 mm.
- American Standard Code for Information Interchange (ASCII)** Standard 7-bit code which represents alphanumeric information. Each alphanumeric character and several nonprinting characters are assigned a binary number, covering 128 possible characters. It is used for information interchange among data processing systems, data communication systems, and associated equipment.
- application software** Software resident on the host or client workstation used to create print documents.
- B4** Paper size measuring 250 by 353 mm.
- background job** Low-priority job, usually batched, which is executed automatically as system resources become available.
- batch** Method by which bodies of data are accumulated and grouped by kind before processing.
- batch processing** Allows for repetitive operations to be performed sequentially on batched data without much involvement of the computer operator.
- baud** Measurement of data rate in bits per second. This term is used to describe information flow between two devices. Unit of data transmitting/receiving speed is roughly equal to a single bit per second. Common baud rates are 110, 300, 1200, 2400, 4800, and 9600.
- binary** Numbering system based on 2 rather than 10 and containing only the symbols 0 and 1. Binary is especially well suited for use in computers and related devices since information can be represented with electric pulses (0=off, 1=on). Most computer calculations are binary.

**binary digit (bit)** In the binary numbering system, either of the characters 0 or 1. The bit is the basic unit of information with which a computer works. It can take the form of a magnetized spot, an electric pulse, a positive or negative charge, etc. A number of bits strung together represents a character to a computer.

**Multipliers are:**

1 byte = 8 bits

1 kilobyte (KB) or 1,024 bytes = 8,192 bits

1 megabyte (MB) or 1,048,576 bytes = 8,388,608 bits.

**Computer space equivalents are:**

1.5 KB = about 1 single-spaced typed page

30 KB = about 20 typed pages

150 KB = about 100 typed pages

**bitmap** Electronic definition of an image, comprised of a matrix of picture elements (pixels or dots), where a bit value of one means that the picture element is imaged, and a bit value of zero means that the picture element is not imaged. The number of picture elements in a square area is a function of the display device resolution.

**bit mapped** Display image generated bit by bit for each point or dot. A software-driven scanner is used to create characters and/or graphics.

**bits per second (bps)** In serial communication, the instantaneous bit speed with which a device or channel transmits a character.

**blocking** Process of combining two or more records into a single block of data which can then be moved, operated upon, stored, etc., as a single unit by the computer.

**block length** Number of characters or bytes contained in a block of data (the block is treated as a unit within the computer). Block length is usually invariable within a system and may be specified in units such as records, words, computer words, or characters.

**boot** To load a program's initial instructions of a program into the computer's memory. These instructions then direct the loading of the rest of the program. Booting may require entry of a few commands at the keyboard or the flip of a switch to begin the process.

**break page** See header page

<b>buffer</b>	Compartment of memory in which data is stored during transfer from one device to another. Useful for (1) accumulating data into blocks before storage or processing, and (2) for adjusting differences of speed between devices, or between a device and a communicating facility.
<b>bypass transport</b>	Optional module that moves paper from the printer to a finishing device.
<b>byte</b>	Fixed number of bits (in data processing, usually 8) operated upon as a unit. A byte may represent a character, a machine instruction, or some other logical unit of information.
<b>CCU</b>	Customer changeable unit. In the DocuPrint Model 92C, the unit is removed to change the color of the dry ink installed in the printer. Consists of the color developer housing and the dry ink bottle.
<b>CCU changeout cart</b>	Cart used to remove and install the customer changeable unit for changing the color dry ink installed in the printer.
<b>carriage return</b>	Control character that (unless set to be interpreted as a line end) causes the printing system to start printing at the left margin of the current line.
<b>case-sensitive</b>	Treating lowercase and uppercase characters differently.
<b>central processing unit (CPU)</b>	Interprets and executes instructions, performs all operations and calculations, and controls input and output units and auxiliary attachments.
<b>channel</b>	<ol style="list-style-type: none"> <li>1. In data communications, a path or line that enables two or more devices to communicate (sometimes called a circuit, facility, or link).</li> <li>2. In computers, a path for communication between the central processing unit (CPU) and input/output units, or between the CPU and peripheral devices.</li> </ol>
<b>character</b>	Single printable letter (A-Z), numeral (0-9), symbol (& % #), or punctuation mark (, . ! ?) used to represent data. Characters can also be nonprinting, such as space, tab, or carriage return.
<b>character cell</b>	Digitized space containing a single character within a font set.
<b>character code</b>	Code representing alphanumeric information, for example, ASCII.
<b>character set</b>	Number of different characters used by a particular device, including alphabetic, numeric, and special characters such as symbols.
<b>characters per inch (cpi)</b>	Designates the number of characters per inch for a particular typeface. Refer to pitch.

<b>client software</b>	Software that manages the submission of print jobs to the Printer Controller.
<b>client workstation</b>	Workstation connected to the network used to create print jobs (documents) and submit them to the printer controller.
<b>command</b>	Statement entered that instructs the system to perform an operation.
<b>communication line</b>	Telecommunication line connecting devices at one location with devices at other locations in order to transmit and receive information.
<b>communication link</b>	Physical means (i.e., data link) connecting one location to another to transmit and receive information.
<b>compatibility</b>	Characteristic of computer equipment permitting one device to use the same information or programs as another device without conversion or code modification.
<b>compile</b>	To translate instructions written in high-level language into machine language for execution by a system.
<b>concatenate</b>	To connect or link in a series, as when files are grouped together for faster processing. Refer to job concatenation mode.
<b>console</b>	Functional unit containing devices used by an operator to communicate with an IOT. It may consist of a display, keyboard, and certain switches or other controls.
<b>control program</b>	An operating system program that manages job flow, input/output processing, and other overall system functions and resources.
<b>daemon</b>	A task that runs continually in conjunction with the UNIX operating system that periodically checks for specific conditions or logical events and performs some action if the conditions are met. The task can be used to display and notify the operator of such conditions.
<b>database</b>	Information to meet specific processing and retrieval needs. Generally applies to integrated file of data, arranged for access by many subsystems.
<b>data communications</b>	Transmission and reception of encoded information over telecommunication lines.
<b>data file</b>	Collection of related data records organized in a specific manner so that each record is similarly structured, e.g., a payroll file set up with one record for each employee, last name first, indicating the rate of pay and all deductions.

<b>data link</b>	Physical means of connecting one location with another for communication, i.e., the communications lines, modems, and controls which transmit information between two or more stations.
<b>data rate</b>	In data communications, the rate at which a channel carries data, measured in bps (bits per second).
<b>data storage</b>	Preservation of data on various media (e.g., tape, disks, magnetic bubble memory, etc.).
<b>data stream</b>	Format of data passed from one device to another.
<b>data transmission</b>	Transmission of coded data over telephone or other telecommunication lines.
<b>DCIM</b>	Data Control Interface Module. The video interface hardware which resides in the SUN workstation (the DCIM replaces the XEPI board).
<b>decomposer</b>	Printer Controller task that translates print data from the PDL command file into a bitmap image of the page to be printed.
<b>default</b>	Predefined value the system uses when another value is not provided.
<b>device</b>	Any piece of hardware other than the CPU (Central Processing Unit).
<b>DFA</b>	Document Feeding and Finishing Architecture. Software that enables third-party feeding and finishing devices to be attached to a Xerox printer to perform pre- and post-processing functions (such as roll-feeding, saddle-stitching, booklet-making, etc.)
<b>diagnostics</b>	Programs used to diagnose problems within the system or to help service personnel pinpoint the source of such problems.
<b>digitize</b>	To express or represent data in digital (binary) form so that it can be processed electronically.
<b>directory</b>	Logical grouping of files and subdirectories that are identified by name. The directory helps organize data on large storage media.
<b>dithering</b>	The process in laser printing which uses dot patterns to simulate shades of gray or tones of a color.
<b>DOS</b>	Disk Operating System. Operating system commonly used on personal computers. <i>See also</i> operating system.
<b>dot</b>	Unit of measurement representing a fraction of an inch, for example, 300 dots per inch (dpi). May also be referred to as a picture element (pixel) or spot.

<b>dry ink</b>	Minute particles of resin and carbon toner deposited and fused onto the page to create images. Toner is combined with developer to form the dry ink.
<b>duplex</b>	Ability to send and receive information simultaneously.
<b>duplex printing</b>	Printing on both sides (front and back) of a page. <i>See also</i> simplex printing.
<b>electronic publishing</b>	The integrated production of documents on demand, using digitally stored documents, computerized composition, and electronic printing systems.
<b>enabler</b>	Hardware devices or software packages that allow the printer to perform as specified.
<b>Ethernet</b>	Network standard consisting of a coaxial cable or twisted pair and associated components for connecting workstations to each other, to file servers, and to peripherals. This communication system enables workstation users to share information and services.
<b>EtherTalk</b>	Hardware interface and network software for Apple Macintosh computers that provides connection to an Ethernet network.
<b>Extended Binary Coded Decimal Interchange Code (EBCDIC)</b>	Coded character set consisting of 8-bit coded characters. It can accommodate 256 characters.
<b>extension</b>	Portion of a filename that follows a period. In some instances it identifies the file type. For example, .ps specifies a PostScript file.
<b>fault</b>	Condition which prevents proper processing of a print job and requires the intervention of an operator. For example, a paper jam is a fault.
<b>FDL</b>	forms description language. LPS-resident source language used for designing electronic forms. <i>See also</i> FSL; form.
<b>field</b>	Preset place for entering information.
<b>file</b>	Set of records or text that can be stored and retrieved. Organized, named collection of records treated as a unit. For offline, it is the data between the two tape marks. For online, it is the data between banner pages.
<b>file maintenance</b>	Keeping a file up to date by regularly adding, changing, or deleting data.
<b>filename</b>	Name of a file or directory in a command line.
<b>finisher</b>	Any optional output finishing solution, for example, the stitcher/stacker.

<b>firmware</b>	Permanent programs stored in read-only memory (ROM).
<b>fixed disk</b>	Disk drive that is mounted within a computer and is not removable.
<b>fixed font</b>	Font containing characters with fixed spacing.
<b>fixed pitch</b>	Font set in which every character cell has the same width. In reference to character sets, this term describes typefaces in which all character cells are of equal width. Monospaced as opposed to proportional spaced.
<b>fixed spacing</b>	Arrangement of characters on a line so that all characters occupy the same amount of horizontal space.
<b>flag</b>	Small indicator marking the occurrence of an event or the existence of a certain condition while the program is executing.
<b>font</b>	A complete set of alphanumeric characters and punctuation marks, having common characteristics such as style, width, height, and weight.
<b>form</b>	1. Compiled forms source library (.FSL) file. 2. Printed or typed document with blank spaces for inserting information. Specific arrangement of lines, text, and graphics stored in a computer under an identifying name. Page of data that, when preceded by proper commands, is stored on the system disk as a permanent file. It may be merged with variable data by a form start command. See also FDL; FSL.
<b>format</b>	1. Layout of a document, including margins, page length, line spacing, typeface, etc. 2. In data storage, the way the surface of a disk is organized to store data. 3. To prepare the surface of a disk for acceptance of data.
<b>form feed</b>	Keyboard/printer control character that causes the printer to skip the top of the next page.
<b>FSL</b>	forms source library. Uncompiled collection of user-created files containing FDL commands. Refer to FDL; form.
<b>fuse</b>	To affix dry ink to paper by heat or pressure or a combination of both.
<b>HCF</b>	High capacity feeder. An optional feeder module containing two feeder trays that work independently with the standard feeder trays 1 and 2. The HCF increases the feeder capacity by approximately 2,000 sheets and allows automatic tray switching and increased uninterrupted printing time.
<b>hard disk</b>	See fixed disk.

<b>hardware</b>	Physical components (mechanical, magnetic, electronic, etc.) of a system, as opposed to programs, procedures, rules, and associated documentation. The hardware is operated by software and firmware.
<b>header page</b>	Page printed at the beginning of a job that provides information about the print job, such as the name of the document and the job sender.
<b>hexadecimal</b>	Numbering system with a base of 16. In this system, 10 through 15 represented by A through F, respectively.
<b>hierarchy</b>	Relative priority assigned to arithmetic or logical operations that must be performed.
<b>high-level language</b>	Programming language consisting of words and symbols that are close to normal English and, therefore, readily understandable by the user. High-level source languages are used for most commercial programs.
<b>host</b>	Computer accessed by users which serves as a source of high-speed data processing for workstations with less computer power. Commonly referred to as mainframe.
<b>host interface</b>	Connection between network and host computer.
<b>HSB</b>	A printing industry standard color definition model in which all colors are defined in terms of values for hue, saturation, and brightness. Refer to color definition model.
<b>identifier (id)</b>	Characters used to identify or name data and possibly to indicate certain properties of that data.
<b>image area</b>	Area on a physical page that may contain text or graphics.
<b>implementation</b>	Process of installing system hardware and software. Also the process of converting a design into an actual working system.
<b>impressions per minute (ipm)</b>	The number of pages (one side) a printer can print during the space of one minute. Used interchangeably with pages per minute (ppm).
<b>in-front page</b>	A term that refers to the top page of a double-sided sheet.
<b>initialize</b>	<ol style="list-style-type: none"><li>1. To prepare the magnetic surface of a blank diskette so that it can accept data.</li><li>2. To set all information in a computer system to its starting values (usually the first step is accomplished when a program is booted).</li></ol>
<b>interface</b>	Hardware that provides physical connection and electronic communication between two hardware devices.

<b>Internet Protocol (IP) address</b>	Refers to an address of any host that uses TCP/IP network protocol.
<b>IOT</b>	Image Output Terminal. See printer.
<b>JDE</b>	job descriptor entry. Collection of job descriptions. See also job; JSL.
<b>JDL</b>	job descriptor library. Collection of compiled job descriptions. See also JSL.
<b>job</b>	Print data and attributes required for processing and printing a document.
<b>job size</b>	Size of the print master data file measured in bytes.
<b>JSL</b>	job source library. Collection of uncompiled job descriptions. See also job; JDE; and JDL.
<b>label</b>	<ol style="list-style-type: none"> <li>1. In data storage, a reference to a file saved on tape or disk, a record indicating the file name or date created, and/or other control information.</li> <li>2. To set all information in a computer system to its starting values (usually the first step is accomplished when a program is booted).</li> <li>3. In programming, a name assigned to a particular instruction or portion of a program as a locational reference (the computer translates the label into an address).</li> </ol>
<b>landscape page orientation</b>	Orientation of print lines or top of an illustration parallel to the long edge of the paper.
<b>language</b>	Defined set of characters and symbols combined together by specific rules. Refer to high-level language and low-level language.
<b>laser printing</b>	Technology that uses a laser to transfer character forms to a page by direct or indirect means.
<b>library</b>	In data storage, a collection of related files or programs.
<b>light emitting diode (LED)</b>	Solid substance that glows when a current is passed through it. Often used for indicator lights on disk drives or modems, as well as for displays on other electronic equipment.
<b>line feed</b>	Control character that (unless set to be interpreted as a line end) causes the printing system to begin printing in the current character position of the next line.
<b>load</b>	To enter data into storage or working registers.
<b>Local Area Network (LAN)</b>	Network connecting computer and peripheral devices through cables.

<b>log</b>	Collection of messages or message segments placed on an auxiliary storage device for accounting or data collection purposes.
<b>logical page</b>	A logical page is defined by an origin location, thus allowing more than one logical page to be placed on a physical page.
<b>long-edge feed (LEF)</b>	The movement of paper through the printer in the direction of the paper length (the longer side of a sheet of paper). <i>See also</i> short-edge feed.
<b>low-level language</b>	Language that is close to machine language so that each written instruction in a program can be converted to machine language on a one-to-one basis.
<b>mainframe</b>	Central processing unit (CPU) and memory of a large computer. More often used to denote any large computer of the type that might be used to control a group of smaller computers, terminals, or other devices. Refer to host.
<b>markform</b>	A parameter name for an end-of-job marker in the IPDS data stream.
<b>megabyte (MB)</b>	A unit of approximately one million bytes.
<b>megahertz (MHz)</b>	<ol style="list-style-type: none"><li>1. Unit of cycling speed (one million cycles per second) for an electromagnetic wave (in particular, a radio wave).</li><li>2. The sending and receiving stations of a radio wave transmission must be tuned in to the same unit of megahertz.</li></ol>
<b>message</b>	Information passed to the user or to a task within the system. The information is usually associated with an error, fault, or system condition.
<b>MICR</b>	Functionality that produces a Magnetic Ink Character Recognition (MICR) line on negotiable and turnaround documents such as checks and bills. The MICR printing system prints documents using magnetic ink and special fonts to create machine readable information that allows for quick document processing. In general, MICR is used to print accounting and routing information on blank checks and other negotiable documents.
<b>mixed environment</b>	Group of different printing systems at the same location.
<b>modem</b>	Device that converts digital information into an analog signal suitable for sending over analog telecommunication lines. Also converts an analog signal from telecommunication lines into digital information.
<b>module</b>	Cohesive unit within a program. It is consistent in its level and identifiable in terms of loading or with other units.

<b>network</b>	<ol style="list-style-type: none"> <li>1. System of geographically separate computers, linked to one another over transmission lines.</li> <li>2. Communication lines connecting a computer to its remote terminals.</li> </ol>
<b>node</b>	Station, terminal, or computer that performs some control operation and influences the operation of the network as a whole.
<b>object file</b>	Source file converted into machine language (binary code).
<b>offline</b>	Devices not under the active control of a central processing unit. For example, a computer makes output to a magnetic tape. The tape is then used by an offline printing system to produce printed data. Offline operations are much slower than online operations. Refer to online.
<b>offset</b>	To place pages currently being printed in slightly different positions from previous pages.
<b>offset printing</b>	A widely-used method of commercial and corporate printing, where ink is picked up by a metal or paper plate, passed to an offset drum, and then passed to the paper.
<b>online</b>	Devices under the direct control of a central processing unit, e.g., a printing system in interactive communication with a mainframe. Refer to offline.
<b>operating system</b>	Basic host- controlling program that governs the operations of a computer, such as job entry, input/output, and data management. The operating system is always running when the computer is active. Unlike other types of programs, it does not run to an end point and stop.
<b>orientation</b>	<ol style="list-style-type: none"> <li>1. In reference to image area, orientation describes whether the printed lines are parallel to the long edge of the paper or the short edge of the paper.</li> <li>2. Choice of printing portrait (vertically) or landscape (horizontally).</li> </ol>
<b>page orientation</b>	Direction in which data is printed on a report. Refer to landscape page orientation and portrait page orientation.
<b>parsing</b>	To read or interpret a command; build up a parameter list from information within a command.
<b>PC</b>	Personal computer. Family of computers that most commonly run a version of DOS.

<b>Page Description Language (PDL)</b>	Page description language used to describe the printing of jobs to a laser printing system. PDL describes the input (type, format, characteristics), performs the processing functions (logical processing), and describes the output (type, format, font selection, accounting options) of a print job.
<b>peripheral</b>	Device used with a computer or workstation, usually for input or output. Printers, modems, and the IPS/NPS cartridge tape drives are examples of peripherals.
<b>platform</b>	Combination of hardware and operating system software.
<b>portrait page orientation</b>	Orientation of print lines or the top of an illustration parallel to the short edge of the paper.
<b>PostScript</b>	Page description language developed by Adobe Systems, Incorporated. PostScript describes the input (type, format, characteristics), performs the processing functions (logical processing), and describes the output (type, format, font selection, accounting options) of a print job.
<b>ppm</b>	Pages per minute.
<b>print attribute</b>	Set of attributes available for controlling the processing of a print job. Print attributes include simplex or duplex printing, media selection, collating, stitching, and so on. Print attributes can be sent to the Printer Controller as part of the job, providing automatic job processing.
<b>printer</b>	Component of the DocuPrint Printing System that accepts data from the Printer Controller and prints the document according to the print attributes specified by the user. The printer also provides paper stacking, collating, and optional finishing. “DocuPrint printer” or “printer” refers to the base printer engine (IOT) only, without the Printer Controller and interface.
<b>Printer Controller</b>	Component of the DocuPrint printing system that manages the spooling and processing of print jobs.
<b>Printer Control Language (PCL)</b>	Printer description language defined by Hewlett–Packard Company. PCL describes the input (type, format, characteristics), performs the processing functions (logical processing), and describes the output (type, format, font selection, accounting options) of a print job.
<b>protocol</b>	Formal set of conventions governing the format of data and the control of information exchange between two communication devices.
<b>query</b>	Request for data or other information, entered by an operator while the system is processing.
<b>queue</b>	List of documents waiting to be processed.

<b>Random Access Memory (RAM)</b>	Volatile memory used for temporary storage of data and software commands, used by programs for immediate task processing.
<b>raster data</b>	Binary data, usually consisting of dots arranged in scan lines, according to the print order.
<b>rasterization</b>	The creation of a bitmap image of a page for printing.
<b>raster output scanner (ROS)</b>	Raster output scanner. A motor-driven laser scanning system.
<b>Read-Only Memory (ROM)</b>	Solid-state memory for programs. It cannot be rewritten.
<b>read/write head</b>	A small electromagnet that reads, writes, and erases data in the form of magnetic dots on the surface of an external storage medium, such as a magnetic disk.
<b>real time</b>	To process transactions as they are entered into a system. User and system interchange allow transactions to be processed and the results returned to the user.
<b>resolution</b>	The number of dots per unit. An imaging system converts a character from digitized data into a printed image composed of these tiny dots. The greater the number of dots per inch (i.e., higher the resolution), the clearer the image is produced.
<b>sequencing</b>	Method of ordering messages, records within a file, or statements in a program according to rank or time of entry.
<b>sequential</b>	In numeric sequence, usually in ascending order. As applied to a file organization, describes files in which records are written one after another and cannot be randomly accessed. For example, the first 99 records in a sequential file-access file have to be read before the 100th record is accessible.
<b>short-edge feed (SEF)</b>	The movement of paper through the printer in the direction of the paper width (the shorter side of a sheet of paper).
<b>simplex printing</b>	Printing on one side of the page. See <i>also</i> duplex printing.
<b>small computer system interface (SCSI)</b>	An accepted standard for connecting devices to computers.
<b>software</b>	Programs, including operating systems, procedures, utilities, applications programs, etc., written for a system.
<b>software application</b>	See application software.
<b>spooling</b>	Process of releasing data from main memory and storing it temporarily until a peripheral device is ready to accept it, e.g., storing text before sending it to a printer.

<b>string</b>	Connected sequence of alphanumeric characters treated as one unit of data by a program.
<b>SunOS</b>	Operating system developed primarily by Sun Microsystems for use on Sun computers and workstations. SunOS provides inherent support for UNIX and for TCP/IP.
<b>syntax</b>	Rules governing the structure of expressions in a programming language.
<b>syntax error</b>	System response to a mistake in the entry of a command.
<b>sysgen</b>	Abbreviated form of system generation.
<b>system administrator</b>	Person responsible for configuring, operating, and maintaining the DocuPrint system, and also for installing client software on network workstations.
<b>system generation</b>	Process whereby the system is made ready to operate. Typically involves selecting the operative parameters and activating the relevant software.
<b>System Network Architecture (SNA)</b>	Total description of logical structure, formats, and protocols of operation sequences for transmitting an information unit through the communication system. Developed by IBM for distributed processing networks.
<b>telecommunications</b>	The transfer of data via telephone lines.
<b>teleprocessing</b>	Data transfer via telecommunication lines for processing among various remote terminals and the central processing unit (CPU).
<b>throughput</b>	In data processing systems, the amount of data that can be processed, transmitted, printed, etc., in a specified unit of time.
<b>Token Ring</b>	Network topology in which a control packet or token is passed from station to station in sequential order. Stations needing access must wait for the token before transmitting data. In a Token Ring, the next logical station receiving the token is also the next physical station.
<b>transaction processing</b>	Method of data processing in which files are updated and results are generated immediately after data entry.
<b>translation</b>	<ol style="list-style-type: none"><li>1. In data communications, the conversion of one code to another on a character-by-character basis.</li><li>2. In programming, the function of a language processor which converts a source program from one programming language to another.</li></ol>
<b>transmission speed</b>	In data communications, the rate at which data is passed through communication lines, usually measured in bits per inch (bpi).

<b>two-up</b>	Application that prints two logical pages on one side of a physical page.
<b>ULTRIX</b>	Operating system that runs on DECStations. It consists of a hierarchical system of commands, shells, files, and directories. See <i>also</i> operating system.
<b>UNIX</b>	Operating system for computers, usually working in a network environment. UNIX consists of a hierarchical system of commands, shells, files, and directories. See <i>also</i> operating system.
<b>user interface (UI)</b>	System for gathering input from a user and presenting data to the user.
<b>virtual page</b>	Page area selected by a forms designer for printing.
<b>virtual printers</b>	Alternate names for the printer which allow different sets of default attributes to be applied to submitted jobs. The operator and system administrator define virtual printer names and the associated set of attributes and values.
<b>workstation</b>	Computer able to process data but designed specifically for interaction with a network.
<b>write</b>	To record data in memory or an external storage medium.
<b>write protection</b>	Data protection feature implemented on magnetic media (e.g., floppy disk) to prevent stored data from being modified, written over, or erased.
<b>xerographic mode</b>	There are two xerographic modes: black mode or highlight mode. Black mode allows printing with black dry ink only, while the highlight mode enables highlight color printing.



## Numerics

- 10Mb/sec twisted pair standard 4-16
- 3-pitch mode A-5
- 4 mm cartridge tape
  - ordering A-14
- 4 mm cartridge tape drive 5-9, 5-10
- 50 Hz voltage requirements
  - Delta configurations 6-3
  - Wye configurations 6-4
- 60 Hz voltage requirements 6-2
- 8 power (X) Comparator with MICR grid A-15
- 8-pitch mode A-5

## A

- access requirements, delivery 6-24–6-28
- accounting information, purging 4-11
- Adobe fonts 2-8
- Advanced Customer Training (ACT) B-4
- AFP environment 1-9
- AppleTalk
  - network 4-11
  - zone name, specifying 4-11
- applications, customer responsibility 4-4
- AS/400, parameters F-21–F-28
- attention light 3-1, 3-5

## B

- back panel, Sun workstations 2-3
- Barr/AFD 8-3
- BCOCA (Bar code Object Content Architecture) 1-10
- billing meter
  - reading 8-5
  - reporting 8-5
- Bin Unload button 3-5
- bus and tag
  - channel connection 1-6
- bypass transport 1-5
  - dimensions 6-12
  - paper path 6-15
  - service access 6-14
  - specifications 6-12–6-16, 6-30

## C

- cables
  - locations 7-2
- carbonless paper A-3
- cartridge tape
  - drive 5-9, 5-10
  - ordering A-14
- CE mark xiii
- central processing unit 2-2, 2-6
- channel attachments E-1–E-3, E-6, E-7
- channel cable connector box 1-8
- channel interface board 1-8
- channel-attached
  - systems 1-8, 1-9
- checklist
  - supplies A-24–A-25
- checklists
  - installation planning 4-4–4-8
  - network installation 4-9–4-15
  - preinstallation 4-9
- cleaning supplies A-22
- clearance space 6-6, 6-20–6-23
- commands
  - font installation 2-8
  - job submission 4-11
  - lpd 4-11
  - lpr 4-11
  - status 4-11
  - UNIX command tool 4-11
- components
  - DocuPrint system 1-10
  - hardware 5-8
  - printer controller 2-1
  - printing system 1-10
- conditioning paper A-10
- configuration, network 1-12
- connectivity boards 2-5
- consumable supplies table A-16
- control panel
  - HCF feeder tray 3-2
- conventions xviii

customer responsibilities 1-13, 4-2–4-4, 8-2–8-3

## D

data cables 7-1

Data Control Interface Module (DCIM2) card 2-5

data streams 1-9

default router 4-10

definitions, *see* sample printer definitions

delivery requirements 6-24–6-28

DELTA configurations 6-4

developer A-13, A-22

devices, input enablement 6-21

dimensions

    bypass transport 6-12

    printers 6-7–6-11

diskettes A-13, A-22

display monitor 5-9, 5-10

Document Feeding and Finishing Architecture, *see* DFA

documentation C-1

    AS/400 F-28

    MVS references F-20

DocuPrint system components 1-10

drives

    cartridge tape 5-9, 5-10

    disk 2-3

    DVD-ROM 2-3

dry ink

    toner A-12, A-21

    waste bottle A-21

DVD-ROM drive 2-3

## E

electrical

    specifications 5-1–5-3

electrical specifications 6-1–6-5

environmental requirements 6-5

Ethernet 2-5

    configurations using 1-6

    framing type 4-13

    requirements 4-15

## F

feeder trays

    described 3-2

    processor 3-2

*see also* high-capacity feeder

feeder/stacker

    space requirements 6-7–6-11

    specifications 6-29–6-30

file server D-12

floor leveling 6-24

font installation commands 2-8

fonts

    Adobe Type 1 2-8

    PCL 2-8, 2-9

framing type, Ethernet 4-13

fuser

    agent A-13, A-22

    shield A-13, A-22

## G

GOCA (Graphics Object Content Architecture) 1-10

## H

hardware

    components 5-8

    printer components 6-28–6-30

    printer controller, installing 8-3

    specifications 5-8–5-9, 6-28–6-30

    supported 1-12–1-13, 6-12

HCF feeder trays

    capacities 3-2

    control panel 3-2

HCU 1-9, 5-8, 5-10

Hewlett-Packard

    PCL fonts 2-8, 2-9

high-capacity feeder 3-3

high-capacity stacker 3-4

Host Channel Unit 1-9

## I

IEEE

    802.3 1-11, 4-16

    802.5 1-11

IEEE 802.3 4-16

In Use indicator 3-5

Infoprint Manager

    AIX E-5, F-30

    Windows 2000 E-4, F-29

    Windows NT E-4, F-29

ink, dry A-21

input enablement

    paper path 3-12

input enablement devices 6-21

## installation

- hardware 8-1
- network checklist 4-9–4-15
- planning checklist 4-4–4-8
- preparation 4-1–4-15
- process 8-1–8-2
- timeframes 4-5
- Xerox responsibilities 4-2

## inverter feeder/stacker module 3-1, 3-3

IOCA (Image Object Content Architecture)  
1-9

## IP

- address 4-9
- broadcast address 4-10
- Netmask 4-9

## IPDS data streams 1-9

IPX internal network number, specifying  
4-13**J**

## JES2

- FSS statement parameters F-3–F-5
- Initialization Dataset commands example  
F-5
- printer definitions E-1

## JES3

- configuring F-5
- FSS statement parameters F-6–F-8
- initialization dataset commands example  
F-8

**K**

## keyboard 2-5, 2-7, 5-9, 5-10

**L**

## labels

- selecting A-2

## LAN network number, specifying 4-13

## laser safety ix

## leveling, floor 6-24

## license, software 8-4

## lpd commands 4-11

## lpr commands 4-11

**M**

## maintenance

- ongoing 8-4–8-5
- routine 8-4–8-5

## meter, billing

## reading 8-5

## reporting 8-5

## MICR

- comparator with MICR grid A-15
- dry ink A-12, A-21
- Positioning and Dimension Gauge A-15

## MO:DCA-P (Mixed Object Document

- Content Architecture for Presentation  
1-9

## monitor 5-9, 5-10

## monthly print volume 1-2

## mouse 2-7, 5-9, 5-10

## MVS

- channel attachment E-1–E-3
- TCP/IP connection F-1–F-20

**N**

## network

- AppleTalk 4-11
- configuration 1-12
- Ethernet 1-11
- installation checklist 4-9–4-15
- Novell 4-12
- Token Ring 1-11, 8-1

## network configurations

- AS/400 F-21
- MVS F-2

## network interface requirements 4-15

## Novell NetWare

- connectivity requirements 4-15
- information 4-12
- installation information 4-12–4-14
- PCONSOLE D-2
- print queues D-1–D-2, D-9, D-12
- PSERVER 4-12, D-3–D-4, D-5–D-9, D-12
- remote printer (RPRINTER) 4-13, D-5–  
D-7, D-10–D-13
- virtual printers 4-13, D-4, D-9, D-12

**O**

## operating systems supported 1-6, 1-12–1-13

## operation safety, Europe xi–xiii

## operation safety, U. S. x–xi

## operator training 4-3

## ordering supplies A-23–A-24

OS/390, *see* MVS

## outlets, power configurations 5-2, 6-2

## ozone production information x

**P**

## paper

- characteristics A-2
- conditioning A-10
- feed direction A-6–A-8
- ordering A-16, A-23
- path
  - described 3-10
  - input enablement 3-12
  - printer 3-10
- path, bypass transport 6-15
- recommended weight, grade A-2
- selecting A-1
- size 6-12, A-1
- sizes A-3–A-8
- storing A-9
- supplies A-16–A-21

## Paper Level indicators 3-3

## password, Superuser 4-10

## PCIM2 card 2-5

## PCL fonts 2-8, 2-9

## PCONSOLE, Novell D-2

## perforated paper A-3

## personnel, training 4-4

## planning checklist 4-4–4-8

## Please Wait indicator 3-2, 3-5

## PostScript fonts 2-8

## power

- cord configurations 6-2
- requirements 5-1–5-3, 6-1–6-5, 6-28–6-30

## precut paper A-3

## predrilled paper A-3

## preinstallation checklist 4-9

## preprinted paper A-3

## print queues, Novell D-1–D-2, D-9, D-12

## print server (PSERVER), Novell 4-12, D-3–D-4, D-5–D-9, D-12

## print volume, monthly 1-2

## printer

- components 1-10
- defining 8-3
- dimensions 6-7–6-11
- installation 8-1–8-2
- maintenance 8-4–8-5
- performance
  - AS/400 F-28
  - MVS F-19
- pinging

## AS/400 F-25–F-27

## MVS F-17–F-19

## placement 6-7

## power requirements 5-8–5-9, 6-28–6-30

## sample definitions

## MVS with channel attachment E-1–E-3

## MVS with TCP/IP connection F-1–F-20

## VM with channel attachment E-6

## VSE with channel attachment E-7

## throughput speed 6-12, A-3–A-4

## printer control console

## components 3-6

## printer controller

## components 2-1

## placement 5-3–5-5

## space requirements 5-8

## printers

## capabilities 1-1

## components

## attention light 3-1, 3-5

## high-capacity feeder 3-3

## high-capacity stacker 3-4

## inverter feeder/stacker module 3-1, 3-3

## printer control console 3-6

## processor feeder trays 3-2

## purge tray 3-1, 3-5

## sample tray 3-1

## configurations 3-8–3-10

## paper path 3-10

## processor 2-2, 2-6, 5-9, 5-10

## PSERVER D-3

## PSF

## printer definitions E-2

## PSF/6000 E-5, F-30

## PSF/MVS

## configuring F-9

## PRINTDEV statement example F-13

## PRINTDEV statement parameters F-9–F-12

## PSF/VSE 1-6

## PTOCA (Presentation Text Object Content Architecture) 1-9

## publications C-1

## purge tray 3-1, 3-5

## purging accounting information 4-11

**R**

Ready to Open indicator 3-2  
Ready to Unload indicator 3-5  
remote printer (RPRINTER), Novell 4-13,  
D-5-D-7, D-10-D-13  
requirements  
  see *also* specifications  
  clearance space 6-20-6-23  
  delivery access 6-24-6-28  
  environmental 6-5  
  Ethernet 4-15  
  network information 4-12  
  network interface 4-15  
  Novell Netware information 4-12  
  power 5-1-5-3, 5-9, 6-1-6-5, 6-28-6-30  
  printer controller space 5-8  
  site 4-6  
  space 5-3, 6-6, 6-19-6-28  
  Token Ring 4-16  
responsibilities  
  customer 1-13, 4-2-4-4, 8-2-8-3  
  Xerox 1-13, 4-1-4-2, 8-2-8-3  
retry count 4-11  
root password 4-10  
router, default 4-10  
RPRINTER D-5

**S**

safety  
  hotline numbers xi  
  laser ix  
  operation x-xiii  
sample printer definitions  
  MVS with channel attachment E-1-E-3  
  MVS with TCP/IP connection F-1-F-20  
  VM with channel attachment E-6  
  VSE with channel attachment E-7  
sample tray 3-1  
selecting  
  labels A-2  
  paper  
    characteristics A-2  
    size A-1  
  transparencies A-2  
service  
  telephone number B-2  
  Xerox responsibilities 4-2  
shared space 6-19, 6-20-6-23  
site

  selection, Xerox responsibilities 4-2  
Sixth Sense 1-14, B-2  
software  
  network 1-12-1-13  
  operating system 1-12-1-13  
  printer controller  
    installing 8-1  
  supported products 1-9  
software prerequisites  
  AS/400 F-21  
  MVS F-1  
space  
  bypass transport 6-14  
  planning guidelines 6-19  
  requirements 5-3, 6-6, 6-19-6-28  
specifications  
  see *also* requirements  
  bypass transport 6-12-6-16  
  electrical 5-1-5-3, 5-8, 6-1-6-5, 6-28-  
    6-30  
  environmental 5-3  
  printer 6-1-6-30  
  printer controller 5-8-5-9  
stacker  
  high-capacity 3-4  
Sun workstations 5-4, 5-6  
Superuser password 4-10  
supplies  
  cartridge tapes A-14  
  checklist A-24-A-25  
  cleaning A-22  
  consumable tables A-16  
  developer A-13, A-22  
  diskettes A-13, A-22  
  dry ink  
    toner A-12, A-21  
    waste bottle A-21  
  fuser  
    agent A-13, A-22  
    shield A-13  
  MICR tools A-15  
  paper A-1, A-10, A-16-A-21  
supplies table A-16  
support services B-1-B-5  
system components 1-10  
System overview 1-1

**T**

tape drive 5-9, 5-10

TCP/IP 8-2  
  defining F-1  
  Ethernet interface 1-6  
  MVS  
    configuring F-13  
    Profile dataset F-14–F-16  
telephone numbers  
  service B-2  
  Xerox Parts and Product Support Center  
    A-23  
throughput speed 1-2  
time requirements, planning installation 4-5  
tinted paper A-3  
Token Ring 1-6, 1-11, 2-5, 4-16  
toner, *see* dry ink  
training B-4  
  customer responsibility 4-4  
  operators 4-3, 8-2  
  Xerox responsibilities 4-2  
transmission rate 1-6  
transparencies  
  selecting A-2  
trays  
  elevators 3-4  
  feeder 3-2  
  purge 3-1, 3-5  
  sample 3-1  
turning radius 6-25–6-28

**U**

United States/Canada 5-2  
UNIX

  command tool 4-11  
  root password, selecting 4-10  
  Sun operating system 2-7  
  Superuser password 4-10

**V**

vertical clearance 6-6  
virtual printers 4-13, D-4, D-9, D-12  
VM E-6  
voltages, requirements 5-2  
VSE E-7

**W**

waste bottle, dry ink A-21  
workstations *see* Sun workstations

**X**

Xerox Client Software 2-8, 4-11, 8-2  
Xerox Customer Documentation Catalog B-3  
Xerox Customer Education B-4  
Xerox Customer Parts and Product Support  
  Center A-23  
Xerox Customer Service Support Center B-1  
Xerox Documentation and Software  
  Services (XDSS) B-3  
Xerox Font Center B-5  
Xerox Printing Systems Customer Support  
  Center B-2  
Xerox responsibilities 4-1–4-2, 8-2–8-3

**Z**

zone name, specifying 4-11