Infoprint 4000 and Infoprint 4100 Models with
Enhanced Operator Console

IBM

# Planning and Configuration Guide

Infoprint 4000 and Infoprint 4100 Models with
Enhanced Operator Console

# Planning and Configuration Guide

> **Note!**
>
> Before using this information and the product it supports, be sure to read the general information under "Notices" on page 239.

**Eighth Edition (December 2004)**

The following paragraph does not apply to any other country where such provisions are inconsistent with local law.

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

Changes are made periodically to this publication.

Requests for IBM publications should be made to your IBM representative or to the IBM branch office serving your locality. If you request publications from the address given below, your order will be delayed, because publications are not stocked there.

A Reader's Comments form is provided at the back of this publication. If the form has been removed, you can send comments by fax to 1-800-524-1519, or 1-303-924-6873, or by E-mail to printpub@us.ibm.com, or by mail to:

    IBM Printing Systems

    Department H7FE Building 004M

    Information Development

    PO Box 1900

    Boulder CO USA 80301-9191

IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

Visit our home page at: http://www.ibm.com/printers

# Contents

# Figures

**ix**

# Tables

# Preface

This publication introduces and summarizes the functions of the IBM Infoprint 4000 and Infoprint 4100 Models with Enhanced Operator Console and its configurations. This publication also contains information to help you prepare for installing and using the printer.

The first part of this publication is written for executives who are thinking about buying Infoprint 4000 or Infoprint 4100 Models with Enhanced Operator Console. The second part is for the planning team that is responsible for installing the printer and preparing it for regular operation. The last part of this publication concerns printer definition (sometimes referred to as printer configuration). It is used for determining how the Models with Enhanced Operator Console are to be configured during installation and for changing printer definition items as necessary after the printing system is installed and operating.

The models supported by this publication are:
- Infoprint 4000 Models IS1, IS2
- Infoprint 4000 Models ID1/ID2
- Infoprint 4000 Models ID3/ID4
- Infoprint 4000 Models ID5/ID6
- Infoprint 4000 Models IR1/IR2
- Infoprint 4000 Models IR3/IR4
- Infoprint 4100 Models PS1, HS1, HS2
- Infoprint 4100 Models PD1/PD2, HD1/HD2, HD3/HD4

## About this Publication

This publication contains the following chapters:

Chapter 1, "Introduction," on page 1 gives an overview of the Infoprint 4000 and Infoprint 4100 Advanced Function Printer characteristics and basic concepts.

Chapter 2, "Specifications," on page 39 describes the Infoprint 4000 and Infoprint 4100 Advanced Function Printer functions and features in detail.

Chapter 3, "Organizing the Planning Team," on page 79 describes the installation planning team and specifies the tasks for which each team member is responsible.

Chapter 4, "Preparing the Processing Environment," on page 83 describes requirements associated with channel attachment, pattern storage, and Advanced Function Presentation licensed programs.

Chapter 5, "Preparing the Physical Environment," on page 103 specifies the Infoprint 4000 and Infoprint 4100 Advanced Function Printer environmental, electrical, and space requirements.

Chapter 6, "Selecting and Testing Forms," on page 133 describes the basic requirements for forms used in the Infoprint 4000 and Infoprint 4100 Advanced Function Printers and describes methods for evaluating them.

Chapter 7, "Setting Printer Definition Values," on page 137 describes the definition options for the Infoprint 4000 and Infoprint 4100 Advanced Function Printers that are defined at installation time and changed later as needs require.

Chapter 9, "Creating a Snapshot," on page 173 describes Snapshots and lists the configuration items that can be saved in a Snapshot, focusing specifically on form settings.

Appendix A, "Obtaining Supplies," on page 175 lists supplies used in the Infoprint 4000 and Infoprint 4100 Advanced Function Printers and describes how to order them.

Appendix B, "Work Sheets," on page 183 provides work sheets on which you can record your installation and definition choices.

Appendix C, "Standard Power Plug Listings," on page 235 provides specifications for standard power plugs by country for the Infoprint 4100 Models HS2 and HD4 printer control unit, the HD3 printer utility module, and the Hunkeler Buffer Flipper Unit.

## Terms

In Infoprint 4000 and Infoprint 4100 Advanced Function Printers publications, the terms *forms* and *paper* have specific meanings. **Forms** refers to the media on which the printer can print. Forms can be blank paper, preprinted paper, adhesive labels, cards, or any other printable material. **Paper** refers to a specific fiber-based material used to make forms.

Duplex printing systems operating in duplex mode, such as the Infoprint 4000 Models ID5/ID6, have two printers commonly referred to in this publication as *Printer 1* and *Printer 2*. **Printer 1** is the first printer to print on the forms as they enter. Printer 1 does not have a touchscreen. **Printer 2** prints on the other side of the forms, which have been turned over by the Buffer/Flipper Unit. Printer 2 has a touchscreen, as well as a keyboard and mouse.

For definitions of other terms, see the "Glossary" on page 245. These comprehensive reference tools contain not only terms used in this publication, but also terms, abbreviations, and acronyms from other publications in the Infoprint 4000 and Infoprint 4100 Advanced Function Printers Library.

## Infoprint 4000 and Infoprint 4100 Advanced Function Printers Library

The following additional Infoprint 4000 and Infoprint 4100 Advanced Function Printers publications are available:
- *IPDS Handbook for Printers that Use the Advanced Function Common Control Unit*, G544-3895, which contains technical information about the host-to-printer data stream, and exception reporting.
- *IBM Infoprint 4000 and Infoprint 4100 Models with Enhanced Operator Console Operator's Guide*, S544-5800, which describes the procedures required to operate the Infoprint 4000 and Infoprint 4100 Models with Enhanced Operator Console.
- *IBM Infoprint 4000 and Infoprint 4100 Models with Enhanced Operator Console Quick Reference Guide*, S544-5801, which describes the tasks an operator may need to run when the online help is not available.

## Related Publications

An extensive listing of available publications is included in *Advanced Function Presentation: Printer Information* G544-3290.

The following publications are referred to in this document:
- *About Type: IBM's Technical Reference for 240-pel Digitized Type*, S544-3516
- *Bar Code Fonts User's Guide*, S544-3190
- *Bar Code Object Content Architecture Reference*, S544-3766
- *Cabling System Optical Fiber Planning and Installation Guide*, GA27-3943
- *Cabling System Technical Interface*, GA27-3773
- *Forms Design Reference for Continuous Forms Advanced Function Printers*, G544-3921
- *General Information Manual: Installation Manual–Physical Planning*, GC22–7064
- *Guide to Advanced Function Presentation*, G544–3876
- *IBM Infoprint 4000 and Infoprint 4100 Models with Enhanced Operator Console Operator's Guide*, S544-5800
- *IBM Product Description*, G544–3949
- *Intelligent Printer Data Stream Reference*, S544-3417
- *IPDS Handbook for Printers That Use the Advanced Function Common Control Unit*, G544–3895
- *Fiber Optic Link Planning*, GA23-0367

Contact your IBM marketing representative for information concerning the Infoprint 4000 and Infoprint 4100 Advanced Function Printers, their manuals, or associated licensed programs.

## Summary of Changes

Changes is this release include:

- Corrections and clarifications were made throughout.
- Numerous updates were made to the "Optional features" section, the "Specifications" chapter, the "Attachment cable features" section, the "Power Requirements" section, and the "Supplies" section.

# Chapter 1. Introduction

---

**Chapter Overview**

This chapter introduces you to the Infoprint 4000 and Infoprint 4100 Models with Enhanced Operator Console. For readers not familiar with nonimpact, all-points-addressable printers, this chapter also defines some basic page-printing concepts.

---

## Printer Characteristics

The Infoprint 4000 and Infoprint 4100 family of printers are nonimpact, all-points-addressable printers. These printers use a laser, electrophotographic print technology, and Advanced Function Presentation™ (AFP) licensed programs to create high-quality text and graphics printer output.

Nonimpact printing, combined with all-points addressability, allows graphics and many different type sizes and styles to appear on a single page. Text, images, and electronic overlays can be placed at any defined point on the page areas on which the printer can print. The printers can be used for text, image, graphics, optical character recognition (OCR), and bar-code printing. See "System Characteristics" on page 3 for the print resolution (pel) of each model.

Using a duplex printing system, the output of the printers can have print on both sides of a form. The system consists of two printer engines in series, each printing on one side of the form with the forms inverted between them. You can use one or both of the printer engines in the system for simplex printing applications.

The printers use continuous-forms in a variety of sizes, styles, and weights, including preprinted forms (see "System Characteristics" on page 3 for more information). The printers use an automatic assist for loading most forms. After printing, the forms may be stacked in the printer stacker or processed by an optional postprocessing device.

Up to three preprocessing and postprocessing device interfaces can be installed on Printer 1. Printer 2 can have two interfaces installed. This provides additional input and output capabilities beyond the standard forms input source and output stacker on the printer.

- Two pre/postprocessing device interfaces are standard, one in each system printer. Two additional pre/postprocessing device interfaces can be installed as optional features on Printer 1. One additional interface can be installed on Printer 2.
- See "Defining Interfaces and Preprocessing or Postprocessing Devices" on page 167 for more information.

**Note:** Infoprint 4100 models HS2, HD3/HD4 can have up to four pre/postprocessing device interfaces per engine.

An Advanced Function Common Control Unit (AFCCU) controls the printing system, whether you select a duplex or simplex configuration. With the duplex models, the AFCCU™ is attached to the second printer engine in the configuration. The AFCCU is based on IBM's recognized RS/6000® technology.

*Table 1. Host Attachments supported in the Infoprint 4000:*

- System/370™ parallel channels
- ESCON® channels
- Token Ring TCP/IP (Transmission Control Protocol/Internet Protocol) Local Area Networks (LAN)
- FDDI (Fiber Distributed Data Interface) TCP/IP LANs (AFCCU microcode levels 11.x and earlier only)
- Ethernet TCP/IP LANs
- Gigabit Ethernet

*Table 2. Host Attachments supported in the Infoprint 4100:*

| Book Printing | Statement Printing |
|---|---|
| • Token Ring TCP/IP (Transmission Control Protocol/Internet Protocol) Local Area Networks (LAN)<br>• FDDI (Fiber Distributed Data Interface) TCP/IP LANs (AFCCU microcode levels 11.x and earlier only)<br>• 10/100 Base T Ethernet TCP/IP LANs<br>• Gigabit Ethernet | • Token Ring TCP/IP (Transmission Control Protocol/Internet Protocol) Local Area Networks (LAN)<br>• FDDI (Fiber Distributed Data Interface) TCP/IP LANs (AFCCU microcode levels 11.x and earlier only)<br>• 10/100 Base T Ethernet TCP/IP LANs<br>• FICON™ channel<br>• Gigabit Ethernet<br>• S/370™ parallel attachment<br>• ESCON channels |
| (See "Host System Attachment Choices" on page 49 for more information.) | |

Performance enhancements, such as the Advanced Function Image and Graphics (AFIG) feature, are integral to the AFCCU design. Additionally, the AFCCU extends the scaling performance enhancement for compressed images to all scaling factors, enabling the printing of compressed images at significantly higher levels of performance.

The printer can be used in z/OS, OS/390®, MVS™, VM, VSE, OS/400®, AIX®, Windows® NT, and Windows 2000 operating environments, and can be channel-attached or Ethernet-attached to many different processors. For additional information, see "Host System Attachment Choices" on page 49.

# System Characteristics

## Infoprint 4000 Models ISx

Refer to the *Forms Design Reference for Continuous Forms Advanced Function Printers* for specific restrictions and qualifications for each printer model.

| Model IS1 | |
|---|---|
| **Modes** | Simplex |
| **Resolution (pel)** | 240/300 |
| **Print Speed (ipm)** | 229/354 |
| **Basis Paper Weights** | 60–160 g/m$^2$ (16–42 lb) |
| **Forms Width** | **Minimum mm (in.):** 204 (8) |
| | **Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013) |
| | **Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

| Model IS2 | |
|---|---|
| **Modes** | Simplex |
| **Resolution (pel)** | 240/300 |
| **Print Speed (ipm)** | 324/501 |
| **Basis Paper Weights** | 60–105 g/m$^2$ (16–28 lb) |
| **Forms Width** | **Minimum mm (in.):** 204 (8) |
| | **Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013) |
| | **Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

| Model IS2 with Feature Code 4930 (Heavy Weight Paper) | |
|---|---|
| **Modes** | Simplex |
| **Resolution (pel)** | 240/300 |
| **Print Speed (ipm)** | 324/501 |
| **Basis Paper Weights** | 60–160 g/m $^2$ (16–42 lb) |
| **Forms Width** | **Minimum mm (in.):** 204 (8) |
| | **Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013) |
| | **Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

**Notes:**

1. The Print Speed for duplex is the total system speed (2 printers).

2. Print Speed is stated in impressions per minute (ipm) for 1–up mode/2–up mode.

# Infoprint 4000 Models IDx

Refer to the *Forms Design Reference for Continuous Forms Advanced Function Printers* for specific restrictions and qualifications for each printer model.

| Models ID1/ID2 | |
|---|---|
| **Modes** | Duplex<br>Dual Simplex |
| **Resolution (pel)** | 240/300 |
| **Print Speed (ipm)** | **Duplex:** 458/708<br>**Dual Simplex:** 229/354 (each engine) |
| **Basis Paper Weights** | **Duplex:** 60–105 g/m$^2$ (16–28 lb)<br>**Dual Simplex:** 60–160 g/m$^2$ (16–42 lb) |
| **Forms Width** | **Minimum mm (in.):** 229 (9) – (Duplex)<br>**Minimum mm (in.):** 204 (8) – (Dual Simplex)<br>**Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

| Models ID1/ID2 with Feature Code 4930 (Heavy Weight Paper) | |
|---|---|
| **Modes** | Duplex<br>Dual Simplex |
| **Resolution (pel)** | 240/300 |
| **Print Speed (ipm)** | **Duplex:** 458/708<br>**Dual Simplex:** 229/354 (each engine) |
| **Basis Paper Weights** | **Duplex:** 60–160 g/m$^2$ (16–42 lb)<br>**Dual Simplex:** 60–160 g/m $^2$ (16–42 lb) |
| **Forms Width** | **Minimum mm (in.):** 229 (9) – (Duplex)<br>**Minimum mm (in.):** 204 (8) – (Dual Simplex)<br>**Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

**Notes:**

1. The Print Speed for duplex is the total system speed (2 printers).
2. Print Speed is stated in impressions per minute (ipm) for 1–up mode/2–up mode.

| Models ID3/ID4 | |
|---|---|
| **Modes** | Duplex<br>Dual Simplex |
| **Resolution (pel)** | 240/300 |
| **Print Speed (ipm)** | **Duplex:** 648/1002<br>**Dual Simplex:** 324/501 (each engine) |
| **Basis Paper Weights** | **Duplex:** 60–105 g/m$^2$ (16–28 lb)<br>**Dual Simplex:** 60–105 g/m$^2$ (16–28 lb) |
| **Forms Width** | **Minimum mm (in.):** 229 (9) – (Duplex)<br>**Minimum mm (in.):** 204 (8) – (Dual Simplex)<br>**Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |
| **Models ID3/ID4 with Feature Code 4930 (Heavy Weight Paper)** | |

| Modes | Duplex<br>Dual Simplex |
|---|---|
| **Resolution (pel)** | 240/300 |
| **Print Speed (ipm)** | **Duplex:** 648/1002<br>**Dual Simplex:** 324/501 (each engine) |
| **Basis Paper Weights** | **Duplex:** 60–160 g/m$^2$ (16–42 lb)<br>**Dual Simplex:** 60–160 g/m $^2$ (16–42 lb) |
| **Forms Width** | **Minimum mm (in.):** 229 (9) – (Duplex)<br>**Minimum mm (in.):** 204 (8) – (Dual Simplex)<br>**Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

**Notes:**

1. The Print Speed for duplex is the total system speed (2 printers).

2. Print Speed is stated in impressions per minute (ipm) for 1–up mode/2–up mode.

| **Models ID5/ID6** | |
|---|---|
| Modes | Duplex<br>Dual Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | **Duplex:** 660/942 ISO A4<br>**Dual Simplex:** 330/471 ISO A4 (each engine) |
| **Basis Paper Weights** | **Duplex:** 60–105 g/m$^2$ (16–28 lb)<br>**Dual Simplex:** 60–105 g/m$^2$ (16–28 lb) |
| **Forms Width** | **Minimum mm (in.):** 229 (9) – (Duplex)<br>**Minimum mm (in.):** 204 (8) – (Dual Simplex)<br>**Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |
| **Models ID5/ID6 with Feature Code 4930 (Heavy Weight Paper)** | |
| Modes | Duplex<br>Dual Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | **Duplex:** 660/942 ISO A4<br>**Dual Simplex:** 330/471 ISO A4 (each engine) |
| **Basis Paper Weights** | **Duplex:** 60–160 g/m$^2$ (16–42 lb)<br>**Dual Simplex:** 60–160 g/m $^2$ (16–42 lb) |
| **Forms Width** | **Minimum mm (in.):** 229 (9) – (Duplex)<br>**Minimum mm (in.):** 204 (8) – (Dual Simplex)<br>**Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

**Notes:**

1. The Print Speed for duplex is the total system speed (2 printers).

2. Print Speed is stated in impressions per minute (ipm) for 1–up landscape mode/2–up portrait mode.

# Infoprint 4000 Models IRx

Refer to the *Forms Design Reference for Continuous Forms Advanced Function Printers* for specific restrictions and qualifications for each printer model.

| Models IR1/IR2 | |
|---|---|
| **Modes** | Duplex |
| | Dual Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | **Duplex:** 300/464 |
| | **Dual Simplex:** 150/232 (each engine) |
| **Basis Paper Weights** | **Duplex:** 60–105 g/m $^2$ (16–28 lb) |
| | **Dual Simplex:** 60–105 g/m$^2$ (16–28 lb) |
| **Forms Width** | **Minimum mm (in.):** 229 (9) – (Duplex) |
| | **Minimum mm (in.):** 204 (8) – (Dual Simplex) |
| | **Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013) |
| | **Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

| Models IR3/IR4 | |
|---|---|
| **Modes** | Duplex |
| | Dual Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | **Duplex:** 458/708 |
| | **Dual Simplex:** 229/354 (each engine) |
| **Basis Paper Weights** | **Duplex:** 60–105 g/m $^2$ (16–28 lb) |
| | **Dual Simplex:** 60–105 g/m$^2$ (16–28 lb) |
| **Forms Width** | **Minimum mm (in.):** 229 (9) – (Duplex) |
| | **Minimum mm (in.):** 204 (8) – (Dual Simplex) |
| | **Maximum mm (in.):** 457 (18) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013) |
| | **Maximum mm (in.):** 356 ±0.3 (14.0 ±0.013) |

**Notes:**

1. The Print Speed for duplex is the total system speed (2 printers).

2. Print Speed is stated in impressions per minute (ipm) for 1–up mode/2–up mode.

# Infoprint 4100 Models

Refer to the *Forms Design Reference for Continuous Forms Advanced Function Printers* for specific restrictions and qualifications for each printer model.

| **Model HS1** (High Quality Simplex) | |
|---|---|
| **Modes** | Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | 251/359 ISO A4<br>247/381 Letter (8.5 x 11 in.) |
| **Basis Paper Weights** | 45–160 g/m$^2$ (12–42 lb) |
| **Forms Width** | **Minimum mm (in.):** 210.8 (8.3)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013) |
| | **Using internal stacker mm (in.):** 432 ±0.3 (17.0 ±0.013) |

| **Model HS2** (High Quality Simplex) | |
|---|---|
| **Modes** | Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | **High Speed:**<br>406/574 ISO A4<br>395/610 Letter (8.5 x 11 in.)<br>**Low Speed:**<br>333/470 ISO A4<br>324/500 Letter (8.5 x 11 in.) |
| **Basis Paper Weights** | 60–105 g/m$^2$ (16–28 lb) |
| **Forms Width** | **Minimum mm (in.):** 210.8 (8.3)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013) |
| | **Using optional internal stacker mm (in.):** 432 ±0.3 (17.0 ±0.013) |

| **Model PS1** (Premium Quality Simplex) | |
|---|---|
| **Modes** | Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | 251/359 ISO A4<br>247/381 8.5 x 11 in. |
| **Basis Paper Weights** | 45–105 g/m $^2$ (12–28 lb) |
| **Forms Width** | **Minimum mm (in.):** 210.8 (8.3)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Length** | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013) |
| | **Using internal stacker mm (in.):** 432 ±0.3 (17.0 ±0.013) |

**Note:** Print Speed is stated in impressions per minute (ipm) for 1–up landscape mode/2–up portrait mode.

| **Model HD1/HD2** (High Quality Duplex) | |
|---|---|
| **Modes** | Duplex<br>Dual Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | 506/718 ISO A4<br>494/762 Letter (8.5 x 11 in.) |
| **Basis Paper Weights**<br>(Tractored) | **Duplex:** 45–160 g/m$^2$ (12–42 lb)<br>**Dual Simplex:** 45–160 g/m $^2$(12–42 lb) |
| **Basis Paper Weights**<br>(Tractorless) | **Duplex:** 45–160 g/m$^2$ (12–42 lb) |
| **Forms Width**<br>(Tractored) | **Minimum mm (in.):** 210.8 (8.3)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Width**<br>(Tractorless) | **Minimum mm (in.):** 203.2 (8.0)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Length**<br>(Tractored) | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013) |
| | **Using internal stacker mm (in.):** 432 ±0.3 (17.0 ±0.013) |
| **Forms Length**<br>(Tractorless) | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013) |

| **Model HD3/HD4** (High Quality Duplex) | |
|---|---|
| **Modes** | Duplex<br>Dual Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | **High Speed:**<br>812/1148 ISO A4<br>790/1220 Letter (8.5 x 11 in.)<br>**Low Speed:**<br>660/944 ISO A4<br>648/1002 Letter (8.5 x 11 in.) |
| **Basis Paper Weights**<br>(Tractored) | **Duplex:** 60–105 g/m$^2$ (16–28 lb)<br>**Dual Simplex:** 60–105 g/m $^2$(16–28 lb) |
| **Basis Paper Weights**<br>(Tractorless) | **Duplex:** 60–105 g/m$^2$ (16–28 lb) |
| **Forms Width**<br>(Tractored) | **Minimum mm (in.):** 210.8 (8.3)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Width**<br>(Tractorless) | **Minimum mm (in.):** 203.2 (8.0)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Length**<br>(Tractored) | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013) |
| | **Using optional internal stacker mm (in.):** 356 ±0.3 (14.0 ±0.013) |
| **Forms Length**<br>(Tractorless) | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013) |

| Model PD1/PD2 (Premium Quality Duplex) | |
|---|---|
| **Modes** | Duplex<br>Dual Simplex |
| **Resolution (pel)** | 480/600 |
| **Print Speed (ipm)** | 506/718 ISO A4<br>494/762 Letter (8.5 x 11 in.) |
| **Basis Paper Weights**<br>(Tractored) | **Duplex:** 45–105 g/m$^2$ (12–28 lb)<br>**Dual Simplex:** 45–105 g/m$^2$ (12–28 lb) |
| **Basis Paper Weights**<br>(Tractorless) | **Duplex:** 45–105 g/m$^2$ (12–28 lb) |
| **Forms Width**<br>(Tractored) | **Minimum mm (in.):** 210.8 (8.3)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Width**<br>(Tractorless) | **Minimum mm (in.):** 203.2 (8.0)<br>**Maximum mm (in.):** 495.3(19.5) |
| **Forms Length**<br>(Tractored) | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013)<br><br>**Using internal stacker mm (in.):**432 ±0.3 (17.0 ±0.013) |
| **Forms Length**<br>(Tractorless) | **Minimum mm (in.):** 76.2 ±0.3 (3.0 ±0.013)<br>**Maximum mm (in.):** 1371.6 ±0.3 (54.0 ±0.013) |

**Note:** Print Speed is stated in impressions per minute (ipm) for 1–up landscape mode/2–up portrait mode.

# Simplex Printers

*Simplex* printing refers to printing on one side of a form. *Duplex* printing refers to printing on both sides of a form.

## Components

Simplex printing systems include the following:

- Printer engine
- Control Unit (AFCCU). This unit includes:
  - Operator Alert assembly
  - Power Control panel
  - An IBM® RS/6000 processor
  - Touchscreen
  - System interconnection electronics and cables
  - Preprocessing/postprocessing device interfaces

## Printing Methods

The continuous forms can be threaded various ways:

- From the forms input area of the printer to the output stacker of the printer
- From the forms input area of the printer to a postprocessing device
- From a preprocessing device through the printer to a postprocessing device.

Up to three preprocessing/postprocessing devices may be connected to the printer. For more information on preprocessing/postprocessing devices see "Preprocessing and Postprocessing Device Interfaces" on page 54.

The printer attaches to a host system through the control unit, which controls the printer.

See allowable configuration in "Configuration for a Simplex Printing System" on page 11.

## Configuration for a Simplex Printing System
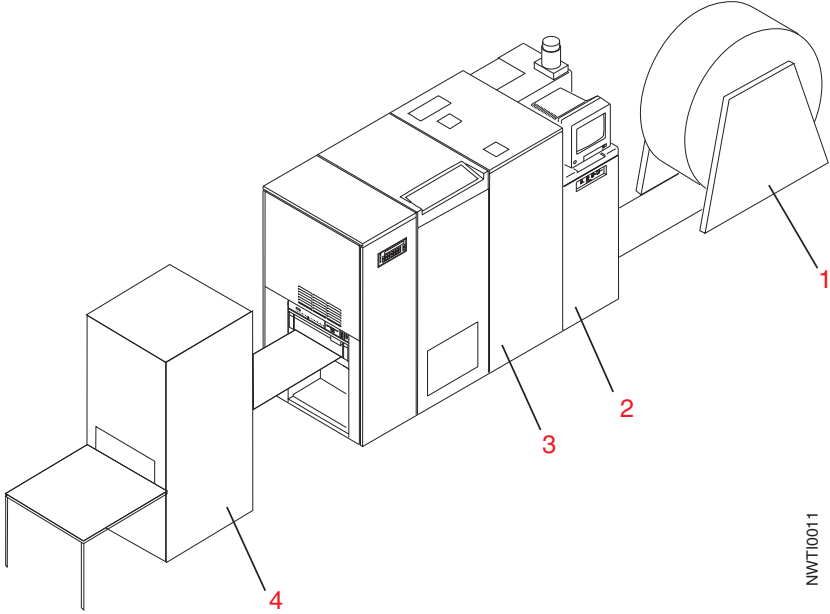


**(1)** Optional preprocessing device
**(2)** Control unit
**(3)** Infoprint 4000\Infoprint 4100 print engine
**(4)** Optional postprocessing device

# Duplex Systems

## Duplex System Printing Methods

*Duplex*: Prints on both sides of a form.

*Simplex*: Prints on one side of a form.

You can operate these printers as follows:

- **Duplex:** Uses both printers (Printer 1 prints on one side of the form and Printer 2 prints on the other side of the form)
- **Simplex:** Uses both printers as in duplex operation, but prints only with one printer; forms pass through the other printer
- **Dual Simplex:** Uses both printers separately in simplex mode; each printer is independent of the other and can print different jobs at the same time

### Duplex Printing

Duplex printing is achieved by arranging both printers in series, separated by a buffer/flipper unit, in a configuration that takes the continuous forms exiting from the first printer through a buffer/flipper unit that turns the forms over (inverts them) before threading them through the second printer. The first printer in the paper path prints one side of a form; the second printer in the paper path prints the other side of the form. See "Physical Dimensions" on page 129 for approximate dimensions of the printers, control units, and buffer/flipper units. See "Buffer/Flipper Unit" on page 14 for optional and required buffer/flipper units for each configuration.

Allowable printer system configurations for duplex printing are:

- Inline configuration (see "Inline Configuration for Any Machine Type or Model" on page 16)
- Left angle configuration (90° angle) (see "Left Angle Configuration for Any Machine Type or Model" on page 17)
- 'H' configuration (see "'H' Configuration for the Infoprint 4000" on page 18 and "'H' Configuration for the Infoprint 4100" on page 19)
- 'U' configuration (see "'U' Configuration for the Infoprint 4000 and Infoprint 4100" on page 20)

The forms path can be:

- From the forms input area of Printer 1 through to the output stacker of Printer 2
- From the forms input area of Printer 1 through to a postprocessing device at the output of Printer 2
- From a preprocessing device ahead of Printer 1 through to a postprocessing device at the output of Printer 2

When running duplex printing applications, both printers in the configuration are operating at the same impressions per minute (ipm) speed. The total speed or ipm of the subsystem is then twice the ipm of an individual printer, counting both the front and back sides of the forms.

For Infoprint 4000 printers, up to three preprocessing/postprocessing devices may be connected to Printer 1, while Printer 2 may have two devices connected. For Infoprint 4100 printers, up to four preprocessing/postprocessing devices may be connected to Printer 1, while Printer 2 may have four devices connected.

**Note:** The Forms Identification Barcode feature uses a pre/postprocessing connection slot.

Both printers in the configuration attach to a host system through the control unit, which controls both printers simultaneously and is physically attached to Printer 2 in the configuration.

## Simplex and Dual Simplex Printing

The configuration shown in "Left Angle Configuration for Dual Simplex Printing" on page 22 supports printing as follows:

- **Simplex:** Continuous forms are threaded completely through both printers and the buffer/flipper unit (with or without flipping) with single sided printing accomplished in either printer under host system control.

  Alternatively, forms can remain threaded continuously through both printers in a duplex physical configuration, but with printing occurring in simplex mode. Printing occurs on only one printer, while the other printer processes blank pages.

  The forms path can be:
  - From the forms input area of Printer 1 through to the output stacker of Printer 2
  - From the forms input area of Printer 1 to a postprocessing device at the output of Printer 2
  - From a preprocessing device ahead of Printer 1 through to postprocessing device at the output of Printer 2.

- **Dual Simplex:** Both printers in the configuration can run independent simplex applications.

  The forms path in each printer can be:
  - From the forms input area of the printer to the output stacker of the printer or to a postprocessing device at the output of the printer
  - From a preprocessing device ahead of the printer to a postprocessing device at the output of the printer.

  Each printer can have its own set of preprocessing and postprocessing devices.

  Both printers in the configuration attach to a host system through the control unit attached to Printer 2. Each printer is controlled independently.

  When the printing system is configured as dual simplex and one of the printers is inoperable, the remaining printer can run independently so long as power and connection to the control unit are maintained.

# Components

The major components of the Infoprint 4000 and Infoprint 4100 Advanced Function Duplex Printing System are a pair of printers, hereafter referred to as a Duplex Printing System.

A Duplex Printing System can be used for simplex and duplex printing applications.

In this publication the first printer is called *Printer 1*, and the second printer is called *Printer 2*.

## Printer 1

This model includes:

- Printer engine
- Control Unit. This unit includes:
  - Operator Alert assembly
  - Power Control panel
  - System interconnection electronics
  - Preprocessing/postprocessing device interfaces

## Printer 2

This model includes:

- Printer engine
- Control Unit – Advanced Function Common Control Unit (AFCCU). This unit includes:
  - Operator Alert assembly
  - Power Control panel

- An IBM RS/6000 processor
- Touchscreen
- System interconnection electronics and cables
- Preprocessing/postprocessing device interfaces

## Complete duplex printing system

Duplex models include a buffer/flipper unit and an urge unit.

### Buffer/Flipper Unit:

The buffer/flipper unit guides the paper path from the first printer to the second printer in a dual-printer configuration. The unit allows the forms to take the following paths from the first printer to the second printer:

- Straight through path (inline) with 180° inversion (see Figure 1 on page 16)
- Left 90° path with 180° inversion (see Figure 2 on page 17)
- 'H' configuration (see Figure 3 on page 18 and Figure 4 on page 19).

The unit turns the forms over (flips) so the other side of the forms can be printed by the second printer. Because of the high speed with which forms travel through Printer 1, a "tall" buffer/flipper unit is used to aid in cooling the paper before it enters Printer 2 in either the straight or left/right path configuration. For the "H" configuration, a "tall" buffer/flipper unit can be ordered in place of the shorter unit.

Table 3 shows the buffer/flipper units that are provided for supported configurations in a duplex system. You may choose to substitute a different buffer/flipper unit, depending on the weight of the forms you use and the typical coverage on your print jobs. For example, a tall buffer/flipper unit might be required if you typically run heavy forms with high coverage. The longer paper path through the tall buffer/flipper allows more time for cooling between Printer 1 and Printer 2.

*Table 3. Optional and required buffer/flipper units for duplex systems*

| Duplex Configuration | Machine Type and Model | Buffer/Flipper Unit |
|---|---|---|
| Inline configuration | All Infoprint 4000 models, except ID5/6 | Any buffer/flipper unit |
| | Infoprint 4000 Model ID5/6 | Tall Buffer Flipper (Feature Code 4403) |
| | Infoprint 4100 Models PD1/2 and HD1/2 | Any buffer/flipper unit |
| | Infoprint 4100 Models HD3/4 | Hunkeler Buffer/Flipper Unit WT4 (Feature Code 4408) |
| Left angle configuration | All Infoprint 4000 models | Tall Buffer/Flipper (Feature Code 4403) |
| | All Infoprint 4100 models | Tall Buffer/Flipper (Feature Code 4407) |
| H configuration | All Infoprint 4000 models | Short Buffer/Flipper (Feature Code 4402) Tall Buffer/Flipper (Feature Code 4403) can be substituted |
| | All Infoprint 4100 models | Short Buffer/Flipper (Feature Code 4401) Tall Buffer/Flipper (Feature Code 4407) can be substituted |
| U configuration | All Infoprint 4000 models | Any buffer/flipper unit |
| | All Infoprint 4100 models | Hunkeler Buffer/Flipper Unit WT4 (Feature Code 4408) |

### Urge Unit:

The urge unit assists in feeding forms from the buffer/flipper unit under the printer into the tractor-feed area of the printer. This power-driven roller assembly is on the floor in the forms input area of Printer 2. The continuous forms are threaded through the unit.

**Note:** If an urge unit is supplied with any preprocessing equipment, the vendor supplied urge unit is installed on Printer 1.

**Note – 'H' Configuration:** The IBM two-roll urge unit flipper must be ordered with the printers if you are anticipating using the 'H' floor layout on Models ID3/ID4 or ID5/ID6. A web drive source (or urge unit) may be required between printer Models HD3/HD4 depending on the distance between printers.

## Preprocessing/Postprocessing Interfaces

Preprocessing/post processing device interfaces allow additional input and output capabilities beyond the standard forms input source and output stacker in the system printers.

Two preprocessing/postprocessing device interfaces (one in each printer) are provided. Additional interfaces can be purchased.

# Inline Configuration for Any Machine Type or Model
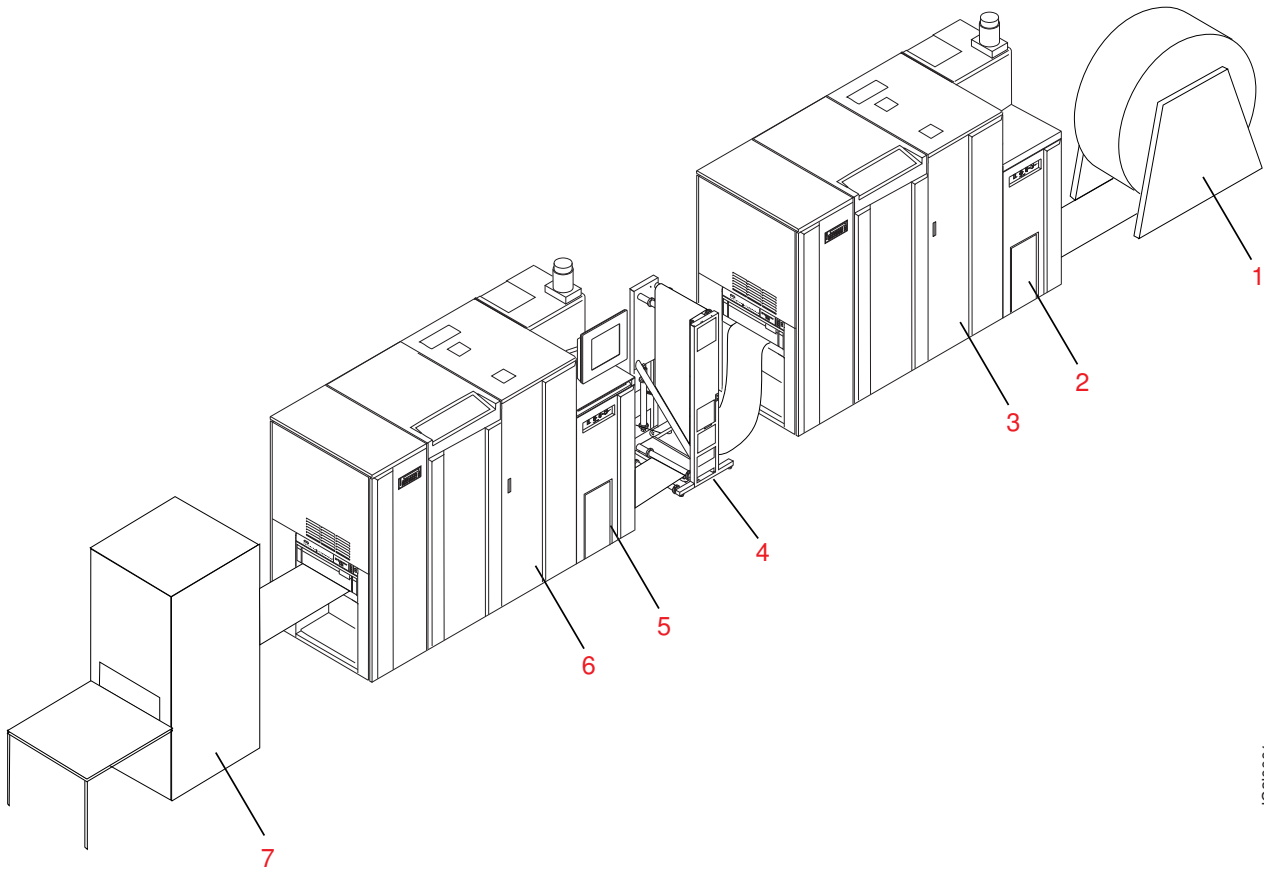


*Figure 1. Duplex inline configuration*

| **(1)** | Optional preprocessing device attached to Printer 1 |
| **(2)** | Control Unit attached to Printer 1 |
| **(3)** | Printer 1 print engine |
| **(4)** | Buffer/flipper unit |
| **(5)** | Control Unit attached to Printer 2 |
| **(6)** | Printer 2 print engine |
| **(7)** | Optional postprocessing device attached to Printer 2 |

See "Space Requirements" on page 113 for floor layouts that specify printer dimensions, service clearance, power cable, and cable locations.

---

**Important**

- Item **(4)**, the buffer/flipper unit is provided with all machine types and models for use in the duplex inline configuration. See "Buffer/Flipper Unit" on page 14 for more information about optional and required buffer/flipper units for this configuration.

---

# Left Angle Configuration for Any Machine Type or Model
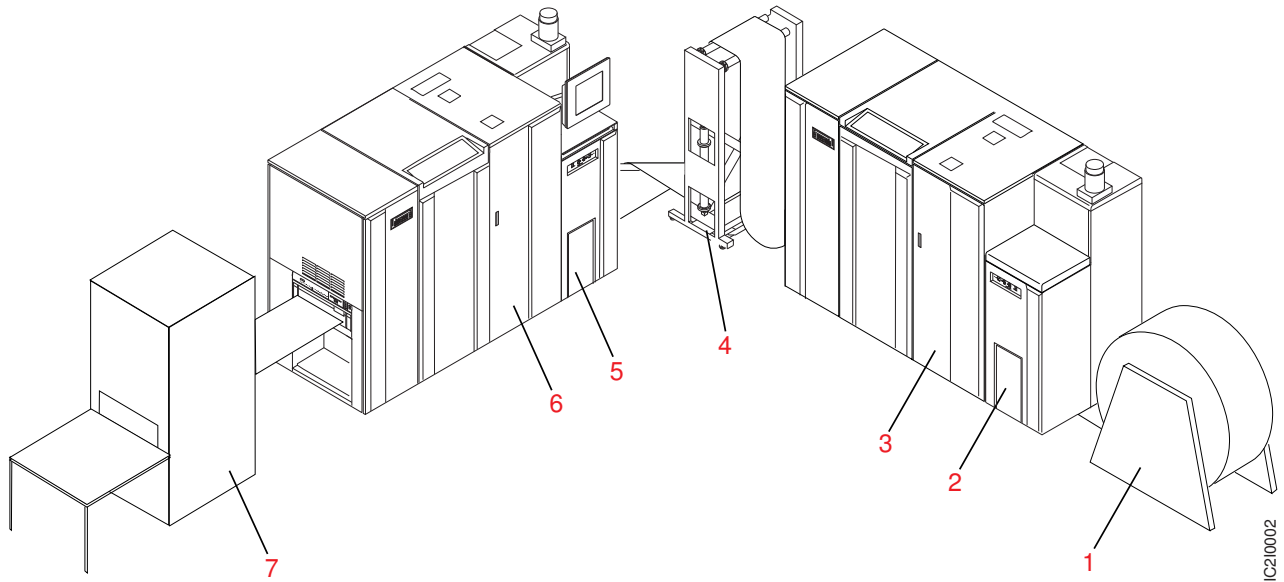


*Figure 2. Duplex left angle configuration*

**(1)**   Optional preprocessing device attached to Printer 1
**(2)**   Control Unit attached to Printer 1
**(3)**   Printer 1 print engine
**(4)**   Tall Buffer/Flipper Unit
**(5)**   Control Unit attached to Printer 2
**(6)**   Printer 2 print engine
**(7)**   Optional postprocessing device attached to Printer 2

See "Space Requirements" on page 113 for floor layouts that specify printer dimensions, service clearance, power cable, and cable locations.

---

**Important**

- Item **(4)**, the Tall Buffer/Flipper Unit, is provided with all machine types and models for use in the duplex left angle configuration. See "Buffer/Flipper Unit" on page 14 for more information about optional and required buffer/flipper units for this configuration.

---

# 'H' Configuration for the Infoprint 4000
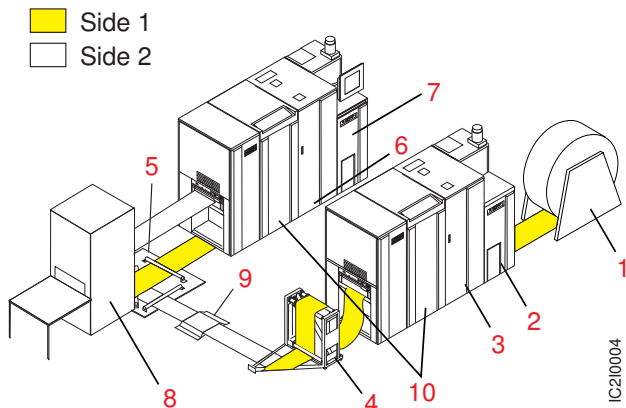


*Figure 3. 'H' Configuration for the Infoprint 4000*

| **(1)** | Optional preprocessing device attached to Printer 1 |
| **(2)** | Control Unit attached to Printer 1 |
| **(3)** | Printer 1 print engine |
| **(4)** | Short Buffer/Flipper Unit |
| **(5)** | Turnbar/flipper (or powered turnbar/flipper) |
| **(6)** | Printer 2 print engine |
| **(7)** | Control Unit attached to Printer 2 |
| **(8)** | Optional postprocessing device attached to Printer 2 |
| **(9)** | Optional walkover |
| **(10)** | Urge unit |

See "Space Requirements" on page 113 for floor layouts that specify printer dimensions, service clearance, power cable, and cable locations.

---

**Important**

- The Tall Buffer/Flipper Unit (not shown), which is provided with some models, allows the forms to cool before they enter Printer 2. With the 'H' configuration, you can substitute the Tall Buffer/Flipper Unit for the short unit. See "Buffer/Flipper Unit" on page 14 for more information about optional and required buffer/flipper units for this configuration.

- Item **(5)**, the customer-provided turnbar, is not available from IBM. It must be ordered, delivered, and ready to use <u>before</u> installation time.

- Item **(9)**, the optional walkover, is not available from IBM. It must be ordered through a pre/post vendor.

- An 'H' configuration that is using an IBM urge unit in Printer 2 requires the IBM 'H' configuration Urge Unit Flipper (RPQ 8B4056), which must be ordered from IBM.

---

# 'H' Configuration for the Infoprint 4100



Side 1
Side 2
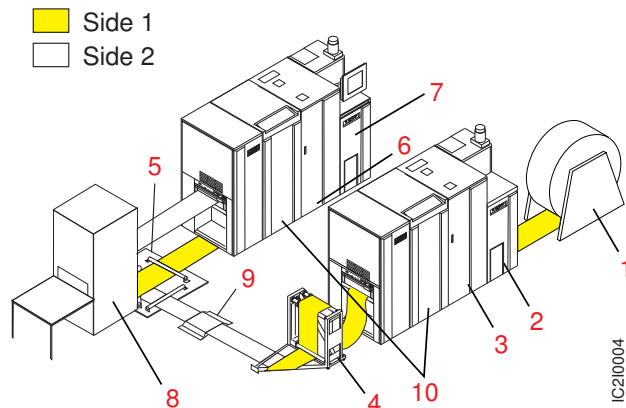
*Figure 4. 'H' Configuration for the Infoprint 4100*

**(1)**     Optional preprocessing device attached to Printer 1
**(2)**     Control Unit attached to Printer 1
**(3)**     Printer 1 print engine
**(4)**     Short Buffer/Flipper Unit
**(5)**     Air bearing turnbar (air bearing is required for high-speed models only)
**(6)**     Printer 2 print engine
**(7)**     Control Unit attached to Printer 2
**(8)**     Optional postprocessing device attached to Printer 2
**(9)**     Optional walkover

See "Space Requirements" on page 113 for floor layouts that specify printer dimensions, service clearance, power cable, and cable locations.

---

**Important**

- The Tall Buffer/Flipper Unit (not shown). which is provided with some models, allows the forms to cool before they enter Printer 2. With the 'H' configuration, you can substitute the Tall Buffer/Flipper Unit for the short unit. See "Buffer/Flipper Unit" on page 14 for more information about optional and required buffer/flipper units for this configuration.
- Item **(5)**, the customer-provided air bearing turnbar and compressed air, is not available from IBM. It must be ordered, delivered, and ready to use before installation time. 100 psi (pounds per square inch) or 7.03 kgf/cm2 (kilogram force per square centimeter) compressed air must be supplied.
- Item **(9)**, the optional walkover, is not available from IBM. It must be ordered through a pre/post vendor.
- For Infoprint Models HD3/4, an additional in-line urge unit may be required between the air bearing turnbars at position 9 in the illustration, depending on web length and layout between engines.
- When running extra heavy paper (greater than 42 pounds), the air bearing turnbar and additional in-line urge unit are required and the Commercial Print Enhancement Feature (Feature Code 4940) must be installed.

# 'U' Configuration for the Infoprint 4000 and Infoprint 4100
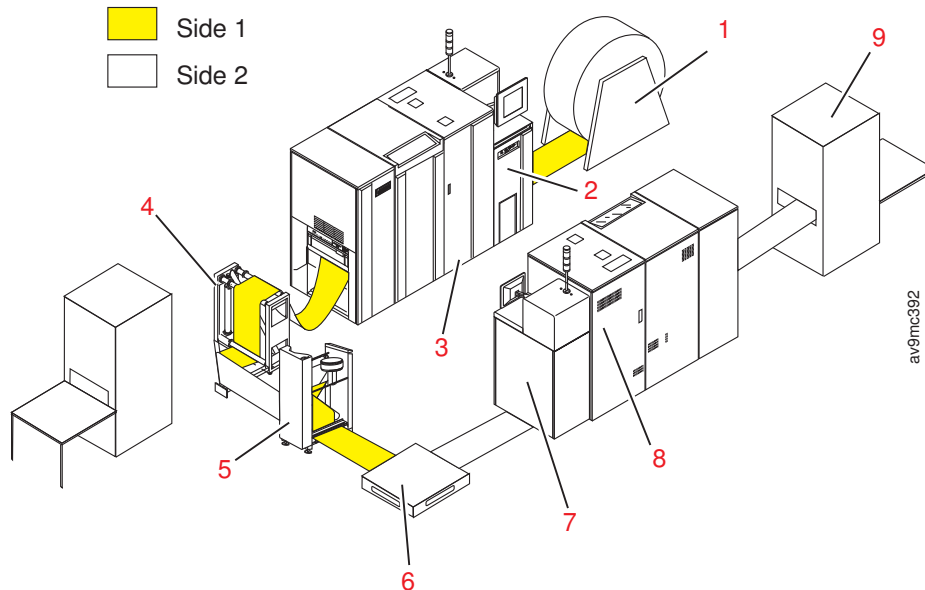


*Figure 5. 'U' Configuration for the Infoprint 4000 and Infoprint 4100*

**(1)**     Optional preprocessing device attached to Printer 1
**(2)**     Control Unit attached to Printer 1
**(3)**     Printer 1 print engine
**(4)**     Short Buffer/Flipper Unit
**(5)**     Buffer/flipper unit

   **Note:**  For Infoprint 4100 models, the Hunkeler Buffer/Flipper Unit WT4 is required. For Infoprint
            4000 models, any buffer/flipper unit may be used.
**(6)**     Air bearing turnbar with 90° turn (air bearing is required for high-speed models only)
**(7)**     Control Unit attached to Printer 2
**(8)**     Printer 2 print engine
**(9)**     Optional postprocessing device attached to Printer 2

See "Space Requirements" on page 113 for floor layouts that specify printer dimensions, service
clearance, power cable, and cable locations. .

> **Important**
>
> - The Tall Buffer/Flipper Unit (not shown), which is provided with some models, allows the forms to cool before they enter Printer 2. With the 'U' configuration, you can substitute the Tall Buffer/Flipper Unit for the short unit. See "Buffer/Flipper Unit" on page 14 for more information about optional and required buffer/flipper units for this configuration.
>
> - Item **(5)**, the Hunkeler Buffer/Flipper Unit WT4, is available from IBM. It must be ordered, delivered, and ready to use <u>before</u> installation time.
>
> - Longer cables may be required for printers that are widely spaced, especially when printers are installed on a solid floor. The following cables replace the 10 meter cables that are provided to connect Printer 1 and Printer 2:
>
>   – For Infoprint Models HD3/4, order RPQ 8B5018. This RPQ includes a 22-meter (82 feet) SC-LC Fiber Channel cable to connect between Printer 1 and Printer 2. It also includes a 25-meter (82 feet) EPO cable.
>
>   – For Infoprint 4000 and 4100 duplex systems that use the SAA interface between engines, order RPQ 8B4283. This RPQ includes a 25-meter (82 feet) SSA and remote power cables.
>
> - When running extra heavy paper (greater than 42 pounds), the air bearing turnbar and additional in-line urge unit are required and the Commercial Print Enhancement Feature (Feature Code 4940) must be installed.

# Left Angle Configuration for Dual Simplex Printing
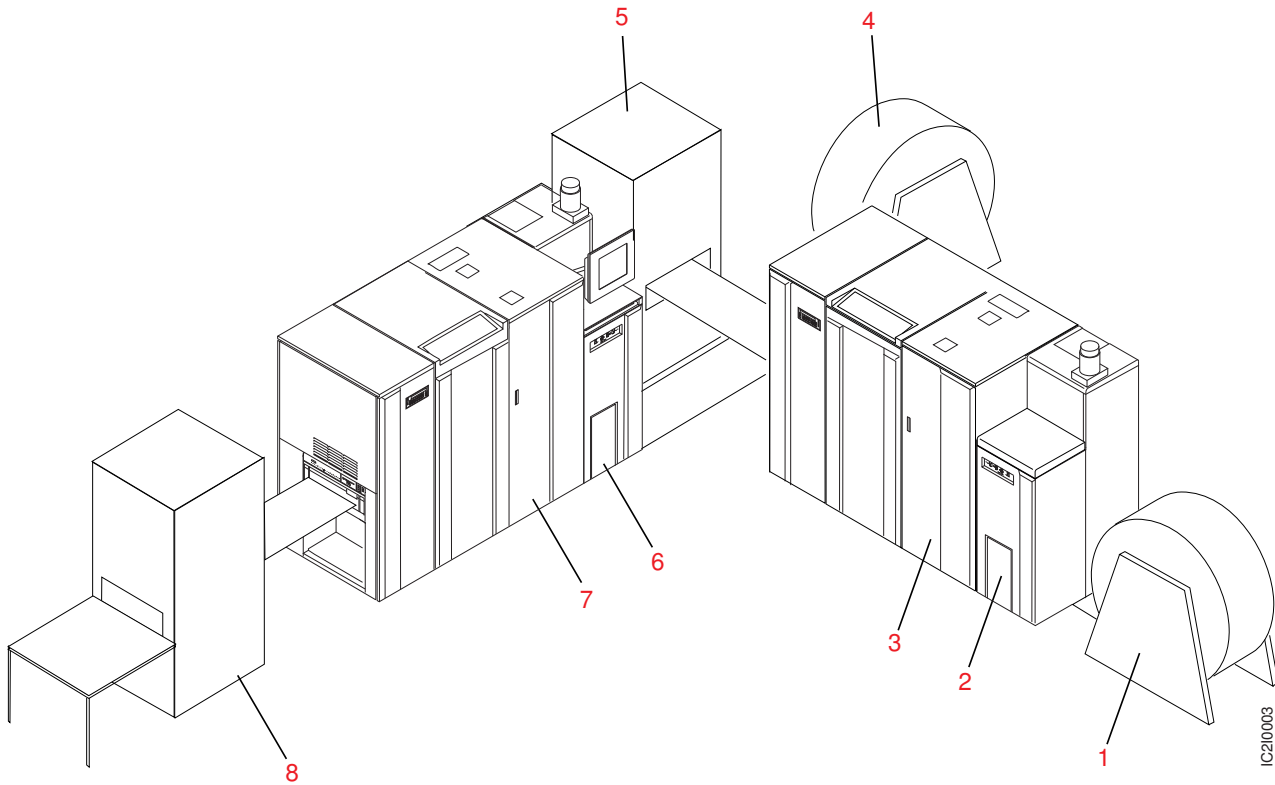


**(1)**   Optional preprocessing device attached to Printer 1
**(2)**   Control Unit attached to Printer 1
**(3)**   Printer 1 print engine
**(4)**   Optional preprocessing device attached to Printer 2
**(5)**   Optional postprocessing device for Printer 1
**(6)**   Control Unit attached to Printer 2
**(7)**   Printer 2 print engine
**(8)**   Optional postprocessing device attached to Printer 2

See "Space Requirements" on page 113 for floor layouts that specify printer dimensions, service clearance, power cable, and cable locations.

# Basic Page-Printing Concepts

The printer expands your printing ability to include new functions, such as in-house publishing, image printing, and electronic forms creation. These special uses are made possible by the IBM Advanced Function Presentation (AFP) licensed programs[1]. The AFP™ programs let you put text, image, graphics, and bar codes at any defined point on a page. This ability is called *all-points addressability*.

Some printers print a single line as a unit. This process is known as *line printing*. The printer and AFP create and print an entire page as a unit. This approach, known as *page printing*, increases your flexibility in designing pages.

# Combining Text with Images

Many companies use system printers to generate memos, reports, invoices, and listings. This output often consists of text combined with simple charts or diagrams that include limited graphics.

In systems with Advanced Function Presentation programs installed, IBM advanced function printers can print illustrations in your documents. For example, the program can combine business graphs and drawings with text for use in manuals and reports.

Figure 6 shows how images can include line drawings, graphics, designs, special symbols, and company logos. You can print them alone or with text, and you can print more than one image on a single page.
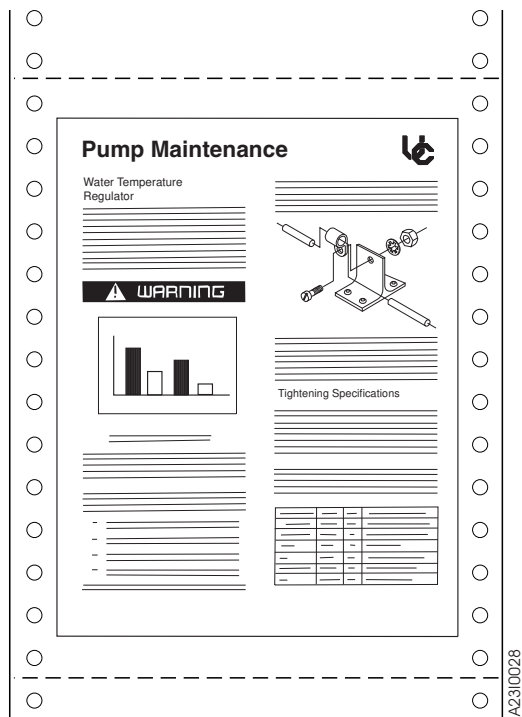


*Figure 6. Combined images and text*

---

1. A licensed program is any separately-priced program that has an IBM copyright and is offered to customers under the terms and conditions of the Agreement for IBM Licensed Programs.

# Orienting Text and Images on a Page

With an advanced function printer, you can print text and images in any of four orientations on a page, as shown in Figure 7.
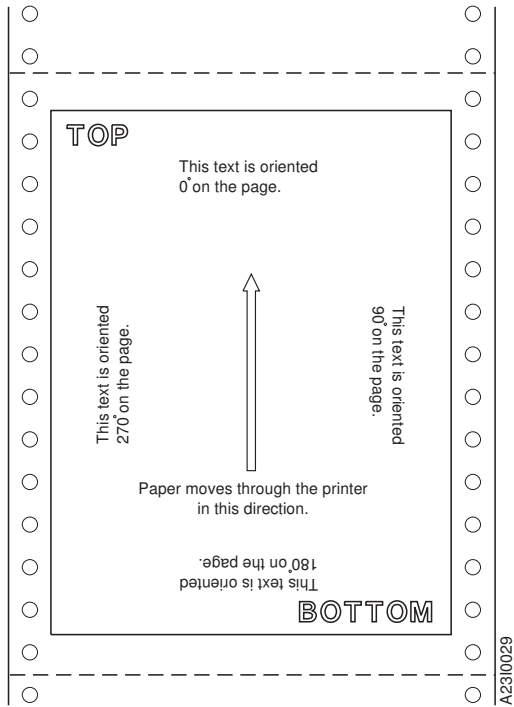


*Figure 7. Available orientations*

## Portrait Orientation

Text and images printed parallel to the shorter side of the forms are in a *portrait* orientation.
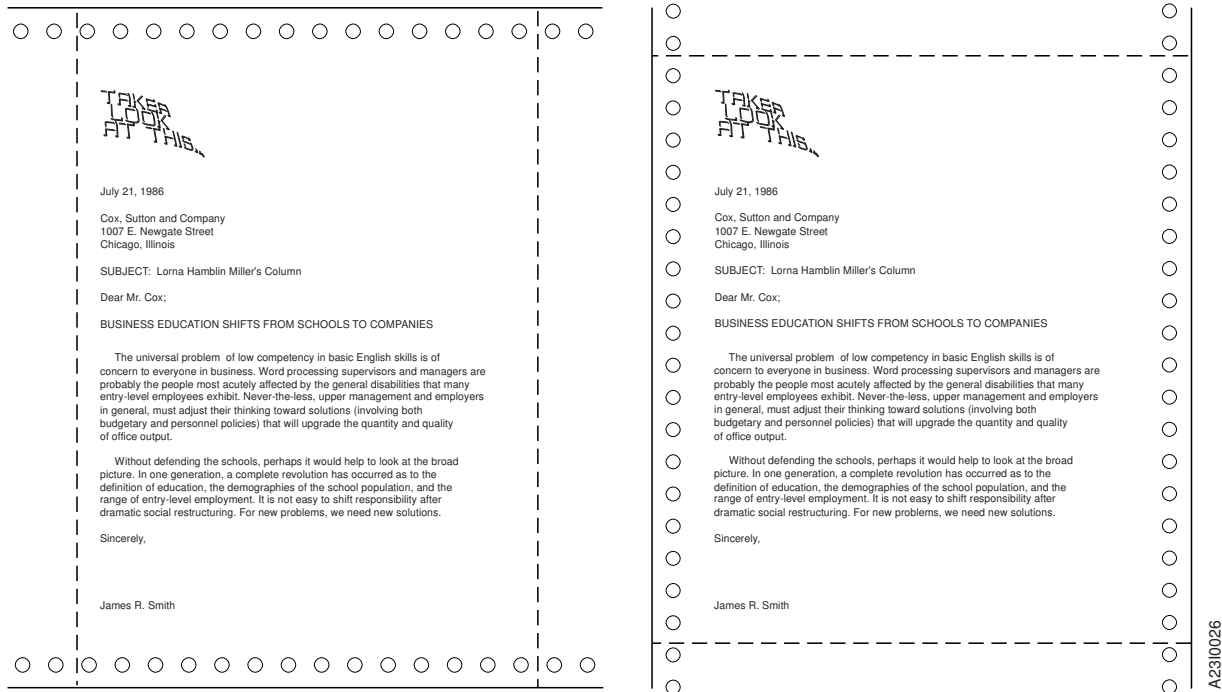


*Figure 8. Portrait orientations*

## Landscape Orientation

Text and images printed parallel to the longer side of the forms are in a *landscape* orientation.



*Figure 9. Landscape orientations*

## Normal and Tumble Duplex

By using a combination of printing directions and orientations, you can put a document together in four different ways. Figure 10 shows documents printed with normal duplex. Notice that the pages are printed in the portrait orientation for Document A and in the landscape orientation for Document B.

Beginning of page 101

Top

Top

Bottom

End of page 100

Bottom

Document A

Normal Duplex Sheet

Beginning of page 101

Top

Top

Bottom

End of page 100

Bottom

Document B

Normal Duplex Sheet

A26C0068
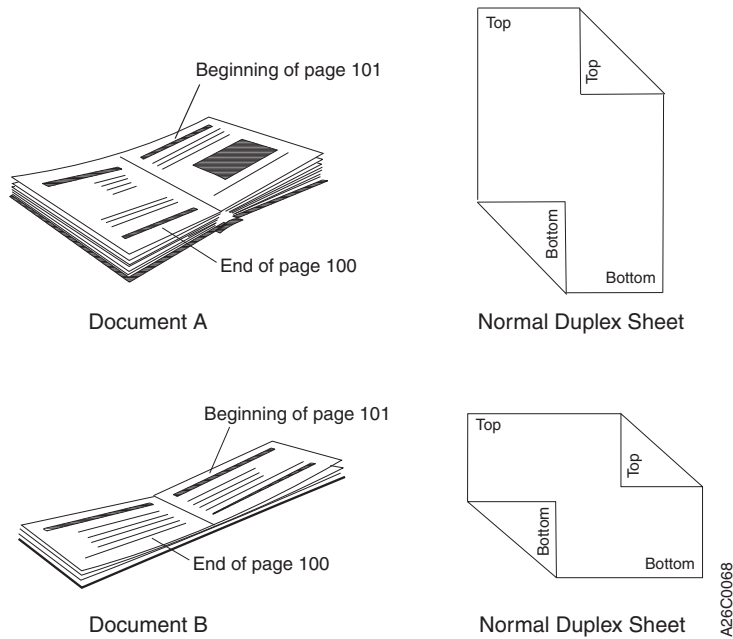
*Figure 10. Normal duplex*

Figure 11 shows documents printed with tumble duplex. Notice that the pages are printed in the portrait orientation for Document C and in the landscape orientation for Document D.

End of page 100

Top

Bottom

Beginning of page 101

Top

Bottom

Document C

Tumble Duplex Sheet

End of page 100

Top

Bottom

Beginning of page 101

Top

Bottom

Document D

Tumble Duplex Sheet

A26C0069
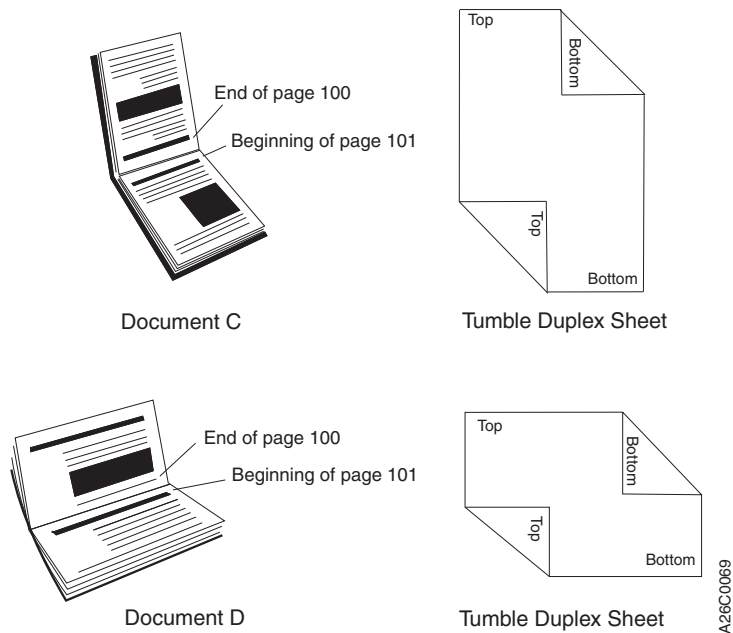
*Figure 11. Tumble duplex*

## Advanced Function Image and Graphics

The Advanced Function Image and Graphics facility within the AFCCU allows the printer to directly process IOCA (Image Object Content Architecture) images, and GOCA (Graphics Object Content Architecture) data, as described in the *IBM Intelligent Printer Data Stream™ Reference*, S544-3417.

Improved processing occurs with the use of compressed images or vector graphics data in the GOCA format by reducing demand on attachment data transfer and host storage.

When the printer decompresses images or rasterizes vectors instead of the host system, host system processing cycles are reduced. These data stream functions also allow the printer to perform scaling operations or resolution correction of scanned images.

# Multiple-up Printing

### Basic N-up Page Positioning

With N-Up Page Positioning, you can print up to four pages in partitions on one side of a form, which enables you to print much more data on a form, saving printer-usage costs, paper, and storage space. See Table 6 on page 48 for a listing of Print Services Facility (PSF) software that supports N-Up printing. Figure 12 is an example of 2-up printing.
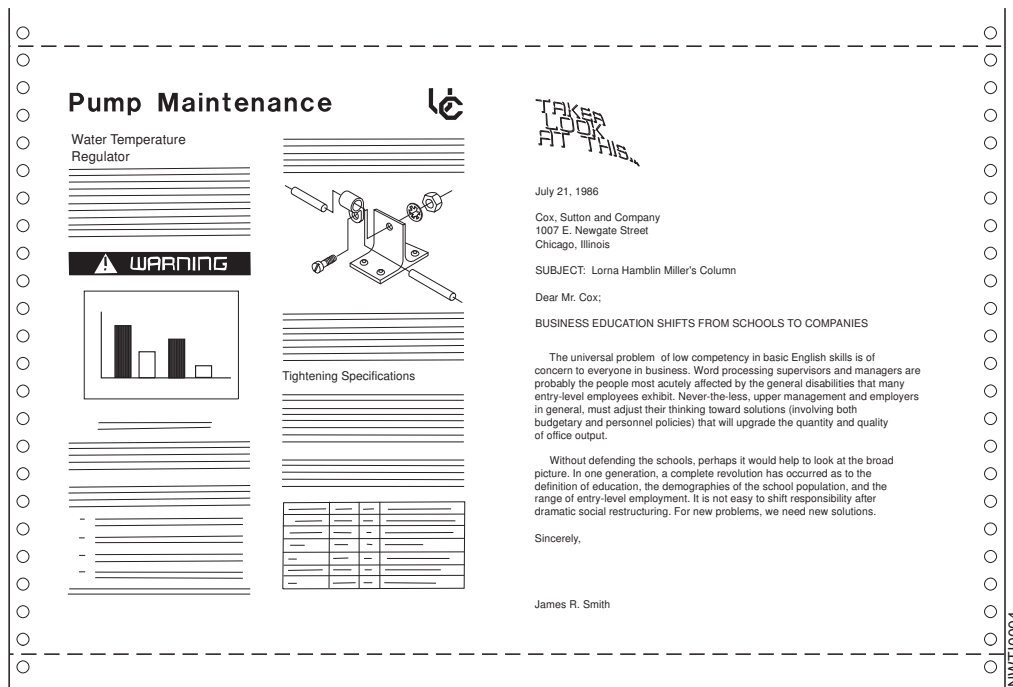


*Figure 12. 2-up printing*

## Enhanced N-up Page Positioning

With Enhanced N-Up Page Positioning, you can place up to four pages at any location on a form—both sides of the form for duplex systems— in any orientation, and of any size. Refer to the appropriate PSF publication for your system for more information. See Table 6 on page 48 for a listing of PSF software that supports Enhanced N-Up printing.

## Cut Sheet Emulation

Cut Sheet Emulation (CSE) is an option that automatically invokes an Enhanced N-Up arrangement to emulate 2 side-by-side sheets of cut paper. Duplex jobs print page 2 on the back of page 1 and page 4 on the back of page 3. CSE provides for different page arrangements to accommodate different postprocessing requirements. Pages can be placed sequentially from left to right or right to left and right side up or upside down.

A default value for CSE is set in the printer definition. Different CSE values can be set when form values are established. The default setting is used for all forms that do not have a different value defined.

CSE requires support in Print Services Facility™ (PSF). The console option for CSE has no effect unless the printer has a PSF that supports CSE. See Table 6 on page 48 for a listing of PSF software that supports CSE printing. For more information on PSF, refer to the appropriate PSF publication.

When the CSE option is enabled, all jobs sent to the printer print 2-up, side by side except when:
- N-Up Page Positioning is specified in the form definition. In this case, the N-Up specification is used and CSE is ignored.
- The PSF print driver enables page-size verification and disables CSE for pages that do not fit 2-Up.

## Options for Multiple-up Printing

With Page Positioning and Cut Sheet Emulation (CSE) to choose from, you now have several options for formatting multiple-up application pages on a single printer sheet:
- Multiple-Up defined in the page definition resource
- N-Up defined in the form definition resource
- Cut Sheet Emulation selected at the touchscreen.

Applications printing simple line data that use the same formatting for each page can easily be handled with traditional multiple-up. They can be handled as well by N-Up Page Positioning and Cut Sheet Emulation if they do not require more than 4 pages for N-Up or more than 2 for CSE on printers that support N-Up and CSE.

CSE can be used whenever the desired output is 2 pages of equal size side by side on the same sheet. CSE is especially useful for moving applications from 8.5 x 11 in. forms to 2-up printing on 11 x 17 in. forms. No change is required to the AFP form definition resource to enable CSE 2-Up printing. The same form definition can be used for printing 1-up on 8.5 x 11 in. forms or 2-up on 11 x 17 in. forms.

N-Up Page Positioning is needed for applications that required pages of different sizes or page positioning other than 2-up side by side. Instructions must be placed in the form definition for N-Up printing.

# Using Stored Information

Several types of stored information are used when printing data on an Advanced Function Printers. For example, your company logo often appears in your printed output. You can code this logo one time, and then store it in a library where it is available to any authorized person.

IBM Advanced Function Printers use information from resource libraries. A *resource* is a collection of stored data that can be used in a printing job. Some resource libraries contain control information that converts data from line printing to page printing. Examples of this type of library include:

- Form definition libraries, that contain the specifications to describe how pages of data are placed on the physical media
- Page definition libraries, that contain the specifications to describe how line data is placed into pages.

Other resource libraries contain information that the program uses to compose pages. Examples of this type of library include:

- Font libraries, which contain characters to be printed.
- Page segment libraries, which contain images and graphics.
- Overlay libraries, which contain collections of unchanging data that can contain images, text, or combinations of both.

  Instead of using preprinted forms, you can use electronic overlays to put boxes, lines, shading, text, and logos on a page. Using electronic overlays can result in significant savings in forms cost and storage space, as well as operator time required to load and unload preprinted forms. Also, you can change electronic overlays more quickly and without paying the scrap charges you have when you change preprinted forms.

Although IBM provides some of these resources for common uses, Advanced Function Presentation licensed programs enable your company to customize its own resources. See "IBM Advanced Function Presentation Software" on page 98 for more information about these programs.

## TrueType/OpenType Fonts and Unicode print data

The TrueType font technology, developed by Apple and Microsoft™, is the most prevalent font technology in the industry today. It is an open font standard that is widely published. The OpenType font format is an extension of the TrueType format that allows better support for international character sets, and broader multi-platform support. OpenType includes information needed to fully support Unicode data for multilingual print and presentation using a single font. It also provides the flexibility of allowing either TrueType outlines or the other standard font technology, Adobe Type 1, to be packaged as an OpenType font.

These new offerings provide significant benefits:

- You will have more choices in selecting typefaces, especially for non-Latin languages
- They provide a truly multilingual environment through support of Unicode, enabling the globalization of applications
- You can print from Windows™ applications with the same fonts that appear on the screen

These offerings are supported on all Infoprint 4100 models and all Infoprint 4100 models with the Enhanced Operator Console.

## Enhanced Toner Loading

Enhanced toner loading is standard on all printers.

This facility allows the operator to add toner to the printer while it is operating. The operator is prompted by an operator console message that the toner supply is low.

# IBM Infoprint 4161 Model 005 Multiple Printer Controller

The Infoprint 4161 Model 005 Multiple Printer Controller runs Infoprint Manager for AIX V4.1 and AIX V5.1 software. This combination of hardware and software allows the IBM Infoprint 4161 to control several production printers from one common print server, resulting in increased productivity, lower costs, workload balancing, and a common point of control.

The base model of the Infoprint 4161 Model 005 includes the following features designed for high performance:

- 2-Way 600 Mhz IBM Power IV RISC processor
- 1 GB of SDRAM
- Seven 18.2 GB hard drives (127.4 GB total hard disk storage)
- A variety of available attachment features
- Console, keyboard, and a mouse

The IBM 4161 Multiple Printer Controller runs under AIX and requires:

- IBM Infoprint Manager for AIX V4.1
- AIX V5.1
- Appropriate LAN and printers

Installation and service are provided by IBM service representatives.

# IBM Infoprint 4161 Model 006 Multiple Printer Controller

The Infoprint 4161 Model 006 Multiple Printer Controller runs Infoprint Manager for AIX V4.1 PU2 and AIX V5.2 software. This combination of hardware and software allows the IBM Infoprint 4161 to control several production printers from one common print server, resulting in increased productivity, lower costs, workload balancing, and a common point of control.

The base model of the Infoprint 4161 Model 006 includes the following features designed for high performance:

- 2-Way 1.2 Ghz IBM Power4+ RISC processor
- 2 GB of DDR SDRAM
- Three 36.4 GB hard drives (109.2 GB total hard disk storage)
- A variety of available attachment features
- Console, keyboard, and a mouse

The IBM 4161 Multiple Printer Controller runs under AIX and requires:

- IBM Infoprint Manager for AIX V4.1 PU2
- AIX V5.2
- Appropriate LAN and printers

Installation and service are provided by IBM service representatives.

# Optional Features

This section lists optional features you can purchase for your printing system. Talk with your marketing representative to decide which features will enhance your system. Many of the following features have already been incorporated into the Infoprint 4100 models and the Infoprint 4000 Model ID5/6.

The following table summarizes which models can be used with which feature.

*Table 4. Optional Features*

| | Infoprint 4100 | | | | | | Infoprint 4000 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HS1 | HS2 | PS1 | HD1/ HD2 | HD3/ HD4 | PD1/ PD2 | IS1 | IS2 | ID1/ ID2 | ID3/ ID4 | ID5/ ID6 | IR1/ IR2 | IR3/ IR4 |
| Attachments | See Chapter 4, "Preparing the Processing Environment," on page 83 | | | | | | | | | | | | |
| Function/ Performance Enhancement | | x | | x | x | x | x | x | x | x | | | x |
| Enhanced Operator Console | s | s | s | s | s | s | x | x | x | x | s | x | x |
| Infoprint Operator Control Feature | s | s | s | s | s | s | s | s | s | s | s | s | s |
| Buffer/Flipper Units | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Signature Page | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Forms Identification (Barcode) | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Pre/Post-processing Interface | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Advanced Function Postprocessing Interface | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Additional Customer Changeable Developers | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Developer Cart | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Mark Perforations on Perfless Paper | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Move Mark Forms | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Infoprint Fidelity Manager (Inline Densitometer) | | | | | | | x | x | x | x | x | x | x |
| Infoprint Low Resolution Books | | | | | | | | | x | x | | | |

*Table 4. Optional Features  (continued)*

| | Infoprint 4100 | | | | | | Infoprint 4000 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HS1 | HS2 | PS1 | HD1/ HD2 | HD3/ HD4 | PD1/ PD2 | IS1 | IS2 | ID1/ ID2 | ID3/ ID4 | ID5/ ID6 | IR1/ IR2 | IR3/ IR4 |
| **Infoprint Forms Management System** | X | X | X | X | X | X | X | X | X | X | X | X | X |
| **Enhanced Printing Adaptor Kit** | S | S | S | S | S | S | X | X | X | X | X | X | X |
| **Magnetic Ink Character Recognition (MICR) CCD** | X | X | | X | X | | X | X | X | X | X | | X |
| **Infoprint Productivity Suite and Productivity Tracking Feature** | X | X | X | X | X | X | X | X | X | X | X | | |
| **CCD with Blue, Green, and Red Toners** | X | | | X | | | X | X | X | X | X | | |
| **Internal Stacker** | S | X | S | S | X | S | S | S | S | S | S | S | S |
| **Commercial Print Feature** | X | X | | X | X | | | | | | | | |
| S = Standard X = optional feature | | | | | | | | | | | | | |

## Attachments

- System/370 Channel Attachment
- ESCON Attachment
- FICON Long Wave Attachment (Infoprint 4100 only)
- FICON Short Wave Attachment (Infoprint 4100 only)
- Token Ring (TCP/IP) Attachment
- Ethernet (TCP/IP) Attachment
- FDDI (TCP/IP) Attachment (AFCCU microcode levels 11.x and earlier only)
- Gigabit Ethernet SX (TCP/IP) Attachment
- Gigabit Ethernet TX (TCP/IP) Attachment

Refer to Chapter 4, "Preparing the Processing Environment," on page 83 for detailed information about attachments.

## Function/Performance Enhancements for AFCCU with Microcode Version 11.x and Earlier

Three new Function/Performance Enhancement features replace the printer control unit with the latest RISC technology.

The first, available on the Infoprint 4000 Models ID2, ID4, IS1, and IS2, includes a 1-way processor with 256 MB of memory. The second, available on the Infoprint 4000 Printer Model IR4, includes a 4-way

processor with 2 GB of memory. These new features improve performance and reduce the likelihood of backhitching. They also provide more support for new functions, such as the Enhanced Operator Console and Customer Changeable Developer optional features on the Infoprint 4000. These new features supersede the previous Function Enhancement-PCI feature.

The third is an optional feature for Infoprint 4100 Models HS2, HD2, HD4, and PD2 that provides a faster processor and increased memory to improve performance when printing in POD mode with an Infoprint Manager host.

# Function/Performance Enhancements for AFCCU with Microcode Version 12.0 and Later

The following new processor upgrades are available with AFCCU microcode Version 12.0 on the RS/6000. For Infoprint 4000 printers, the RS/6000 processor is a pSeries 615 Model 6E3. For Infoprint 4100 printers, the RS/6000 processor is a pSeries 630 Model 6C4.

- The upgrade available on the Infoprint 4000 Models IS1, IS2, ID2, ID4, and ID6, includes a 1-way 1.2 GHz processor with 1 GB of memory on the p615 processor.
- The upgrade available on the Infoprint 4100 Models HS1, HS2 and PS1, includes a 1-way 1.2 GHz processor with 1 GB of memory on the p630 processor.
- The upgrade available on the Infoprint 4100 Models HD2 and PD2, includes a 1-way 1.2 GHz processor with 1 GB of memory.
- The upgrade available on the Infoprint 4100 Model HD4, includes a 2-way 1.2 GHz processor with 1 GB of memory.
- An optional upgrade is available on the Infoprint 4100 Models HD2, HD4, and PD2 to add additional processors and additional memory.

## Enhanced Operator Console

The hardware consists of a flat-panel touchscreen console with a keyboard and mouse. The enlarged flat-panel display provides clearer and more easily recognizable commands and functions while retaining the touch-sensitive feel of today's console, while the keyboard and mouse expand the operators interface alternatives.

The GUI provides simpler buttons and functions for all capabilities. Special emphasis has been placed on reducing the number of menus and number of clicks that an operator must go through in order to perform a task.

The new GUI, along with the new Infoprint Operations Architecture, is the basis for future improvements in operator help and printer management functions.

## Infoprint Operator Control

This facility allows printer operators to automate the control of the critical basic parameters of the printer through the use of the IBM exclusive Infoprint Operations Architecture. This architecture is integral to the Advanced Function Common Control Unit (AFCCU). It allows you to save settings for different types of forms.

Once the operator has stored the critical printer parameters through the Infoprint Operations Architecture, they can be invoked when the operator selects a specific defined form, referred to as a Snapshot in the AFCCU. The critical parameters that are automated include:

- Contrast values
- Preheat Platen Temperature
- Hot Roll Temperature
- Hot Roll Oil Rate
- Backup Idler Roll Engage/Disengage

- Oil Belt Speed
- Paper Weight
- Cut Sheet Emulation

## Buffer/Flipper Units

A buffer/flipper device controls the paper flow between the two engines. You can order short, tall, or air bearing units to fit your paper path.

Following are the feature codes for buffer/flipper units for Infoprint 4000 and 4100 models:

- Infoprint 4000 models:
  - Short Buffer/Flipper Unit - Feature Code 4402
  - Tall Buffer/Flipper Unit - Feature Code 4403
- Infoprint 4100 models:
  - Short Buffer/Flipper Unit - Feature Code 4401
  - Tall Buffer/Flipper Unit - Feature Code 4407
  - Hunkeler Buffer/Flipper Unit WT4 (also known as the Air Bearing Buffer/Flipper Unit) - Feature Code 4408

See "Buffer/Flipper Unit" on page 14 for optional and required buffer/flipper units for the various duplex configurations.

## Signature Page

This is an optional feature for duplex printing systems that extends the maximum forms length to 54 inches, allowing you to print longer forms. Refer to "Form Lengths Not Supported with the Signature Page Feature (Infoprint 4000 Models Only)" on page 136 for exceptions on the Infoprint 4000. The Signature Page feature supports all lengths on the Infoprint 4100.

This feature includes a forms buffer assembly that may require an additional one to three feet of floor space. Whether additional space is required depends on the current distance between engines, the printer system configuration, and which buffer/flipper unit is being used.

## Forms Identification (Barcode)

The Forms Identification feature, also known as Forms Barcode, ensures that the form required for a specific application, or print job, is actually the form loaded in the selected printer. The Forms Identification feature reads a preprinted barcode as the form is moving through the printer. The value of the Forms Identification feature includes increased operations performance and quality, reduced operations costs, and improved operations control.

More information can be found in the *Infoprint 4000 Form Identification (Barcode) Feature Operator's Guide*, S544-5787, and in the *IBM Page Printer Formatting Aid: Operator's Guide*, S544-5284, under the description of VFYSETUP. This function is dependent on the driver support and uses one of the Pre/postprocessing Interface or Advanced Function Postprocessing Interface slots on Printer 2.

## Additional Pre/Postprocessing Interface

One pre/postprocessing interface comes standard on each model. This feature provides the electrical interface for attachment of OEM pre- and postprocessing equipment. The Pre/Postprocessing interface feature provides control of add-on pre/postprocessing devices (such as continuous forms stackers, envelope inserting equipment, roll-feed equipment, and others). Additionally, this feature disables the standard stacker functions.

One pre/postprocessing interface comes standard on each engine. In the Infoprint 4100 models HS1, HS2, PS1, HD1, HD3, and PD1 and the Infoprint 4000 models IS1, IS2, ID3, and ID5 up to two pre/post

processing interfaces, (in addition to the standard pre/post processing interface) may be ordered, or a combination of one additional pre/postprocessing interfaces, and one advanced function post processing interface, may be ordered.

In the Infoprint 4100 models HD2, HD4, and PD2 and Infoprint 4000 models ID2, ID4, and ID6 one pre/post processing interface, (in addition to the standard pre/post processing interface) may be ordered. The need for one or more of these feature codes is totally dependent on the postprocessing equipment being used with the printer. Coordination with the selected postprocessing vendor is recommended when planning for the appropriate features.

Postprocessing equipment is required when printing forms longer than 17 inches (432 mm).

**Note:** You will lose one slot if the Forms Identification (Barcode) feature is installed.

## Advanced Function Postprocessing Interface

This feature provides the electrical interface for attachment of OEM postprocessing equipment. This feature provides architected software and communications control of add-on pre/postprocessing devices such as printers using nonelectrophotographic technology, MICR impact printers, or selectable color printers.

When this feature is to be used to attach the MICR impact printer, order RPQ 8A8083 for the MICR fonts for AFP support. This feature may co-reside with pre/postprocessing interface. A maximum of one of this feature code may be ordered for each engine.

This feature is required for Select Medium Modifications (SMM) support. IPDS supports a command, Select Medium Modifications (SMM), which selects one or more actions or modifications to be taken or inhibited on the current sheet of physical media (paper) being processed by postprocessing equipment. SMM is supported for both production and Print on Demand printing environments. SMM is needed for all advanced function postprocessing interface commands with the exception of MICR Imprinter printing. SMM support is not available on all PSF platforms.

## Customer Changeable Developer

This new solution allows customer operators to easily remove and install developer units so that the toner can easily be switched from black to MICR or from MICR to black.

## Additional Customer Changeable Developers

This feature provides an additional developer unit that can be installed by an operator to replace the developer unit initially shipped with an Infoprint 4000 Model ID5/ID6 or an Infoprint 4100 printer. Each additional CCD is unique to one printer. For example, to have additional CCDs for three printers requires that this feature be ordered for each of the three printers.

The Additional CCD feature consists of an operator-installable developer and one developer cart to carry the CCD provided by this feature. When this feature is ordered, it may be necessary to order a Developer Cart. This extra Developer Cart is needed once per print room to remove and store the CCD initially installed in the printer.

## Developer Cart

In addition to the Developer Cart shipped with the additional CCD feature, one additional Developer Cart is required per print room for the removal of the CCD that was initially installed in the printer.

The developer carts are used so that the developer unit does not have to be lifted or carried by the operator. The cart attaches to the printer so that the developer unit can slide onto the cart when it is being switched. Likewise, the new developer unit can be easily slid off the cart and installed in the printer.

Developer carts can be used with any developer. Once a CCD has been installed in a printer, the cart that was shipped with the CCD can be used to remove a CCD from another printer. Developer units are unique to a given printer.

## Mark Perforations on Perfless Paper

This feature prints a page boundary mark on perfless paper where the perforations between pages would normally be. These marks enable the alignment of postprocessing equipment to the exact top of the page.

When this feature is enabled, a mark approximately 25 mm (1 inch) long by 3 pels wide is printed on every page, with the top of the mark being the exact top of the page. This mark appears on all pages, including threading and NPRO pages. This mark is not moved by print adjust.

For printers in dual simplex mode, each printer is enabled or disabled separately.

This feature is available on all printers at code version 8.1 or higher.

## Move Mark Forms

This feature prints 20 marks along the perforations at the top and bottom edges of the header and trailer pages instead of the standard 5 marks. Also, the longer mark pattern is printed at the side of the pages rather than the center. This allows easier separation of print jobs. This feature can be enabled or disabled by the key operator.

For printers in dual simplex mode, each printer is enabled or disabled separately.

This feature is available on all printers at code version 8.1 or higher.

## Infoprint Fidelity Manager (Inline Densitometer)

This feature automates the process of verifying and adjusting the optical print density of duplex printing systems, thus reducing operations time and improving the quality of the printed product. This feature makes sure that the front and back pages have the same darkness.

## Infoprint Low Resolution Books

This feature incorporates the Book function of high resolution Print-on-Demand (POD) printers into low resolution duplex printers, thus providing a low resolution books alternative.

The Book function allows the printer to buffer multiple pages (such as a book) and then print multiple copies. This improves printer throughput performance, frees up channel band width, and frees up the host system.

**Note:** This feature only works with Infoprint Manager for AIX.

This feature is available on the Infoprint 4000 Models ID1/ID2 and ID3/ID4.

## Infoprint Forms Management System

This feature provides:
- Improved operator control of paper path
- Enables long form support (up to 28-inch maximum length)
- Expands operator control of forms marks and forms sizes

- Enables error override of forms size checking

This feature is designed to assist with those applications utilizing media at the boundaries of the forms specifications. Direct Mail customers are the intended users. This optional feature is available on all Infoprint 4000 Models.

## Enhanced Printing Adaptor Kit

The Enhanced Printing Adaptor Kit contains the physical adaptor necessary to attach the new toner bottle to the toner inlet. The kit also contains new toner control algorithms. The adaptor is required to load the Enhanced Printing Toner (a new polyester based toner), which may only be used with the Enhanced Printing Developer, toner control algorithms, and Transfer Functions. Once the adaptor is installed, old toner cannot be loaded. The Kit is standard on the Infoprint 4100.

## Magnetic Ink Character Recognition (MICR) CCD

The Customer Changeable Developer (CCD) on the Infoprint 4100 enables you to print MICR applications on the Infoprint 4100 Family of high-speed, continuous forms printers. This feature provides the following benefits:

- Easily switch from printing production black toner applications to printing MICR checks simply by switching the developer.
- Exceptional MICR read rates are obtained by using the print quality enhancements and 600 DPI output of the Infoprint 4100 along with newly developed outline MICR fonts.
- Print the same MICR applications on both the Infoprint 4000 and 4100 Families.

**Note:** A developer cart DOES NOT ship standard with this feature.

See "Magnetic ink character recognition (MICR) CCD" on page 59 for more information about using the MICR CCD.

## Infoprint 4000/4100 Productivity Tracking Feature

The Infoprint Productivity Suite is a new software package designed to provide more information about the operation of select IBM continuous-forms printers. This new software can be used to provide more insight into the production environment with the goal of improving efficiency.

This feature provides the necessary microcode to allow selected Infoprint 4000 and Infoprint 4100 Printers to send production data to a Windows Server attached via an Ethernet LAN to the printer Control Unit. The LAN attached server must have the Infoprint Productivity Suite Program Product (5739-AA8) with the Productivity Tracking feature installed.

With the Infoprint 4100 and Infoprint 4000 Productivity Tracking feature, the Infoprint Productivity Suite provides an integrated solution to enhance the information available on events that have occurred during production. This information can be analyzed by printer, by operator, or by job. This program receives operational data from the printer and converts it to a DB2 format so that management can have a broad base of information to assist in improving operating efficiency. The program contains sample templates that display commonly requested production data, such as foot count of pages printed, toner changes, error frequency, and estimated foot count per job.

This feature requires an Ethernet attachment to attach to the Windows Server running the Infoprint Productivity Suite. The Ethernet attachment can be Ethernet SX, Ethernet TX or 10/100 Ethernet. The integrated 10/100 Ethernet attachment on the 64-bit processors can also be used.

## Internal Stacker

The internal stacker can be used to automatically stack perforated forms. The internal stacker supports a maximum page length of 14″ and a minimum of 7 inches. The stacker does not function when running in duplex mode. This feature is optional on the Infoprint 4100 Models HS2 and HD3/4; it it standard on all

other Infoprint 4000 and 4100 models. When this feature is installed on Infoprint 4100 Models HS2 and HD3/4, it requires the speed switch feature and operates only at the lower speed.

## CCD with Blue, Green, or Red Toners

These features provide a Customer Changeable Developer with blue, green, or red toners. The AFCCU in the Infoprint 4000 and 4100 Models works with your AFP applications and Print Services Facility (PSF) printing subsystem to print one highlight color on a page in addition to black printing. Printer 1 prints the black portion of the page and Printer 2 prints color. You can print at rated speed of the printer, allowing you to take advantage of highlight color without sacrificing the high throughput of your roll-feed production printers.

**Note:** A developer cart DOES NOT ship standard with these features.

With color toners, IBM increases the application flexibility of the Infoprint 4000 and 4100 families of printers. You can now choose to print simplex jobs with black toner and a highlight color, or the reverse side of a duplex job can be printed with a different color. The Customer Changeable Developer (CCD) feature of the Infoprint 4000 or 4100 families of printers allows you to switch from printing black duplex jobs to simplex jobs with a highlight color without the need to engage IBM Service to change developers and toner.

The ability to have important items highlighted in color printing provides a powerful means to communicate with your customers. In addition, the ability to print ″Terms and Conditions″ in a different color on the reverse side of a statement saves the cost of buying and storing many preprinted forms.

See "Using highlight color with the Infoprint 4000 and Infoprint 4100" on page 66 for more information about using highlight color.

## Commercial Print Support

This feature provides hardware enhancements specifically tailored for the printing of 9-point coated stock (61 lb or 225 gsm basis weight) forms. This feature code includes a hot roll optimized to provide improved fusing on heavy forms. In addition a PTFE Mat is supplied with this feature when ordered for the Infoprint 4100 Model HD4 to combat toner sticking to the preheat platen. Additional PTFE Mats can be ordered as a replacement supply item.

# Chapter 2. Specifications

---
**Chapter Overview**

This chapter describes the characteristics, functions, and features of the printers. It also contains hardware and software requirements for incorporating the printer into your operating and application environments.

---

The printers provide high-performance, high-quality printing in large-scale data-processing environments. They receive data through the IBM Intelligent Printer Data Stream (IPDS).

## Printing Speed

Printing speed and options are defined in "System Characteristics" on page 3.

The following conditions affect the actual performance in your installation:

- Configuration of the printer
- Number of characters per page
- Number of imbedded control commands
- Number of fonts, bar codes, and images per page
- Performance of the controlling computer
- Channel or LAN bandwidth
- Channel activity

See "Performance Considerations" on page 97 for additional information.

## Print Material

The size limitations and options for Infoprint 4000 and Infoprint 4100 printer forms are listed in "System Characteristics" on page 3.

The printer can print on many special-purpose materials, such as preprinted forms. The inks, papers, adhesives, and other components that make up these special materials must withstand the printer's fusing temperature and mechanical action; therefore, be sure to thoroughly test any preprinted forms you plan to use for your printing applications.

The *Forms Design Reference for Continuous Forms Advanced Function Printers* contains information to help you select print materials. Work closely with your IBM marketing representative while you are selecting what kinds of forms and special-purpose materials to use. Your marketing representative can give you technical help, share information from other successful printer users, and help you design your own special materials. Refer to Chapter 6, "Selecting and Testing Forms," on page 133 for more information.

*Basis weight* is the weight in pounds of four reams (500 sheets) of paper cut to a given standard size. In most environments, 75 g/m$^2$ (20-pound) forms usually perform best for the printers. The basis weights for the various models of printers is listed in "System Characteristics" on page 3.

The stacker on these printers can stack forms from 7 to 14 inches (178 to 356 mm) long. You also can stack forms of less than 7 inches if you fold them correctly. For instructions for printing on various size forms, see "Continuous Forms" on page 133.

**39**

With fanfold forms in duplex printing mode, you can use the stacker or a postprocessing device behind Printer 2. A postprocessing device prevents stacking problems caused by the occasional loss of the fold direction memory after the paper travels through both printers and the Buffer/Flipper Unit.

## Print Quality

The forms you use and the composition of your logical pages significantly affect the quality of your printer output. To ensure printing legibility in your application, test small fonts and special characters, such as logos, bar codes, and OCR fonts, in your application. See Chapter 6, "Selecting and Testing Forms," on page 133 and the *Forms Design Reference for Continuous Forms Advanced Function Printers* for important information about this type of testing.

Some print quality issues can be addressed by the operator by adjusting the values set in the form settings (**Forms → Forms Settings**). See Chapter 8, "Establishing Form Settings," on page 169 for more information.

## Print Quality Enhancement

The Print Quality Enhancement facility within the printer consists of three items: edge smoothing, fine fidelity protection, and boldness control.

- *Edge Smoothing*: This is smoothing along the edges of diagonal lines. This function provides more defined and crisp character and graphics images. If selected, additional smoothing algorithms are applied when 240 and 300 PEL raster font data is printed.
- *Fine Fidelity Protection*: Protects fine details in the print and prevents blurring between details by completely filling solid areas or by not filling in single-pel white areas. For example, if there are several black lines next to each other and there is only one white pel between the lines, fine fidelity protection ensures that the white pel is not filled with toner and the white space between the lines is preserved. Another example is that when a character is printed, toner is applied from edge to edge of the character to completely fill in the character and thus avoid white spaces between the edges.
- *Boldness Control*: Controls print boldness, independent of the contrast setting. This allows you to change the print boldness to compensate for other changing conditions within the printer without affecting the solid area darkness.

## Simulating Color with Gray Printing

This standard feature, sometimes referred to as *gray-scale printing*, simulates color using gray tones, allowing color Advanced Function Printing™ (AFP) jobs to be printed on Infoprint 4000 and Infoprint 4100 printing systems. This minimizes the need for duplicate print applications, one for color printers and one for monochrome printers.

---
**Simulating color with gray**
**Printer Definition → Printer → Advanced**

---

The Gray-Scale feature accepts the following AFP color objects and converts them to shades of gray:
- PTOCA text
- GOCA graphics
- Color object areas and logical pages
- Bi-level IOCA images (FS10)
- Color BCOCA bar codes

**Note:** Continuous tone color IOCA images (FS45) are not supported by this feature.

Other kinds of color objects must be transformed before printing. IBM includes color transforms in the following program products:

- In OS/390 and z/OS environments, IBM Infoprint® Server Transforms for OS/390 V1R1 (5697-F51) can be used to convert PostScript, PDF, and PCL 5E to bi-level IOCA. These transforms are invoked automatically.
- In AS/400® and iSeries environments, Infoprint Server for iSeries V5R1 (5722-IP1) can be used to convert PostScript, PDF, PCL 5E, TIFF, GIF, and JPEG to bi-level IOCA. These transforms are invoked automatically.
- In an AIX environment, Infoprint Manager for AIX V3R2 (5766-E42) includes transforms to convert PostScript, PDF, PCL 5E, TIFF, GIF, and JPEG to bi-level IOCA. The optional SAP Print feature of Infoprint Manager for AIX V3R2 includes a transform to convert SAP print data to AFP. These transforms are invoked automatically.
- In Windows NT® and Windows 2000 environments, IBM Infoprint Manager for Windows NT and Windows 2000 V1R1 (5639-I27) includes transforms to convert PostScript, PDF, PCL 5E, TIFF, GIF, and JPEG to bi-level IOCA. These transforms are invoked automatically.

**Note:** While these PostScript transforms may be used to convert Embedded PostScript (EPS) objects, these objects are not intended to be printed stand-alone. They may lack the PostScript *showpage* command necessary for physical printing or the PostScript positioning commands necessary for correct orientation and printing on a physical page.

## Printer Resolution

Outline fonts, which have been used in the past, are still used today. These fonts have no resolution, but are built in the printer to the printhead resolution. Because they provide resolution independence, outline fonts should be used whenever possible. However, applications designed using custom raster fonts, or raster fonts for which no outlines are available, require these raster fonts for printing.

Images will have the best quality if printed at a printhead resolution equal to, or an even multiple of, the image's native resolution. For example, when printing legacy 240-dpi images on a printer with a 240/300 switchable printhead, use a printhead resolution of 240. When printing on a printer with a 480/600 switchable printhead, use a printhead resolution of 480.

Infoprint 4000 and Infoprint 4100 printers offer additional resolution options:

With these additional resolution options, you need to plan operator procedures for selecting the correct options for your job mix.

*Table 5. Printer resolution options*

| Resolution | Options |
| --- | --- |
| 480 | **IPDS™ Resolution (DPI)**<br>240<br><br>**Font Smoothing**<br>• Enhanced Single Byte (Yes\|No)<br>• Enhanced Double Byte (Yes\|No) |

*Table 5. Printer resolution options  (continued)*

| Resolution | Options |
|---|---|
| 600 | **IPDS Resolution (DPI)**<br>• 240<br>• 300<br>• 480<br>• 600<br>• Automatic<br><br>**Font Smoothing**<br>• Enhanced Single Byte (Yes\|No)<br>• Enhanced Double Byte (Yes\|No) |

# 240/300 Switchable Printers (Infoprint 4000 Models Only)

---
**Selecting printhead resolution**
**Printer Definition → Printer → Basic → Printhead Resolution**

---

If your printer has a 240/300 DPI® switchable printhead, you will need operator instructions on when and how to switch between the two different resolutions. If all your jobs are developed at a single DPI, for example 240 DPI, you may want to keep the printer at 240 DPI resolution all the time. However, if you have some jobs for 240 DPI and some for 300 DPI, you will need to have some way of separating the jobs by resolution and of notifying the operator when to change the resolution on the printer. This change is done from the touchscreen by selecting the Printer Definition tab and proceeding through the definition steps. The printer normally takes less than 1 minute to complete this operation.

When switching printer resolution, the operator must also switch the libraries for raster fonts. Only 240 DPI raster fonts can print at 240 DPI; only 300 DPI raster fonts can print at 300 DPI. Steps for switching the libraries depend on the PSF software that is driving the printer. For more information, see the appropriate PSF system programming guide.

If your PSF is PSF/MVS 2.2 with APAR OW27622 for Multiple Resolution support, you can set up the PSF printer definition so that the font libraries switch automatically when the printer resolution is changed. See the APAR documentation for details.

# 480/600 Switchable Resolution

---
**Selecting printhead resolution**
**Printer Definition → Printer → Basic → Printhead Resolution**

---

With a switchable printhead, you will need operator instructions on when and how to switch between the two different resolutions. If all your jobs are developed at a single DPI, for example 240 DPI, you may want to keep the printer at 480 DPI resolution all the time.

However, if you have some jobs for 240 DPI and some for 600 DPI, you will need to have some way of separating the jobs by resolution and of notifying the operator when to change the resolution on the printer. This change is done from the touchscreen by selecting the Printer Definition tab and proceeding

through the definition steps.. The printer normally takes less than a minute to complete this operation. Switching printer resolution involves switching the raster font libraries.

In 480 DPI resolution, the printer reports to PSF that it is a 240 DPI printer. It accepts 240 DPI raster fonts and automatically scales them to 480 DPI. From an operational and application standpoint, it is no different than a 240 DPI switchable printer.

Note that there are no 480 DPI raster fonts supplied by IBM, nor does IBM recommend that you create or use 480 DPI raster fonts. You should use only 240 DPI raster fonts or outline fonts with 480 DPI printhead resolution. 300 dpi raster fonts are best supported when printing in 600 dpi resolution (Infoprint 4100 models only).

With 480/600 switchable printheads, IBM recommends that jobs that use 240 DPI raster fonts be printed with the 480 DPI printhead, rather than with the 600 DPI printhead. Because scaling 240 to 480 DPI is a simple matter of doubling the dots, both appearance and performance of 240 DPI jobs may be better at 480 DPI resolution than at 600 DPI.

When the printer is in 600 DPI mode, you have a new capability: the option to specify IPDS Resolution mode.

## IPDS Resolution (600 DPI Only)

---
**Selecting IPDS resolution**
**Printer Definition → Printer → Basic → IPDS Resolution**

---

With a 480/600 switchable printhead switched to 600 DPI resolution, the operator is able to select an intelligent printer data stream (IPDS) resolution. The choices are:
- 240 DPI
- 300 DPI
- 600 DPI
- Automatic

The operator selects an option from this screen. The printer reports the option selected to PSF.

### 240 DPI and 300 DPI IPDS Resolution Mode
When the printer is set in 240 DPI IPDS resolution mode, it reports to PSF that it is a 240 DPI printer. PSF can then send 240 DPI raster fonts to the printer without receiving an error. The printer automatically scales the 240 DPI raster fonts (and all other resources) to 600 DPI for printing. When the printer is set in 300 DPI IPDS resolution mode, it reports to PSF that it is a 300 DPI printer. PSF can then send 300 DPI fonts to the printer without receiving an error. Operational considerations for switching between 240 and 300 DPI IPDS resolution modes are the same as those for switching between 480 and 600 DPI as discussed in "480/600 Switchable Resolution" on page 42.

However, unlike a 240/300 DPI switchable printer, the print resolution is actually 600 DPI. Applications using outline fonts can take full advantage of the 600 DPI resolution in either mode. The printer renders the outlines at full 600 DPI resolution.

Note that when the printer has both a 480 DPI printhead and a 600 DPI printhead, it is generally preferable to print 240 DPI jobs using the 480 DPI. See "480/600 Switchable Resolution" on page 42.

### 600 DPI IPDS Resolution Mode
When the printer is set in 600 DPI IPDS resolution mode, it reports to PSF that it is a 600 DPI printer. PSF does not send 240 or 300 DPI raster fonts to the printer. It sends outline fonts only. Although technically

the printer could accept 600 DPI raster fonts, IBM does not supply 600 DPI raster font and does not encourage you to use 600 DPI raster fonts. At 600 DPI, outline fonts are the recommended font technology.

Note that setting the printer in 600 DPI IPDS resolution mode does not provide any benefit over either 240 or 300 DPI IPDS resolution mode. In all cases, the resolution at which the data is printed is 600 DPI. Also in all cases, outline fonts are accepted and rendered at 600 DPI. The only difference between a 600 DPI printer set in 240 DPI IPDS resolution mode or in 600 DPI IPDS mode is that when the printer is in 600 DPI IPDS resolution mode, it cannot receive and print 240 DPI raster fonts.

### Automatic IPDS Resolution Mode

The final IPDS resolution mode is ″Automatic″. When a 600 DPI printer is in Automatic IPDS resolution mode, the printer reports to PSF that it is capable of accepting any font resolution. This allows PSF to send 240 DPI raster fonts, 300 DPI raster fonts, or outline fonts to the printer without requiring the operator to change any printer configuration options on the touchscreen. Jobs needing 240 DPI fonts can be intermixed with those needing 300 DPI fonts.

Using automatic mode can simplify operating procedures for enterprises with jobs requiring resource resolutions. However, with a 480/600 switchable printhead, you need to weigh this advantage against possible improvements in throughput and print clarity of 480 DPI for jobs formatted using 240 DPI resources. See "480/600 Switchable Resolution" on page 42.

**Note:** Automatic IPDS resolution mode requires updates to PSF to enable it to respond to and take advantage of this printer capability. Do not select this mode unless you have PSF capable of Multiple Resolution support. PSF/MVS 2.2 with APAR OW27622 has this support. See the APAR documentation for details.

# Font Smoothing Mode (480 and 600 DPI Only)

```
 ┌─ Selecting font smoothing ──────────────────────────────────┐
 │  Printer Definition → Printer → Advanced → Font Smoothing    │
 │                                                              │
 └──────────────────────────────────────────────────────────────┘
```

Operators are able to select whether font smoothing is desired. The window presents two options:
- Enhanced Single-byte font enhancement (Yes|No)
- Enhanced Double-byte font enhancement (Yes|No)

The option appears when the operator selects 480 DPI printhead resolution or IPDS Resolution for 600 DPI printhead resolution. Specifying Yes causes the printer to initiate additional smoothing algorithms for 240 DPI and 300 DPI raster fonts when they are printed with the 480 or 600 DPI printhead. For most cases, selecting Yes results in better print quality. However, because print aesthetics are subjective, this enhancement can be turned off for either single-byte or double-byte fonts or both by specifying No. Specifying Yes to this option should have little or no impact on printer performance.

# AFP Resource Resolution

Raster fonts are the only print objects or resources that are strictly resolution dependent.[2] Other AFP resources are resolution independent. Form definitions and page definitions do not depend on printer resolution. Overlays and page segments that contain images and text formatting designed at a specific resolution are automatically adjusted by the printer to the correct resolution. However, this adjustment sometimes causes formatting differences. Images and text for which exact positioning is important print best at the resolution for which they were designed. For this reason, you may want to maintain separate

---

2. Currently there is also a resolution dependence in certain GOCA objects that include image definition within GOCA.

resolution libraries of critical resources such as page segments and overlays that contain very precise formatting or logos or signatures for which the highest quality print is required. The Multiple Resolution support in PSF/MVS 2.2 provides the capability to automatically select from the correct resolution library. See documentation for PSF/MVS APAR OW27622.

## Forms Handling

You can load forms manually or with the automatic forms loading feature.

Automatic forms loading applies only to an individual printer. Autoload does not completely thread the whole system but is used to load Printer 1 and Printer 2. The forms must be manually threaded through the buffer/flipper unit.

## Splicing Station

The splicing station on the printer allows you to splice a new supply of forms to the trailing edge of the previous supply of forms without having to re-load the forms through the printer.

## Print Area

The printer can print to the horizontal page perforations and within 12.7 mm (½ inch) of either vertical (tractor-hole) edge of the form. See Figure 13 on page 46.

Print quality may be degraded when printing near folding perforations, an internal perforation, or any cut in the form. To ensure correct operation and print quality, maintain the following distances:
- From non-folding and internal perforations: 1.27 mm (0.05 in.)
- From folding perforations: for text, OCR, and bar codes: 8.5 mm (0.33 in.); for images and solid-area fill: 12.7 mm (0.5 in.)
- From binder holes and cuts: 2.54 mm (0.1 in.).

Refer to the *Forms Design Reference for Continuous Forms Advanced Function Printers* and Chapter 6, "Selecting and Testing Forms," on page 133 for more information.

Do not use forms that have printing between the tractor holes

Vertical (tractor-hole) Edge

Horizontal Page Perforations

12.7 mm (0.5 in.)  12.7 mm (0.5 in.)

R4CI0056
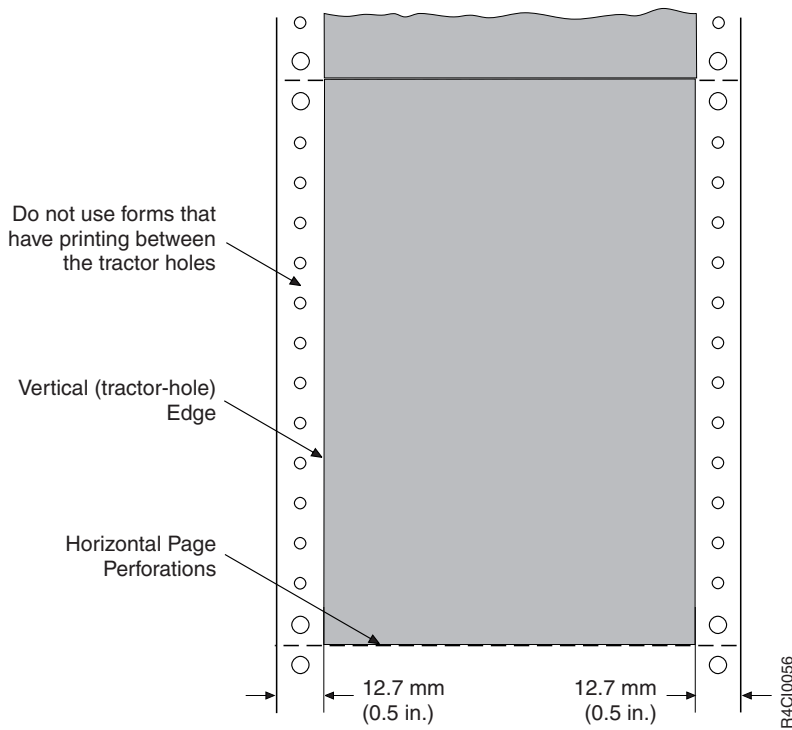
*Figure 13. Printable page area*

# Touchscreen

The touchscreen is the primary way the operator inputs information to the printer and receives status and error messages from the printer in any of several different languages. Both the printer operator and the service representative use this touchscreen.

The touchscreen is used to set up and operate the printer. Some of the things you can do from the touchscreen are:

- Change printer definitions
- Change host system channel attachment definitions
- Change preprocessing/postprocessing device definitions
- Define form settings and create snapshots

# Power Control

## Duplex Models

A power control panel on the control unit on Printer 1 or on Printer 2 is used to select either remote or local power control for each printer in the configuration and the control unit independently.

When the Local/Remote switch is set to Local, power for that control unit is controlled by power switches on the same power control panel as the Local/Remote switch. When a Local/Remote switch is set to Remote, power for the control unit on Printer 2 is controlled from the controlling computer system, and power for either printer or the control unit on Printer 1 is controlled from the control unit on Printer 2.

Each power control panel also contains a system Unit Emergency switch that drops power to all elements controlled by that panel.

## Simplex Models

The power control panel on the control unit allows you to select either remote or local power control for the printer and the control unit independently.

When either the printer or control unit Local/Remote switch is set to Local, you can control power for that element from the power control panel. When a Local/Remote switch is set to Remote, you can control power for the AFCCU from the controlling computer system and power for the printer from the AFCCU.

The power control panel also contains an Emergency Power Off switch that drops power to all elements controlled by that panel.

## Software Requirements

Two modes of operation are available on certain models of the Infoprint 4000 and Infoprint 4100 printers:
*   Print On Demand (POD) mode
*   IPDS mode (Production Print Mode).

Different printers execute in different modes:
*   Infoprint 4000 Models IR3/IR4 operate in either POD mode or IPDS mode.
*   All other Infoprint 4000 models printers operate in IPDS mode only.
*   Infoprint 4100 models use IPDS with POD mode enabled or disabled.

## Print on Demand

Certain Infoprint 4000 models can be set to operate in Print On Demand (POD) mode. All Infoprint 4100 models are able to operate in Print On Demand (POD) mode. Print On Demand (POD) mode works with an Infoprint Manager for AIX server to cache one copy of a job in the printer and then print it multiple times. The job does not begin printing until the entire job is stored in the printer's memory. Print On Demand (POD) mode can also be used to store a job in the printer that may otherwise not print at rated speed. When the printer definition in the Infoprint Manager server is set to ″Optimize for multiple copies″, it activates the job caching for any printer in Print On Demand (POD) mode.

For more information about Print on Demand (POD) Services, refer to *Print on Demand Executive Summary and Planning Guide*, G544-3876 and *Print on Demand User's Guide*, G544-5325.

See your IBM marketing representative for more information about the hardware and software required for Print on Demand.

## IPDS Mode (Production Print Mode)

IPDS mode—sometimes referred to as traditional or full IPDS mode—supports duplex printers in both duplex and dual simplex mode. IPDS mode requires one of the host licensed Print Services (PSF) products shown in Table 6 on page 48.

Each software environment has specific operating system and AFP program requirements. For a list of the programs that are required for a particular environment, refer to the corresponding Print Services Facility (PSF) publications listed in *Advanced Function Presentation: Printer Information*, G544-3290. Also see "Advanced Function Presentation Licensed Programs" on page 98 for a listing of AFP software.

If the printer is connected to a print-on-demand (POD) server while in IPDS mode, the printer does not attempt to save pages on the printer. This may cause the printer to run slower when it is printing multiple copies of a document than it would in POD mode or when it is printing a document that would have been previously saved in POD mode.

*Table 6. Software support for the respective attachments and functions*

| AFP Licensed Program | S/370 Parallel Channel | ESCON Channel | FICON Channel | Token Ring or 10/100 Ethernet TCP/IP | FDDI TCP/IP (note 1) | Gigabit Ethernet TCP/IP | Select Medium Modification (SMM) | Basic/ Enhanced N-Up | Cut Sheet Emulation | Gray- Scale | True Type Fonts |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PSF for OS/390 and z/OS | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes |
| PSF/VM (note 2) | Yes | Yes | No | No | No | No | No | No | Yes | Yes | No |
| PSF/VSE (note 2) | Yes | Yes | No | Yes | No | No | Yes | Yes | No | Yes | No |
| PSF/400 | No | No | No | Yes | No | Yes | No | Yes | Yes | Yes | No |
| Infoprint Manager for AIX | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Infoprint Manager for Windows | No | No | No | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes |

**Notes:**

1. FDDI is supported with AFCCU microcode levels 11.x and earlier only.
2. PSF/VM and PSF/VSE support Infoprint Manager 4000 Models only.

Contact your IBM marketing representative for details about ordering these configurations and features.

## Application Environment

In IPDS mode, the printer supports the IBM Advanced Function Presentation (AFP) licensed programs. These programs let application developers take advantage of many special kinds of printing, including bar code and optical character recognition (OCR) output.

The printer supports FOCA (Font Object Content Architecture), which allows printing with outline fonts. Outline fonts give you more choices of fonts with substantially less storage requirements.

The printer prints optical character recognition (OCR) characters and bar code applications and most standard OCR fonts and bar code BCOCA (Bar Code Object Content Architecture) formats.

The printer processes advanced function printing functions. These functions use the Intelligent Printer Data Stream (IPDS) to drive the printer. Refer to the *IBM Product Description*, G544-3895, or the *Intelligent Printer Data Stream Reference*, S544-3417, for more information. Also see "Advanced Function Presentation Licensed Programs" on page 98 for a listing of AFP software. Refer to Table 7 on page 50 for a listing of printer model choices as they relate to channel/adapter attachment choices.

## Host System Attachment Choices

Infoprint 4000 printers executing in IPDS mode and Infoprint 4100 printers can attach to the processing systems shown in Table 7 on page 50 and Table 8 on page 51 with the indicated attachment choices:

Infoprint 4000 and Infoprint 4100 printers can have a maximum of two attachments. These attachments may be intermixed in any combination of two, except that you cannot have two TCP/IP attachments or two FICON attachments.

*Table 7. Host processing systems and attachment choices for Infoprint 4000*

| Host System | S/370 Parallel Channel | ESCON Channel | FICON Channel | Token Ring or 10/100 Ethernet TCP/IP LAN | FDDI TCP/IP LAN | S/370 Channel Emulator/ Adapter | Gigabit Ethernet TCP/IP |
|---|---|---|---|---|---|---|---|
| IBM ES/9000 | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | | |
| S/390 Multi-prise 2000, G3 Enterprise, Parallel Enterprise Server | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | | |
| S/390 G5, G6 Parallel Enterprise Server zSeries z900 | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | | ID3/ID4 ID5/ID6 |
| zSeries z990 z800 | | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | | ID3/ID4 ID5/ID6 |
| IBM ES/9370/ 9371 (Note 1) | IS1, IS2 ID1/ID2 ID3/ID4 | | | | | | |
| iSeries | | | | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | | ID3/ID4 ID5/ID6 |
| pSeries | | | | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | IS1, IS2 ID1/ID2 ID3/ID4 ID5/ID6 IR1/IR2 IR3/IR4 | | ID3/ID4 ID5/ID6 |

**Notes:**

1. A High-Speed Printer Adapter is required when connecting to the Micro Channel® on the ES/9371.

*Table 8. Host processing systems and attachment choices for Infoprint 4100*

| Host System | S/370 Parallel Channel | ESCON Channel | FICON Channel | Token Ring or 10/100 Ethernet TCP/IP LAN | FDDI TCP/IP LAN | S/370 Channel Emulator/ Adapter | Gigabit Ethernet TCP/IP |
|---|---|---|---|---|---|---|---|
| IBM ES/9000 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | | | |
| S/390 Multi-prise 2000, G3 Enterprise, Parallel Enterprise Server | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | | | |
| S/390 G5, G6 Parallel Enterprise Server zSeries z900 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 |
| zSeries z990 z800 | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 |
| iSeries | | | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 |
| pSeries | | | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 | HS1, PS1 HD1/HD2 PD1/PD2 | | HS1, PS1 HD1/HD2 PD1/PD2 HS2 HD3/4 |

See Chapter 4, "Preparing the Processing Environment," on page 83 for more information about system and channel-attachment requirements.

# System/370 Channel Attachment

The channel attachment is to a single-byte wide block multiplex System/370 parallel channel. You can connect it as follows:

- Directly to a host system System/370 channel
- To the remote end of an IBM 3044-II Fiber Optic Channel Extender
- To the remote end of an IBM 9034 ESCON Converter

You can attach one System/370 channel adapter and one of the following:

- A second System/370 channel adapter
- An ESCON channel adapter
- A FICON channel adapter
- A Token-Ring TCP/IP adapter
- An Ethernet TCP/IP adapter
- A FDDI TCP/IP adapter (AFCCU microcode levels 11.x and earlier only)

When you order a second System/370 channel adapter, a **Two-Channel Switch** function is provided which maintains a connection with either channel as a single device control unit with an interface switch. The Two-Channel Switch function supports either static or dynamic channel switching modes (operator selectable) for both channels:

- **Manual mode** – In manual mode, you can enable only one channel interface. You can connect the two interfaces to two channels on the same processing unit, on tightly-coupled processing units (units controlled by the same operating system), or on independent (uncoupled) processing units.

  **Note:** Select Manual Mode if either or both attachments are from an RS/6000 or an AS/400.
- **Dynamic mode** – In dynamic mode, you can enable both channel interfaces by using the Two-Channel Switch as a dynamic interface switch. Both interfaces must be connected to two channels either on the same processing unit or on tightly-coupled processing units (processing units controlled by the same operating system).

When you install the second System/370 channel feature for the **Two-Channel Switch** function, an optional **Remote Channel Enable/Disable** feature is also provided. With this feature, you can remotely enable and disable directly-connected System/370 channels.

# Enterprise Systems Connection (ESCON) Channel Attachment

You can attach to an ESCON channel as follows:

- Directly to a host system ESCON channel
- To the remote end of an IBM 9032/9033 ESCON Director
- To the remote end of an IBM 9036 ESCON Remote Channel Extender

You can attach one ESCON channel adapter and one of the following:

- A second ESCON channel adapter
- A FICON channel adapter
- A System/370 channel adapter
- A Token-Ring TCP/IP adapter
- An Ethernet TCP/IP adapter
- A FDDI adapter (AFCCU microcode levels 11.x and earlier only)

Adding a second ESCON adapter allows dynamic channel switching mode with tightly coupled channels and/or processing units, or with Assign/Unassign (which can be used with one or two ESCON Adapters).

## System/390® Fiber Connection (FICON) Channel Attachment (Infoprint 4100)

You can attach to an FICON channel as follows:

- Directly to a host system FICON channel
- To the remote end of an IBM 2032/2042 FICON Director
- To the remote end of an IBM 2029 Dense Wavelength Division Multiplexor (DWDM)

You can attach one FICON channel adapter and one of the following:

- An ESCON channel adapter
- A System/370 channel adapter
- A Token-Ring TCP/IP adapter
- An Ethernet TCP/IP adapter
- A FDDI adapter (AFCCU microcode levels 11.x and earlier only)

Only one FICON adapter is supported.

## Local Area Network (LAN) Attachments

You can attach the printer to a Token Ring TCP/IP (Transmission Control Protocol/Internet Protocol), or 10/100 Ethernet TCP/IP with host systems running

- PSF for OS/390 and zOS
- PSF/MVS
- PSF/VM
- PSF/VSE
- PSF/400
- Infoprint Manager for AIX
- Infoprint Manager for NT and Windows 2000

You can attach one Token Ring adapter and one of the following:

- An ESCON channel adapter
- A FICON channel adapter
- A System/370 channel adapter

You can attach one Ethernet adapter and one of the following:

- An ESCON channel adapter
- A FICON channel adapter
- A System/370 channel adapter

## FDDI Attachment

**Note:** FDDI is supported with AFCCU microcode levels 11.x and earlier only. For AFCCU microcode levels 12.0 and later, FDDI attachment support for Infoprint 4000 printers is no longer offered. The Gigabit Ethernet attachments are recommended as a replacement.

You can use FDDI TCP/IP to attach the printer to a host system running Infoprint Manager for AIX or Infoprint Manager for Windows® NT® and Windows 2000®.

You can connect the FDDI attachment as follows:

- Directly to an RS/6000 processor
- 8260 Multiprotocol Intelligent Switching Hub attached to an RS/6000 processor

You can attach one FDDI adapter and one of the following:

- An ESCON channel adapter
- A FICON channel adapter
- A System/370 channel adapter

## Gigabit Ethernet Attachment

You can attach the printer with Gigabit Ethernet to host systems running

- Infoprint Manager® for AIX
- Infoprint Manager for Windows
- PSF for OS/390 and z/OS
- PSF for OS/400

You can attach one Gigabit Ethernet adapter and one of the following:

- An ESCON channel adapter
- A FICON channel adapter
- A System/370 channel adapter

## Preprocessing and Postprocessing Device Interfaces

Preprocessing and Postprocessing Device Interfaces allow you to attach special equipment to help automate the handling of forms input or forms output (or both) to the printer. Preprocessing equipment is on the forms input side (for example, a roll feed) and postprocessing equipment is on the forms output side (for example, a folder, burster, trimmer, stacker, take-up roll, and MICR or color printer).

Each of the printers has three interface ports. These ports may be equipped with Preprocessing/Postprocessing (Pre/Post) or Advanced Function Postprocessing (AF Post) interfaces.

- **Preprocessing/Postprocessing** (Pre/Post) – Attaches most types of preprocessing and postprocessing equipment, such as: continuous forms stackers, envelope inserting equipment, and roll-feed equipment.

  Pre/Post is standard.

- **Advanced Function Postprocessing** (AF Post) (Optional) – Attaches only postprocessing equipment that requires architected software and communications control, such as MICR printers. Only one AF Post interface can be installed on each printer.

  IPDS supports the Select Medium Modifications (SMM) command which is used to invoke processing options through the Advanced Function Postprocessing interface. SMM support is not available on all PSF platforms. See "AFP Software Summary" on page 98 and Table 6 on page 48 for PSF support details.

In duplex models, Port 1 in each printer has a Preprocessing/Postprocessing interface, which is standard. You may select optional Pre/Postprocessing or Advanced function postprocessing interfaces to equip Ports 2 and 3. (In Printer 2 with Side 2 Verify installed, only Port 2 is available.)

**In the IS1 and IS2 Simplex Models** – One interface is standard and two are selectable.

**Things to Remember About Pre/Postprocessing Equipment:**

1. When using preprocessing equipment, be sure that attachment cables do not interfere with forms under the printer. See "Space Requirements" on page 113 for cable placement.
2. When using 457-mm (18-inch) wide paper, the distance between the back edge of the paper and the back of the machine is about 0.6 cm (0.25 in.). This means that some of the powered-assist rollers (urge units) used with other IBM printers may not work. Be sure to discuss this with your pre- or postprocessor vendors.
3. Be sure that any preprocessing or postprocessing devices you order operate at the same resolution (DPI) as the printer.

4. **With Duplex Configurations** – To avoid static drag between the paper and the floor, IBM recommends that you install a conductive floor plate in front of each urge unit between the printer leveling pads. The floor plate is connected to the printer frame with a grounding strap. Normally, preprocessor vendors supply these plates. The plate should be approximately 61 cm x 152 cm x 0.71 mm (2 ft x 5 ft x 0.028 in.).

Refer to "Defining Interfaces and Preprocessing or Postprocessing Devices" on page 167 for more information concerning the Pre/Postprocessing interfaces.

## Universal printer pre- and postprocessing interface (UP3I)

The universal printer pre- and postprocessing interface (UP[3]I) is a standard intelligent LAN interface that connects production printers, inline pre- and postprocessing devices, workflow managers, and remote operating stations. UP[3]I uses the industry standard IEEE 1394 ″Firewire″ connectivity architecture to provide high speed two way communications between the AFCCU and pre- and postprocessing devices.

### Universal Printer Pre- and Postprocessing Interface UP3I (FC 4730)

With the UP[3]I feature enabled, you can check the status of, enable, and disable your UP[3]I pre- and post-processing devices from the printer console:

- Select **Printer Definition** ⟶ **Pre/Postprocessing** ⟶ **Postprocessing Options**. Select **Yes** or **No** for **UP[3]I Enabled**.
- Select the pre- or postprocessing device on the Main touchscreen panel. This allows you to view the status and current settings of the UP[3]I devices that have checked in on the UP[3]I network and see the status of the *paper paths*, or sequences of UP[3]I devices, that have been defined.
- Select **Printer Definition** ⟶ **Pre/Postprocessing** ⟶ **UP3I Devices**. This displays a list of the UP[3]I devices that are currently communicating on the UP[3]I network. For each device you select, you can check the status and edit the device settings. The device settings panel lets you change the device name, specify the distance between the printer and the UP[3]I device, and select the postprocessing operations you want to perform.
- Select **Printer Definition** ⟶ **Pre/Postprocessing** ⟶ **UP3I Paper Sequences**. This displays a list of the paper paths that have been defined and what devices are on each path. You can add, edit, and delete new paper paths or sequences of UP[3]I devices from this panel.

For additional information, refer to the *Planning and Configuration Guide*.

UP[3]I provides the following improvements:

- UP[3]I broadcasts information about values changed on the printer console to other UP[3]I devices. The operator needs to change the value only once. For example, the Forms Length today is set at the printer and the operator must manually enter the same setting at each postprocessing device. Now the operator only needs to make the change at the printer console and the change will take affect in each postprocessing device.
- UP[3]I reduces or eliminates setup errors by reducing the operator actions needed today to efficiently use a high-speed continuous forms printer with pre- and postprocessing devices.
- The printer can save postprocessing templates that contain settings for a given job. These settings can be automatically sent to devices, rather than being manually setup by the operator.
- Today's pre- and postprocessing devices rely on printed marks and barcodes for control codes to operate the devices. UP[3]I eliminates these marks by sending appropriate information over the LAN. This eliminates trimming to remove unacceptable marks on statements and books. It also eliminates difficult barcode implementation by the customer.
- UP[3]I tracks pages through the whole system. With an extended jam recovery point, the printer can also request pages that have been jammed at the postprocessing device.
- The customer can code finishing options and instructions in the formdef, requiring less operator intervention and providing more options.

- Applications can specify the types of pre- and postprocessing required. Application information can be electronically transmitted from the application program to the pre- or postprocessing device. Finishing information, such as saddle-stitch or edge-stitch, can be specified. This increases compatibility between continuous forms printers and cut-sheet printers where application information can specify the postprocessing options.
- UP³I improves operational efficiency by directing blank pages to a waste device rather than a postprocessing device.

## System requirements

The following items are required to fully implement UP³i:

The following printer models support UP³i:
- Infoprint 4100 Model HS1/HS2 with Feature Code 4730
- Infoprint 4100 Model PS1 with Feature Code 4730
- Infoprint 4100 Model HD2 with Feature Code 4730
- Infoprint 4100 Model HD4 with Feature Code 4730
- Infoprint 4100 Model PD2 with Feature Code 4730

IBM ships the following items:
- UP³I interface card
- AFCCU microcode Version 12.0 or higher

You need to order the following items from other vendors:
- IEEE 1394 switch boxes that meet the specifications of the 6-pin IEEE 1394 Firewire Smart A/B Switcher from Ocean Matrix
- Power supply for switch box
- IEEE 1394 Repeater cables that meet the specifications of the Firewire (i.Link) Extension Cable - 6Pin-F / 6Pin-M 15 FT (built-in repeater) from A2Z Cables, Inc.
- IEEE 1394 cables that meet the specifications of the Firewire (i.Link) Cable - 6Pin-M /6Pin-M 15FT from A2Z Cables, Inc. - The specified cable length per segment (at 400 Mbit/s) is limited to a length of 10 meters. If there is a longer distance between the UP³I device and the hub, an IEEE 1394 Repeater device has to be inserted.

Make sure you use pre- and postprocessing devices that are UP³I enabled.

*Table 9. UP³I device configurations*
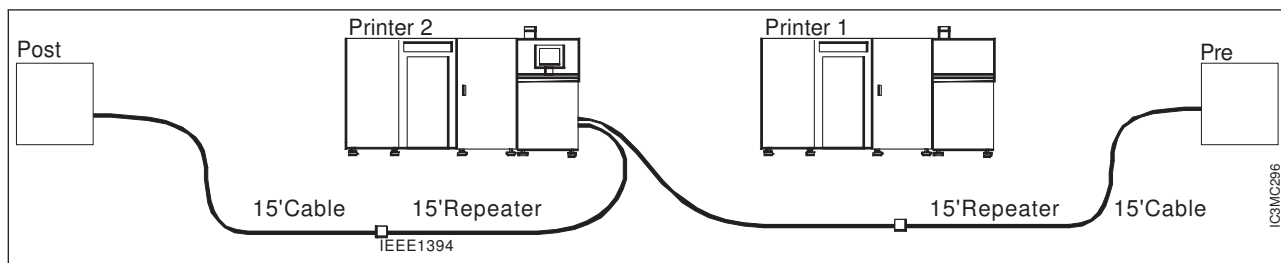
*Table 9. UP³I device configurations  (continued)*
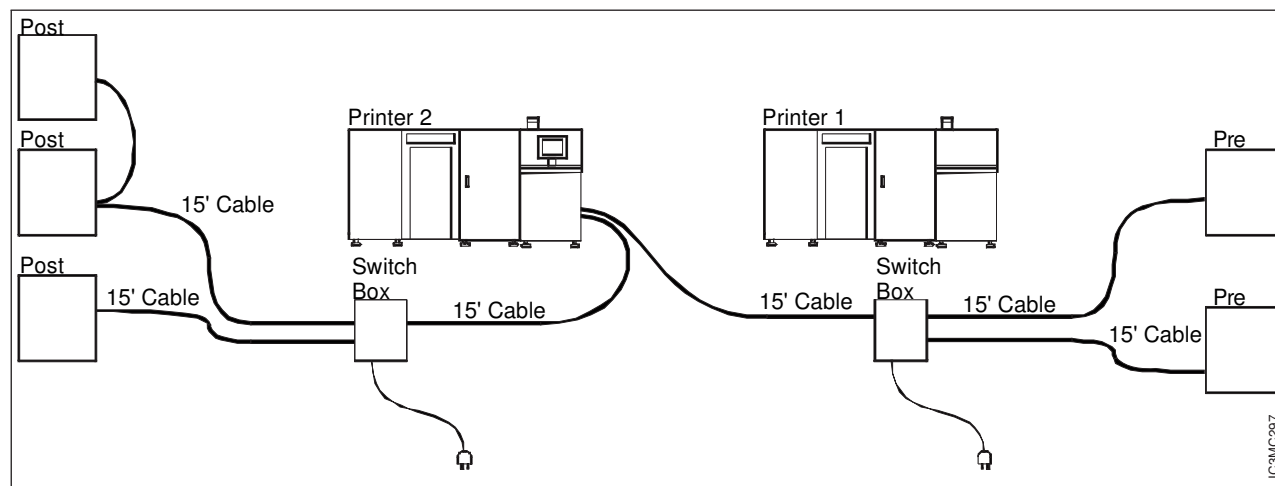


## PPFA UP³I support

UP³I functionality must be written into your FORMDEF.

A UP³I finishing interface is being added to Page Printer Formatting Aid (PPFA). The function is supported at the print file and document level by coding the keyword ″UP³I″ and its related parameters on the Form Definition, and at the medium level, using ″UP³I″ and its parameters on the COPYGROUP command. For specific information, refer to the *IBM Page Printer Formatting Aid: User's Guide*:

1. Go to http://www.printers.ibm.com.
2. Under **Products and services** select **Printing software**.
3. Under **Print application creation software** select **Page Printer Formatting Aid/370**.
4. Under **Product resources** select **Library**.

## Conduit support for UP³i

Infoprint Manager and Print Services Facility (PSF) for OS/390 provide conduit support for UP³I, meaning that you can submit jobs that have UP³I functionality written into the formdef through these applications.

For more information about these products, refer to the Infoprint Manager product library:

1. Go to http://www.printers.ibm.com.
2. Under **Resources for** select **Infoprint Manager**.
3. Under **Products** select **Infoprint Manager for AIX** or **Infoprint Manager for Windows**.
4. Under **More information** select **Product library**.

and to the PSF for OS/390 library:

1. Go to http://www.printers.ibm.com.
2. Under **Resources for** select **z Series (S/390) printing**.
3. Under **Product resources** select **Product list**.
4. Under **Products** select **PSF for OS/390 and z/OS**.
5. Under **Product resources** select **Library**.

# Reliability, Availability, and Serviceability

The printer is designed to ensure maximum reliability, availability, and serviceability. The following elements reflect this:

* **Message Display**

    The touchscreen windows and the display on the printer operator panel display messages in the language of your choice:
    – U.S. English
    – Spanish
    – French
    – German
    – Japanese
    – Italian
    – Brazilian Portuguese
    – Chinese Simplified
    – Chinese Traditional
    – Korean
    – Hungarian
    – Russian

    These messages give status information, request operator intervention, and guide operators through procedures that have more than one step. Help functions are available for most operations.

* **Error Log**

    Sensors and microcode detect faults in the printer. Information about faults is displayed to the operator and logged on the control unit hard disk for use in correcting problems.

* **Traces**

    The RS/6000 can perform several kinds of traces. It can record detailed information about the printer and control unit activities and communications with the host system. The operator starts and stops traces.

* **Print Samples**

    You can print these print samples whenever necessary to sample print quality, solve problems, adjust the printer, or test the printer functions.

# Data Security

The printer has the following data security features:

* The controlling computer cannot retrieve any data after sending it to the printer.
* After printing the last page, the printer cannot print any data that remains in the page buffer.
* The printer removes images that remain on the photoconductor.
* The control unit accepts commands from the controlling computer system to erase all residual print data and fonts from its storage.
* Characters stored in the page buffer are difficult to interpret because the printer translates them from 8-bit EBCDIC (extended binary-coded decimal interchange code) characters to another form.

If many of the printing applications for your company are confidential, consider placing the printer in a controlled-access area. Then, by using special print classes, you can control when sensitive data is printed.

# Resident Fonts

The printer supports the following contents of the IBM Strategic Font Set:
- IBM Core Interchange Resident Scalable Font Set
- 4028 Compatibility Resident Font Set
- IBM Coordinated Resident Font Set
- DBCS Resident Raster Font Set
- DBCS Resident Scalable Outline Font Set

For more information on fonts, see Chapter 3 of the *IPDS Handbook for Printers That Use the Advanced Function Common Control Unit*, G544-3895.

# Magnetic ink character recognition (MICR) CCD

Magnetic ink character recognition (MICR) is a specified character set that is defined in American National Standard Institute (ANSI) booklet X9.27. For over thirty years, MICR has been the common document language used by the commercial banking industry for interbank exchange of money data.

The most common use of MICR is for printing negotiable documents. The characters are uniquely shaped according to ANSI standards and can be read by various readers and sorters throughout the world to direct the documents to their proper financial institutions.

Before the availability of MICR printers, companies that printed negotiable documents used forms that were pre-printed with MICR characters by a commercial check-printing company. Commercial companies print the MICR characters with magnetic ink.

To enable a printing system to print MICR, complete the following steps:
1. Order the MICR Customer Changeable Developer feature.
2. Your Service representative must install the MICR Feature. This action enables the feature.
3. Insert the MICR Configured CCD into the correct engine. Refer to *Infoprint 4000 and Infoprint 4100 Models with Enhanced Operator Console Operator's Guide* for instructions on changing the customer changeable developer (CCD).
4. Select **Printer Definition → Printer → Advanced** to define the physical status of the MICR CCD. In the **MICR Installed** field, select the printer engine where the MICR CCD is installed. Your options are:
   - Duplex: **Printer 1**, **Printer 2**, and **None**
   - Dual Simplex: **Printer 1** or **Printer 2** and **None**
   - Simplex: **Yes** and **No**
5. Select **OK** to complete the installation and enablement of the MICR feature.

**Notes:**
1. In duplex mode, the printer that can use MICR toner depends on the printer model:
   - For Infoprint 4000 Models HD1/2 and HD3/4, MICR toner can be used in Printer 1 only.
   - For Infoprint 4000 Models ID3/4 and ID5/6, MICR toner can be used in Printer 1 only.
   - For Infoprint 4000 Models ID1/2, MICR toner can be used in either printer.
2. In dual simplex mode, MICR toner can be used in both printers.
3. The supported paper weight is 75 to 90 gsm (20 to 24 lb). Paper checks are to be 24 lb across the web and in the web direction or 20 lb in the web direction only. (This is the banking industry standard for check stock.)
4. Tractorless paper is not supported with MICR.
5. MICR forms must be processed into a post processing device to allow sufficient cooling for the toner and paper. MICR forms cannot be stacked in the internal stacker, ″Blocking″ will result.

# Using the Infoprint 4000/4100 to print MICR documents

IBM has long been associated with the negotiable document industry in the form of designing encoders and readers/sorters, and has an understanding of the importance of MICR print quality.

The Infoprint 4000/4100 printers use a specially designed magnetic toner that can print MICR characters with a quality that meets ANSI standards and can withstand the many passes through readers and sorters.

With the Advanced Function Printing (AFP) software interface that is available with all IBM system printers, the Infoprint 4000 can be used to print an entire negotiable document; bypassing commercial check-printing companies and the necessity for pre-printed forms.

The most common use of MICR is for check printing. Specifications of standards requirements for check printing are in the ANSI booklets X9.27 and X9.13.



*Figure 14. Front of check*

**CLEAR BAND - NO MICR CHARACTERS/TONER SPOTS/ETC.**

ENDORSE HERE

✕

DO NOT WRITE, STAMP OR SIGN
BELOW THIS LINE

ENDORSEMENT AREA

RESERVED FOR FINANCIAL INSTITUTIONS USE
FEDERAL RESERVE BOARD OF GOVERNORS REG. CC

AV1U0021
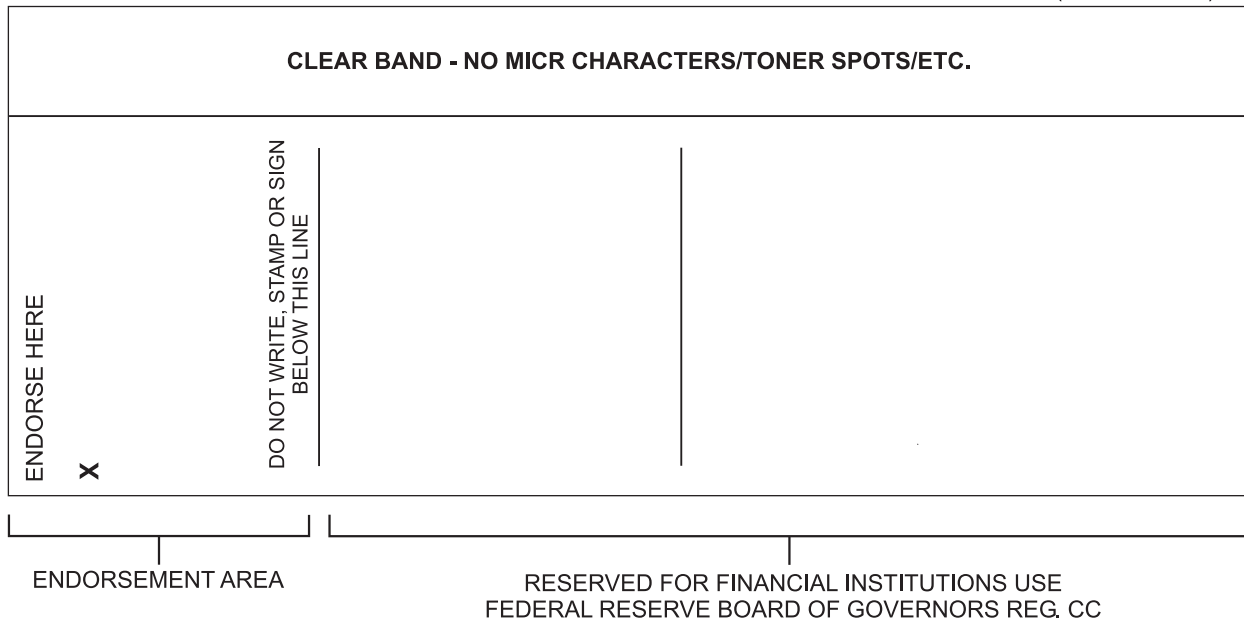
*Figure 15. Back of check*

**Notes:**

1. There must not be any printing in the area that is the clear band area of the front of the check.

2. It is recommended that MICR character printing be done with the MICR character line printed in the scan direction only.

3. The internal stacker cannot be used when printing with MICR toner and a postprocessing device must be used instead. This allows for better cooling. When printing with MICR toner, the printer runs hotter than with non-MICR toners.

4. A special MICR toner is used in the printer, which contains iron particles. The print does not look as black as with non-MICR toners. This should not be considered a problem, because it is a characteristic of MICR toner.

# Setting up the printer for printing with MICR toner

The following procedure describes how to set required values when printing with MICR toner. These values must be set on the printer where the MICR toner is installed.

**Note:** Access the printer settings from the Main touchscreen panel of the Enhanced Operator panel.

1. Select **Printer Definition → Print Quality** to display the Print Quality panel.

2. Select the following values:

   • Contrast = 4 *

     **Note:** You may need to adjust this to obtain proper signal strength.

   • Boldness

     – For 240 and 300 DPI fonts = 50

     – For outline fonts (480 and 600 DPI) = 50

     – For CMC7 outline font = 60

   • Preheat Platen Temperature = 85

   • Fuser Temperature = 50
     (Hot Roll) (This is the highest setting you can select.)

   • Oil Rate = 85

| • Oil Belt speed = 50
| • Backup Idler Roll usage = Enable
| 3. Select **Printer Definition → Printer → Advanced → Font Smoothing** to display the Printer - Advanced
| panel.
| Set the following values:
| • Single-byte Font Smoothing = No
| • Double-byte Font Smoothing = No

## MICR fonts

In addition to the normal fonts supplied with the printer, three standard fonts are available to print MICR characters: E13B, E13B*, and CMC7.

| The E13B font is used in the United States and the CMC7 font is used in certain countries in Europe. The
| Hollow E13B* font is identical in size to the E13B font, but will not be read correctly by MICR reader-sorter
| equipment. This font can be used for application development while the security of the E13B font is
| maintained.

| Test documents that contain Hollow E13B* font will exhibit the same registration characteristics as the
| E13B font, but the documents will not be negotiable.

| AFP MICR fonts for Infoprint 4000/4100 printers are available for downloading at www.printers.ibm.com
| (select Support and Maintenance and then Downloads).

## MICR format requirements

The MICR line has an established format that can cause rejects if the format conventions are not followed. The MICR line is composed of four fields. The fields are, from right to left:

- Amount field, positions 1–12
- On-Us field, positions 14–31
- Transit field, positions 33–43
- External process control field, position 44 (optional)
- Auxiliary On-Us field, positions 45–65 (optional)

The following figure shows the MICR line field positions for a 152 mm (6 in.) check.
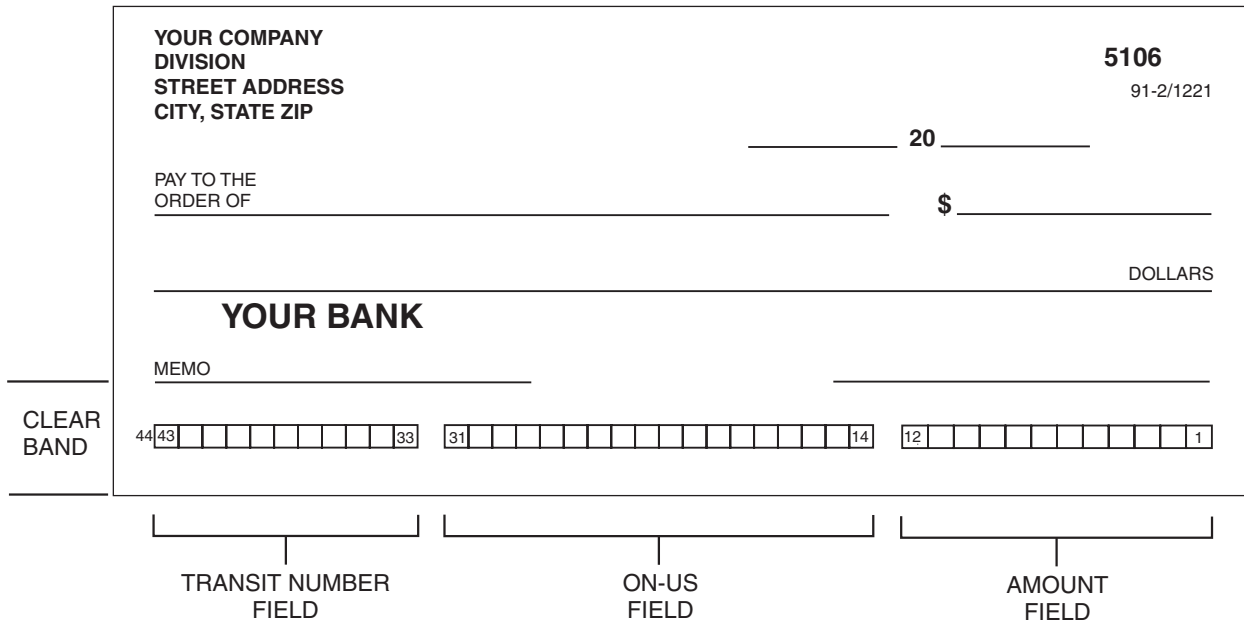
*Figure 16. MICR line field positions*

## Amount field, Positions 1–12

The amount field is fixed by convention as follows:

- Position 1 contains the amount symbol.
- Positions 2 and 3 contain the cents amount.
- Positions 4 to 11 contain the dollar amount. An added zero fills each position to the left the dollar amount, up to and including position 11.
- Position 12 contains the amount symbol.

## On-us field, positions 14–31

The arrangement of characters and symbols in the on-us field is determined by the bank the checks are drawn on. These characters must be reproduced exactly as the bank has specified. Consultation with the bank is highly recommended.

## Transit field, positions 33–43

The transit field identifies the institution upon which the check is drawn. The field is fixed by convention as follows:

- Position 33 contains the transit symbol.
- Position 34 contains the check digit.
- Positions 35 to 38 contain the ABA bank number (numerator).

  **Note:** In Canada a dash symbol is required in position 37.
- Positions 39 to 42 contain the routing number (denominator).
- Position 43 contains the transit symbol.

## External process control field, position 44 (optional)

This field is used only for items that are not required to be returned to the issuing institution. The character to use is controlled by the ANSI committee on banking standards.

### Auxiliary on-us field, positions 45–65 (optional)

The arrangement of characters and symbols in the auxiliary on-us field is determined by the bank the checks are drawn on. The field usually contains the check serial number bracketed by on-us symbols. This field can be used only for checks longer than 152 mm (6 in.). The content of this field can begin in position 49.

## MICR quality control

If used correctly, the IBM Infoprint 4000/4100 will produce quality MICR documents. To produce quality MICR documents consistently, you must monitor both the application program and the printer output to be sure both are within banking specifications. You must assume responsibility for the quality of the documents released into the banking system. The banking system must assume the responsibility of having adequate, properly maintained reader systems.

A special MICR toner is used in the printer, which contains iron particles. The print does not look as black as with non-MICR toners. This should not be considered a problem, because it is a characteristic of MICR toner.

The strength of signal that is generated in the MICR readers by MICR characters is a function of the magnetic strength and size of the iron particles, the amount of iron particles in the toner, the amount of toner placed on the paper (pile height), and the relative shape of the printed characters. Most readers read the relative length of the vertical edges/transitions of the characters. Increasing the amount of iron on the page will produce stronger signals at the magnetic character reader. Too little MICR toner on the page will produce a low signal and increase the reject rate. Too much MICR toner will produce pile height that is too high and can contaminate the check reading equipment.

The operator can adjust the MICR signal strength by adjusting the contrast setting. Changing the contrast settings will vary the amount of toner on the paper. When the signal strength is too low, a higher contrast setting can be selected. When the signal is too high a lower contrast setting can be selected.

A MICR verifier/analyzer device (which should be made available by the customer for operator and SSR use) is required to achieve the best signal strength. Correct character position can be assured using an overlay or Glarden Gauge. IBM requires that these devices meet ANSI Standard X9.27-1995 or higher, for Magnetic Ink Character Printing (MICR). An operator must vary the contrast setting until good MICR signals are obtained. Experience has shown that a check average of 110 - 140% of the standard, for all characters on the page, is usually the best signal strength to obtain. However, the standard lower and upper limits for each character are 50% and 200% respectively. Since there is a variety of check stock papers and since paper characteristics can effect signal strength, the contrast setting may need to be readjusted for each check stock paper the customer uses. IBM printers can store these parameters for a large number of forms in snapshots.

### Quality control tools

To correctly evaluate the quality of MICR printing on the Infoprint 4000/4100, you will need the following tools:

- **MICR printing and layout gauge**

  A MICR registration and layout gauge (Glarden gauge) is supplied with various MICR test devices. The gauge tests the placement of the MICR characters on the page. It can also be used to verify registration and to check the clear band area. Check the clear band area on the back side of the check also, because the magnetic materials read through the paper.

- **Clear band overlay**

  The clear band overlay is a mask that blocks from view everything except the clear band and is used to check for extraneous toner that may appear on the printed sheet. The MICR layout gauge can be used for this function if the MICR line appears on the bottom of the sheet.

If you design your forms with the MICR line other than on the bottom of the sheet, you should make a mask for each application. For example, if you plan to print documents with three checks on a sheet, make a mask from clear plastic that blocks all areas other than the three MICR line.

- **MICR signal strength tester**

  A signal strength tester may be used to determine the magnetic signal strength of the MICR characters because it is not possible to determine the magnetic signal strength by visual examination.

  You will need to obtain a signal strength MICR check reader to assure acceptability of your MICR printing.

## MICR quality and format verification

The MICR quality check verifies registration, clear band, voids, and signal strength. The format check verifies that the correct MICR information is being printed on its specified position on the document. To verify the quality and format requires a periodic sampling of the printed sheets.

### Sampling frequency

The frequency of checking MICR print quality is based on how many prints the user is willing to reprint should a problem be detected. Greatest attention should be paid at the beginning of a MICR job. The schedule below can serve as a guide for MICR printing applications. With experience, the user of the Infoprint 4000/4100 will discover the best verification frequency.

| Time | Action |
|------|--------|
| Start of job | MICR quality check and format check |
| Every 2 hours | MICR quality check |
| Change of forms | MICR quality check |

### Vertical registration

The Infoprint 4000/4100 places characters in the same place from page to page within the specifications of MICR printing. The MICR layout gauge measures registration and character placement. The MICR document is inserted into the gauge, and the right-hand edge is aligned with the right side of the gauge. The printer prints approximately three pages per each revolution of the imaging drum. Therefore three consecutive pages should be examined to verify that the characters are aligned vertically and centered within the boxes.

Vertical registration can be adjusted on the touchscreen.

### Horizontal registration

In the US, ensure correct horizontal registration by examining character box 33. This box should contain the transit symbol. Ideal placement is for the right edge of the transit symbol to line up with the right side of character box 33. The right side of the transit symbol can be no more than half of a character box left or right of the right side of the box.

Horizontal registration can be adjusted on the touchscreen.

### Clear band area

The clear band area is the bottom 15.875 mm (0.625 in.) of a MICR document. This area can contain only MICR characters. The application program must not contain any instruction to print in this area. Because the Infoprint 4000/4100 printers use magnetic toner, borders and signatures that stray into the clear band area can cause rejects. To avoid such rejects, it is recommended that the clear ban area be 19 mm (0.75 in.).

The printer prints three 8.5″ x 11″ pages per each revolution of the imaging drum. Therefore, a defect in the drum will appear at every three images. Three consecutive pages should be checked for extraneous toner using a mask or the layout gauge to examine the clear band on each page. Extraneous toner larger

than 0.076 x 0.076 mm (0.003 x 0.003 in.) should not be in the clear band area. If extraneous toner can be seen at a normal reading distance, the documents should not be put into circulation.

### Voids

Voids are the opposite of extraneous toner. Voids or malformed characters cause distortion in the magnetic signals read by a reader/sorter to determine what a character is. Characters must not contain a void larger than 0.203 x 0.203 mm (0.008 x 0.008 in.). Check three consecutive pages for voids. A void is acceptable if it is barely discernible at normal reading distance; however, numerous voids indicate that these documents should not be put into circulation.

## Using highlight color with the Infoprint 4000 and Infoprint 4100

The following is an introduction to using highlight color with the IBM Infoprint 4000 and Infoprint 4100.

To enable highlight color on the Infoprint 4000 and Infoprint 4100, do the following:
1. Select **Printer Definition → Features**.
2. Select **8B4273**.
3. Select **Enable**.
4. Select **Close**. A restart occurs automatically. Do not attempt any other task until the restart completes.

Innovations in high-speed printing technology have made it possible to produce customer documents with highlight color, including color variable data fields, at only a little greater cost per page than black printing. Highlighting key information improves the readability of documents, and the readers' comprehension of the information.

The Advanced Function Common Control Unit (AFCCU) in the Infoprint 4000 and Infoprint 4100 work with your AFP applications and your Print Services Facility (PSF) printing subsystem to print one highlight color on a page in addition to black printing. Printer 1 of the Infoprint 4000 and Infoprint 4100 prints the black portion of the page, and Printer 2 prints color. You can print at rated speed of the Infoprint 4000 and Infoprint 4100 printer, allowing you to take advantage of highlight color without sacrificing the high throughput of your roll-feed production printers.

If you are considering using highlight color for the first time, you may want to read some of the many reports and design guidelines on color printing available from consultant services and color printing experts. Using color effectively in business documents is not rocket science, but there are some well-established "Do's and Don'ts" that will help you make your documents the best they can be. Once you know how you want your document to look, this documentation will help you understand how highlight color operates, and how to develop your Advanced Function Presentation (AFP) application to use its highlight color capabilities. Many existing AFP applications can take advantage of highlight color without any program changes at all, by simply changing an overlay or Page Definition to specify areas to be printed in color. Applications that generate fully formatted AFP datastream (AFPDS, or MO:DCA (Mixed Object Document Content Architecture)) may require some redesign. If you need assistance with your application design and/or implementation, contact your IBM Printing Systems Division marketing representative to discuss a services contract with IBM PSD Application Solutions.

Products such as the Page Printer Formatting Aid (PPFA), Overlay Generation Language (OGL) and the AFP Toolbox support development of highlight color applications and AFP resources. Color can be added to variable data with a Page Definition, to an overlay using OGL, to images such as logos and signatures, or as highlight color boxes under black text. Print Services Facility (PSF) or Infoprint Manager sends the color information to the printer in the IPDS (Intelligent Printer Data Stream) printer command stream. The AFCCU generates separate bitmaps for black and color printing. The black bitmap is passed to Printer 1 for printing, while the color bitmap is printed in Printer 2.

# Prerequisites

In order to use highlight color with the Infoprint 4000 and Infoprint 4100, you must:

- Use one of the following models that supports highlight colors:
    - Infoprint 4000 Models ID1/2 with Feature 4445
    - Infoprint 4000 Models ID3/4 with Feature 9945
    - Infoprint 4000 Models ID5/6
    - Infoprint 4100 Models HD1/2
- Install the RPQ for highlight color for Infoprint 4000 Models ID1/2 and ID3/4.
- Install the Enhanced Operator Console with Version 11.3 code or higher, if it is not already available.
- Order an individual customer changeable developer (CCD) for each color you use.
- Put black toner in Printer 1 and color toner in Printer 2. Otherwise you cannot use tractorless forms (if you are printing black on side 1 and color on side 2), Side 1/Side 2 Verification, and the Forms Identification (Barcode) feature.

    **Note:** Tractorless forms are not supported if you are printing simplex jobs.
- Create jobs that use highlight color correctly. Observe the following constraints:
    - Highlight color can be on the same side as black toner by submitting the job as a simplex job with Highlight Color #1 specified. If the printer is threaded for a duplex job, you need to rethread it. Refer to "Threading the printer (side 1 to side 1)" on page 75 for more information.
    - If you want to print highlight color on the back side of a duplex job, you don't have to make any changes to already existing black jobs. The front side will print in black and the back side will print in color.

    Refer to "Planning the application" on page 69 for information about creating jobs to use this feature and to "Threading the printer (side 1 to side 1)" on page 75 for information about threading the printer.

The following limitations apply:

- Auto-align is only available when the color CCD is located in Printer 2 of a duplex system. Auto-align is not supported in a simplex system.
- Data verification between black and color data is not available. For this reason, IBM does not recommend printing sensitive customer data in color toner.
- Although it is possible to print both 1-D and 2-D barcodes with color toner, not all barcode scanners and readers will be able to properly decode a color barcode. For this reason, it is not recommended to print bar codes with color toner.
- CCDs are not interchangeable between different printer engines or models. A CCD is dedicated to one serial numbered printer engine. Additional CCDs can be ordered to print other color or MICR applications.
- Once a CCD is loaded with one color toner, it cannot be changed to another type of toner.
- Tractorless mode is only supported for duplex applications when the color CCD is located in engine 2. Simplex applications with a highlight color are not supported in tractorless mode.
- Custom colors are not available.
- The AFCCU cannot detect which, if any, color CCDs are installed. It is the operator's responsibility to determine if the CCD installed matches the application being run.
- There is no AFCCU detection of color, meaning the AFCCU does not know which toner (black or color) is installed.
- Infoprint Fidelity Manager, also known as Densitometer, (FC 4832 or 4833) is not supported.
- Side 1/Side 1 Verification is not supported.
- No Print on Demand (POD) jobs (statements printing only).
- CE printhead alignment is required.

## Aligning the printhead

The printhead in Infoprint 4000 and Infoprint 4100 duplex printing systems must be correctly aligned in order for your jobs to print correctly. Contact your IBM service representative to perform this alignment for you.

## Considering print registration

Highlight color is implemented by rendering a separate bitmap in the AFCCU for black and for the highlight color to be printed. A bitmap is a two-dimensional array of 0's and 1's.

Figure 17 shows how a bitmap is placed on the physical form. The origin (0,0) is the location at which the
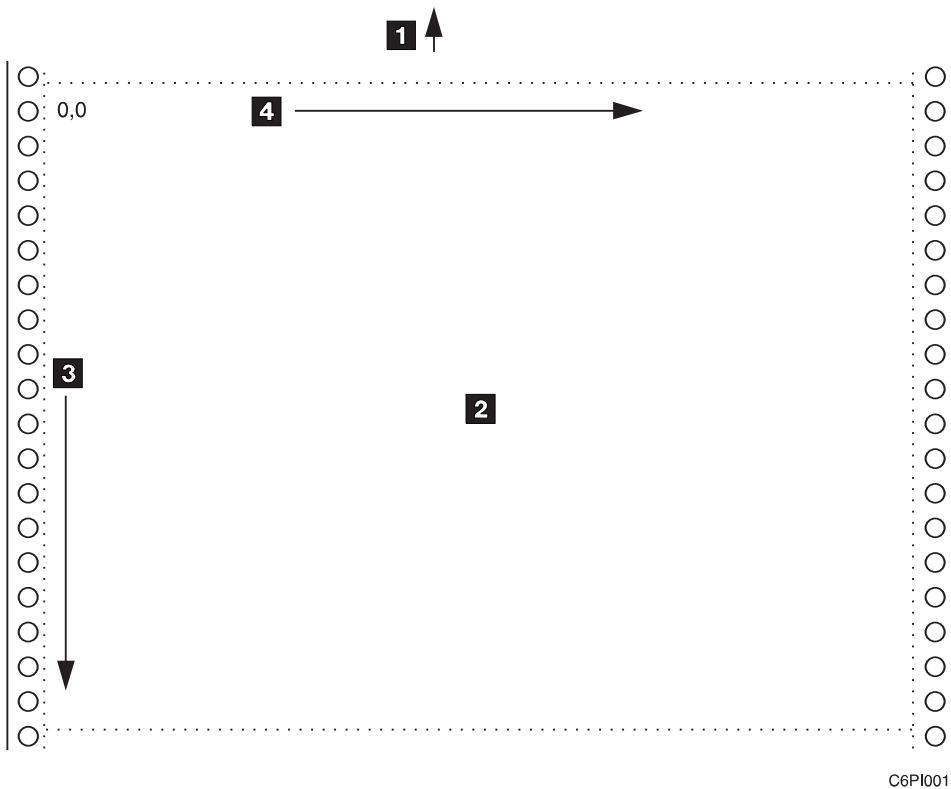


C6PI0013

*Figure 17. Bitmap orientation*

scan direction and process direction begin. The term ″scan direction″ refers to the direction in which the Infoprint 4000 and Infoprint 4100 printers generate image across the form. The scan direction is perpendicular to the to the direction in which the forms are moving through the printer. The term ″process direction″ refers to movement through the various stages of the printer's imaging system, and is parallel to the direction in which the forms are moving through the printer.

While the Infoprint 4000 and Infoprint 4100 printer 1 is imaging everything to be printed in black, a separate bitmap for highlight color is passed to printer 2. When designing a highlight color application, the accuracy with which the Infoprint 4000 and Infoprint 4100 printing system's Printer 1 and Printer 2 can place the bitmaps with respect to each other must be considered.

Refer to the *Infoprint 4000/4100 Operator's Guide* for instructions on setting print registration.

# Planning the application

Now that you know how the highlight printing process works, you are ready to start planning and implementing your highlight color application. You probably have an existing application that prints in black today, and plan to add highlight color to call attention to certain information on the page.

## Designing the document

Starting with the application's current output, identify the information you want to emphasize using highlight color. Keep in mind that when adding color for focus or emphasis, less is more. Too much color becomes distracting and defeats your purpose of focusing the reader's attention on specific information. If you are not familiar with the concepts and guidelines for using color effectively in business documents, you may want to research the subject before you start your design. Identify the information to be highlighted and choose the colors you think are most effective.

Color must be specified as Highlight Color #1. If it is specified as OCA named color ″Blue″, it will be simulated as black or grayscale and will print with black ink. It is possible to use a Color Mapping Table (refer to your software application's documentation for more information) that would map an OCA named ″Blue″ to Highlight Color #1. In this way an OCA named ″Blue″ could be used.

## Example of highlight color application: OUTBACK

The OUTBACK cable TV billing application is an example of an AFP overlay. Overlay Generation Language (OGL) was used to develop the overlay in Figure 18 on page 70. Use the *Overlay Generation Language /370 User's Guide Reference*, S544–3702 for further information about commands and structure within the overlay file. Figure 18 on page 70 is followed by the associated OGL commands.

**1** OUTBACK ®**2**
CABLE TV, INC.

**3** PLEASE
PRESENT
THIS
STATEMENT
WITH
PAYMENT

Statement Date:
Transaction Cut-Off:
Amount Due:
Due on or Before:

STATEMENT OF ACCOUNT NO.:

**4** OUTBACK ® **5**
CABLE TV, INC.

**6** For inquiries call
CUSTOMER
SERVICE
at PSC-IBM-3900.

Statement Date:
Transaction Cut-Off:
Amount Due:
Due on or Before:

| DATE | POSTED DATE | DESCRIPTION | AMOUNT |
|------|-------------|-------------|--------|

| Connection Fees | Subscription Fees | Converter Fee | Service Fee | PPV/Premium | Adjustment | Other |
|-----------------|-------------------|---------------|-------------|-------------|------------|-------|

**7** IMPORTANT
NOTICE:
Effective 1/1/97, There is a $5.00 increase to your
monthly basic subscription service. Thank You.

ACCOUNT SUMMARY

| BEGINNING BALANCE | CHARGES (+) | PAYMENT (-) | ENDING BALANCE **8** |
|-------------------|-------------|-------------|----------------------|

Please disregard if payment has already been made.

AV8M0026

*Figure 18. Overlay Output*

```
-'********************************************************************'
-'*   cable TV bill for Infoprint 4000 and 4100 with color           *'
-'********************************************************************'
          control replace;
          overlay out1c  size 8.50 in 11.0 in offset 0.0 in 0.0 in;
          orient 0 ;
          setunits 1 in 1 in;

      -'*   define the highlight colors    *'

          DEFINE 0001  COLOR  HIGHLIGHT 1 ;    -'100 percent'
          DEFINE 0002  COLOR  HIGHLIGHT 1 coverage 66; -'66 percent'
          DEFINE 0003  COLOR  HIGHLIGHT 1 coverage 33; -'33 percent'

          font font6  h22061 filetype font300;  -'helvetica 6 pt'
          font font6b h42061 filetype font300;  -'helvetica 6 pt bold'
          font font7  h22071 filetype font300;  -'helvetica  7 pt'
          font font7b h42071 filetype font300;  -'helvetica  7 pt bold'
          font font8  h22081 filetype font300;  -'helvetica  8 pt'
          font font8b h42081 filetype font300;  -'helvetica  8 pt bold'
          font font8c h22081 filetype font300;  -'helvetica  8 pt hilite 1'
            COLOR 0002;                     -66% coverage'
          font font9  h22091 filetype font300;  -'helvetica  9 pt'
          font font9b h42091 filetype font300;  -'helvetica  9 pt bold'
          font fon12  h220b1 filetype font300;  -'helvetica 12 pt'
          font fon12b h420b1 filetype font300;  -'helvetica 12 pt bold'
          font fon14  h220d1 filetype font300;  -'helvetica 14 pt'
          font fon14b h420d1 filetype font300;  -'helvetica 14 pt bold'

          font trade  gte1   filetype font300   -'trade mark    '
            COLOR 0001  ;                   -'HELVETICA 24'
          font logo   h520n1 filetype font300
            COLOR 0001  ;                   -'HELVETICA 24 used for logo'

  1   -'place the name at 100% highlight 1'
          position 0.50 0.80 ;
          settext line logo 'OUTBACK';        -'Outback Logo'

  2   -'place the trademark character at 100% highlight 1'
          position 2.28 0.60 ;
          settext line trade hex 'AF';        -'Trade Mark'

          position 0.55 1.00 ;
          settext line font9 'CABLE TV, INC.' ;

  3   -'draw a box with no rules using highlight 1 at 33% coverage'
                        -'to cover the "PLEASE PRESENT" text'
          position 7.30 0.53 ;
          drawbox 0.70 0.30 0 color 0003  ; -'33% coverage'


|
```

```
          position 7.30 0.50 ;
          drawbox 0.70 0.90 0
            withtext center center spaced 9 points
              line font7  'PLEASE'
              line font7  'PRESENT'
              line font7  'THIS'
              line font7  'STATEMENT'
              line font7  'WITH'
              line font7  'PAYMENT' ;

          position 5.00 1.43 ;
          drawbox 1.15 0.60 0
            withtext top left spaced 12 points
              line font9  'Statement Date:'
              line font9  'Transaction Cut-Off:'
              line font9  'Amount Due:'
              line font9  'Due on or Before:' ;

          position 1.00 2.60 ;                              '
          drawbox 7.40 0.30 0
            withtext center center
              line fon12b 'STATEMENT OF ACCOUNT NO.:'  ;

          position .50 2.90 ;
          drawrule 7.50 3 dashed ;               -'Tear off'

  4    -'place the company name at 100% highlight 1'
          position 0.50 3.30 ;
          settext line logo 'OUTBACK';          -'Company Logo'

  5    -'place the trademark character at 100% highlight 1'
          position 2.28 3.10 ;
          settext line trade hex 'AF';          -'Trade Mark'

          position 0.55 3.50 ;
          settext line font9 'CABLE TV, INC.' ;

  6    -'draw a box with no rules using highlight 1 at 33% coverage'
                      -'to cover the "For inquiries call" text'
          position 7.30 2.98 ;
          drawbox 0.70 0.15 0 color 0003 ;  -'33% coverage'

          position 7.00 3.00 ;
          drawbox 1.00 1.00 0
            withtext top right spaced 9 points
              line font7 'For inquiries call'
              line font7 'CUSTOMER'
              line font7 'SERVICE'
              line font7 'at PSD-IBM-4000.'  ;

          position .50 3.60 ;
          drawrule 7.50 3          ;                -'solid rule'

          position 5.00 3.90 ;
          drawbox 1.15 0.60 0
            withtext top left spaced 12 points
              line font9  'Statement Date:'
              line font9  'Transaction Cut-Off:'
              line font9  'Amount Due:'
              line font9  'Due on or Before:' ;
```

```
              position 0.50 5.00 ;
              drawbox 7.50 0.25 0 shade 9 ;

              position 1.10 5.17 ;
              settext line font8b 'DATE' ;

              position 2.05 5.17 ;
              settext line font8b 'POSTED DATE' ;

              position 3.80 5.17 ;
              settext line font8b 'DESCRIPTION' ;

              position 6.30 5.17 ;
              settext line font8b 'AMOUNT' ;

              position 0.50 7.80 ;
              drawbox 7.50 0.25 0 shade 6 ;

              position 0.70 7.96 ;
              settext line font8b 'Connection Fees' ;

              position 1.80 7.96 ;
              settext line font8b 'Subscription Fees' ;

              position 3.00 7.96 ;
              settext line font8b 'Converter Fee' ;

              position 4.15 7.96 ;
              settext line font8b 'Service Fee' ;

              position 5.15 7.96 ;
              settext line font8b 'PPV/Premium' ;

              position 6.25 7.96 ;
              settext line font8b 'Adjustment' ;
              position 7.35 7.96 ;
              settext line font8b 'Other' ;

   7   -'draw a box with no rules using highlight 1 at 33% coverage'
                      -'to cover the "IMPORTANT NOTICE" text'
              position 7.30 8.43 ;
              drawbox 0.70 0.30  0 color 0003 ; -'33% coverage'

              position 4.98 8.45 ;
              drawbox 3.00 0.55 0
                withtext top right spaced 10 points
                   line font8  'IMPORTANT'
                   line font8  'NOTICE:'
                   line font8  'Effective 1/1/97, There is a $5.00 increase to your'
                   line font8  'monthly basic subscription service.  Thank You.' ;

              position .50 9.10 ;
              drawrule 7.50 3        ;                 -'solid rule bottom'
```

|

```
        position 0.10 9.10 ;
         drawbox 8.30 0.40 0
           withtext center center
                 line fon12b 'A C C O U N T   S U M M A R Y' ;

         position .50 9.50 ;
         drawrule 7.50 3        ;                -'solid rule bottom'

         position 0.80 9.75 ;
         settext line font8 'BEGINNING BALANCE' ;

         position 2.95 9.75 ;
         settext line font8  'CHARGES (+)' ;

         position 4.65 9.75 ;
         settext line font8 'PAYMENT (-)' ;

8   -'place 'ENDING BALANCE' string, highlight 1 at 66% coverage'
         position 6.45 9.75 ;
         settext line font8c 'ENDING BALANCE' ; -'66% coverage'

         position .50 10.20 ;
         drawrule 7.50 3  ;                      -'solid rule bottom'

         position 0.10 10.35 ;
          drawbox 8.30 0.20 0
           withtext center center
                 line font8 'Please disregard if payment has already been made.';
```

# Application considerations

Rendering of the colors is inherently device and resolution independent. The command to cover an area with highlight color in some percent coverage is not resolved into a bitmap until it is being processed in the printer.

## Page synchronization

When there is an error during printing on an AFP printer, for example a paper jam or unexpected communications failure, the PSF print software will recover the job and continue to print at the last page in process when the error occurred. When printing on printers with long paper paths, such as the Infoprint 4000 and Infoprint 4100 duplex printers, and printers with attached post-processors, this process is quite complex. PSF must take into account not only the pages in the printer, but also the pages in any attached post-processing equipment. In rare instances, it is possible for side 1 and side 2 of a document to get out of synchronization. Because of the long paper path through the Infoprint 4000 and Infoprint 4100, this same possibility exists for a highlight color application. The following are some suggestions for techniques that can be considered to insure page synchronization.

*Duplex Side 1/2 Verification:*  The Infoprint 4000 and Infoprint 4100 duplex printing system can verify the proper alignment and synchronization of side 1 and side 2 of a document when printing on these systems. A requirement is that the black toner must be in engine 1 and the color toner must be in engine 2.

**Note:** When printing simplex jobs, Side 1/1 Verification is not supported.

*Program-controlled synchronization verification:*  For an application that is printing numbers in color, for example the amount now due, while the main part of the page is standard text printed in black, it would be desirable for the operator to have some means to verify that the correct color data is, in fact, being printed on a page after a recovery action. One technique for doing this is to duplicate printing of the color data in black in very small type at the edge or bottom of a page. This data redundancy technique gives the operator something to compare to insure synchronization. This technique has been used effectively in

printing systems in which the variable data is system generated, while page formatting instructions for each page are stored independently in the printer and coordinated by the printer on a page by page basis.

## System software support differences

You may need to develop your application on one IBM system environment for printing on another, or you may be developing applications for sale to customers in a variety of system environments. Contact the IBM Software Support Center for the product of interest or contact your IBM Printing Systems Division Marketing Specialist for the most up to date information on the exact software support you can expect on a given system.

# Threading the printer (side 1 to side 1)

Refer to the *Infoprint 4000/4100 Operator's Guide* for instructions on loading forms in the printer. However, remember that you do not want to invert the forms between Printer 1 and Printer 2. Therefore, refer to "Straight line configuration (side 1 to side side 1)," "Left angle configuration (side 1 to side 1)" on page 76, and "H-configuration (side 1 to side 1)" on page 77 for instructions on threading the Buffer/Flipper Unit.

## Straight line configuration (side 1 to side side 1)

Figure 19 on page 76 shows the Buffer/Flipper Unit viewed from the front.

Use Figure 19 on page 76 to thread the forms through the Buffer/Flipper Unit. Use the numbered arrows as guides from Printer 1 at the middle of the figure (arrow **(1)**) to Printer 2 at the bottom of the figure (arrow **(5)**). The result is that the forms are buffered but not inverted between Printer 1 and Printer 2.

The guide collars on the roller bars, denoted by letters **(A)** through **(D)**, were adjusted properly when the system was initially installed. Adjustments by you are probably not necessary, even if you are threading a form through the system with a different width than you previously threaded.
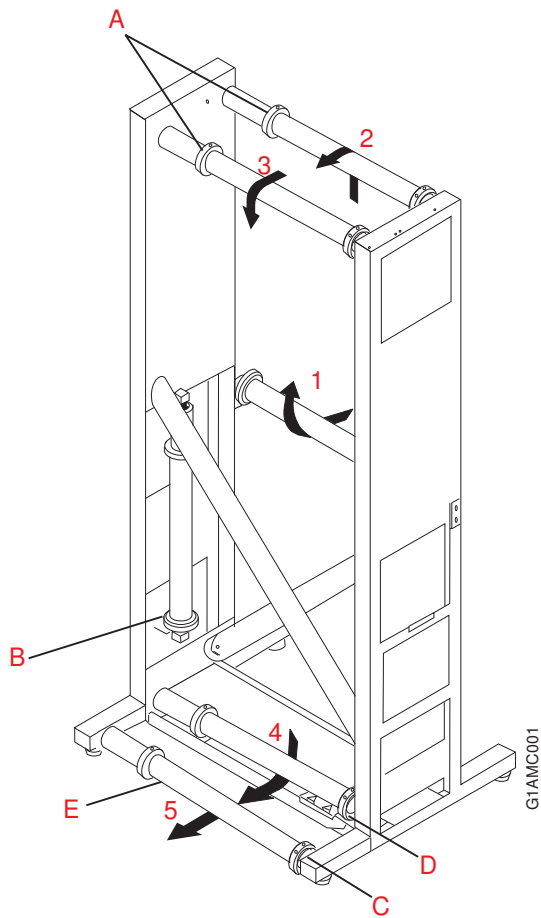
*Figure 19. Inline configuration for the tall buffer/flipper unit*

## Left angle configuration (side 1 to side 1)

Figure 20 on page 77 shows the Buffer/Flipper Unit from the front.

Use Figure 20 on page 77 to thread the forms through the Buffer/Flipper Unit. Use the numbered arrows as guides from Printer 1 at the middle of the figure (arrow **(1)**) to Printer 2 at the bottom of the figure (arrow **(9)**). The result is that the forms are buffered but not inverted between Printer 1 and Printer 2 and also make a 90° turn.

The guide collars on the indicated roller bars, denoted by letters **(A)** through **(D)**, were adjusted properly when the system was initially installed. Adjustments by you are probably not necessary, even if you are threading a form through the system with a different width than you previously threaded.

**Note:** Items **(E)** and **(F)** are additional items that you need for a (side 1 to side 1) left angle configuration.
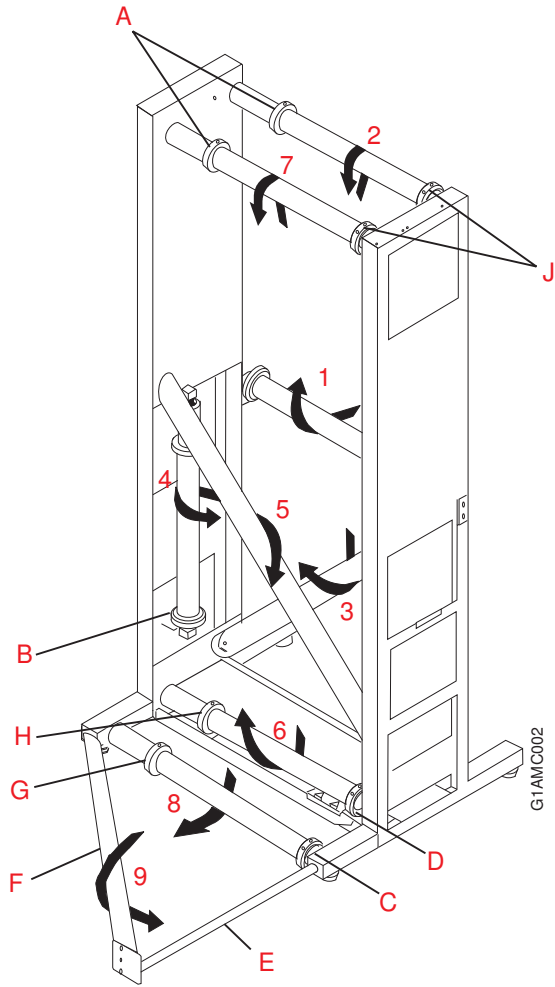
*Figure 20. Left angle configuration for the tall buffer/flipper unit*

## H-configuration (side 1 to side 1)
H-configuration shows the Buffer/Flipper Unit from the front.

Refer to the diagram when threading the Buffer/Flipper Unit. As the form enters the flipper, its rear edge should run close to the collar. As the form leaves the 45° bar, the edge should line up with the tractors of Printer 2. The result is that the forms are buffered but not inverted between Printer 1 and Printer 2 and also make a 90° turn.
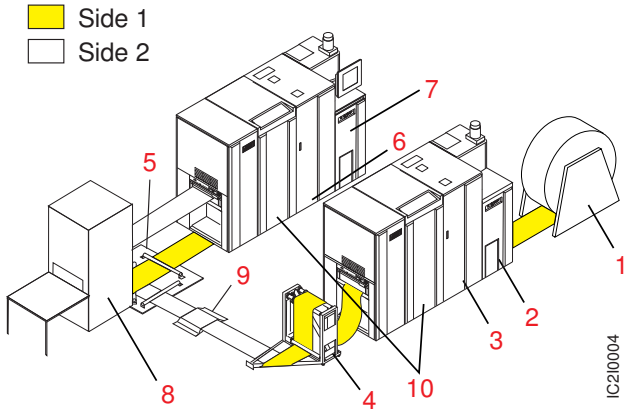
*Figure 21. H-configuration for the tall buffer/flipper unit*

# Chapter 3. Organizing the Planning Team

> **Chapter Overview**
>
> This chapter describes tasks for each planning team member and identifies additional resources to which team members can refer. Because printer operators participate in the daily operation of the printers, their duties are also in this chapter.

The first step in preparing to install the printer is to select a planning coordinator. This person is responsible for organizing and managing a project team to plan, order, and install the printer and, if necessary, the Advanced Function Presentation (AFP) programs.

A typical planning team includes the following members:
- Planning coordinator
- Physical planner
- System programmer
- Application programmer

You may also want to include representatives from end-user areas as part of the planning team. Their input can be valuable in determining requirements for advanced printing functions and special-purpose materials.

## Planning Coordinator

Throughout the planning phase, the planning coordinator meets with the planning team and the IBM installation planning representative to ensure that all pre-installation tasks are proceeding smoothly. "Implementation Plan" on page 81 is a checklist of these planning tasks.

The planning coordinator should read all the chapters in this publication to help the other team members prepare for the printer. The planning coordinator should also be familiar with the other manuals in the Infoprint 4000 and Infoprint 4100 Advanced Function Printers Library (see "Infoprint 4000 and Infoprint 4100 Advanced Function Printers Library" on page xiv).

In addition to the tasks described in this publication, the planning coordinator should consider related issues, such as:
- **Training** – Who needs to be trained on the printer or AFP? Who conducts the training sessions? When will training be scheduled?
- **Testing** – Who performs the printer or AFP tests? What applications should we test? What forms should we test? How can we conduct testing without affecting production schedules?
- **Implementation** – How will the printer be phased into production? What applications will use the printer first?
- **Documentation** – Which local procedures do we need to change? Who is responsible for changing local written procedures? Who needs copies of IBM hardware and software manuals?
- **Supplies** – How large should the initial printer supply order be? What is the local procedure for ensuring that supplies are kept in stock?
- **Attachment Cables** – Which attachment cables will be needed? Are they included on the printer order or will customer supply cables?

# Physical Planner

The physical planner is typically an industrial engineer or a supervisor. Physical planners determine the location for the printer and prepare a layout plan. They are responsible for ensuring that the environmental, electrical, and space requirements for the printer are met, and that the location is convenient for printer operators and customer engineers.

IBM offers special assistance with physical planning. Contact your IBM marketing representative for information.

Chapter 5, "Preparing the Physical Environment," on page 103 is directed primarily toward physical planners. It includes a physical planning work sheet and a site-preparation checklist.

# System and Application Programmers

System and application programmers typically plan for and order the required Advanced Function Printing licensed programs.

System programmers are responsible for:

- Ensuring that host channel cables, System/370, ESCON, FICON, Token Ring, FDDI, Ethernet, and any channel extenders, converters, multi-station access units, transceivers, or switching boxes required in the host attachment configuration are available for installation
- Ensuring that if SNMP is to be used, a TCP/IP (Ethernet, Token Ring, or FDDI) LAN feature code has been ordered as one of the attachments
- Installing and testing the licensed programs
- Incorporating the printer into the system configuration

Information about system requirements for the printers is in *Guide to Advanced Function Presentation*, G544-3876, and *Advanced Function Presentation: Printer Information*, G544-3290.

Application programmers create and modify application programs that interact with the licensed programs. Application programmers participate in testing forms and applications. Chapter 6, "Selecting and Testing Forms," on page 133 and the *Forms Design Reference for Continuous Forms Advanced Function Printers* contains information related to testing.

If you are a system or application programmer, read Chapter 4, "Preparing the Processing Environment," on page 83 for information about planning for installing licensed programs, and Appendix B, "Work Sheets," on page 183 for information about selecting printer options.

# Operator

Printer operators perform the following day-to-day tasks for the printer:

- Responding to the operational needs of the printer, such as loading forms and clearing forms jams
- Replenishing the printer supplies, such as toner, developer mix, fuser oil, oiler belt, toner collector bottle, and fine filter
- Performing routine cleaning
- Checking print quality
- Running traces
- Splicing forms (if required).

The *Operator's Guide*, supplied in softcopy format with each printing system, contains general operating procedures, and is the primary reference book for printer operators. Printer operators should also read "Supplies" on page 175 for information about printer supplies.

The *Quick Reference Guide*, supplied with each printing system, contains the tasks an operator may need to run when the online help is not available.

## Implementation Plan

This checklist contains many of the major tasks that must be performed before and during the printer's installation. Use this checklist as a basis for developing your own detailed implementation project plan.

## Fifteen Weeks Before Delivery

The *planning coordinator*:

__ 1. Identifies the members of the planning team.

__ 2. Orders the printer.

   **Note:** Ensure that the Infoprint Multiple Printer Controller (MPC) and Infoprint Manager software are also ordered.

__ 3. Orders the IBM Advanced Function Presentation licensed programs.

__ 4. Orders any additional hardware that is required, such as the turnbar/flipper device and the 'h' configuration adapter (RPQ 8B4056) for the 'h' printer configuration (Infoprint 4000 models).

__ 5. Verifies the order for the appropriate channel cables, System/370, ESCON, TCP/IP, FICON, and for any required channel extender, converter, or switching hardware boxes in the channel interface. Determines if customer will supply any of the attachment cables or devices.

__ 6. Prepares a plan for selecting and testing forms for use with the printer.

The *physical planner*:

__ 1. Determines the location for the printer and arranges for any changes to the site. Ensures that the site will have conductive flooring.

__ 2. Identifies the delivery route for the printer.

__ 3. Prepares a space layout plan.

__ 4. Determines who will install the electrical wiring and outlets.

__ 5. Determines the type of electrical attachment and ground-fault circuit protection to be used.

The *system programmer*:

__ 1. Determines the Advanced Function Presentation licensed programs needed.

__ 2. Creates a conversion plan for line-printer data and electronic overlays.

The *application programmer*:

__ 1. Identifies the applications that must be changed for migration to the printer.

__ 2. Prepares a detailed plan for converting and testing applications that will be used with the printer.

## Ten Weeks Before Delivery

The *planning coordinator*:

• Meets with the IBM installation planning representative to review the planning process.

The *physical planner*:

• Schedules the installation of electrical wiring and outlets.

The *system programmer*:

__ 1. Determines the administrative procedures for using Advanced Function Presentation licensed programs.

__ 2. Begins installing and testing the Advanced Function Presentation licensed programs in the computer system.

## Eight Weeks Before Delivery

The *planning coordinator*:

• Orders initial supplies for the printer.

The *physical planner*:

• Ensures that the electrical wiring and outlets are being installed on schedule.

## Six Weeks Before Delivery

The *physical planner*:

__ 1. Reviews site-preparation progress with the IBM installation planning representative.

__ 2. Reminds the IBM service representative to order the CE Toolkit and Maintenance Information. See "CE Toolkit" on page 112 for ordering information.

## Four Weeks Before Delivery

The *physical planner*:

__ 1. Completes installing and testing of electrical wiring and outlets.

__ 2. Completes all site preparation.

__ 3. Verifies that a forklift will be available to unload the printers.

> **Note:** Uncrate the printers at the installation site.

## Arrival of the Printer

The *planning coordinator*:

• Contacts the service representative and arranges to have the printer installed.

The *system programmer*:

• Completes tests of the Advanced Function Presentation licensed programs, including the IBM-supplied installation verification procedures.

The *physical planner*:

__ 1. Unpacks the printer and inspects it for external damage.

__ 2. Moves the printer to the prepared site.

# Chapter 4. Preparing the Processing Environment

<div>
<strong>Chapter Overview</strong>

This chapter contains specific information to help system programmers plan for integrating the printers into the existing processing environment. The basic hardware, software, and application requirements for the printer are described in "Host System Attachment Choices" on page 49 and "Application Environment" on page 49.
</div>

## Channel and Local Area Network Attachments

Infoprint 4000 and Infoprint 4100 printers support a variety of attachments:

- FICON channel
- ESCON channel
- System/370 parallel channel
- Token Ring TCP/IP
- 10/100BaseT Ethernet TCP/IP
- Gigabit Ethernet TCP/IP
- FDDI TCP/IP (AFCCU microcode levels 11.x and earlier only)

See "Host System Attachment Choices" on page 49 for specifics on printers and host systems that support each of these attachments.

Infoprint 4000 and Infoprint 4100 printers support up to two attachments. The two attachments may be the same (for example, two ESCON channels) or mixed (for example, one ESCON and one Token Ring). The exception is that the printer can have only *one* TCP/IP attachment of any type. You cannot have two Token Ring attachments; two Ethernet attachments; or two FDDI attachments (AFCCU microcode levels 11.x and earlier only); or a combination of TCP/IP attachments (for example, one Token Ring attachment and one Ethernet attachment). The Infoprint 4100 can support a FICON attachment. When a FICON attachment is used, the second attachment cannot be a FICON attachment. The RISC System/6000 with AFCCU microcode Version 12.0 and later supports two active attachments simultaneously, one for host data and the second, Ethernet, for monitoring.

For duplex systems operating in dual simplex mode, only one attachment is needed to connect the two simplex engines to the system. Although the system consists of two printer engines, it is driven by a single control unit. The two simplex engines require two contiguous addresses on an ESCON, FICON, or parallel channel (beginning with an even-numbered address). When the printing system is operating in duplex mode, the printers can use one of these addresses or a separate address on the same channel.

When the printing system is printing in dual simplex mode, each printer engine can use a different attachment to the same or different systems. For example, Printer 1 can be printing jobs from an MVS system attached through an ESCON channel, while Printer 2 is printing jobs from an AIX system attached through a Token Ring.

When the printing system is printing in duplex configuration, only one attachment can be active at any given time. If both attachments are to the same system, a tightly-coupled system, ESCON, or FICON with Assign/Unassign and the attachments are of the same type (for example, both are ESCON), switching between the two attachments can be performed dynamically by the host system. If the attachments or hosts differ, or the hosts are not tightly-coupled, or Assign/Unassign is not used with ESCON or FICON, switching must be performed manually by the operator. The printer must be disabled from the current system and attachment before it can be enabled to the other attachment.

You can enable both ESCON or FICON links at the same time at the printer and then print jobs from different hosts without interference. This is done by the automatically enforced vary on/off (assign/unassign) protection. See "ESCON Multiple Host Environment" on page 86 for details and prerequisites.

As you plan the type and transfer mode for your channel-attachment configuration, refer to the system reference manual for your host system.

Verify with your planning coordinator that the desired attachment cables and any converter or extender hardware boxes are ordered when the printer is ordered.

## System/370 Channel Attachment

**Note:** Use attachment Feature Code 9960/4110 for AFCCU microcode level 11.x and earlier. Use attachment Feature Code 9610/6410 for AFCCU microcode level 12.0 and later.

You can configure System/370 channels to use either DC Interlock (double-tag) mode, or Data-Streaming mode.

You can configure Data-Streaming mode for one of the following transfer rates:
* 3.0MB per second
* 4.5MB per second

Use the highest data-streaming mode rate supported on the attaching host system.

When connecting directly to a System/370 channel, you can locate the printer at a maximum distance of 122 meters (400) feet from the channel if it is the only control unit on the interface. For each additional control unit ahead of the printer on the channel, the maximum distance is reduced by 4.57 meters (15 feet).

You also can connect the printer to the remote end of either an IBM 3044-II Fiber Optic Channel Extender or an IBM 9034 ESCON Converter to extend the maximum channel length by up to 3 kilometers (1.875 miles).

**Note:** Connection through a 3044-II is limited to the IBM 4361, ES/4381™, ES/9370™, and 3090™ processing systems only.
The IBM 9034, with either an IBM 9032 or 9033 ESCON Director, further extends the maximum channel length by up to 6 kilometers (3.750 miles) with one 9032/9033 in static connection mode (with RPQ approval), or by up to 9 kilometers (5.625 miles) with two 9032/9033 in static connection mode (with RPQ approval).

The Extended Distance Feature (XDF) on the 9032/9033 ESCON Directors also extends the distance. Submit an RPQ if you require the XDF. The RPQ approval specifies the maximum distance allowed for your environment.

The following figure shows the details of the above connection options, with the distance extensions shown on the Host System side of the diagram.

Parallel

(Note 1)

3 km    ESCON (MM)      9034   Parallel

3 km    Parallel    3044    Fiber Optic Parallel    3044   Parallel

(Note 3)6 km   ESCON (MM)    9032/9033    ESCON (MM)    9034   Parallel

HOST SYSTEM

(Note 3)9 km   ESCON (MM)   9032/9033   ESCON (MM)   9032/9033   ESCON (MM) 9034   Parallel    PRINTING SYSTEM

(Note 4)   XDF   ESCON (SM)   XDF 9032/9033   ESCON (MM)   9034   Parallel   (Note 2)

(Note 4)   XDF   ESCON (SM)   XDF 9032/9033   XDF ESCON (SM)   XDF 9032/9033   ESCON (MM) 9034   Parallel   (Note 2)

NWTI0012

*Figure 22. System/370 parallel channel attachment options*

**Notes:**

1. 61 meters (200 feet) maximum from PS/2® or RISC System/6000® (Models 0W1 and D02 only) 122 meters (400 feet) maximum from 4361, 4381, OS/390, ES/3090™, ES/9370, or ES/9000®.
2. When XDF in used in the interface, set the transfer mode between the 9034 and the printer to DC Interlock mode. To keep the performance acceptable, ensure that the cable length between the 9034 and printer is less than 100 feet.
3. RPQ approval is required for this configuration and distance.
4. RPQ approval is required and specifies the maximum distance for the environment.
5. SM = Single Mode (Laser Driver - 20 km maximum distance); MM = Multi Mode (LED Driver - 3 km maximum distance).
6. The System/370 channel attachment is not recommended for applications that are data intensive and require a high bandwidth.

## ESCON Channel Attachment

**Note:** Use attachment Feature Code 9970/4131 for AFCCU microcode level 11.x and earlier. Use attachment Feature Code 9631/6431 for AFCCU microcode level 12.0 and later.

When connected directly to an ESCON channel, the printer can be a maximum distance of 3 kilometers (1.875 miles) from the channel. Either an IBM 9032 or 9033 ESCON Director provides connectivity to additional host systems and also extends the maximum channel length as follows:

- Up to 6 kilometers (3.750 miles) with one 9032 or 9033 ESCON Director
- Up to 9 kilometers (5.625 miles) with two 9032 or 9033 ESCON Directors

The Extended Distance Feature (XDF) on the 9032 or 9033 ESCON Director also extends the maximum channel length as follows:

- Up to 23 kilometers (14.375 miles) with one Director
- Up to 43 kilometers (26.875 miles) with two Directors

The IBM 9036 ESCON Remote Channel Extender (Models 1 or 2) extends the interface across common carrier fiber optic connections. You can use one, two, or three 9036 extenders for a maximum distance of 43 kilometers.

The ESCON attachment is available on all Infoprint 4100 and 4000 models:

- For AFCCU microcode level 12.x and later, this attachment is feature code 9631/6431. The attachment has a MT-RJ fiber connector and uses multi-mode (MM) fiber cable. When ordering, refer to "Attachment cable features" on page 91 for information about selecting a cable.
- For AFCCU microcode level 11.x and earlier, this attachment is feature code 9970/4131. The attachment has a duplex ESCON fiber connector and uses multi-mode (MM) fiber cable. When ordering, select an ESCON cable of the appropriate length.

Figure 23 shows the details of the above connection options.
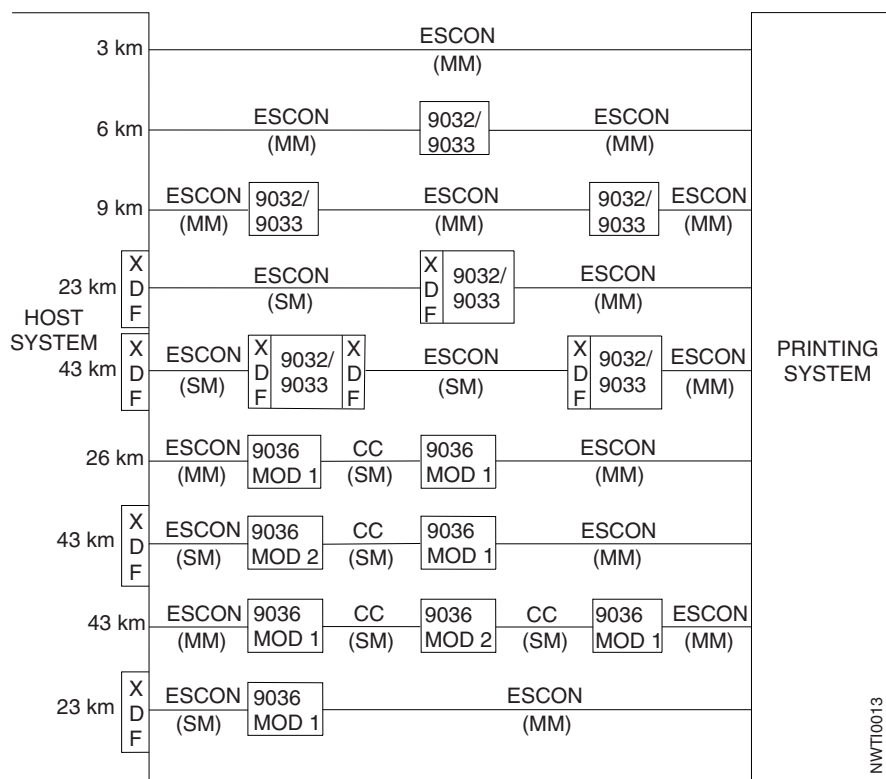


*Figure 23. Serial channel attachment options*

**Note:**

- CC = Common Carrier Fiber Optic Connection (SM)
- SM = Single Mode (Laser Driver - 20 km maximum distance)
- MM = Multi Mode (LED Driver - 3 km maximum distance)

## ESCON Multiple Host Environment

With ESCON, a single ESCON attachment can be shared between multiple LPARS or system images. However, the printer cannot be shared between multiple PSF hosts at the same time. Operational procedures must be put in place to take the printer off-line to the existing PSF host before bringing it on-line to another PSF. Otherwise, unpredictable print results can occur.

The printer ESCON configuration option for Multi-Host Environment insures that an operator cannot inadvertently vary the printer on-line to multiple PSF hosts simultaneously. This allows sharing of ESCON

attachments without concern that operator error could cause print problems. Use of the Multi-Host Environment option requires support for printer ASSIGN and UNASSIGN in both the operating system and PSF. Operating system support is provided in OS/390 V1R3.0 (which may be VM guests) and higher. PSF support is provided in PSF 3.1.0 for OS/390 and higher, and also with APAR OW29992 to PSF/MVS 2.2. Do not enable the printer configuration option for Multiple-Host Environment unless all hosts connected to the printer support printer ASSIGN and UNASSIGN. Otherwise, PSF cannot access the printer.

To allow access by a different PSF host, the operator must drain the printer and vary it off to one host before varying it on to the second host. A second host trying to vary on the printer is denied access with a notice that the printer is assigned elsewhere. The printer cannot be successfully varied on to the second host until the operator drains and varies it off to the first host. For more information on PSF/MVS ASSIGN and UNASSIGN support, see PSF for OS/390 Customization, or the documentation for APAR OW29992 to PSF/MVS 2.2.

# FICON Channel Attachment ( Infoprint 4100)

**Notes:**

1.  For longwave (LW) connections, use attachment Feature Code 9975/4175 for AFCCU microcode level 11.x and earlier. Use attachment Feature Code 9675/6475 for AFCCU microcode level 12.0 and later.
2.  For shortwave (SW) connections, use attachment Feature Code 9976/4176 for AFCCU microcode level 11.x and earlier. Use attachment Feature Code 9676/6476 for AFCCU microcode level 12.0 and later.

You can attach to a FICON channel as follows:
*   Directly to a host system FICON channel
*   To the remote end of an IBM 2032/2042 FICON Director
*   To the remote end of Dense Wavelength Division Multiplexor (DWDM)

FICON attachments may run at 1 Gbps (1 000 000 000 bits per second) or 2 Gbps, depending on the equipment used. The FICON fiber channel network will auto-negotiate to the appropriate speed.

For 1 Gbps attachment, the following guidelines apply:
*   Longwave (LW) maximum link distance is 10 kilometers for 9/125 um single-mode (SM) fiber.
*   Shortwave (SW) maximum link distance is 500 meters for 50/125 um multi-mode (MM) fiber.
*   Shortwave (SW) maximum link distance is 175 meters for 62.5/125 um multi-mode (MM) fiber.
*   Mode conditioning patch (MCP) cables may be used on each end of a multi-mode fiber to create a Longwave link with a maximum distance of 550 meters.

For 2 Gbps attachment, the following guidelines apply:
*   Longwave (LW) maximum link distance is 10 kilometers for 9/125 um single-mode (SM) fiber.
*   Shortwave (SW) maximum link distance is 300 meters for 50/125 um multi-mode (MM) fiber.
*   Shortwave (SW) maximum link distance is 120 meters for 62.5/125 um multi-mode (MM) fiber.
*   Mode conditioning patch (MCP) cables are not supported.

Set the host system missing-interrupt handler (MIH) timer for 15 minutes.

FICON attachment is available on all Infoprint 4100 models:
*   For AFCCU microcode 12.x levels, this attachment uses a duplex LC fiber connector and is capable of either 1 Gbps or 2 Gbps operation. To operate at 2 Gbps, all equipment on the link must be capable of 2 Gbps operation. See "Attachment cable features" on page 91 for information about selecting a cable. Feature codes are as follows:
    –   FICON LW attachment is Feature Code 9675/6475.
    –   FICON SW attachment is Feature Code 9676/6476.

- For AFCCU microcode 11.x levels, this attachment uses a duplex SC fiber connector and is capable of either 1 Gbps operation. Fiber cables with SC connectors are provided with the feature. Feature codes are as follows:
  - FICON LW attachment is Feature Code 9975/4175.
  - FICON SW attachment is Feature Code 9976/4176.
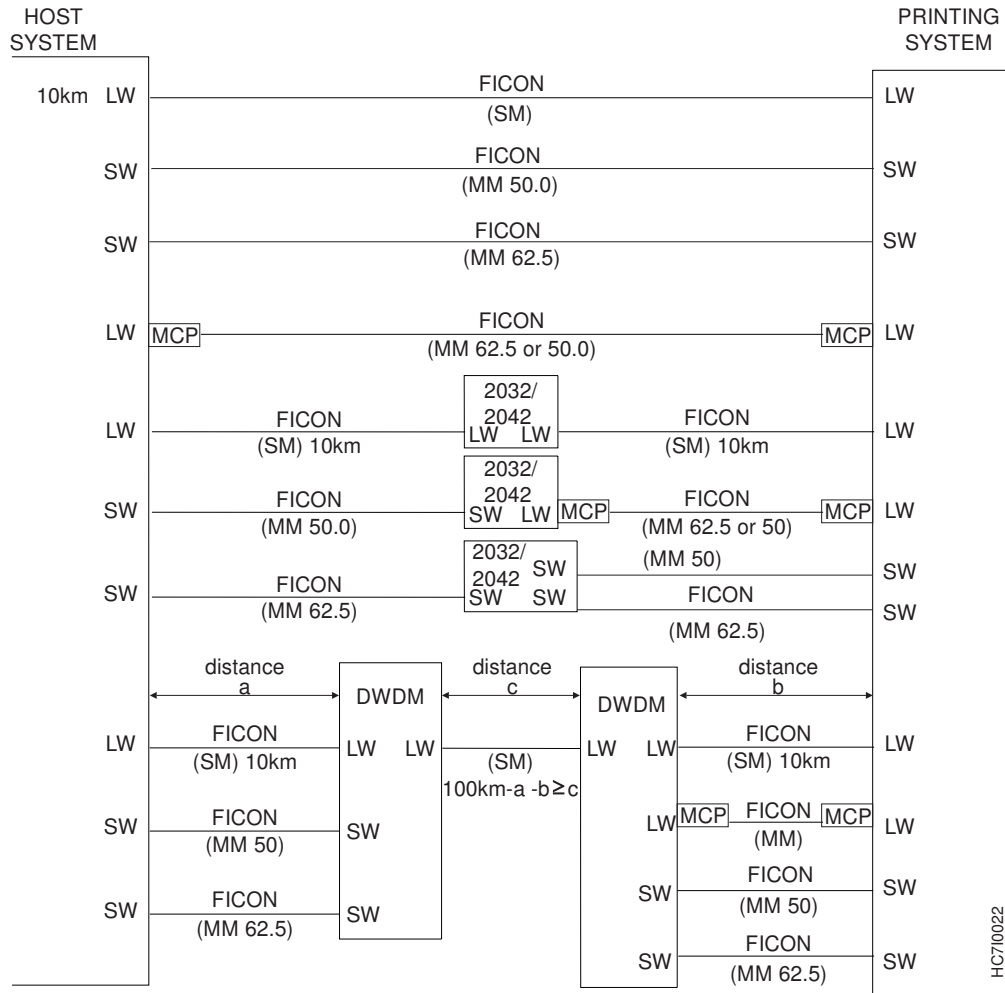


Figure 24. FICON channel attachment options

**Note:**

- SM = Single Mode Fiber
- MM = Multi Mode Fiber
- LW = Long Wave® Laser
- SW = Short Wave Laser
- um = micrometer or micron
- MCP = Mode Conditioning Patch Cable (1 Gbps only)

## Token Ring TCP/IP Local Area Network

**Note:** Use attachment Feature Code 9980/4121 for all AFCCU microcode levels.

You can attach the printer to a host token ring through IBM token-ring cabling with the IBM Token Ring Adapter. The adapter is installed in the printer AFCCU. The AFCCU can attach to either a 16Mbit/sec or a 4Mbit/sec Token Ring Local Area Network. The attachment conforms to the IBM Token-Ring Network Original Equipment Manufacture Interface. The following documents comprise this interface:

- *IBM Cabling System Technical Interface Specification*, GA27-3773
- *IBM Local Area Network Technical Reference*, SC30-3383
- *IBM Token-Ring Area Network Architecture Reference*, SC30-3374
- *Token-Ring Access Method and Physical Layer Specification*, IEEE Standard 802.5-1989

The printer can be a maximum of 100 meters from the 8228 Multistation Access Unit or 8230 Control Access Unit. For more information, refer to 8228 and 8230 publications.

You can increase the distance to the 8228 by using either the 8220 or 8219 Optic Fiber Repeater. For more information, refer to 8220 and 8219 publications.

The token ring attachment is not recommended for applications that are data intensive and require a high bandwidth. If possible, avoid token ring local area networks in new installations due to restricted availability of token ring LAN components.

## Ethernet TCP/IP Local Area Network

**Note:** Use attachment Feature Code 9993/4165 for AFCCU microcode level 11.x and earlier. For AFCCU microcode level 12.0 and later, the attachment is standard.

You can attach the printer to a host Ethernet through the Integrated Ethernet LAN adapter. The adapter is installed in the printer AFCCU. The AFCCU can attach to the following:

- 10/100BaseT
- Cabling must meet specifications in *ANSI/IEEE 802.3a, b, c, and e*.
- Ethernet Twisted Pair
  - To connect to 100BaseT LAN, use category 5 or 6 unshielded twisted pair (UTP) cabling supplied by the customer with a RJ45 connector.
  - To connect to 10BaseT LAN, use category 3, 4, or 5 (UTP) cabling supplied by the customer with a RJ45 connector.
- The building cabling must conform to *EIA-569* standard.

## Gigabit Ethernet SX (fiber) TCP/IP Local Area Network

**Note:** Use attachment Feature Code 9972/4172 for AFCCU microcode level 11.x and earlier. Use attachment Feature Code 9672/6472 for AFCCU microcode level 12.0 and later.

The Gigabit Ethernet SX feature is a TCP/IP attachment that offers high-speed data transfers using multi-mode optical fiber.

This feature is also known as 1000BASE-SX Ethernet.

The Gigabit Ethernet SX feature can be used to connect to a print server running PSF or Infoprint Manager software. The connection to the server can be direct (point-to-point) or through standard Gigabit Ethernet SX LAN connections.

The attachment complies with the IEEE 802.3z standard which is part of the IEEE 802.3 (2000) standard.

The Gigabit Ethernet SX attachment is a 1000BASE-SX PCI adapter that utilizes short-wave light and a duplex SC connector to connect to multi-mode optical fiber. When used with 62.5/125um multi-mode fiber the maximum cable segment distance is 275 meters (with 200 MHz-km cable). When used with 50/125 multi-mode fiber the maximum cable segment distance is 500 meters (with 400-500 MHz-km cable).

This attachment supports Jumbo Frames (frames larger than 1500 bytes). Since Jumbo Frame operation is not part of the IEEE 802.3 standard, its implementation should only be used on point-to-point links to another Gigabit Ethernet SX device of the same type.

This attachment is available on all Infoprint 4100 models and Infoprint 4000 models ID5/ID6 and ID3/ID4.
- For AFCCU microcode level 12.x, the Feature Code is 9672/6472. For this feature, the connector type is a duplex LC fiber connector. See "Attachment cable features" on page 91 for information about selecting a cable.
- For AFCCU microcode levels 11.x with Feature Code 4450/9450 installed, this attachment Feature Code 9972/4172. For this feature, the connector type is a duplex SC fiber connector. For Feature Code 4172, a 22m 62.5/125 multi-mode fiber cable with SC connectors on each end is included.

## Gigabit Ethernet TX (copper) TCP/IP Local Area Network

**Note:** Use attachment Feature Code 9982/4182 for AFCCU microcode level 11.x and earlier. Use attachment Feature Code 9682/6482 for AFCCU microcode level 12.0 and later.

The Gigabit Ethernet TX feature is a TCP/IP attachment that offers high speed data transfers using standard Category 5 or 6 UTP copper cabling.

This feature is also known as 10/100/1000 BASE-T Ethernet or 1000BASE-T.

The Gigabit Ethernet TX feature can be used to connect to a print server running PSF or Infoprint Manager software. The connection to the server can be direct (point-to-point) or through standard Gigabit Ethernet TX (copper) LAN connections.

The attachment complies with the IEEE 802.3ab standard which is part of the 802.3 (2000) standard.

The Gigabit Ethernet TX attachment is a 10/100/1000BASE-T PCI adapter that utilizes a RJ-45 connector to connect to a Category 5 or 6 Ethernet cable. When used with standard Category 5 or 6 Ethernet cabling, the maximum cable segment distance is 100 meters.

This attachment supports 10 Mb, 100Mb, and 1000Mb links to an Ethernet network.

The IEEE 802.3 (2000) standard specifies that Category 5 Ethernet facility wiring may be used with 1000BASE-T if it meets certain new transmission parameter requirements.

This attachment supports Jumbo Frames (frames larger than 1500 bytes). Since Jumbo Frame operation is not part of the IEEE 802.3 standard, its implementation should only be used on point-to-point links to another Gigabit Ethernet TX device of the same type.

This attachment is available on all Infoprint 4100 models and Infoprint 4000 models ID5/ID6 and ID3/ID4.
- For AFCCU microcode level 12.x, the Feature Code is 9682/6482. For this feature, the connector type is RJ-45. See "Attachment cable features" on page 91 for information about selecting a cable.
- For AFCCU microcode levels 11.x with Feature Code 4450/9450 installed, this attachment Feature Code 9982/4182. For this feature, the connector type is RJ-45 . For Feature Code 4182, the Ethernet cable is supplied by the customer.

# FDDI Local Area Network

**Note:** Use attachment Feature Code 9992/4192 for AFCCU microcode level 11.x and earlier. The FDDI attachment support is not offered in AFCCU microcode level 12.0 and later.

You can attach the printer to a host FDDI through the FDDI Single Station fiber adapter. The adapter is installed in the RS/6000. The attachment complies with the following:

- Fiber Network Interface specifications of ANSI X3T9.5 and X3T9.12
- FDDI Station Management SMT 7.3 from the ANSI X3T9 technical committee

All models of the Infoprint 4000 printer and Infoprint 4100 can be located a maximum distance of 2 kilometers from the 8260 Multiprotocol Intelligent Switching Hub or RS/6000 processor using 62.5/125 um multi-mode fiber. For more information, refer to 8260 publications.

The FDDI adapter cable PN 54G3375 or PN 19G4867 (20 meters in length) is included with the printer. This cable is 62.5/125 multi-mode fiber, and has a Subscriber Connector (SC) at each end.

The FDDI PCI adapter provides a Subscriber Connector (SC) to attach the multi-mode fiber cable.

You can use FDDI to attach the printer to a host system running Infoprint Manager for Windows NT and Windows 2000.

Refer to IBM publication *Planning for Fiber Optic Links* GA23–0367 when planning for fiber optic installations.

---

**Attention**

Because FDDI cables are made of a fiber optic material, you should consider the following limitations when planning the location of a printer with FDDI connections:

- Do not place the FDDI cables where they can be walked on.
- Do not route the cables where they could be pinched between a door and its frame.
- Do not place the printer in a place that requires a tight bend in the FDDI cable.
- Route the cable so that it lies flat, with no twists or knots.

---

For other cable types, contact IBM Connectivity Service through your IBM Marketing Representative.

# Attachment cable features

Each installation requires custom planning for attachment cabling. Often the facility infrastructure dictates the type of cable that will be used, the connectors that are available, and the length of cable that is required. Also, the attachment feature being ordered will support a particular cable type and connector.

There are two types of connectors, often called the receptacle (socket) connector and the standard connector. A standard connector plugs into a receptacle (socket) connector of the same type (for example LC to LC (R)).

Beginning with AFCCU microcode level 12.0, one or more of the chargeable cable features may be ordered with the printer. There is a non-chargeable feature code that may be selected when no cable will be ordered with the attachment (customer supplied cable). In some cases the cable features shown will not meet the requirements of the installation and cables will have to be provided using an alternate method.

If the customer is supplying the cable, make sure the customer has the attachment feature information that specifies cable type and connector type (from Table 10 on page 92.)

# Selecting a cable feature

To select a cable feature:

1. Determine what connectors and cable types are supported on the attachment feature that is being ordered (see Table 10).

2. Determine what facility cabling (cable types and connector types) the customer will use. Table 15 on page 96 shows a graphical representation of the cable connectors.

3. Select a cable feature code to match the attachment feature to the facility cabling (see Table 11 on page 93).

4. If necessary, use Table 12 on page 93 to select a converter to convert a cable connector type to the attachment feature connector type.

5. Use the examples provided in Table 14 on page 94 to select the correct cable feature codes.

Table 10 shows the connector types and cable types supported for the attachment features. These are the adapter features that can be installed in the printer control unit.

*Table 10. Cable and connector types supported by attachment features*

| Feature Code | Attachment Feature Description (PCI adapter) | Cable Type Supported | Connector |
|---|---|---|---|
| Standard | 10/100 BaseT Ethernet (onboard in control unit) | Cat6 or Cat5e UTP (twisted pair) | RJ-45 (R) |
| 9682 (6482) | Gigabit Ethernet TX Attachment Feature (10/100/1000 BaseT Ethernet) | Cat6 or Cat5e UTP (twisted pair) | RJ-45 (R) |
| 9672 (6472) | Gigabit Ethernet SX Attachment Feature | 62.5 or 50 um MM fiber | LC (R) |
| 9631 (6431) | ESCON Attachment Feature | 62.5 or 50 um MM fiber | MT-RJ (R) |
| 9675 (6475) | FICON LW Attachment Feature | 9 um SM fiber | LC (R) |
| 9676 (6476) | FICON SW Attachment Feature | 62.5 or 50 um MM fiber | LC (R) |
| 9610 (6410) | Parallel Channel Attachment Feature | Parallel channel cable and connector block supplied | |
| 9980 (4121) | 4/16 Token Ring Attachment Feature | Token Ring cable supplied | |
| (R) = receptacle (socket) type connector<br>MM = Multi-Mode fiber<br>SM = Single-Mode fiber<br>um = micrometer or micron | | | |

Table 11 shows the attachment cable features. These optional cables are 31 meters (100 feet) in length.

*Table 11. Feature Codes for attachment cables*

| Feature Code | Description | Cable Type | Connector 1 and 2 | Length | Common Usage |
|---|---|---|---|---|---|
| 9777 | No cable - Customer will supply (non-chargeable) | | | | |
| 7501 | Cable - fiber | 9 um SM fiber | LC | 31 meters (100 feet) | FICON LW |
| 7502 | Cable - fiber | 50 um MM fiber | LC | 31 meters (100 feet) | Gb Ethernet SX FICON SW |
| 7503 | Cable - fiber | 62.5 um MM fiber | LC | 31 meters (100 feet) | Gb Ethernet SX FICON SW |
| 7504 | Cable - fiber (order 7402 converter also) | 62.5 um MM fiber | SC | 31 meters (100 feet) | Gb Ethernet SX FICON SW |
| 7505 | Cable - fiber (ESCON: order 7401 converter) (others: order 7404 converter) | 62.5 um MM fiber | ESCON | 31 meters (100 feet) | ESCON Gb Ethernet SX FICON SW |
| 7506 | Cable - fiber | 62.5 um MM fiber | MT-RJ | 31 meters (100 feet) | ESCON |
| 7507 | Cable - copper twisted pair | Cat6 or Cat5e UTP | RJ-45 | 31 meters (100 feet) | Gb Ethernet TX Ethernet |
| MM = Multi-Mode fiber SM = Single-Mode fiber um = micrometer or micron | | | | | |

Table 12 shows cable converters for common connector types. Sometimes the available cable connectors do not match the connectors provided on the attachment feature. The cable converters may be ordered with the attachment feature to convert the supplied connector to another common connector type. These converters are commonly plugged onto the end of a longer cable to adapt the connector type of the cable to the connector type of the attachment feature. These optional converters are all 2 meters (6 feet) in length.

*Table 12. Attachment Cable Converters (connector type converters)*

| Feature Code | Description | Cable Type | Connector 1 Type (plugs into adapter) | Connector 2 Type (R) (plugs into cable) | Length | Common Usage |
|---|---|---|---|---|---|---|
| 7401 | Cable converter (fiber) | 62.5 um MM fiber | MT-RJ | ESCON (R) (old ESCON) | 2 meters (6 feet) | ESCON |
| 7402 | Cable converter (fiber) | 62.5 um MM fiber | LC | SC (R) | 2 meters (6 feet) | Gb Ethernet SX FICON SW |
| 7403 | Cable converter (fiber) | 50 um MM fiber | LC | SC (R) | 2 meters (6 feet) | Gb Ethernet SX FICON SW |
| 7404 | Cable converter (fiber) | 62.5 um MM fiber | LC | ESCON (R) | 2 meters (6 feet) | Gb Ethernet SX FICON SW |
| 7405 | Cable converter (fiber) | 9 um SM fiber | LC | SC (R) | 2 meters (6 feet) | FICON LW |
| R = receptacle (socket) type connector MM = Multi-Mode fiber SM = Single-Mode fiber um = micrometer or micron | | | | | | |

Table 13 shows the type of connector present on features used on the Infoprint 4100 before the attachment adapters shown in Table 10 on page 92 were available. Use this table to determine the type of converter cable you need if you are using the existing cabling when upgrading processors or printers.

For example, if you have ESCON (FC 9970/4131) installed and are replacing it with ESCON (FC 9631/6431), the table shows that the original ESCON (FC 9970/4131) uses an ESCON (R) type connector. Table 10 on page 92 shows that the new ESCON Attachment Feature (FC 9631/6431) uses an MT-RJ (R) type connector. Therefore, select converter cable 7401 (MT-RJ to ESCON (R) (from Table 12 on page 93) to use with the existing cabling and the new ESCON Attachment Feature.

*Table 13. Attachment Adapters on Infoprint 4000 Prior to P615 Processors*

| Feature Code | Description | Attachment Connector | Cable Type | Most Likely Existing Facility Connector |
|---|---|---|---|---|
| 9970/4131 | ESCON | ESCON (R) | 50 or 62.5 um MM fiber | ESCON |
| 9975/4175 | FICON LW | SC (R) | 9 um SM fiber | SC |
| 9976/4176 | FICON SW | SC (R) | 50 or 62.5 um MM fiber | SC |
| 9972/4172 | Gigabit SX | SC (R) | 62.5/125 or 50/125 um MM fiber | SC |
| 9982/4182 | Gigabit TX | RJ-45 (R) | Twisted Pair Cat52 or Cat6e | RJ-45 |
| 4191/9992 | FDDI | SC (R) | 50 or 62.5 um MM fiber | SC |
| R = receptacle (socket) type connector  MM = Multi-Mode fiber  SM = Single-Mode fiber  um = micrometer or micron | | | | |

Table 14 shows examples of the feature codes for common cable types. Use this table to order the correct cable feature codes when your facility has one type of cable connector and the printer has a different type of cable connector. Table 15 on page 96 shows a graphical representation of the cable connectors.

For example, to order a 62.5 um MM cable that requires an LC connector at one end and an LC connector at the other end and is 31 meters (100 feet) long, order Feature Code 7503. This cable could be used between an adapter that has an LC (R) connector and facility cabling with an LC (R) connector.

To order a 62.5 um MM cable that requires an LC connector at one end and an SC connector at the other end and is a total of 33 meters (106 feet) long, order Feature Codes 7402 and 7504. This cable could be used between an adapter that has an LC (R) connector and facility cabling with an SC (R) connector.

To order a 62.5 um MM cable that requires an LC connector at one end and an ESCON connector at the other end and is a total of 33 meters (106 feet) long, order Feature Codes 7404 and 7505. This cable could be used between an adapter that has an LC (R) connector and facility cabling with an ESCON (R) connector.

*Table 14. Example Feature Codes for Common Cables*
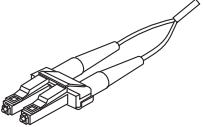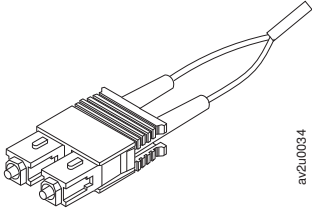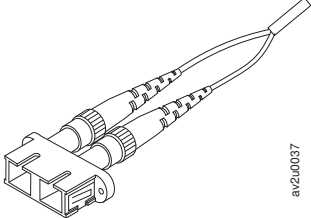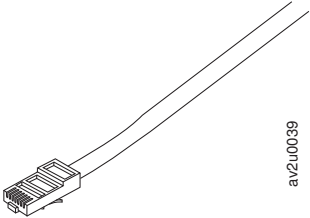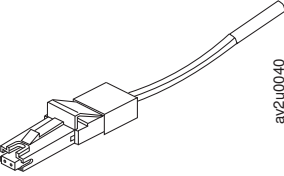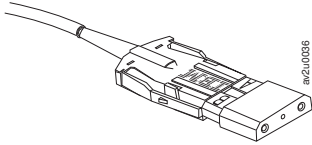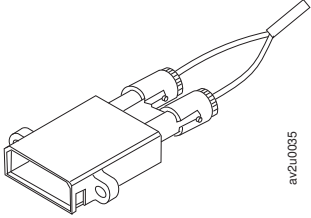
| Attachment Type | Cable Connector at Printer | Cable Type | Cable Length | Cable Feature Codes | Cable Connector at Facility |
|---|---|---|---|---|---|
| Gb Ethernet TX | RJ-45 | Ethernet Cat5e or Cat6 twisted pair | 31 meters (100 feet) | 7505 | RJ-45 |
| 10/100 Ethernet | RJ-45 | Ethernet Cat5e or Cat6 twisted pair | 31 meters (100 feet) | 7505 | RJ-45 |
| | | | | | |

Table 14. Example Feature Codes for Common Cables  (continued)

| Attachment Type | Cable Connector at Printer | Cable Type | Cable Length | Cable Feature Codes | Cable Connector at Facility |
|---|---|---|---|---|---|
| ESCON | MT-RJ | 62.5 um fiber | 31 meters (100 feet) | 7506 | MT-RJ |
| ESCON | MT-RJ | 62.5 um fiber | 2 meters (6 feet) 31 meters (100 feet) | 7401 7505 | ESCON |
| ESCON | MT-RJ | 62.5 um fiber | 2 meters (6 feet) | 7401 | ESCON (R) |
| | | | | | |
| Gb Ethernet SX | LC | 62.5 um MM fiber cable | 31 meters (100 feet) | 7503 | LC |
| Gb Ethernet SX | LC | 62.5 um MM fiber cable | 2 meters (6 feet) 31 meters (100 feet) | 7402 7504 | SC |
| Gb Ethernet SX | LC | 62.5 um MM fiber cable | 2 meters (6 feet) 31 meters (100 feet) | 7404 7505 | ESCON |
| Gb Ethernet SX | LC | 62.5 um MM fiber cable | 2 meters (6 feet) | 7402 | SC (R) |
| Gb Ethernet SX | LC | 62.5 um MM fiber cable | 2 meters (6 feet) | 7404 | ESCON (R) |
| Gb Ethernet SX | LC | 50 um MM fiber cable | 31 meters (100 feet) | 7502 | LC |
| Gb Ethernet SX | LC | 50 um MM fiber cable | 2 meters (6 feet) | 7403 | SC (R) |
| | | | | | |
| FICON SW | LC | 62.5 um MM fiber cable | 31 meters (100 feet) | 7503 | LC |
| FICON SW | LC | 62.5 um MM fiber cable | 2 meters (6 feet) 31 meters (100 feet) | 7402 7504 | SC |
| FICON SW | LC | 62.5 um MM fiber cable | 2 meters (6 feet) 31 meters (100 feet) | 7404 7505 | ESCON |
| FICON SW | LC | 62.5 um MM fiber cable | 2 meters (6 feet) | 7402 | SC (R) |
| FICON SW | LC | 62.5 um MM fiber cable | 2 meters (6 feet) | 7404 | ESCON (R) |
| FICON SW | LC | 50 um MM fiber cable | 31 meters (100 feet) | 7502 | LC |
| FICON SW | LC | 50 um MM fiber cable | 2 meters (6 feet) | 7403 | SC (R) |
| | | | | | |
| FICON LW | LC | 9 um SM fiber cable | 31 meters (100 feet) | 7501 | LC |
| FICON LW | LC | 9 um SM fiber cable | 2 meters (6 feet) | 7405 | SC (R) |
| | | | | | |
| No cables needed. | | This Feature Code indicates customer will supply cable. | | 9777 | |
| R = receptacle (socket) type connector  MM = Multi-Mode fiber  SM = Single-Mode fiber  um = micrometer or micron | | | | | |

*Table 15. Cable Connectors*

| LC | SC | SC (R) | RJ-45 |
|---|---|---|---|
| av2u0038 | av2u0034 | av2u0037 | av2u0039 |
| MT-RJ | ESCON | ESCON (R) | |
| av2u0040 | av2u0036 | av2u0035 | |

# Performance Considerations

This section contains questions for system programmers to answer when planning for the channel-attachment configuration and for Advanced Function Presentation licensed programs.

- How much and what kind of data will be printed?

  A printed page can consist of different types of text, images, overlays, and fonts. The combination of information on the page determines the time needed to prepare the data for printing. Jobs with little text and no image or graphics are processed faster than jobs with complex pages that may include scaling and image decompression.

- Will multiple pages of data be printed per sheet?

  If an application uses N-Up Page Positioning or Cut Sheet Emulation (CSE), you will be increasing the number of pages printed per minute. For example, for a printer with a maximum throughput of 229 simplex 8.5 in. forms per minute, changing the application to print 2-Up 11 in. forms increases the maximum throughput to 354 simplex pages per minute. If the application is duplex, the maximum throughput is doubled to 708 pages per minute.

  Increasing the throughput increases the amount of data per minute being transferred to and processed by the system and the printer. System and channel loads may need to be reevaluated and adjusted to allow for the increased processing and transfer requirements. Increasing the number of pages per minute also intensifies processing based on page count, such as Checkpointing. Consider increasing the Check Point interval for applications using N-Up, CSE, or duplexing.

- How busy is the system?

  Several things affect the performance of the system and directly affect communication with the printer:

  - Speed of the computer system
  - Amount of available storage
  - Importance of tasks assigned in the system
  - Control program used to drive the printer

- Can the attachment support the data rate required for this application?

  Slower technologies such as S/370 Parallel channel and Token Ring are not recommended for applications that are data intensive and require a high bandwidth. Newer technologies such as FICON channel or Gigabit Ethernet provide excellent bandwidth and room for future growth in print data.

  Plan your system so that it can adjust to the change and growth of your company.

Consider the following issues while setting up your channel-attachment configuration.

## System/370 Attachment

- Transfer rates in DC Interlock mode have a greater reduction as cable distance increases than does Data-Streaming mode.

  **Note:** For best performance, use data-streaming mode.

- Different processor channels have different rates of transfer depending on the channel number. Refer to the system reference manual for your host system for data-transfer rates. Not all channels support data-streaming mode.

- Set the missing-interrupt handler (MIH) for 13 minutes or more.

- When attached to an IBM 3044–II Fiber Optic Channel Extender or an IBM 9034 ESCON Converter, configure the printer for one of the data-streaming transfer modes and not the DC Interlock transfer mode.

  **Note:** An exception to the above is when XDF is used in the interface with the distance between the host and the printer exceeding 10 km, then use the DC Interlock transfer mode. See Note 2 in Figure 22 on page 85.

  For any 3044–II restrictions on transfer rate, refer to the 3044–II publications.

- Using data chaining with data-streaming mode can cause an overrun condition. For more details, see the channel or system library publication for your computer system, and *System/370 Principles of Operation*. (IBM PSF does not use data chaining.)
- Before attaching the printer to non-IBM equipment (such as channel extenders), ensure that the equipment supports the printer. The equipment vendor can answer your questions about configuration options and other channel-attachment issues.

### ESCON Attachment

The ESCON channel is the replacement for the System/370 parallel channel. It provides improvements in data rate, physical path length, cable space requirements, and overall system connectivity.

Set the missing-interrupt handler (MIH) for 13 minutes or more.

### FICON Attachment

The FICON channel is the high performance replacement for the System/370 parallel channel and the ESCON channel. It provides improvements in data rate, physical path length, cable space requirements, and overall system connectivity.

Set the missing-interrupt handler (MIH) for 15 minutes or more.

## Direct-Attach

You can use the printer as a direct output device (direct-printing) when attached to an MVS host system. When using the printer in direct-printing mode, PSF/MVS provides exclusive use of the printer for a particular application. The application with direct control of the printer cannot take advantage of system-assisted restart, data set checkpointing, multiple data set processing, or use of operator commands to control the printer.

## Advanced Function Presentation Licensed Programs

Some Advanced Function Presentation (AFP) licensed programs are required for operating the printer; others are optional.

The planning team should work with the end-user community to determine which optional advanced functions are needed. Using the *Guide to Advanced Function Presentation* may be helpful during this process. That publication contains a summary of Advanced Function Presentation, its concepts, products, and benefits. It contains an introduction to Advanced Function Presentation and describes how the licensed programs can meet your specific needs.

## IBM Advanced Function Presentation Software

Determining the printing needs of your company and selecting the software that best meets these needs are important steps in improving your printing operations. Refer to *Guide To Advanced Function Presentation* G544-3876, for a description of available AFP software.

You need to order Print Services Facility (PSF) licensed programs for the operating system of each host to which your printer will be attached. "AFP Software Summary" lists the PSF licensed programs that IBM requires for use with its Advanced Function Printers.

Contact your marketing representative for the minimum PSF levels and prerequisites and limitations that apply for supporting the printer.

### AFP Software Summary
- **PSF/MVS:** 5695-040
- **PSF/VM:** 5684-141

- **PSF/VSE:** 5686-040
- **PSF/400:** 5763-SS1, 5769-SS1
- **Infoprint Manager for AIX, Windows NT and Windows 2000:** 5648-A35, 5648-B34
- **PSF for OS/390:** 5655-B17

Infoprint Manager can be used along with the SNMP support in the printer to monitor the status of the printer remotely. SNMP support in the printer also gives faster effect at the printer when it is purging pages for the Infoprint Manager "Forward Space and Backward Space" function.

Network Printer Manager can be used along with SNMP support in the printer to monitor the status of the printer remotely.

# Optical Character Recognition and Bar Code Applications

You can use the printer for optical character recognition (OCR) and bar code applications.

Because of variations in OCR readers and bar-code scanners, be sure that you test the printer OCR and bar code output with the actual readers and scanners that you use in your processing environment. "Testing Forms and Applications" on page 134 has more information related to testing OCR and bar code output.

For more information about OCR and bar-code printing, refer to:
- *Forms Design Reference for Continuous Forms Advanced Function Printers*, G544-3921
- *About Type: IBM's Technical Reference for 240-Pel Digitized Type*, S544-3516
- *Bar Code Fonts User's Guide*, S544-3190
- *Bar Code Object Content Architecture Reference*, S544-3766

See your IBM marketing representative to obtain these publications.

All of the printers support OCR-A and OCR-B fonts.

IBM supports three methods for processing bar codes:
- Bar Code Object Content Architecture (BCOCA), which is IBM's strategic method
- Document Composition Facility (Program 5748-xx9)
- Bar Codes and Optical Character Recognition Fonts (Program 5688-021)

## BCOCA Support

All of the PSFs process BCOCA objects once the objects are generated. IBM supplies the following BCOCA generators:
- Advanced Function Printing Utilities/400 (57xxAF1)
-  OS/400 Data Description Specification (DDS)
- Page Printer Formatting Aid (PPFA) (5688–190)
- Advanced Print Utility for AS/400
- Advanced Function Printing Toolbox

Other platforms require non-IBM generators to produce BCOCA objects.

BCOCA supports the following bar code types:

*Table 16. Bar-code type and modifier combinations for AFCCU printers*

| Bar Code Type | Modifier |
|---|---|
| X'01': 3-of-9 Code | X'01' and X'02' |
| X'02': MSI | X'01' through X'09' |
| X'03': UPC/CGPC, Version A | X'00' |
| X'05': UPC/CGPC, Version E | X'00' |
| X'06': UPC, 2-Character Supplemental | X'00' |
| X'07': UPC, 5-Character Supplemental | X'00' |
| X'08': EAN 8 (includes JAN short) | X'00' |
| X'09': EAN 13 (includes JAN standard) | X'00' |
| X'0A': 2-of-5 Industrial | X'01' and X'02' |
| X'0B': 2-of-5 Matrix | X'01' and X'02' |
| X'0C': Interleaved 2-of-5 | X'01' and X'02' |
| X'0D': Codabar | X'01' and X'02' |
| X'11': Code 128 | X'02' |
| X'16': EAN, 2 Digit Add-on | X'00' |
| X'17': EAN, 5 Digit Add-on | X'00' |
| X'18': Postnet | X'00' through X'03' |
| X'1A': RM4SCC | X'00' |
| X'1B': Japan Postal Bar Code | X'00' and X'01' |
| X'1C': Data Matrix 2D Bar Code | X'00' |
| X'1D': MaxiCode 2D Bar Code | X'00' |
| X'1E': PDF 417 2D Bar Code | X'00' and X'01' |
| X'1F': Australian Post Bar Code | X'00' through X'08' |
| X'20': QRCode 2D Bar Code | X'02' |
| X'86': UPC, 2-Character Supplemental | X'01' and X'02' |
| X'87': UPC, 5-Character Supplemental | X'01' and X'02' |
| X'91': Code 128 | X'03' |
| X'96': EAN, 2 Digit Add-on | X'01' |
| X'97': EAN, 5 Digit Add-on | X'01' |
| X'98': Postnet | X'04' |
| X'9A': RM4SCC | X'01' |

### Document Composition Facility (Program 5748-XX9)

- Codabar
- Code 3 of 9
- Industrial 2 of 5
- Matrix 2 of 5
- Interleaved 2 of 5
- MSI
- European article numbers (EAN) 8 and 13, which include Japanese article number (JAN) Short and Standard
- Universal product codes (UPC) A and E, which include Canadian grocery product code (CGPC)

### Bar Codes and Optical Character Recognition Fonts (Program 5688-021)

- Code 39
- Industrial 2 of 5
- Matrix 2 of 5
- Interleaved 2 of 5
- MSI
- European article numbers (EAN) 8 and 13, which include Japanese article number (JAN) Short and Standard
- Universal product codes (UPC) A and E, which include Canadian grocery product code (CGPC)

## Installing and Verifying

The system programmer installs and verifies the AFP programs before the printer is installed. Licensed programs include test procedures to ensure that the software is installed correctly.

At installation, the application programmer creates the resources (form definitions, page definitions, electronic overlays, and page segments) that will be in the resource libraries.

## Conversion

With the availability of Advanced Function Presentation, you may want to review your general approach to printed output to get maximum benefit from the new functions. Your application development staff may want to begin planning for this conversion effort before the printer is installed. Typical tasks to consider include:

- Changing font character sets
- Converting line-printer applications to page-printer applications
- Converting preprinted forms to electronic overlays
- Creating new applications by using electronic overlays
- Enhancing existing applications to take advantage of printer functions
- Investigating applications that have special programming requirements, for example, printer Direct-Attach

# Chapter 5. Preparing the Physical Environment

---

**Chapter Overview**

This chapter describes the environmental, power, physical, and space requirements that are necessary before you install the printers. Refer to Appendix B, "Work Sheets," on page 183 for an installation-planning work sheet and a physical-planning work sheet. The audience for this chapter is the physical planner and the system programmer.

---

## Environmental Requirements

Consider the following requirements as you select the location for your printer:

- Temperature and humidity

  Extremes of temperature and relative humidity can affect forms and adversely affect machine performance. These affects may include forms jams and unacceptable print quality. Operate the printer within the following ranges of temperature and humidity for **optimal** performance:

  - **Temperature**: 18 – 24 ° C (65–75°F)
  - **Relative Humidity**: 40%–60%

  This ensures the best machine performance and print quality for machines that print continuously for periods of four hours or more.

- Ventilation

Dust and other contamination can cause machine faults. It is not recommended to place the printer in close proximity to storage devices, such as tape drives and disk drives. The printer operates best in an air-conditioned computer room with year-round humidity control and predominately recirculated, filtered air. Refer to the *IBM General Information Manual: Installation Manual—Physical Planning*, GC22-7064, for details about ventilation requirements for other IBM equipment.

To maintain the ambient temperature within the above temperature range for optimal performance, there must be an adequate supply of cooling air and outdoor make-up air for each print engine in the printer room.

**Cooling air:**
> Infoprint 4000: 2900 m3/hr
> Infoprint 4100: 3225 m3/hr

**Outside make-up air:**
> A minimum 10% of the cooling air must be outside make-up air.

Adherence to the IBM recommendations on ventilation should preclude the development of adverse human-health effects because of outgassing and emissions from preprinted forms. Refer to *Forms Design Reference for Continuous Forms Advanced Function Printers* for more information about selecting preprinted forms and using them safely.

# Environmental Impact

Consider the heat and sound generated by the printer when selecting its location.

## Heat/Power

The heat dissipation values in the following table apply equally to **Infoprint 4000 Models IS1 and IS2**.

Table 17. Heat dissipation and power for Models IS1 and IS2

| | Idle Ready Mode | | Printing | | |
| --- | --- | --- | --- | --- | --- |
| | 50 Hz | 60 Hz | 50 Hz | 60 Hz | |
| | | | 42 lb | 20 lb | 28 lb |
| kVA | 3.5 | 3.4 | 12.0 | 10.6 | 12.4 |
| kW | 3.0 | 2.8 | 11.3 | 10.4 | 12.2 |
| kBTU/Hr | 10.2 | 9.6 | 40.3[2] | 35.6 | 41.6 |
| **Notes:** | | | | | |
| 1. 50 Hz printing may be expected to operate within 10% of the 60 Hz values. | | | | | |
| 2. Measured at 28 lb. | | | | | |

The heat dissipation values in the following table apply equally to **Infoprint 4000 Models ID1 or ID2**.

Table 18. Heat dissipation and power for Models ID1/ID2

| | Idle Ready Mode | | Printing | | |
| --- | --- | --- | --- | --- | --- |
| | 50 Hz | 60 Hz | 50 Hz | 60 Hz | |
| | | | 42 lb | 20 lb | 42 lb |
| kVA | 3.5 | 3.4 | 11.5 | 8.8 | 11.9 |
| kW | 3.0 | 2.8 | 11.3 | 8.7 | 11.7 |
| kBTU/Hr | 10.2 | 9.6 | 38.6 | 29.7 | 40.1 |
| **Notes:** | | | | | |
| 1. 50 Hz printing may be expected to operate within 10% of the 60 Hz values. | | | | | |

The heat dissipation values in the following table apply equally to **Infoprint 4000 Models ID3/4 and ID5/6**.

Table 19. Heat dissipation and power for Infoprint 4000 Models ID3/ID4, ID5/ID6.

| | Idle Ready Mode | | Printing | |
| --- | --- | --- | --- | --- |
| | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
| | | | 42 lb | 20 lb |
| kVA | 3.6 | 3.5 | N/A | 10.8 |
| kW | 3.1 | 2.9 | N/A | 10.4 |
| kBTU/Hr | 10.2 | 9.6 | N/A | 36.9 |
| **Notes:** | | | | |
| 1. 50 Hz printing may be expected to operate within 10% of the 60 Hz values. | | | | |

The heat dissipation values in the following table apply equally to **Infoprint 4000 Models IR1 and IR2**.

*Table 20. Heat dissipation and power for Models IR1/IR2*

|  | Idle Ready Mode | | Printing | |
| --- | --- | --- | --- | --- |
|  | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
|  | | | 42 lb | 20 lb |
| kVA | 3.6 | 3.5 | N/A | 7.5 |
| kW | 3.1 | 2.9 | N/A | 7.3 |
| kBTU/Hr | 10.6 | 9.9 | N/A | 24.5 |
| **Notes:**<br>1.  50 Hz printing may be expected to operate within 10% of the 60 Hz values. | | | | |

The heat dissipation values in the following table apply equally to **Infoprint 4000 Models IR3 and IR4**.

*Table 21. Heat dissipation and power for Models IR3/IR4*

|  | Idle Ready Mode | | Printing | |
| --- | --- | --- | --- | --- |
|  | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
|  | | | 42 lb | 20 lb |
| kVA | 3.5 | 3.4 | N/A | 9.0 |
| kW | 3.0 | 2.8 | N/A | 8.7 |
| kBTU/Hr | 10.2 | 9.6 | N/A | 30.7 |
| **Notes:**<br>1.  50 Hz printing may be expected to operate within 10% of the 60 Hz values. | | | | |

The heat dissipation values in the following table apply equally to **Infoprint 4100 models HS1, PS1, PD1/2, and HD1/2**.

*Table 22. Heat dissipation and power for Infoprint 4100 models HS1, PS1, PD1/2, HD1/2.*

|  | Idle Ready Mode | | Printing | |
| --- | --- | --- | --- | --- |
|  | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
|  | | | 20 lb | 20 lb |
| kVA | 3.6 | 3.6 | 9.6 | 9.6 |
| kW | 3.1 | 3.1 | 9.0 | 9.0 |
| kBTU/Hr | 10.2 | 9.6 | 30.7 | 30.7 |
| **Notes:**<br>1.  50 Hz printing may be expected to operate within 10% of the 60 Hz values. | | | | |

The heat dissipation values in the following table apply equally to **Infoprint 4100 models HS2, HD3/4**.

*Table 23. Heat dissipation and power for Infoprint 4100 models HS2, HD3/4.*

|  | Idle Ready Mode | | Printing | |
| --- | --- | --- | --- | --- |
|  | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
|  | | | 20 lb | 20 lb |
| kVA | 3.0 | 3.0 | 12.5 | 12 |

*Table 23. Heat dissipation and power for Infoprint 4100 models HS2, HD3/4.  (continued)*

|  | Idle Ready Mode | | Printing | |
| --- | --- | --- | --- | --- |
|  | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
|  |  |  | 20 lb | 20 lb |
| kW | 2.0 | 2.0 | 12 | 12 |
| kBTU/Hr | 6.8 | 6.8 | 41 | 41 |

# Sound

The upper limits for sound level, for all the printers, are as follows. Operating levels are measured during continuous running with 20-pound forms.

*Table 24. Sound levels*

|  | $L_{WAd}$ (see note 1) | | $<L_{pA}>_m$ (see note 2) | | I | T |
| --- | --- | --- | --- | --- | --- | --- |
|  | Printing (bels) | Idle (bels) | Printing (dB) | Idle (dB) |  |  |
| 60 Hz | 8.8 | 7.8 | 65 | 58 | Y | Y |
| 50 Hz | 8.8 | 7.8 | 65 | 58 | Y | N |

**Notes:**

1. $L_{WAd}$ is the sound power emission level.

2. $<L_{pA}>_m$ is the mean value of the space-averaged sound pressure emission levels at one-meter positions.

3. I is impulsive noise.

4. T is prominent tones.

# Physical Requirements

Consider the electrical requirements for the printer when selecting its location.

## Normal Precautions to Prevent Fire

Because the forms and toner used in the IBM printer can burn, take precautions to prevent fire. These precautions include common-sense measures, such as keeping potentially combustible materials (for example, curtains and chemicals) away from the printer, and providing adequate ventilation and cooling.

## Power Requirements

The following sections describe power requirements for the print engines, the printer control unit, and the Hunkeler Buffer Flipper Unit WT4.

### Power Outlet and Cable Summary

You should plan for one or more outlets, as summarized below.

Infoprint 4100 HS2 and HD3/4:

- Print engine (one outlet for simplex and two outlets for duplex). See "Power - Print engine" on page 108 for details.
- Printer control unit (one outlet for simplex and two outlets for duplex). See "Power - Printer control unit (Infoprint 4100 HS2 and HD3/4 only)" on page 108 for details.
- Hunkeler Buffer/Flipper Unit WT4 (one outlet, if the WT4 is installed). See "Power - Hunkeler Buffer/Flipper Unit WT4" on page 108 for details.

Infoprint 4100 (all other models) and Infoprint 4000:

- Print engine (one outlet for simplex and two outlets for duplex). See "Power - Print engine" on page 108 for details.
- Hunkeler Buffer/Flipper Unit WT4 (one outlet, if the WT4 is installed). See "Power - Hunkeler Buffer/Flipper Unit WT4" on page 108 for details.

Plan for cable lengths when doing your space planning. Figure 25 shows cable lengths for the print engine power cable and the printer control unit power cable.
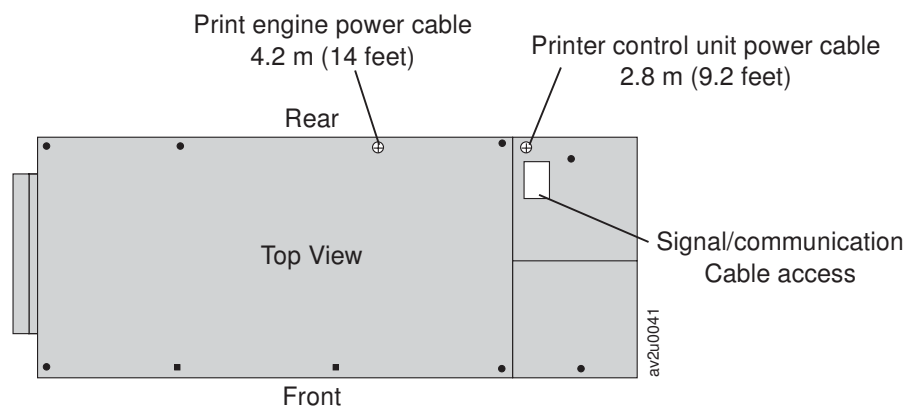


*Figure 25. Power cable lengths for engine and printer control unit*

The following sections provide more detailed information about power requirements for the print engine, the printer control unit, and the Hunkeler Buffer Flipper Unit WT4

## Power - Print engine

Ensure that you have an electrical outlet that supports 12 kVA and meets the power requirements listed in Table 25 for each printer. This outlet must supply 3-phase power and be able to disconnect power from each printer, such as:

- A compatible plug and receptacle installed near each printer. See "Print Engine Power Cable and Receptacle" on page 111 for more information.
- A circuit breaker that breaks all live poles for each printer. This circuit breaker must be dedicated to the printer and be within easy reach.

Table 25. Basic electrical requirements for the printer

| Country | AC Voltages | | | Wiring Information | Phase | Circuit Rating |
|---------|---------|---------|---------|---|---|---|
| | Nominal | Minimum | Maximum | | | |
| U.S.A, Canada 60Hz | 208 220 230 240 | 187 198 207 216 | 229 242 252 264 | 4-wire power cable with three phases and ground. Neutral is not required. | 3 | 60 Amperes |
| Japan 50/60Hz | 200 200 | 180 180 | 220 220 | 4-wire power cable with three phases and ground. Neutral is not required. | 3 | 60 Amperes |
| Europe 50Hz | 380 400 415 | 342 360 374 | 418 440 456 | 5-wire power cable with three phases, ground, and neutral. Direct connection of neutral to ground required. | 3 | 30 Amperes |
| **Attention:** The 50-Hz 380/400/415 Volt version does not support non-earthed neutral and impedance-grounded neutral power distribution systems. Installation on an impedance-grounded neutral power system (IT Power System) could result in failures of motors and transformers in the printer. | | | | | | |

## Power - Printer control unit (Infoprint 4100 HS2 and HD3/4 only)

If an Infoprint 4100 HS2 or HD3/4 is installed, an additional outlet is required to provide power to the printer control unit. The HS2 (simplex) system requires one additional outlet. The HD3/4 (duplex) system requires two additional outlets. You should ensure that appropriate service, including an outlet, is provided. The cables, which are provided, extend 282 cm (9.2 feet) from the control unit.

Table 26. Basic electrical requirements for the printer control unit

| Country | Hz | AC Voltage[1] | Power Plug Information | Phase | Circuit Rating |
|---------|----|---------------|------------------------|-------|----------------|
| All | 50/60 | 200–208/220/230/240 | See Appendix C, "Standard Power Plug Listings," on page 235 for descriptions of the power plugs provided. | 1 | 10 Amperes |
| **Notes:** | | | | | |
| 1. Maximum/minimum limits are 10% above/below nominal voltages. | | | | | |

## Power - Hunkeler Buffer/Flipper Unit WT4

If a Hunkeler Buffer/Flipper Unit WT4 is installed, an additional outlet is required. You should ensure that appropriate service, including an outlet, is provided. The cable, which is provided, extends 425 cm (14 feet) from the Hunkeler Buffer/Flipper Unit.

*Table 27. Basic electrical requirements for the Hunkeler Buffer Flipper Unit WT4*

| Country | Hz | AC Voltage[1] | Power Plug Information | Phase | Circuit Rating |
|---------|-----|------------------------|---------------------------------------------------------------------------------------------------------|-------|------------------|
| All | 50/60 | 200–208/220/230/240 | See Appendix C, "Standard Power Plug Listings," on page 235 for descriptions of the power plugs provided. | 1 | 2.5 Amperes |

**Notes:**

1. Maximum/minimum limits are 10% above/below nominal voltages.

## Physical installation power and grounding recommendations

**Note:** Consult electrical authorities to ensure compliance with local electrical code.

*Power recommendations:* De-rate facility step-down transformers 50% to handle surge currents and harmonic currents. Assume that the transformer's neutral connection (400V installations) will see two times (2X) the current of any of the phases.

The transformer neutral connection is bonded to earth. Ensure that (1) the connection between earth and transformer is secure, (2) that the grounding rods are in good condition and in good contact with earth, and (3) that the connection distance is the shortest path possible.

To minimize interference between devices in the printing room, separate step-down transformers may be used to feed separate groups of equipment. However, this is not always feasible. To reduce interference, install the transformers as close as possible to the distribution panel and, from the panel, feed every device with its own separate power cord (L1, L2, L3, (N,) E). This will ensure the shortest length of common (shared) wiring.

The power cord neutral wire must be at least as large as the phase wires.

To best balance the loading on the phases of the transformer when more than one printer engine is installed, the phase wires (but not neutral wire) to the printers may be rotated. See Figure 26 on page 110.

If more than one printer is installed, the power line wires may be rotated to balance the transformer phase loading. In high voltage regions (400V), a neutral wire is present, but is not rotated.
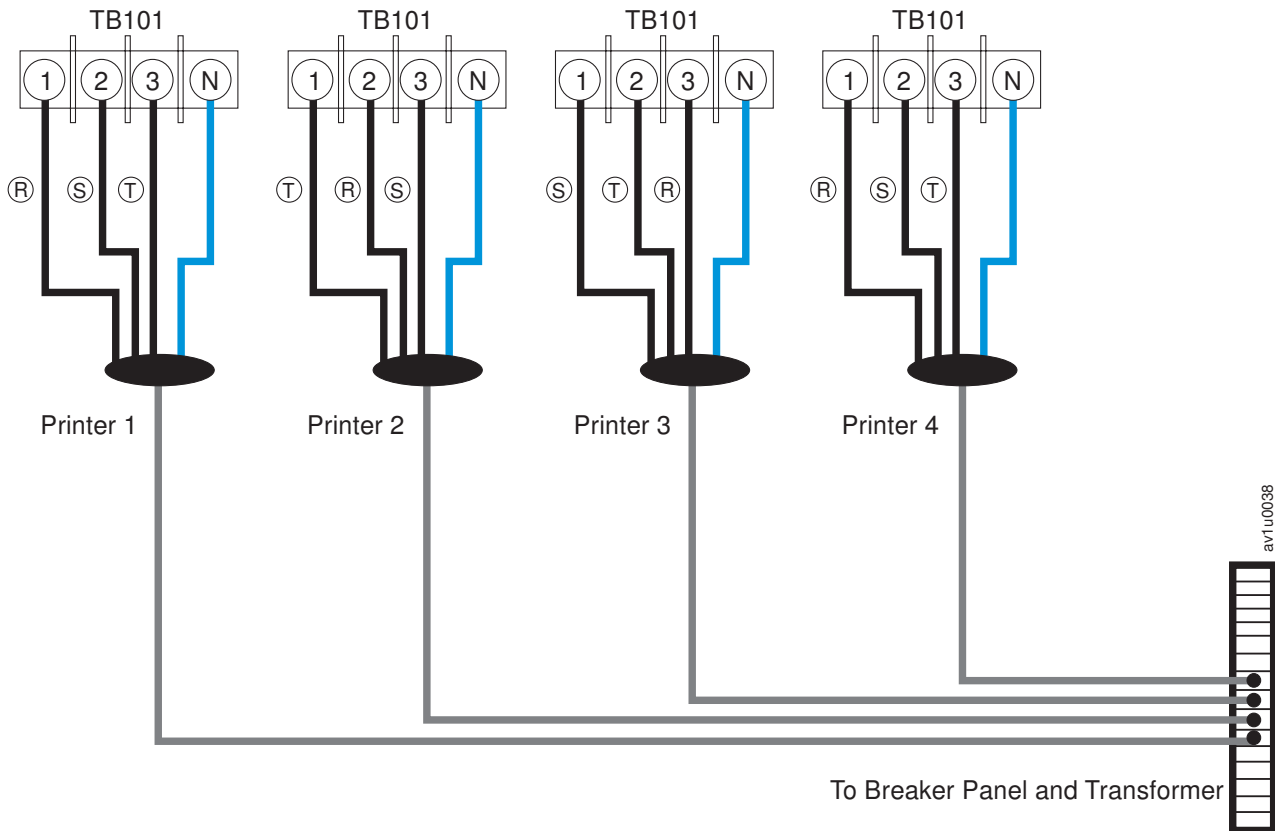
*Figure 26. Breaker panel and transformer wiring*

**Grounding recommendations:**

- Good grounding (earthing) is essential for reliable operation of electronic printers.
- Ensure that neutral is securely bonded to ground at the feeding transformer.
- Connect the ground line to earth in the power distribution panel. This might be required by local ordinance.
- The printer power cord must contain a dedicated ground wire. Using conduit for grounding of electronic devices is not sufficient and is not reliable.
- To ensure all equipment operates from an equal potential ground, the facility may utilize a grounding ring around the periphery and/or a grounding grid under the floor or building.
- To maintain good grounding at high frequencies, it is recommended that ground be accessible close to the printers. This might be in the form of rods driven into the earth directly under the printer room floor, or the building's steel structure which should be in good contact with the earth. The IBM service technician will connect a wire from this local ground to the frame of the printer.
- Since the pre- and post-processing equipment works integrally with the printer, it is recommended that the frame of each pre/post device be wired to the frame of the printer. The IBM service technician will perform this wiring.

**Auxiliary power source recommendations:**   The IBM Infoprint printers are designed to tolerate loss of power without damage. Therefore, backup power sources such as UPS units or other electronic power supplies are not recommended.

The dynamic power consumption of laser printers must be understood if a backup power source is being considered.

1. Startup power, and current, might exceed five times (5X) the continuous, or average, power. This is highly dependent on the impedance of the facility's distribution system and power source. This surge of power lasts only a few cycles of AC and rapidly falls to its nominal level.

2. While printing, there are regular changes in current loading as lamps and heaters cycle on and off, and this intermittent, instantaneous power might exceed two times (2X) the average power.

3. The continuous, or average, power was specified in the preceding sections.

Therefore, the selection of an auxiliary power source must involve careful consideration of these aspects of power consumption, and it is recommended that the manufacturer of such equipment understand these power requirements.

## Additional electrical requirements

In addition to the electrical requirements defined in Table 25 on page 108 and Table 27 on page 109 and Table 26 on page 108, the following are minimum requirements for service current capacity and short circuit ratio:

**Service current capacity ($I_{scc}$)**
> 75 amps minimum for duplex models
> 50 amps minimum for simplex models

**Short circuit ratio ($R_{sce}$)**
> 150 minimum

**Note:** Refer to "Glossary" on page 245 for definitions of these terms.

## Interface point requirements for low frequency phenomena

**EN 61000-3-11 Compliance Statement:** This equipment complies with EN 61000-3-11 provided that $Z_{max}$ is less than or equal to 0.05 ohms at the interface point between the user's supply and the public network. It is the user's responsibility to ensure the equipment is connected only to a supply of that impedance or less. The user may consult with the electrical utility, if necessary, to determine the network impedance.

## Print Engine Power Cable and Receptacle

An AC power cable is supplied with all printers. This cable measures 427 cm (14 feet), except for printers installed in Chicago, Illinois, U.S.A., where the power cable measures 183 cm (6 feet).

### U.S. and Canada

The printer uses cords with Hubbell plugs (IBM part number 53F1722, or IBM part number 53F1723 for printers installed in Chicago; both include the cord and Hubbell plug type 460P9V05). Provide either of the following Hubbell connector or receptacle (or equivalent) for this plug:

**460C9V05**    Connector (inline)

**460R9V0**    Receptacle (mounts on a wall or rail)

**Note:** These parts are available through Hubbell even though the part numbers shown may not be a standard item listed in their catalog. The Hubbell part numbers may have "HBL" prefixed to the part number shown above.

Figure 27 on page 112 shows a Hubbell cord, plug, and receptacle.
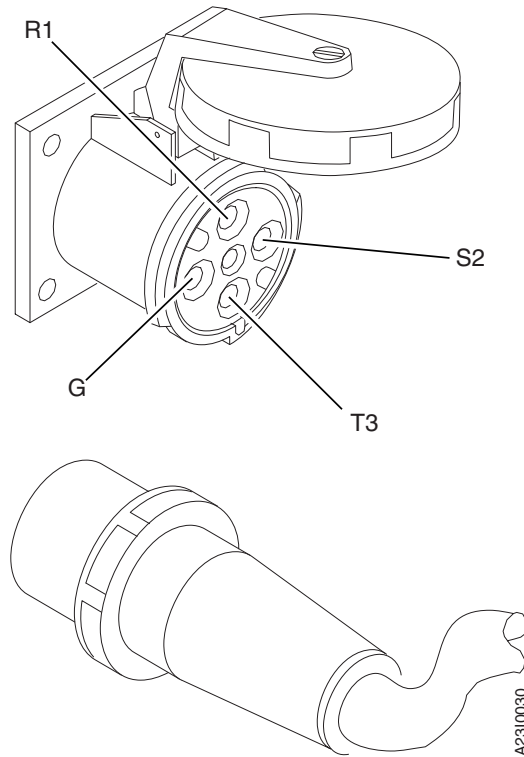
*Figure 27. Hubbell plug and receptacle*

Positions for phase connectors R1, S2, T3, and ground (G) are shown. An angle back box may be used in conjunction with the receptacle.

### All Other Countries

The power cable is supplied without a plug. Provide the appropriate plug and compatible receptacle.

Understand the electrical standards for your country, and use only an approved plug. Your IBM marketing representative has information on the voltage requirements in your country.

For more information about voltage requirements and for Hubbell part numbers, refer to the *IBM General Information Manual: Installation Manual—Physical Planning*, GC22-7064.

## Vacuum Cleaner

Ensure that the vacuum cleaner used to clean the printer meets the following requirements:

- All attachments or tools that are connected to the vacuum cleaner through which paper dust, toner, or developer mix pass are nonconductive.
- Vacuum-cleaner motor cooling must be separate from the vacuum line so that these same substances do not contact the electrical brushes of the vacuum-cleaner motor. Filtering the vacuum line and allowing the filtered air to cool the motor is not safe.

## CE Toolkit

Remind the IBM service representative to order the CE Toolkit. For ordering information, refer to RETAIN® tip H137066.

# Space Requirements

---

**Attention!**

The Infoprint 4100 models are 990.6 mm (39 in.) in width. Special accommodations such as wider doorways may be necessary.

---

The minimum size for Channel Cable Access opening is 8 x 8 in. (200 x 200 mm).

---

**Important**

For printing systems with the Customer Changeable Developers (like the Infoprint 4100), space must be allocated for the developer cart and CE Service Rail.

---

## Duplex Systems

The dimensions of the Duplex Printing System and the Buffer/Flipper Unit **(1)**, the optimum separation of the units, the service clearance around the allowable configurations of these units, and the power cable and channel cable locations are shown in the following figures.

**Note:** The minimum size for Channel Cable Access opening is 200 x 200 mm (8 x 8 in.).

### Inline Configuration for All Infoprint 4000 Models with the Short Buffer/Flipper Unit
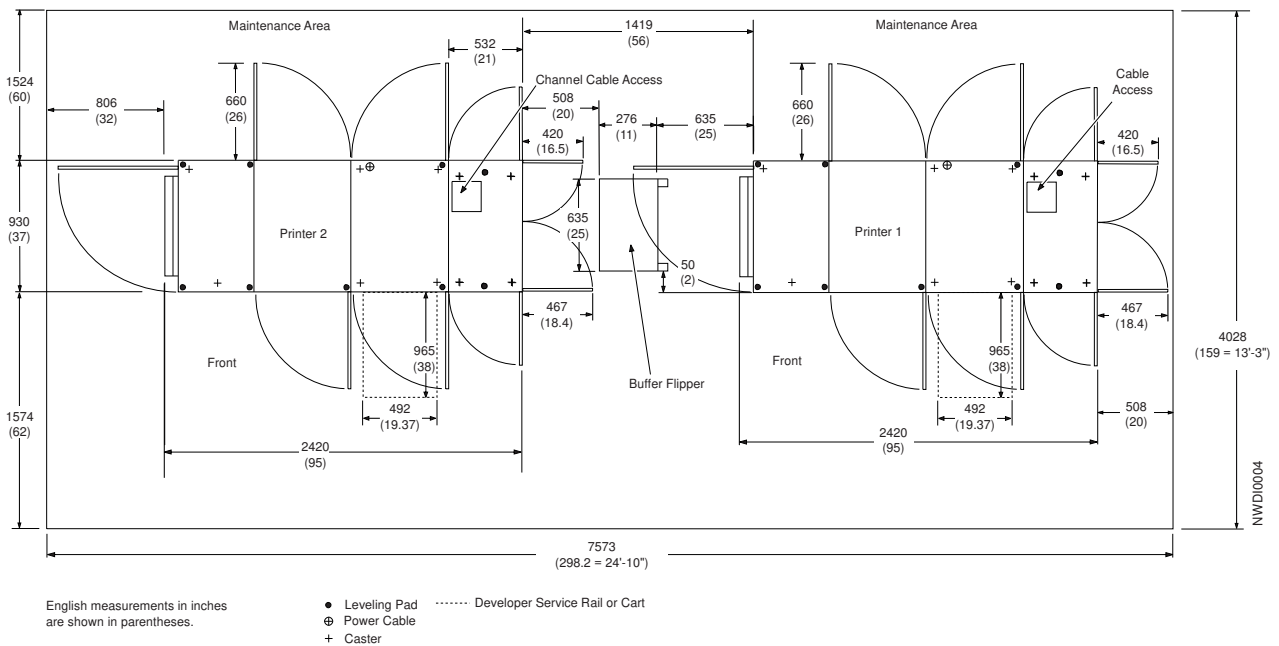


*Figure 28. Inline configuration for all Infoprint 4000 Models with the short Buffer/Flipper Unit*

**Notes:**

1. With the Signature Page feature, an additional 305 mm (12 in.) are required between the output of Printer 1 and the Buffer/Flipper Unit

2. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

3. Figures are not drawn to scale.

4. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Inline Configuration for All Infoprint 4000 Models with the Tall Buffer/Flipper Unit
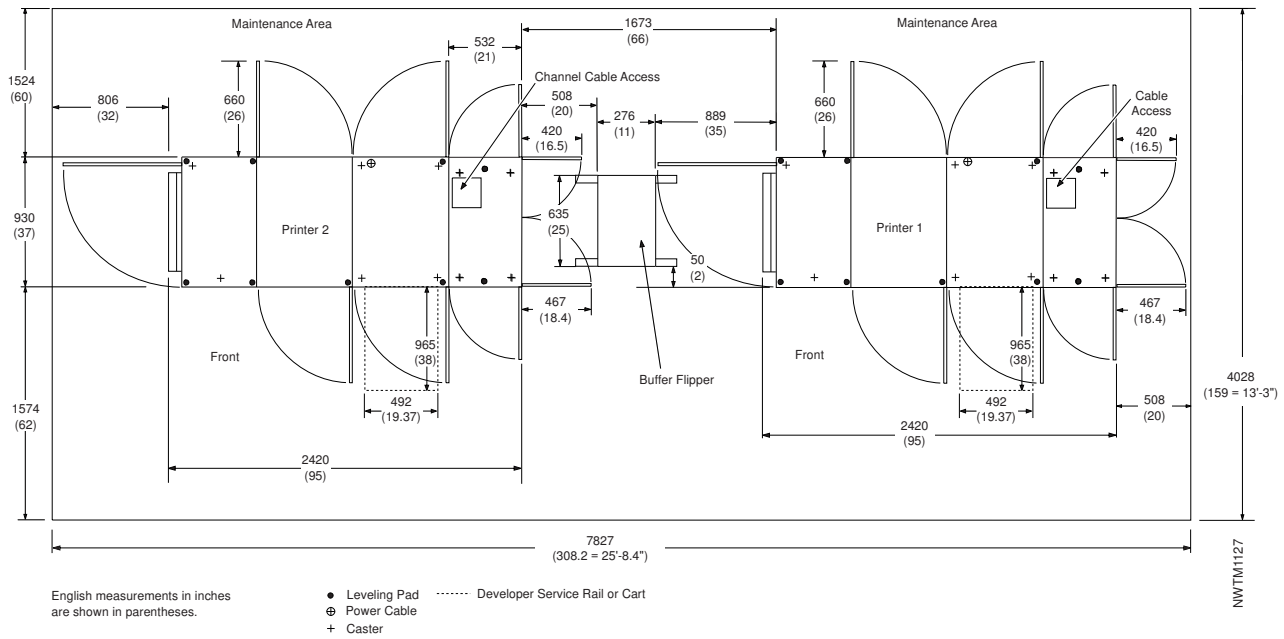


*Figure 29. Inline configuration for Infoprint 4000 Models with the tall Buffer/Flipper Unit*

**Notes:**

1. With the Signature Page feature, an additional 305 mm (12 in.) are required between the output of Printer 1 and the Buffer/Flipper Unit

2. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

3. Figures are not drawn to scale.

4. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Inline Configuration for All Infoprint 4000 Models with the Hunkeler Buffer/Flipper Unit WT4
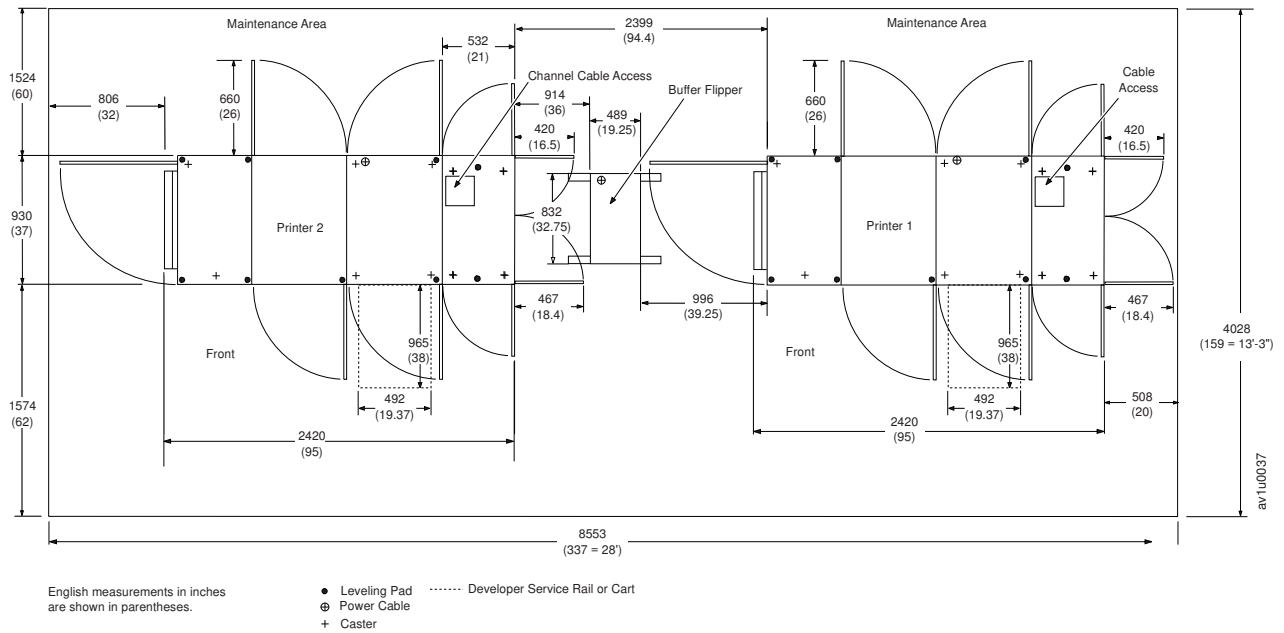


*Figure 30. Inline configuration for all Infoprint 4000 Models with the Hunkeler Buffer/Flipper Unit WT4*

**Notes:**

1. With the Signature Page feature, an additional 305 mm (12 in.) are required between the output of Printer 1 and the Buffer/Flipper Unit

2. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

3. Figures are not drawn to scale.

4. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Left Angle Configuration for All Infoprint 4000 Models with the Short Buffer/Flipper Unit
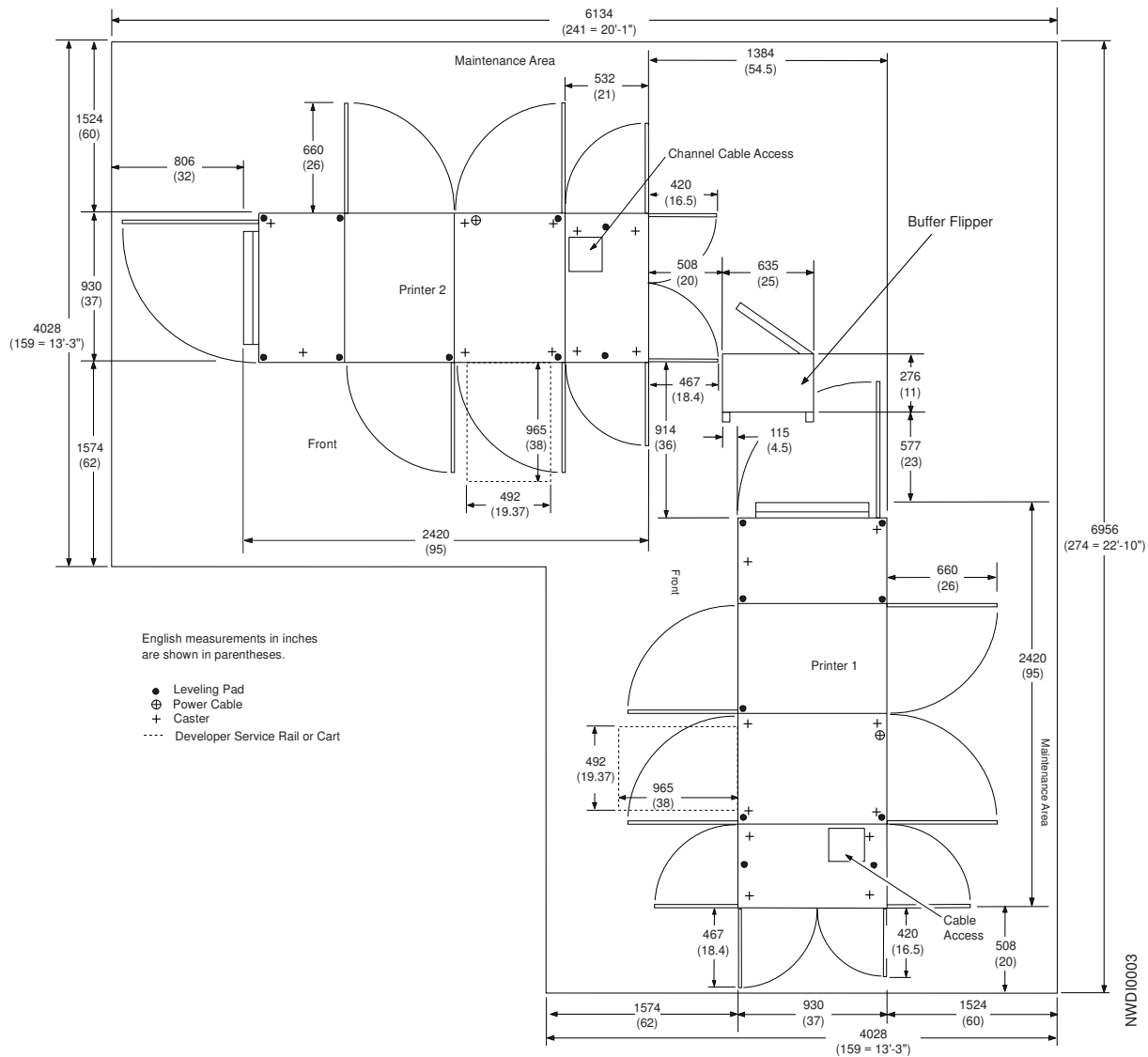


*Figure 31. Left angle configuration for all Infoprint 4000 Models with the short Buffer/Flipper Unit*

**Notes:**

1.  With the Signature Page feature, an additional 305 mm (12 in.) are required between the output of Printer 1 and the Buffer/Flipper Unit

2.  Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

3.  Figures are not drawn to scale.

4.  For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Left Angle Configuration for All Infoprint 4000 Models with the Tall Buffer/Flipper Unit
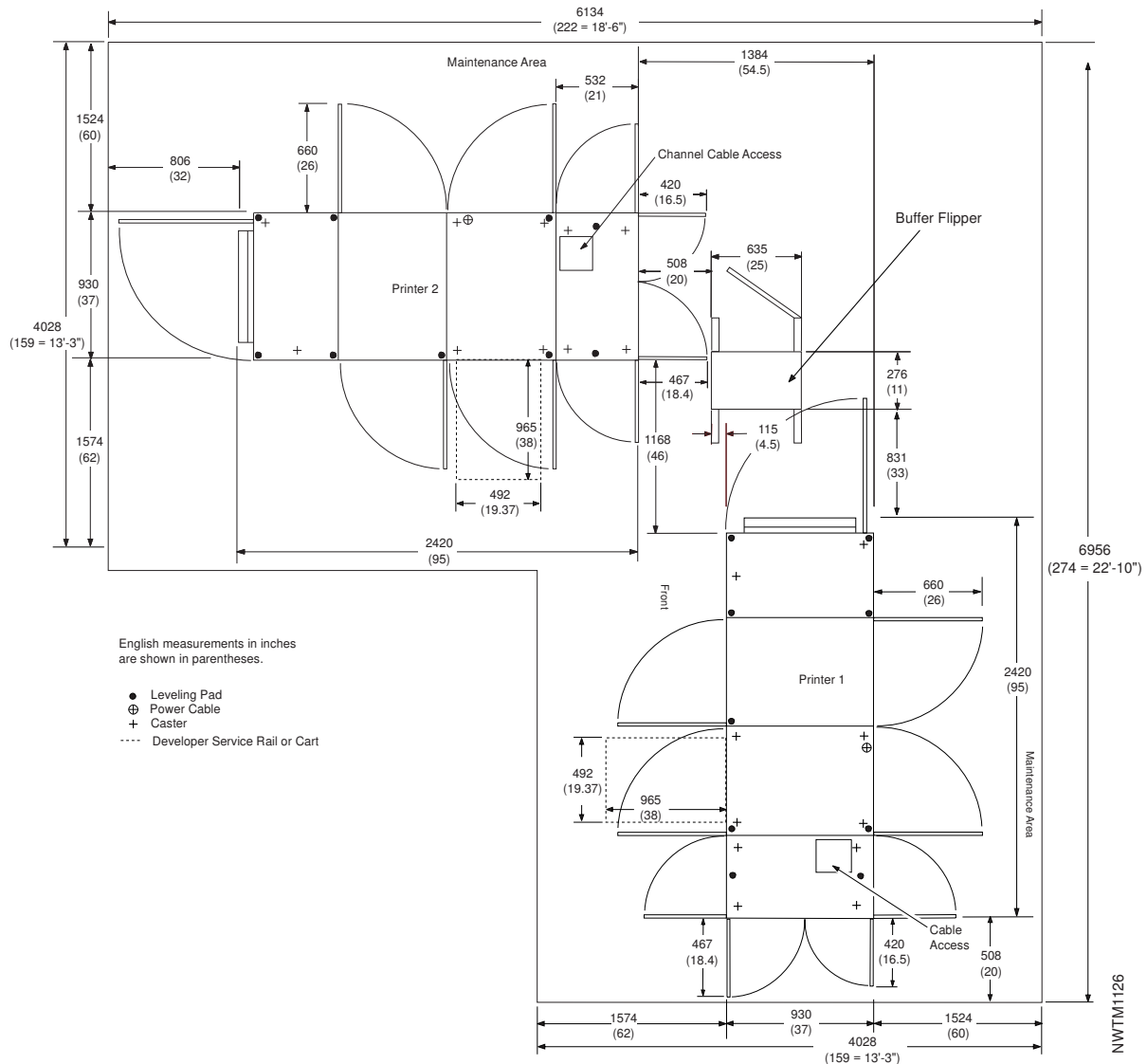


*Figure 32. Left angle configuration for all Infoprint 4000 Models with the tall Buffer/Flipper Unit*

**Notes:**

1. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

2. Figures are not drawn to scale.

3. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## 'H' Configuration for All Infoprint 4000 Models with Any Buffer/Flipper Unit (both printers facing the same direction)
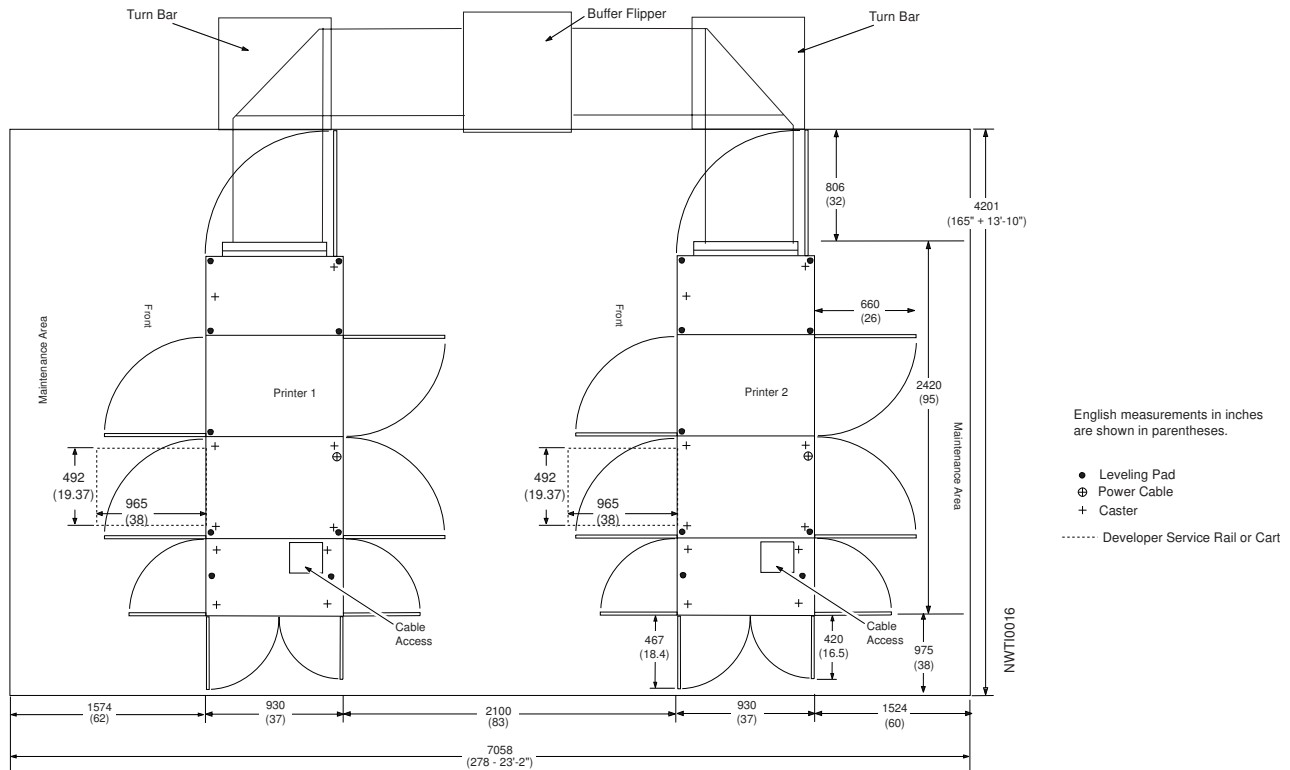


*Figure 33. 'H' configuration for all Infoprint 4000 Models with any Buffer/Flipper Unit (both printers facing the same direction)*

**Notes:**

1. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

2. Figures are not drawn to scale.

3. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

---

**Important**

- The customer-provided turnbar is not available from IBM and must be ordered through a pre/post vendor. It must be ordered, delivered, and ready to use before installation time.

- The optional walkover is not available from IBM. It can be ordered through a pre/post vendor.

- For Infoprint Models HD3/4, an additional in-line urge unit may be required between the air bearing turnbars, depending on the web length and layout between engines.

---

## 'U' Configuration for All Infoprint 4000 Models with the Hunkeler Buffer/Flipper Unit WT4 (printers facing each other)
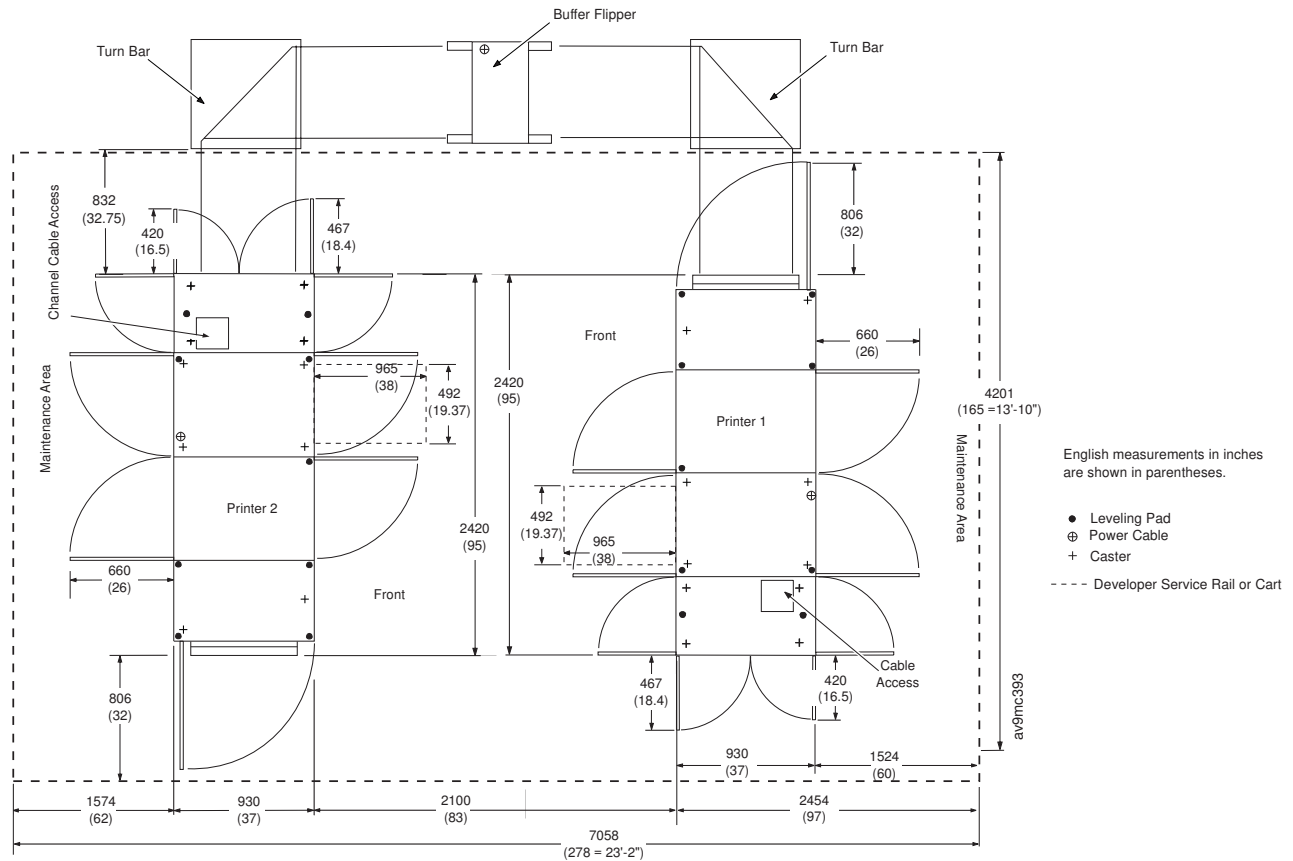


Figure 34. 'U' configuration for all Infoprint 4000 Models with the Hunkeler Buffer/Flipper Unit WT4 (printers facing each other)

**Notes:**

1. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

2. This configuration may require longer interconnecting cables. Refer to "Physical Planning Work Sheet" on page 186 for more information about required cables.

3. Figures are not drawn to scale.

4. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

---

**Important**

- The customer-provided turnbar is not available from IBM and must be ordered through a pre/post vendor. It must be ordered, delivered, and ready to use <u>before</u> installation time.

- The Hunkeler Buffer/Flipper Unit WT4 is available from IBM. It must be ordered, delivered, and ready to use <u>before</u> installation time.

---

## Inline Configuration for the Infoprint 4100 Models HD1/HD2 and PD1/PD2 with the Tall Buffer/Flipper Unit
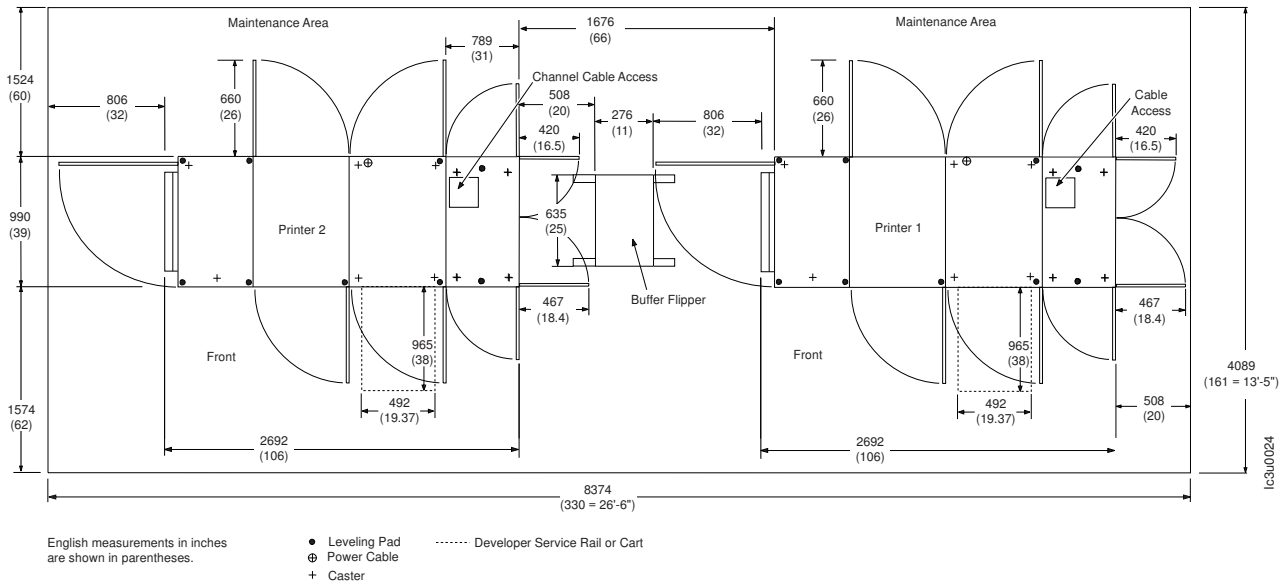


*Figure 35. Inline configuration for the Infoprint 4100 Models HD1/HD2 and PD1/PD2 with the tall Buffer/Flipper Unit*

**Note:** For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Inline Configuration for All Infoprint 4100 Models with the Hunkeler Buffer/Flipper Unit WT4
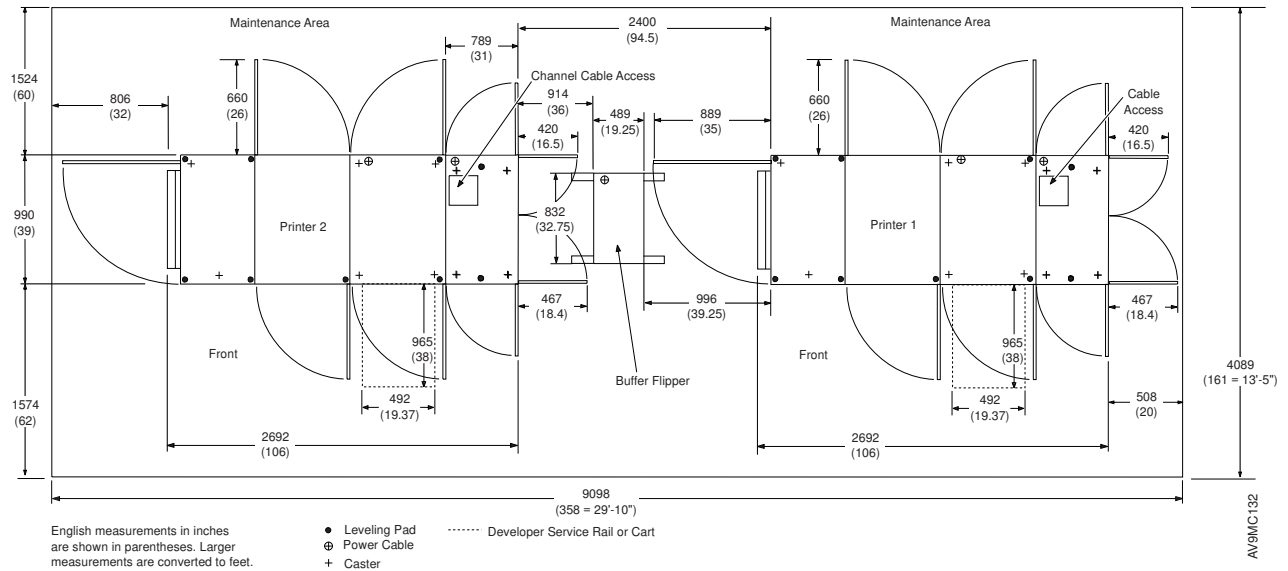


*Figure 36. Inline configuration for all Infoprint 4100 Models with the Hunkeler Buffer/Flipper Unit WT4*

**Notes:**

1. The Hunkeler Buffer/Flipper Unit WT4 is optional for the Infoprint 4100 Models HD1/HD2 and PD1/PD2; it is required for Models HD3/HD4.

2. With the Signature Page feature, an additional 305 mm (12 in.) are required between the output of Printer 1 and the Buffer/Flipper Unit

3. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

4. Figures are not drawn to scale.

5. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Left Angle Configuration for the Infoprint 4100 Models HD1/HD2 and PD1/PD2 with the Tall Buffer/Flipper Unit
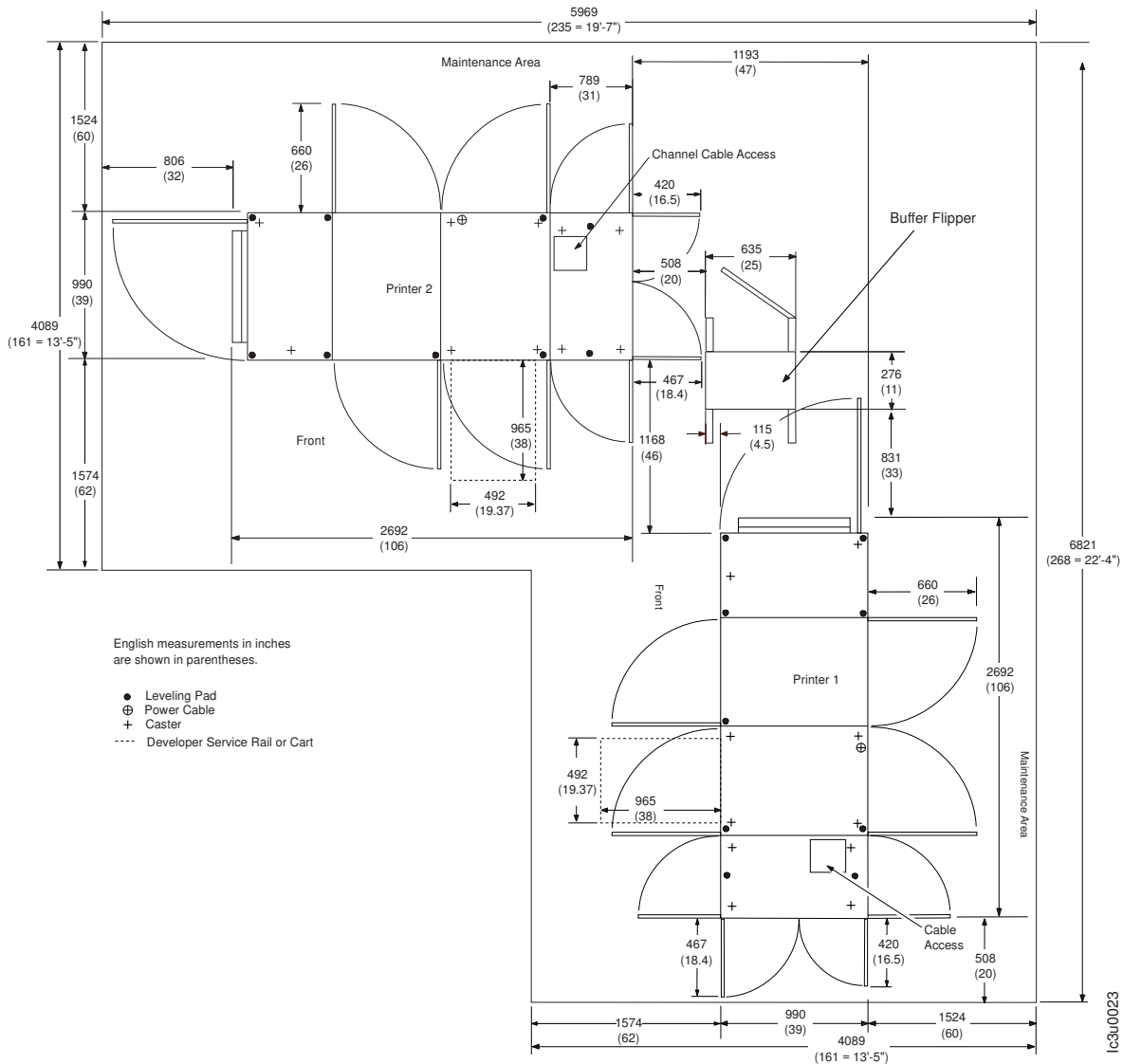


*Figure 37. Left angle configuration for the Infoprint 4100 Models HD1/HD2 and PD1/PD2 with the tall Buffer/Flipper Unit*

**Notes:**

1. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

2. Figures are not drawn to scale.

3. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Left Angle Configuration for the Infoprint 4100 Models HD3/HD4 with Any Buffer/Flipper Unit
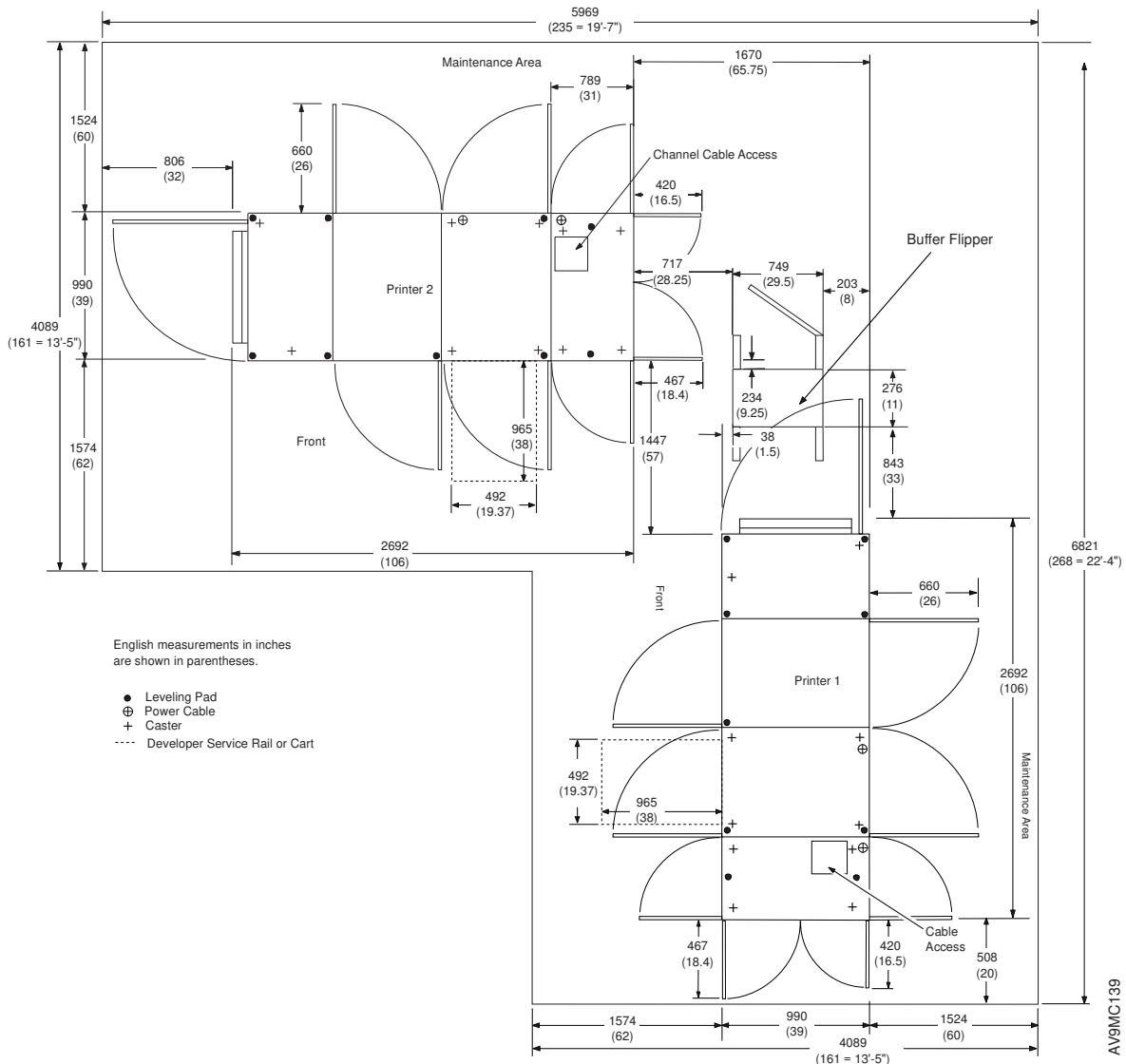


*Figure 38. Left angle configuration for the Infoprint 4100 Models HD3/HD4 with any Buffer/Flipper Unit*

**Notes:**

1. With the Signature Page feature, an additional 305 mm (12 in.) are required between the output of Printer 1 and the Buffer/Flipper Unit

2. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

3. Figures are not drawn to scale.

4. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

# 'H' Configuration for All Infoprint 4100 Models with Any Buffer/Flipper Unit (both printers facing the same direction)
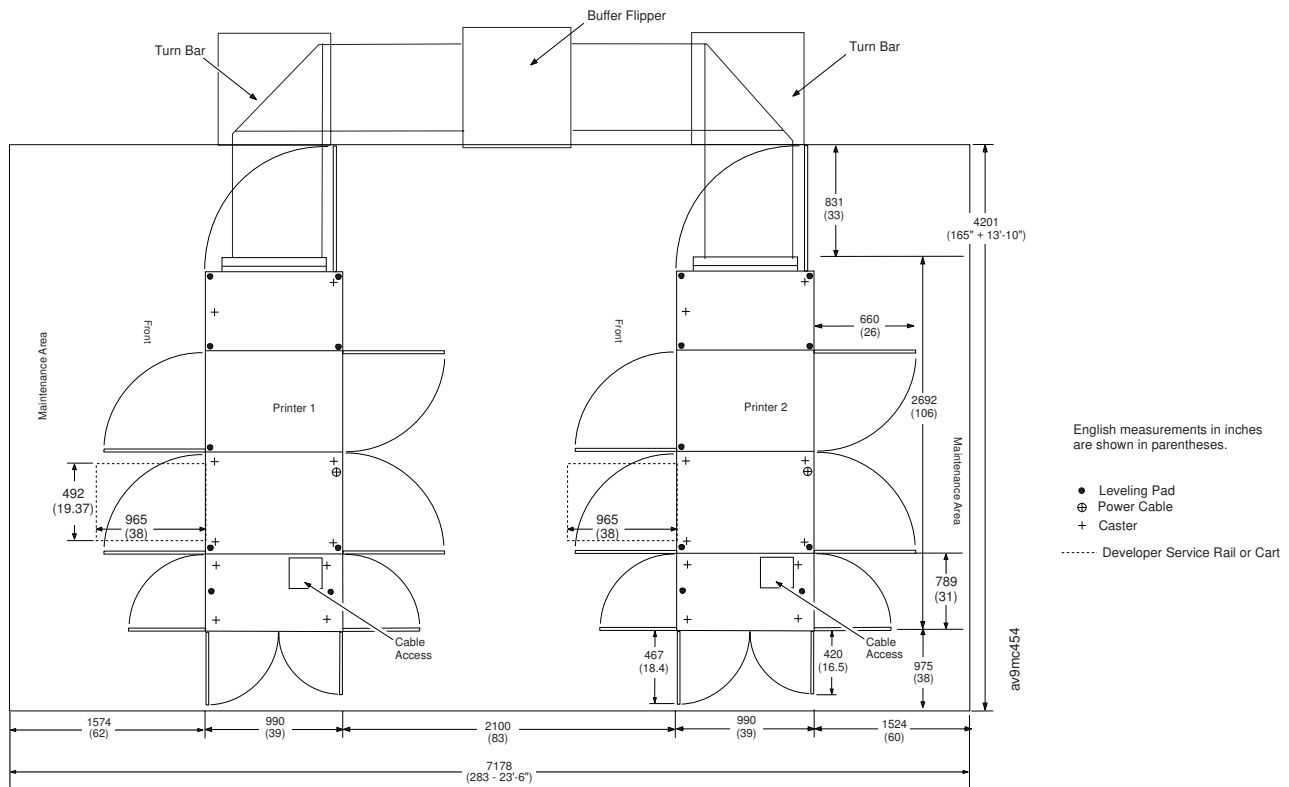


*Figure 39. 'H' configuration for all Infoprint 4100 Models with any Buffer/Flipper Unit (both printers facing the same direction)*

**Notes:**

1. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

2. Figures are not drawn to scale.

3. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

---

**Important**

- The customer-provided turnbar is not available from IBM and must be ordered through a pre/post vendor. It must be ordered, delivered, and ready to use before installation time.

- The optional walkover is not available from IBM. It can be ordered through a pre/post vendor.

---

# 'U' Configuration for All Infoprint 4100 Models with the Hunkeler Buffer/Flipper Unit WT4 (printers facing each other)
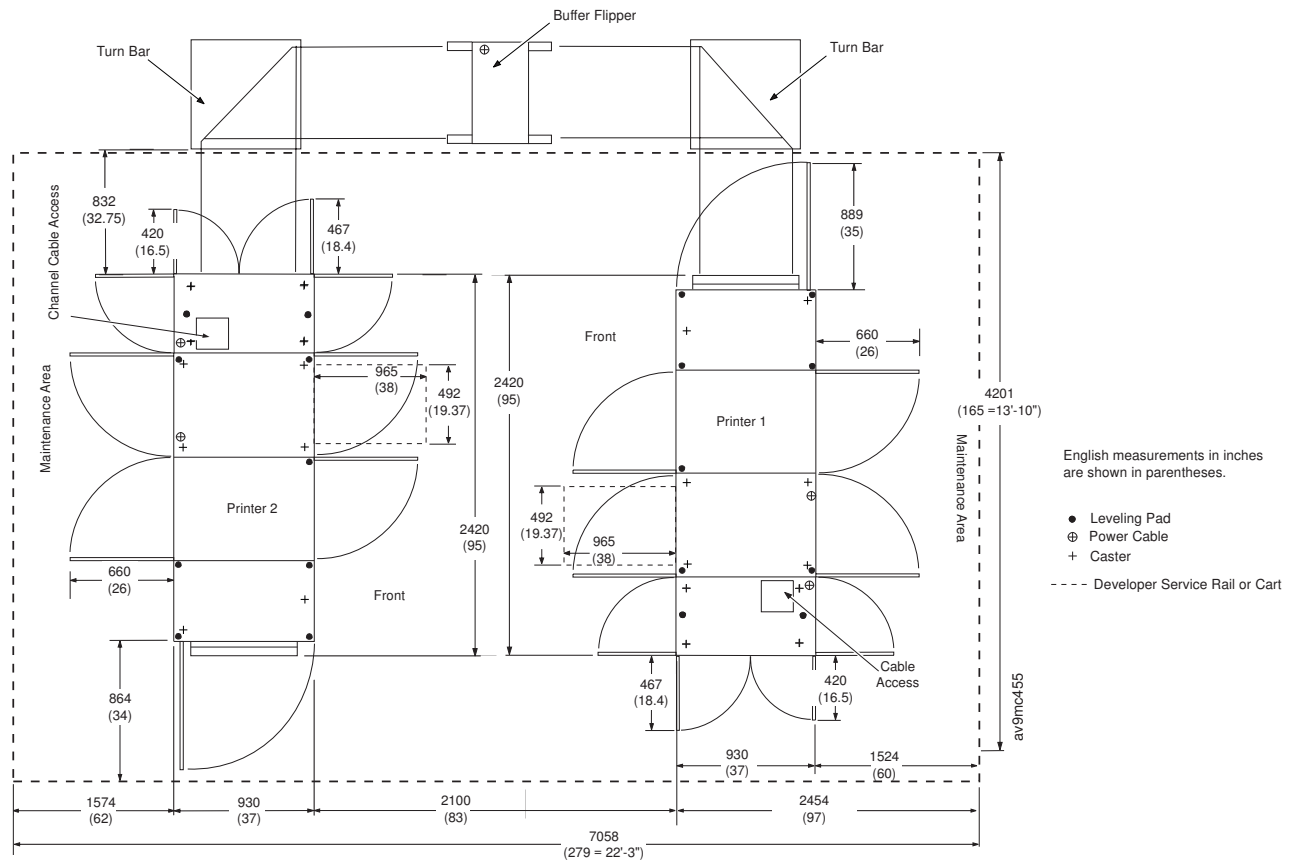


*Figure 40. 'U' configuration for all Infoprint 4100 Models with the Hunkeler Buffer/Flipper Unit WT4 (printers facing each other)*

**Notes:**

1. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

2. This configuration may require longer interconnecting cables. Refer to "Physical Planning Work Sheet" on page 186 for more information about required cables.

3. Figures are not drawn to scale.

4. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

---

**Important**

- The customer-provided turnbar is not available from IBM and must be ordered through a pre/post vendor. It must be ordered, delivered, and ready to use <u>before</u> installation time.

- The Hunkeler Buffer/Flipper Unit WT4 is available from IBM. It must be ordered, delivered, and ready to use <u>before</u> installation time.

---

# Simplex Systems

## Infoprint 4000 Models IS1 and IS2

Figure 41 shows the dimensions of the printer, space and service clearance, and power cable and channel cable locations for Infoprint 4000 Models IS1 and IS2.
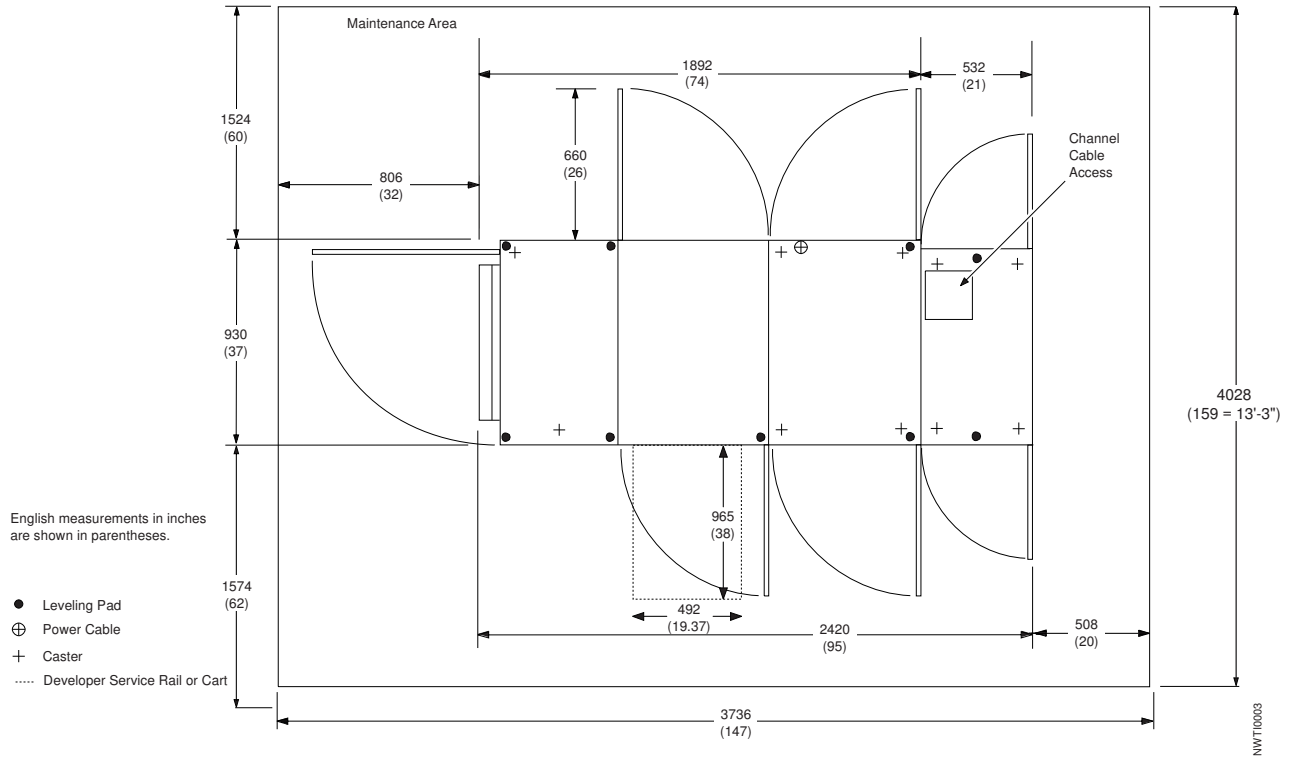


*Figure 41. Dimensions, service clearance, power cable, and cable locations for Infoprint 4000 Models IS1 and IS2*

**Notes:**

1. Service clearance of 1574 mm (62 in.) is required with/without the CCD Cart feature.

2. Figures are not drawn to scale.

3. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Infoprint 4100 Models

Figure 42 shows the dimensions of the printer, space and service clearance, and power cable and channel cable locations for all Infoprint 4100 Models.
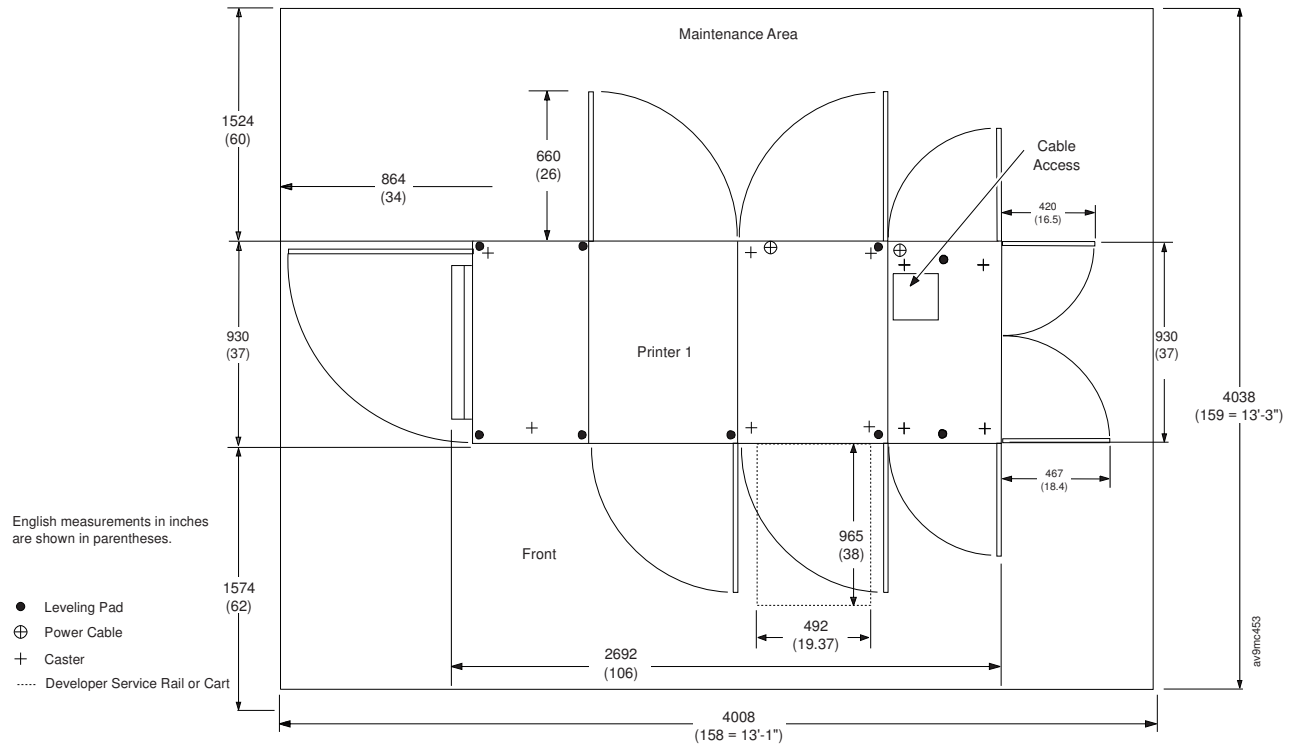


*Figure 42. Dimensions, service clearance, power cable, and cable locations for Infoprint 4100 Models*

| **Notes:**

| 1. The power cable shown on the printer control unit applies to Infoprint 4100 Models HS2 and HD3/4 only.

| 2. For information about outlets and power cables, see "Power Outlet and Cable Summary" on page 107.

## Systems with the Dual Inline Densitometer

Ensure that the customer has the minimum required distance of 1829 mm (6ft) between Printer 2 and any post processing devices. Position any post processing devices to accomodate the installation of the Dual Inline Densitometer.



Printer 2

57
(2.25)

305 - 457  max
(12 - 18 max)

Front

1067 max
(42 max)

English measurements in inches
are shown in parentheses.

NWTI0027
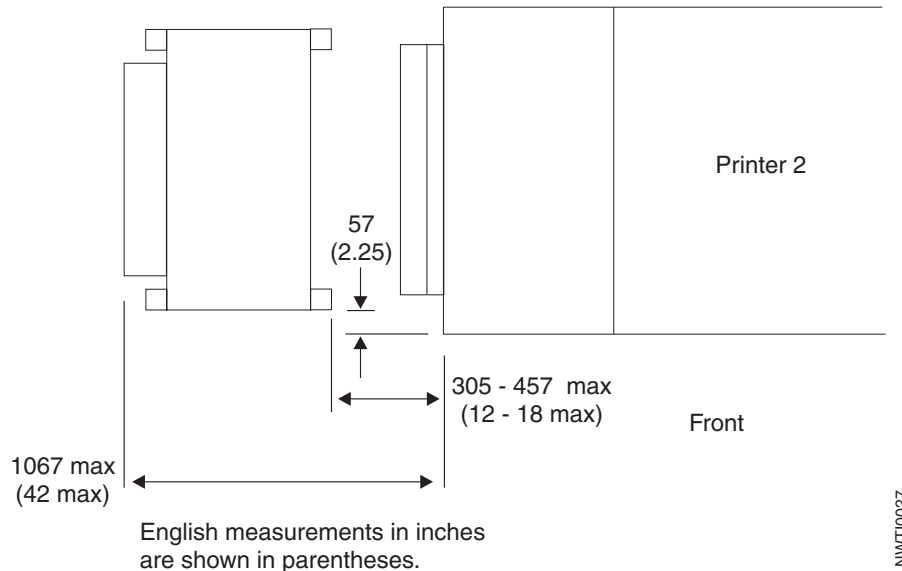
*Figure 43. Space requirements for the Dual Inline Densitometer*

## Physical Layout

As you plan your physical layout, be sure to:

- Install the printer away from the main traffic pattern. Allow space for operators and service representatives to perform their tasks. This space should not extend into walkways.
- Install the printer in a location that is convenient for the operator. For example, consider whether the planned location is close to printer supply storage areas and to output distribution areas.
- Allow 210 cm (83 inches) between the floor and the lowest permanently attached object above the printer, such as a light or a cable rail. This layout gives printer operators and service representatives space in which to work.
- Allow 152 cm (60 inches) between any outside surface of the printer and an adjacent wall to prevent ambient heat rise. If the specified clearance cannot be achieved, see "Installation Requirements" on page 130.

## Shipping Notes

As you plan for the arrival of the printer, note that:

- Each printer is shipped on two separate pallets: one pallet for the printer frame and a second pallet for the control unit frame. For sizes and weights, see Table 28 on page 129, Table 29 on page 129, and Table 31 on page 129.
- In addition to the pallets, one or two additional cartons are shipped with the printer. These cartons contain options and miscellaneous hardware necessary to install the printer.
- Check the route that the printers must travel from your loading dock to the location where they will be installed to ensure that they fit through the doorways and halls. The printers are **wider than a standard doorway.**

# Physical Dimensions

Approximate dimensions of the printer frames and control units are shown in Table 28 and Table 29. Approximate dimensions of the Buffer/Flipper Units are shown in Table 30.

*Table 28. Approximate frame physical dimensions and weights uncrated for* **Infoprint 4000**

| Dimension | Print Engine | Printer 1 Control Unit | Printer 2 Control Unit [1] |
|---|---|---|---|
| Depth[2] | 930 mm (37 in.) | 930 mm (37 in.) | 930 mm (37 in.) |
| Height | 1500 mm (59 in.) | 1500 mm (59 in.) | 1500 mm (59 in.) |
| Length | 1879 mm (74 in.) | 532 mm (21 in.) | 532 mm (21 in.) |
| Weight | 989 kg (2175 lb) | 107 kg (236 lb) | 181 kg (400 lb) [3] |

**Notes:**

1. Simplex or printer 2 in a duplex system.
2. The printer is wider than a standard doorway.
3. Excluding the weight of the RS-6000 controller.

*Table 29. Approximate frame physical dimensions and weights uncrated for the* **Infoprint 4100**

| Dimension | Print Engine | Printer 1 Control Unit | Printer 2 Control Unit[1] |
|---|---|---|---|
| Depth[2] | 990 mm (39 in.) | 990 mm (39 in.) | 990 mm (39 in.) |
| Height | 1550 mm (61 in.) | 1550 mm (61 in.) | 1550 mm (61 in.) |
| Length | 1905 mm (75 in.) | 789 mm (31 in.) | 789 mm (31 in.) |
| Weight | 1023 kg (2250 lb) | 227 kg (500 lb) | 249 kg (550 lb)[3] |

**Notes:**

1. Simplex or printer 2 in a duplex system.
2. The printer is wider than a standard doorway.
3. Excluding the weight of the RS-6000 controller.

*Table 30. Approximate frame physical dimensions and weights uncrated for the Buffer/Flipper Units*

| Dimension | Short Buffer/Flipper | Tall Buffer/Flipper | Hunkeler Buffer/ Flipper WT4 |
|---|---|---|---|
| Depth | 635 mm (25 in.) | 635 mm (25 in.) | 832 mm (32.75 in.) |
| Height | 838 mm (33 in.) | 1600 mm (64 in.) | 1245 mm (49 in.) |
| Length | 276 mm (11 in.) | 276 mm (11 in.) | 489mm (19.25 in.) |
| Weight | 16 kg (36 lb) | 32 kg (70 lb) | 145 kg (320 lb) |

*Table 31. Printer frame physical dimensions when crated[1]*

| Dimension | Simplex Models | Duplex Models |
|---|---|---|
| Depth | 1080 mm (42.5 in.) | 1118 mm (44 in.) |
| Height | 1715 mm (67.5 in.) | 1930 mm (76 in.) |
| Length | 2007 mm (79.5 in.) | 2032 mm (80 in.) |
| Weight | 1066 kg (2350 lb) | 1211 kg (2664 lb) |

*Table 31. Printer frame physical dimensions when crated[1]  (continued)*

| Dimension | Simplex Models | Duplex Models |
|---|---|---|
| **Notes:** | | |
| 1.  The Infoprint 4100 models are larger when crated. | | |

## Physical Attachment Requirements

The system programmer, the IBM installation planning representative, and the physical planner plan the channel-cable route between the controlling computers and the printer.

- For System/370 Parallel Channels — Refer to the *IBM General Information Manual: Installation Manual—Physical Planning*, GC22-7064, for definitions of the cable groups and maximum cable lengths for the printer.
- For ESCON and FICON Channels — Refer to *Planning for Fiber Optic Links*, GA23-0367, for definitions of the cable groups and the maximum cable lengths for the printer.
- For Token Ring LANs, refer to *IBM Cabling System Technical Interface*, GA27-3773, for cabling information.
- For Ethernet, copper cabling must meet specifications in *ANSI/IEEE Standard 802.3a, b, c, and e*.
  - Ethernet Twisted Pair
    - To connect to 100BaseT LAN or 1000BaseT LAN, use category 5 or category 6 unshielded twisted pair (UTP) cabling supplied by the customer with a RJ45 connector.
    - To connect to 10BaseT LAN, use category 3, 4, or 5 (UTP) cabling supplied by the customer with a RJ45 connector.
  - The building cabling must conform to *EIA-569* standard. Which includes that the cable should be set away from an EMI source. Some excerpts from the standard show the minimum distance from:
    - Transformers and electric motors: 40 inches.
    - Power Source at 480 V or less, Unshielded power lines or electrical equipment in proximity to open or non-metal pathways: 24 inches.
    - Unshielded power lines or electrical equipment in proximity to grounded metal conduit pathway. Power lines enclosed in a grounded metal conduit in proximity to grounded metal conduit pathway: 12 inches.
    - Fluorescent lighting: 12 inches.
- For Gigabit Ethernet SX, fiber optic cabling must meet the specifications in IEEE standard 802.3 (2000). Consult *Planning for Fiber Optic Links*, GA23-0367, when planning fiber optic connections.
- For Gigabit Ethernet TX, cabling must meet the specifications in IEEE standard 802.3 (2000).
- For FDDI, cabling must meet specifications in *IBM Cabling System Optical Fiber Planning and Installation Guide*, GA27-3943.

When you order your printer, also order cables for the System/370 channel, FICON channel, ESCON channel, Token Ring, FDDI, or Ethernet, plus any channel extenders, converters, directors, switching boxes, terminators, or multi-station access units required in the interface.

**Note:** There are data transfer rate restrictions (if running in 3.0 or 4.5MB/sec data streaming) when using certain types of printer channel cables. See your IBM marketing representative for additional information.

## Installation Requirements

A service representative installs the printer. However, you are responsible for the following pre-installation tasks:

- Ensure that the environmental, electrical, and space requirements specified in this chapter are met. Use the "Installation Planning Work Sheet" on page 184 to complete this step.
- **With a Duplex Configuration**, if the required distance between the printer and an adjacent wall cannot be achieved, install air blowers to circulate air between the printer and the wall.
- Work with your IBM marketing representative to ensure that a forklift and forklift operator are available at delivery to remove the printer from its shipping pallet.

  After the printer is removed from the shipping pallet, you can move it on its own casters to the desired location.

  **Note:** As soon as possible after your printer arrives, unpack it and check for external damage. If the covers are broken, bent, or scratched, work with the shipping contractor and your IBM marketing representative to resolve the problem.

- Inspect the receiving area and the areas through which the printer must be moved. Ensure that no obstacles interfere with moving the printer to its planned location. Consider the following:
  - The forklift needs space in which to operate.
  - Halls and doorways must be large enough for the printer to pass through (see Table 29 on page 129).
  - Hall corners and angles must be large enough to permit the printer to turn.
  - Ramps must have no more than a 13° incline.
  - Elevators and elevator doorways must be able to accommodate the size and weight of the printer and the people who are moving it.
  - Stairs, door sills, floor gaps, and carpeting can make it impossible to roll the printer.
- Ensure that the floor is level within ±1°.
- Ensure that the correct attachment cables and hardware are available for System/370 channels, ESCON or FICON channels, or Ethernet LANs, or Token Ring LANs, or FDDI LANs.
- Ensure that approved electrical outlets with correct power are reserved for the printer, and that they can be reached with the power cables. The approximate locations of the printer power cable and the signal communication cable areas are shown earlier in this chapter.
- Ensure that a separate ground wire for all connections from the printer engine, the printer control unit, and all pre/postprocessors go to the ground bus bar of the circuit breaker box. See Figure 44 on page 132.
- Ensure that the ground wire and the neutral wire between the circuit breaker box and the source (building ground) are separate wires; one wire is for neutral and one is for ground. See Figure 44 on page 132.
- Ensure that the printer engine power and the control unit power go to the same circuit breaker box.
- If you are installing the printer on a raised floor, ensure that the access holes in the raised floor are large enough for both the channel cable and the power cable, and ensure that the raised floor panels under the right side (developer side) of the printer are vented (perforated with holes) to prevent internal heat rise.
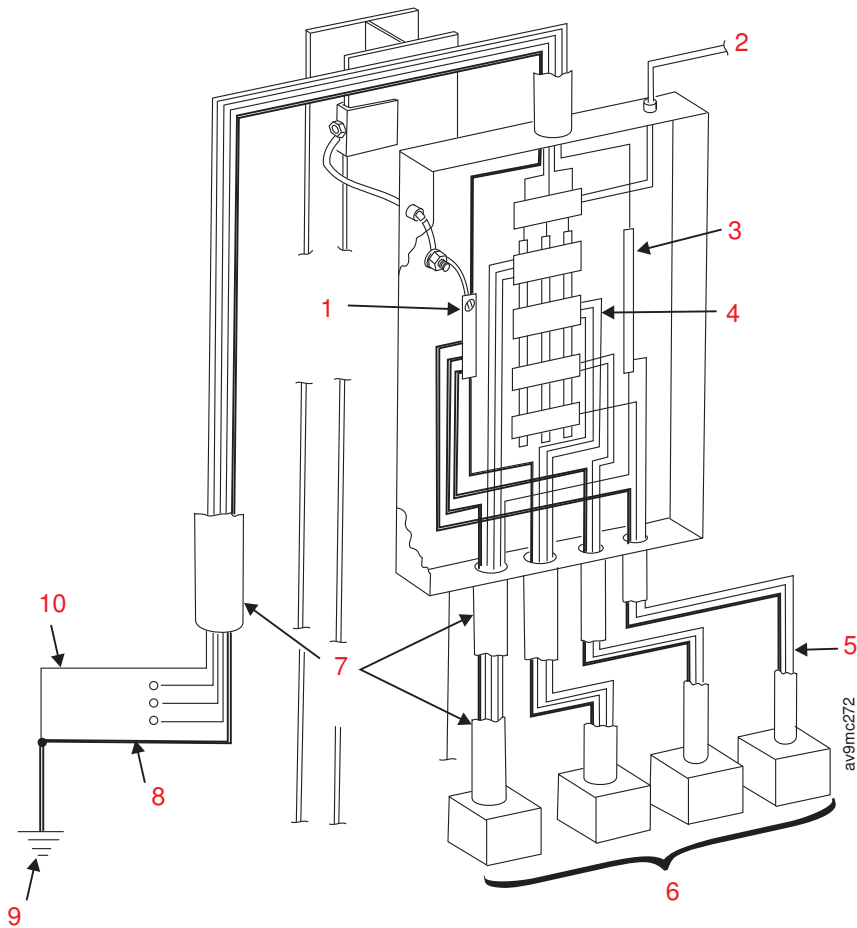
Figure 44. Power distribution system

 1. Grounding terminal bar electrically attached (bonded) to enclosure and building steel
 2. Remotely operated power service disconnect
 3. Neutral bus
 4. Circuit breakers of appropriate size
 5. Branch circuits
 6. Customer-supplied receptacles/connectors in accordance with local codes
 7. Conduit electrically attached to enclosure
 8. Ground
 9. Service entrance ground or suitable building ground interconnected with all other grounds
10. Neutral

# Chapter 6. Selecting and Testing Forms

**Chapter Overview**

This chapter reviews the basic requirements for print materials intended for use on Infoprint 4000 and Infoprint 4100 printers.

To get maximum reliability and print quality from the printer, IBM recommends that you rely on the *Forms Design Reference for Continuous Forms Advanced Function Printers*, your forms supplier, and your IBM marketing representative to help you choose the best forms and special-purpose materials for your applications.

## Continuous Forms

The printer generally uses single-ply, fanfold forms with both edges punched for tractor feeding and with horizontal perforations between the sheets. Micro-perforated forms can be used for cleaner cuts between sheets. With appropriate pre-processing and post-processing devices attached, the printer can also use roll-feed forms.

## Stacking Forms

The stacker can stack forms prefolded from 7 to 14 inches (178 to 356 mm) in length as measured in the process direction (parallel to the tractor holes). 7.0 in. to 17 in. (147.3 to 356 mm) for Infoprint 4100 models.

**Notes:**

1. The prefolded forms length does not have to be identical to the forms length printed (as specified in the defined forms). For example: A 3-inch form may have been prefolded with three forms between folds (a 9-inch prefolded length).

2. Roll forms <u>cannot</u> be stacked. For these and other applications you must have suitable post-processing equipment installed and enabled on the printer, which disables the stacker.

Continuous forms are folded and stacked on a stacker table. As the height of the form stack increases, the stacker table lowers until the printing stops or until the stacker is full.

You can adjust the length and width of the stacker to fit the size of forms being used. The two shortest lengths of the common-use sizes, 3½ and 5½ inches, are prefolded two lengths at a time, in folds of 7 and 11 inches, respectively.

The two shortest lengths of ISO sizes, 3½ and 3 inches, are folded two and three lengths at a time, in folds of 7 and 9 inches, respectively. Forms that are 6 inches long are folded in 12-inch lengths.

## Special-Purpose Materials

Discuss your special-purpose applications with your forms suppliers and ensure that they understand that the forms are being run on a printer. Before you use new preprinted forms for production runs, test the jobs that print them to ensure everything works well.

Work closely with your IBM marketing representative while you are selecting what kinds of forms and special-purpose materials to use. Your marketing representative can give you technical help, share information from other successful printer users, and help you design your own special materials.

# Preprinted Forms

If you are planning to use preprinted forms (for example, your company letterhead), ensure that the ink is designed for nonimpact printing. Certain inks are likely to rub off or smear after they have been heated by the fuser. Remember the following recommendations when selecting ink for preprinted forms:

- Use offset lithography to make preprinted forms for the printer.
- Choose laser inks that can tolerate the high temperatures in the fuser. Generally, oxidation-cured, oil-based inks withstand high temperatures better than latex inks.
- Allow plenty of drying time (from 1 to 2 weeks) before running preprinted forms through the printer. This is especially important when oil-based inks are used. Drying should take place in a mild environment of 15° to 27°C (60° to 80°F) and 35% to 50% relative humidity.
- Limit the amount of ink on the preprinted forms.
- Limit the use of oxidation retardants on the printing press when oxidation-cured inks are used.
- Choose forms with a surface that absorbs ink well. Avoid forms with a ribbed or heavy surface because they do not absorb ink well.

# Storing Print Materials

Store forms and special-purpose materials in an area where temperature and humidity are similar to the environment in which they are used. If forms are allowed to absorb too much moisture, wrinkles and blank spots may result.

Avoid areas with extreme heat or humidity. Extended exposure to these extremes can permanently damage the materials. Also, storing forms in an area where relative humidity is above 65% may result in reduced print quality.

# Testing Forms and Applications

An ideal application for the printer would print standard-font text and simple images on plain white paper, 75-g/m² (20-lb) bond. This paper would be manufactured specifically for use in nonimpact printers, and would be free of binder holes, cut-outs, and other cuts. The page layout would keep text and images away from perforations. After leaving the printer, output from an ideal application would be allowed to cool, and would receive minimal handling, rubbing, and creasing.

When it is processing an ideal application, the printer can deliver maximum print quality and reliability. With applications that deviate from the ideal, print quality may decrease, and the need for operator interventions may increase. This does *not* mean that the printer cannot be used for the application; it *does* mean that you need to test the application.

For detailed information on deciding what forms and applications to test and how to test them, refer to *Forms Design Reference for Continuous Forms Advanced Function Printers*, G544-3921.

# Valid Form Lengths in Inches

*Table 32. Examples of some valid form lengths in inches*

| If the Form Length is: | Use this value at the Touchscreen | Use this value at the Stacker Control Panel: |
|---|---|---|
| 3.0 | 3.0 | See note 2 on page 136 |
| $3^1/_2$ | 3.5 | See note 2 on page 136 |
| 4.0 | 4.0 | See note 2 on page 136 |
| $4^1/_2$ | 4.5 | See note 2 on page 136 |
| 5.0 | 5.0 | See note 2 on page 136 |
| $5^1/_2$ | 5.5 | See note 2 on page 136 |
| 6.0 | 6.0 | See note 2 on page 136 |
| $6^1/_2$ | 6.5 | See note 2 on page 136 |
| 7.0 | 7.0 | 7.0 |
| $7^1/_2$ | 7.5 | $7^1/_2$ |
| 8.0 | 8.0 | 8.0 |
| $8^1/_6$ | 8.1 | See note 1 on page 136 |
| $8^1/_3$ | 8.3 | $8^1/_3$ |
| $8^1/_2$ | 8.5 | 8 |
| $8^2/_3$ | 8.6 | $8^2/_3$ |
| $8^5/_6$ | 8.8 | See note 1 on page 136 |
| 9.0 | 9.0 | 9.0 |
| $9^1/_2$ | 9.5 | $9^1/_2$ |
| 10.0 | 10.0 | 10.0 |
| $10^1/_2$ | 10.5 | $10^1/_2$ |
| 11.0 | 11.0 | 11.0 |
| $11^1/_2$ | 11.5 | $11^1/_2$ |
| 12.0 | 12.0 | 12.0 |
| $12^1/_2$ | 12.5 | $12^1/_2$ |
| 13.0 | 13.0 | 13.0 |
| $13^1/_2$ | 13.5 | $13^1/_2$ |
| 14.0 | 14.0 | 14.0 |
| $14^1/_2$ | 14.5 | $14^1/_2$ |
| 15.0 | 15.0 | 15.0 |
| $15^1/_2$ | 15.5 | $15^1/_2$ |
| 16.0 | 16.0 | 16.0 |
| $16^1/_2$ | 16.5 | $16^1/_2$ |
| 17.0 | 17.0 | 17.0 |

*Table 32. Examples of some valid form lengths in inches  (continued)*

| If the Form Length is: | Use this value at the Touchscreen | Use this value at the Stacker Control Panel: |
|---|---|---|
| **Notes:**<br>1. The form lengths shown are <u>examples</u> only. You can enter form lengths in one-sixth of an inch increments at the touchscreen. For reference, see $8^1/_3$ and $8^2/_3$ above.<br><br>   The stacker control panel does not allow form lengths in one-sixth of an inch. The smallest increment allowed on the stacker control panel is one-third of an inch.<br><br>2. The setting equals the forms length *as measured from fold perforation to fold perforation*. Infoprint 4100 Models DO NOT support page sizes less than 76 mm (3 inches) in length.<br><br>3. Form lengths as prefolded greater than 14.0 inches up to the maximum are permissible if the stacker is disabled and a Post-processing device is installed and enabled.<br><br>   Form lengths greater than 17 inches can be used if RPQ 8B3929, 8B3930, or 8B4053 is installed. | | |

# Form Lengths Not Supported with the Signature Page Feature (Infoprint 4000 Models Only)

The Signature Page feature allows form lengths up to 54 inches. However, there are some lengths between 14 inches and 54 inches that are not supported with the Infoprint 4000. The Infoprint 4100 supports all lengths. Table 33 lists the lengths that are not supported with this feature.

*Table 33. Signature Page feature lengths NOT supported*

| | | | | | |
|---|---|---|---|---|---|
| $17^1/_6$ | $26^1/_6$ | $34^1/_3$ | $40^1/_6$ | $46^1/_3$ | $52^1/_3$ |
| $17^5/_6$ | $27^1/_6$ | $35^1/_6$ | $41^5/_6$ | $46^5/_6$ | $52^5/_6$ |
| $18^1/_6$ | $27^5/_6$ | $35^2/_3$ | $42^1/_3$ | $47^1/_6$ | $53^1/_2$ |
| $18^5/_6$ | $28^5/_6$ | $36^1/_3$ | $42^5/_6$ | $48^5/_6$ | |
| $21^1/_6$ | $29^5/_6$ | $37^1/_6$ | $43^2/_3$ | $49^2/_3$ | |
| $21^5/_6$ | $30^1/_6$ | $37^2/_3$ | $43^5/_6$ | $50^1/_3$ | |
| $22^5/_6$ | $31^5/_6$ | $37^5/_6$ | $44^5/_6$ | $51^1/_6$ | |
| $23^1/_6$ | $32^1/_6$ | $38^1/_6$ | $45^1/_6$ | $51^1/_2$ | |
| $24^5/_6$ | $32^5/_6$ | $38^5/_6$ | $45^2/_3$ | $51^5/_6$ | |
| $25^1/_6$ | $33^1/_6$ | $39^5/_6$ | $46^1/_6$ | $52^1/_6$ | |

# Chapter 7. Setting Printer Definition Values

---

**Chapter Overview**

This chapter describes how to set and update the printer definition. Please note the table contains information on all possible choices across the various models. Not all entries are applicable to all models.

Appendix B, "Work Sheets," on page 183 contains work sheets you can use to record your definition choices

---

You can define the printer in the categories of information described in the following sections:
- "Changing the Language of Messages"
- "Defining the Printer" on page 138
- "Defining the Host Attachments" on page 166
- "Defining Interfaces and Preprocessing or Postprocessing Devices" on page 167

## Changing the Language of Messages

This procedure changes the language used for all text within the touchscreen windows, and, except for Japanese, on the printer operator panel display. When you select Japanese, the printer operator panel displays U.S. English text.

Once you change the language, it remains in effect until changed again with this procedure.

A selection box lists the available language choices. A scroll bar on the right side of the box displays additional choices not shown in the box, and highlights the current choice. The options are:
- English
- Spanish
- German
- Japanese
- French
- Italian
- Brazilian Portuguese
- Simplified Chinese
- Traditional Chinese
- Korean
- Russian
- Hungarian

---

**Changing the language**

**Printer Definition → Printer → Basic → Language**

---

**137**

# Defining the Printer

This procedure lets you view or update a copy of the printer definition.

**Note:** The printer can have multiple sets of definition data: one for each mode in which the printer can operate. To update a definition for a particular mode, the printer must be running in that mode.

---
**Printing printer data**

**Maintenance → Print Samples → Printer Configuration**

---

---
**Important**

Printer data is always printed in U.S. English regardless of the language used on the touchscreen.

---

# Printer Definition Information

Table 34 on page 139 describes all configuration items, what each is used for, and the allowable value options for each item. The factory set default value options are <u>underlined</u> or separately specified.

**Important!**Table 34 on page 139 lists all configuration items for all models of Infoprint 4000 and Infoprint 4100 printers. Some items may be grayed out or not shown on particular models.

- Configuration items marked (D) appear only for duplex systems.
- Configuration items marked (S) appear only for simplex systems.
- Configuration items marked (POD) appear only for Infoprint 4000 Models IR1/IR2, and IR3/IR4.
- All unmarked items appear for both duplex and simplex systems.
- ‡ indicates items that are saved in Snapshots.

*Table 34. Printer Definition Items*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Print Quality** | | |
| Printer 1 Contrast ‡ | This entry is used to adjust the contrast (toner density) of print on the forms. | 1 to 7<br><br>Default is 4. |
| Printer 1 Boldness ‡ | This entry is used to change the vector boldness. The boldness is expressed as a percentage of stroke width. | Default is 50. |
| Printer 1 Preheat Temperature ‡ | This entry is used to adjust the preheat platen temperature. The value entered is a relative number, not a measure of degrees, with 1 being the coolest and 100 being the hottest. | 1 to 100<br><br>Default is 50. |
| Printer 1 Fuser Temperature ‡ | This entry is used to adjust the hot roll temperature. The value entered is a relative number, not a measure of degrees, with 1 being the coolest and 100 being the hottest. | 1 to 100<br><br>Default is 50. |
| Printer 1 Oil Rate ‡ | This entry is used to adjust the amount of oil fed to the oil belt or oil roller. The value entered is a relative number, not a measure of quantity, with 1 being the lowest rate and 100 being the highest rate. | 1 to 100<br><br>Default is 50. |
| Printer 1 Oil Belt ‡ | This entry is used to adjust the speed at which the oil belt moves. The value entered is a relative number, not a measure of speed, with 1 being the slowest speed and 100 being the fastest speed. | 1 to 100<br><br>Default is 50. |
| Printer 1 Use Backup Idler Roll ‡ | This entry indicates whether the backup idler roll is to be used to improve fusing and reduce bloom.<br>**Note:** You must enable this configuration item using **Printer Definition → Printer → Service** where you must state whether the backup idler roll is physically installed.<br><br>**Default** allows the BIR to be switched on or off automatically depending on whether the printer is in duplex or simplex mode. It also allows the BIR to be switched on or off automatically when LIGHT paper is run on the Infoprint 4100.<br><br>**Yes** overrides normal operation and always uses the backup idler roll.<br><br>**No** overrides normal operation and never uses the backup idler roll. | • Default<br>• Yes<br>• No |
| Example Settings | This item gives you example settings for preheat, fuser, oil roll, and oil belt for various paper weights. Selecting an item from the dropdown menu will adjust the slider to show typical settings for the specified paper weight. | • Light<br>• Medium<br>• Heavy |
| Printer 2 Contrast (D) ‡ | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Boldness (D) ‡ | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Preheat Temperature (D) ‡ | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Fuser Temperature (D) ‡ | See entry for Printer 1. | See entry for Printer 1. |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| Printer 2 Oil Rate (D) ‡ | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Oil Belt (D) ‡ | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Use Backup Idler Roll (D) ‡ | See description for Printer 1. | See entry for Printer 1. |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Print Quality → Beam Adjustments** | | |
| Printer 1 Beam 1 Offset Adjustment | (CE Change Only) Beam adjustment is used by maintenance personnel to control the vertical alignment or horizontal adjustment of the separate beams of a multi-beam printer. See "AOM Skew" in the Multi-Beam Printhead section of "Removal and Adjustments" within the Maintenance Information. | Beam 1 cannot be changed. |
| Printer 1 Beam 2 Offset Adjustment | (See information in *Beam 1 offset adjustment*) | 0.0 to 15.9 Default is 8.0 units. Unit = .1 pel. |
| Printer 1 Beam 3 Offset Adjustment | (See information in *Beam 1 offset adjustment*) | (See information in *Beam 2 offset adjustment*) |
| Printer 1 Beam 4 Offset Adjustment | (See information in *Beam 1 offset adjustment*) | (See information in *Beam 2 offset adjustment*) |
| Printer 1 Beam 5 Offset Adjustment | (See information in *Beam 1 offset adjustment*) | (See information in *Beam 2 offset adjustment*) |
| Printer 2 Beam 1 Offset Adjustment | (See information in *Printer 1 Beam 1 offset adjustment*) | Beam 1 cannot be changed. |
| Printer 2 Beam 2 Offset Adjustment | (See information in *Printer 1 Beam 1 offset adjustment*) | (See information in *Printer 1 Beam 2 offset adjustment*) |
| Printer 2 Beam 3 Offset Adjustment | (See information in *Printer 1 Beam 1 offset adjustment*) | (See information in *Printer 1 Beam 2 offset adjustment*) |
| Printer 2 Beam 4 Offset Adjustment | (See information in *Printer 1 Beam 1 offset adjustment*) | (See information in *Printer 1 Beam 2 offset adjustment*) |
| Printer 2 Beam 5 Offset Adjustment | (See information in *Printer 1 Beam 1 offset adjustment*) | (See information in *Printer 1 Beam 2 offset adjustment*) |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Print Quality → PQE Adjustments** | | |
| Printer 1 Beam Number | (CE Change Only) This entry allows you to select a beam on which to make print quality enhancements. Selecting **All** changes the settings for each beam, overriding any changes you have made for specific beams. | • <u>All</u><br>• 1 to 5 |
| Printer 1 Current Vector | (CE Change Only) | 0 to 7 |
| Printer 1 Vector Boldness | (CE Change Only) | 0 to 7 |
| Printer 1 Horizontal High | (CE Change Only) | 0 to 63 |
| Printer 1 Horizontal Low | (CE Change Only) | 0 to 63 |
| Printer 1 Vertical High | (CE Change Only) | 0 to 63 |
| Printer 1 Vertical Low | (CE Change Only) | 0 to 63 |
| Printer 2 Beam Number | See entry for Printer 1. | • <u>All</u><br>• 1 to 5 |
| Printer 2 Current Vector | See entry for Printer 1. | 0 to 7 |
| Printer 2 Vector Boldness | See entry for Printer 1. | 0 to 7 |
| Printer 2 Horizontal High | See entry for Printer 1. | 0 to 63 |
| Printer 2 Horizontal Low | See entry for Printer 1. | 0 to 63 |
| Printer 2 Vertical High | See entry for Printer 1. | 0 to 63 |
| Printer 2 Vertical Low | See entry for Printer 1. | 0 to 63 |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Printer → Basic** | | |
| Printer Mode | This entry allows setting whether the duplex system is to be operated in duplex or simplex (dual-simplex) mode.<br><br>A **Restart** is required for a change in this parameter to take effect. If you are in dual-simplex mode, both printers need to be restarted. | • Duplex<br>• Simplex |
| Printer Speed (Infoprint 4100 Models HS2 and HD3/4 Models) | Use **Printer Speed** to control the printer speed on Infoprint 4100 Models HS2, and HD3/4. Use **High** for normal operations. Use **Low** for situations involving heavy weight or other hard to fuse papers. | • High<br>• Low |
| POD Mode (POD) | This entry enables the Print on Demand function.<br><br>A **Restart** is required for a change in this parameter to take effect. If you are in dual-simplex mode, both printers need to be restarted. | • Yes<br>• No |
| Cut Sheet Emulation ‡ | Sheets are divided in half using an imaginary line that is parallel to the tractor strips. Each resulting "half sheet" is treated as if it were a whole sheet running through a cut-sheet printer.<br><br>**None** implies the cut-sheet emulation is not enabled.<br><br>**Normal Left-to-Right**  allows the print data to be placed on the left half-sheet first and then the right half-sheet. The left half-sheet is closest to the operator. The physical orientation of the data is based on the lower-left corner of the paper as viewed from the operator's viewpoint.<br><br>**Normal Right-to-Left** allows the print data to be placed on the right half-sheet first and then the left half-sheet. The right half-sheet is furthest from the operator. The physical orientation of the data is based on the lower-left corner of the paper as viewed from the operator's viewpoint.<br><br>**Inverted Left-to-Right** allows the print data to be placed on the left half-sheet first and then the right half-sheet. The left half-sheet is furthest from the operator. The physical orientation of the data is based on the upper-right corner of the paper as viewed from the operator's viewpoint. This mode is the "upside down" version of the **Normal Left-to-Right** mode.<br><br>**Inverted Right-to-Left** allows the print data to be placed on the right half-sheet first and then the left half-sheet. The right half-sheet is closest to the operator. The physical orientation of the data is based on the upper-right corner of the paper as viewed from the operator's viewpoint. This mode is the "upside down" version of the `Normal Right-to-Left` mode.<br><br>This value is used only when no other value is set during the Define Forms procedure for a specific form. | • None<br>• Normal Left-to-Right<br>• Normal Right-to-Left<br>• Inverted Left-to-Right<br>• Inverted Right-to-Left |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| Printhead Resolution ‡ | This parameter changes the resolution that the printhead in this printer uses. Not all values are supported on all printers. | • 240<br>• 300<br>• 480<br>• <u>600</u><br><br>The values available to you depend on the model of printer.<br><br>To have a selectable IPDS resolution, select 600. |
| IPDS Resolution ‡ | This parameter can only be set when a printhead resolution of 600 DPI is selected. | • Automatic<br>• 240<br>• 300<br>• <u>600</u><br><br>The values available to you depend on the model of printer and the printhead resolution selected. |
| Front Sheet Sequence (D) ‡ | This entry sets whether the front side of the forms will be printed on Printer 1 or Printer 2 in duplex mode.<br><br>**Front First** means that the odd pages (1st, 3rd, 5th,...) of a customer job will print on Printer 1, and the even pages (2nd, 4th, 6th, ...) pages will print on Printer 2. **Front Second** means just the opposite of Front First.<br><br>A post-processing device is being used that bursts and stacks the output, the "Front Second" setting will deliver output with the odd number pages facing to the front. | • <u>Front First</u><br>• Front Second |
| Same Side Printing‡ | Printer 2 will print on the same side of the paper as printer 1 (the paper is not being flipped over between machines). | • <u>No</u><br>• Yes for duplex data<br>• Yes for color data |
| Eject to Front Facing ‡ | Box paper unfolds accordion style, alternating pages between front facing and back facing. This entry allows accepting or rejecting the Eject to Front Facing (EFF) signals sent by the host. A **Disabled** value will suppress EFFs. If **Enabled**, the EFF signal from the host will cause a blank page to be inserted between print jobs if the prior job contained an odd number of pages. When set, forms — front facing can be used to adjust whether the form is front facing or rear facing.<br><br>This option should be set to **Disabled** if either a postprocessing device is installed that bursts and stacks output pages, or if Direct Attach is set to **Yes**. | • Enabled<br>• <u>Disabled</u> |
| Auto NPRO at EOF ‡ | This entry indicates whether an automatic NPRO is performed when an End of Forms is detected. | • Yes<br>• <u>No</u> |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| Reprint Pages After Jams‡ | This entry controls under what conditions the host system will automatically retransmit pages after a forms jam has been cleared.<br><br>• **Yes** - All lost pages are automatically retransmitted and reprinted.<br>• **No recovery for MICR pages** - Lost pages printed with a MICR printer will not be retransmitted.<br>• **No** - No lost pages will be retransmitted. Any missing or damaged pages must be manually recovered. | • <u>Yes</u><br>• No recovery for MICR pages<br>• No |
| Direct Attach ‡ | This entry shows if printing is to occur in direct-printing mode when connected to an OS/390 operating system, with no host-assisted recovery procedures such as retransmission of pages after a forms jam.<br><br>The host system programmer will inform you whether this entry should be set to **Yes**. | • Yes<br>• <u>No</u> |
| Language | This entry changes the language used for all text within the touchscreen windows. When you select Japanese, Korean, Simplified Chinese, or Traditional Chinese, the printer operator panel displays U.S. English text. | • <u>English</u><br>• Spanish<br>• German<br>• Japanese Kanji<br>• French<br>• Italian<br>• Brazilian Portuguese<br>• Simplified Chinese<br>• Traditional Chinese<br>• Korean<br>• Russian<br>• Hungarian |
| Keyboard Language | (CE Only) Indicates which keyboard is used. This entry changes the language used for all text within the touchscreen windows. | • <u>English</u><br>• Spanish<br>• German<br>• Japanese Kanji<br>• French<br>• Italian<br>• Brazilian Portuguese<br>• Simplified Chinese<br>• Traditional Chinese<br>• Korean<br>• Russian<br>• Hungarian |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Printer → Advanced** | | |
| Snapshot Mode | (CE Change Only) This item allows you to specify whether to **Save All Settings**, including printer definition configuration items, in a Snapshot, or to **Save Only Form Settings**. | • <u>Save All Settings</u><br>• Save Only Form Settings |
| Logical Page Increment | This entry allows expansion of the logical page size, for cases where the printed page is larger than the valid printable area, without errors being set.<br><br>The value entered will increase the valid printable area by that number of pels in all directions. Please review your applications to ensure that this setting does not cause loss of data, such as printing on the tractor hole carrier strip that will be trimmed off. | <u>0</u> to 20 pels |
| MICR Installed | The printer host is informed of where MICR capability is present. Specify where MICR printing is to be allowed. | • Both<br>• Printer 1<br>• Printer 2<br>• None |
| 3130 Barcode Emulation | This entry controls whether the printer operates in 3130 Barcode Compatibility mode. | • Yes<br>• <u>No</u> |
| Simulate Color with Gray | This entry allows the printer to print color print jobs using gray tones. | • <u>Yes</u><br>• No |
| Line Mode Enabled | This entry allows the printer to enter the 3800 compatibility mode (line mode). Whenever you change this setting, you must restart the printer. | • Yes<br>• <u>No</u> |
| Single-byte Font Smoothing | This entry is used for edge smoothing of raster single-byte fonts | • Yes<br>• <u>No</u> |
| Double-byte Font Smoothing | This entry is used for edge smoothing of double-byte raster fonts | • Yes<br>• <u>No</u> |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Printer → Setup** | | |
| Autostart | If **Yes**, all current attachment interface status (enabled/disabled) is saved during a **Shutdown** procedure, and automatically restored at the next power on of the system. | • Yes<br>• <u>No</u> |
| Side Verify Page Numbers (D) | This entry indicates if verification marks (numbers) are to be printed on the edge (tractor hole area) of each side of forms. When these marks are printed, it is possible to verify that the forms are synchronized or aligned (the two sides of the form coincide).<br><br>The verification numbers can be read by the operator. If the number on side 1 of a form matches the number on side 2, the forms are correctly synchronized. Multiple copies of the same page will have the same verification mark numbers. | • Yes<br>• <u>No</u> |
| Form Feed Length | This entry sets the number of inches that will feed when the **Start Alignment** button is selected during the Align Form procedure. | 17 to 250 inches |
| Jam Recovery Point Distance | This entry sets a distance past the printer fuser sufficient for forms to reach an installed post-processing device, so that those forms will be reprinted following a forms jam recovery.<br><br>In duplex mode, this distance is measured past the fuser of Printer 2. In dual simplex mode, it is a distance past either Printer 1 or Printer 2.<br><br>A non-zero value setting assumes that: a postprocessing device is installed and enabled, the "Jam Recovery Type" configuration item setting above allows reprinting of pages, and the "Direct Attach" configuration item setting above is **No**. | <u>0</u> to 500 inches |
| Printer 1 to Printer 2 Distance (D) | This entry sets the length, in inches, of the forms path length from the alignment mark on the lower transfer station tractors of Printer 1, through Printer 1, across the floor to the Buffer/Flipper Unit, through the Buffer/Flipper Unit, across the floor to Printer 2, under Printer 2 up to the alignment mark on the lower transfer station tractors of Printer 2. This is used during the duplex mode Align Forms procedure. If you are continually feeding paper at either printer in order to get the forms aligned, this configuration item may have to be changed.<br><br>See "Space Requirements" on page 113 for physical layout details and dimensions. | 150 to 800 inches<br><br>Default is 315 inches. |

*Table 34. Printer Definition Items (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| NPRO Length | This entry sets an *extra* length that is added to the fixed NPRO length to create a total distance that forms are moved through the printer.<br><br>This entry can be used when an uncoupled (not functionally attached) post-processing device is installed and it is necessary to extend the NPRO length to be able to easily remove forms at the post-processing device output.<br><br>If any installed and enabled pre/postprocessing devices have the "Pre/postprocessor Extended NPRO" distance of an enabled pre/postprocessor set to greater than zero, then that distance will take precedence over the "NPRO Length", even if the "NPRO Length" is longer. The "Pre/postprocessor Extended NPRO" distance is set in the Define Pre/Post procedure. If several "Pre/postprocessor Extended NPRO" distances are set, then the longest one takes precedence. | 0 to 1200 inches |
| Fuser Sleep Timeout | This entry sets the time, in hours, of printer inactivity before the fuser is to be turned off. This saves electrical power costs and extends the life of the printer. The fuser will automatically turn on when printing resumes, with a delay until the fuser has reached operating temperature. **None** means that the timer is not being used. | • None<br>• 1 Hour<br>• 2 Hours<br>• 4 Hours |
| Clear Memory for Security | This entry allows setting of whether residual print data is to be cleared from memory. Clearing memory can result in a delay of up to two minutes before a print job starts. Select **Yes** if a high level of security is required. | • Yes<br>• No |
| Audible Alarm | This entry allows suppression of the Operator Alert alarm tone for error and supply-item actions. | • Yes<br>• No |
| Date and Time | (CE Change Only) This is in the form of **yyyymmdd, hhmmss**.<br><br>The time is a 24-hour clock.<br><br>To adjust, highlight the field to change and press arrow up or arrow down. | yyyy=year<br>mm=month<br>dd=day<br>hh=hour<br>mm=minute<br>ss=second |
| Auto Align | This entry enables the printer to align itself when a **Forms Alignment Required** condition exists. Select **Start** and the printer will align itself as the job is printed. Select **Yes** to enable the auto-align feature.<br><br>**Notes:**<br>1. Forms cannot be greater than 17 inches in length.<br>2. If you are running with the Forms Identification (Barcode) feature installed, forms cannot be less than 6 inches in length. | • Yes<br>• No |
| Side 2 Verify | (CE Change Only) This feature automatically checks to make sure that the duplex printing system is properly aligned and that the printing on both sides of the forms is synchronized. | • Enable<br>• Disable |

*Table 34. Printer Definition Items (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Printer → Setup → Advanced** | | |
| Suppress Off Page Errors | This entry sets the distance (in pels) to suppress off page errors. This will allow the job to print off the physical page without errors and data can be lost. This is useful when you want to print jobs that are poorly defined and changing the print job is not an option. | • Yes<br>• <u>No</u> |
| Movable Side Verify Marks | Set **Movable Side Verify Marks** to **Yes** to enable the **Side Verify Mark Location** field on the **Form Settings** panel. That field allows you to adjust the side verify marks in the vertical direction. | • Yes<br>• <u>No</u> |
| Stop on toner low | Set **Stop on toner low** to **Yes** to stop the printer and generate an **Add toner** message 5000 feet after a toner low condition is detected. Set to **No** if you want the printer to continue running until the toner supply is exhausted. | • Yes<br>• <u>No</u> |
| Open Clear Buffers Alert | Set **Open Clear Buffers Alert** to **Yes** to check whether print data is currently being held in memory whenever the printer stops. When data is present, the message Clear Buffers will be posted in the Operator Messages area of the main window. | • Yes<br>• <u>No</u> |
| Dual sensor installed | (CE Change Only) Indicates whether the sensor hardware has been updated to allow measuring marks on both sides of the paper. Set **Dual sensor installed** to **Yes** to verify front-to-back and page-to-page registration when printing data on printer 1 and printer 2 on the same side of the paper. Also use this when printing on preprinted forms in tractorless mode to read the top-of-forms registration marks at the rear of the printer on side one of the paper. | • Yes<br>• <u>No</u> |
| Display Consumables | (CE Change Only) Select **Yes** to display information about consumables in the printer Details window to all users. Select **No** to display information about consumables in the printer Details window to service-level users only. | • Yes<br>• <u>No</u> |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Printer → Service** | | |
| Printer 1 Machine Serial | (CE Change on Initial Configuration Only) This is the code for plant of manufacture of Printer 1 (2 numeric only characters) and sequence number for Printer 1 (7 alphanumeric characters). Each time the RS/6000 hard disk is replaced, this data is lost; the CE must re-enter the serial number found on the rear inside of the control unit frame. | 9 characters |
| Printer 1 Print Count | (CE Change Only) The Print Usage Count from the mechanical counter at the rear of the printer may be transferred to this counter, which will then become a new base count in the running "Printer Count" displayed in the main touchscreen window. | 0 to 2 000 000 000 |
| Printer 1 Backup Idler Roll Installed | (CE Change Only) This entry indicates whether a Backup Idler Roll (BIR) is installed. | • Yes<br>• No |
| Printer 1 Scan Factory Adjustment | (CE Change Only) This is used by service personnel to adjust the scan direction printing registration. See "Registration" in the Printhead section of "Removal and Adjustments" within the Maintenance Information. | 0 to 100 units<br><br>Default is 40 units.<br><br>Unit = 2 pels. |
| Printer 1 Process Factory Adjustment | (CE Change Only) This is used by service personnel to adjust the process direction printing registration. See "Registration" in the Printhead section of "Removal and Adjustments" within the Maintenance Information. | 0 to 60 units<br><br>Default is 40 units.<br><br>Unit = 2 pels. |
| Printer 1 Ozone Filter Installed | (CE Change Only) This is used by service personnel to specify whether the ozone filter has been installed. Setting this field to **Yes** allows Preventive Maintenance to track and display usage information and warn when the filter must be replaced. | • Yes<br>• No |
| Printer 2 Machine Serial (D) | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Print Count (D) | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 BIR Installed (D) | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Scan Factory Adjustment (D) | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Process Factory Adjustment (D) | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Ozone Filter Installed | See entry for Printer 1. | See entry for Printer 1. |
| Printer 2 Side Verify Factory Adjust | (CE Change Only) This is used by service personnel to adjust the **Side 2 Verify** timing (in pels) in the process direction. Use this adjustment after the print position has been set correctly using **Scan Factory Adjustment** and **Process Factory Adjustment**, if the **Side 2 Verify** sensor position cannot or should not be moved. The sensor should not be moved after it has been adjusted for tractorless mode registration. | 20 to 220 pels<br><br>Default is 120 pels. |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Printer → Resource Utilization** | | |
| Font Usage | This entry allows you to select the amount of memory that the printer control unit (computer) will use for font management. Select the font usage according to the type of print jobs you run.<br><br>Select **Low** font usage for jobs using a normal number of fonts with normal point sizes, but not double-byte fonts. **Medium** font usage indicates an abnormal SBCS (single-byte character set) printing mode; select it for jobs using a large number of fonts or very large point sizes, but not double-byte fonts. **High** font usage is primarily for double-byte font jobs. | • Low<br>• Medium<br>• High |
| Page Segment and Overlay Usage | This entry is used to allocate space for IPDS source for page segments and overlays. Set to **Low** if the size or number of page segments and overlays is a small. Set to **High** if the size or number of page segments and overlays is large. | • Low RAM<br>• Medium RAM<br>• High RAM<br>• Unlimited disk |
| Overlay Cache Usage | This parameter is used to set overlay caching. Set to **None** if overlays are not reused multiple times or if overlays are not reused in the same location on subsequent pages. | • High<br>• Medium<br>• Low<br>• None |
| Input Buffer Size | This parameter is used to allocate space for the IPDS data that was just received from the server before being processed by the control unit. Set to **Low** if pages contain little data or if printing from PSF/MVS on a S/370 channel or a FICON or ESCON channel (this is because of the frequent IPDS acknowledgment rate). Set to **High** if printing pages with large amounts of data (such as large images). | • Low<br>• Medium<br>• High |
| Output Buffer Size | This parameter is used to allocate space for ready-to-print pages, including pages between the transfer points of a continuous-forms, duplex printer. Set the value to **Low** if these conditions are met:<br>• The pages contain little data<br>• This is a simplex printer<br>• This is a duplex printer with a distance between transfer points of less than 400 inches.<br><br>Set the value to **High** if these conditions are met:<br>• The pages contain large amounts of data, especially shaded areas<br>• This is a duplex printer with a distance between transfer points of over 400 inches. | • Low<br>• Medium<br>• High |
| Large Trace Size | This field sets the maximum size for large IPDS data traces when **Enable Large IPDS Data Traces** is selected. By default, the IPDS data trace is 1 Megabyte. **Note:** This amount of RAM will be set aside for saving the data trace, so selecting very large values will have performance impacts when large traces are enabled. | 0 to 100 000 000 bytes |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Attachments → Parallel** | | |
| Parallel Link A Installed | This entry specifies if Parallel Channel Link A is installed. | • Yes<br>• <u>No</u> |
| Parallel Link B Installed | This entry specifies if Parallel Channel Link B is installed. | • Yes<br>• <u>No</u> |
| Second Channel | This entry specifies the switching mode of the Two-Channel Switch: Static or Dynamic Mode. When a second Parallel Channel is installed, a Two-Channel Switch facility is provided.<br><br>• **Static** enables only one channel at a time. You can connect two interfaces to two channels on the same processing unit, on tightly coupled processing units (units controlled by the same operating system, or on independent (uncoupled) processing units.<br><br>• **Dynamic** enables both channels at the same time with the two-Channel Switch used as a dynamic interface switch. Connect the two interfaces to two channels either on the same processing unit or on tightly-coupled processing units (units controlled by the same operating system).<br><br>You cannot select this item unless two channels are installed. | • <u>Static</u><br>• Dynamic |
| Device Address | This entry specifies the 2-digit hexadecimal channel address which includes the device address.<br><br>**Notes:**<br><br>1. In simplex mode, only one device address is required.<br><br>   In dual simplex mode, each printer requires a unique device address. Printer 1 requires an even number (for example, X'30'); Printer 2 requires the next consecutive number (for example, X'31').<br><br>2. The duplex system does not require a unique number. It can use either of the addresses used for dual simplex Printer 1 or dual simplex Printer 2. However, it is often easier from an operational viewpoint to assign duplex a separate address (so the duplex and simplex printers look like unique devices to the operating system). The general convention in this case is to assign the duplex system the next consecutive address (even) after the address for simplex Printer 2.<br><br>   For example, if you define Printer 1 in dual simplex as X'30', you should then define Printer 2 in dual simplex as X'31', and, optionally, define the complete system in duplex as X'32'.<br><br>3. The device addresses specified above must match the device addresses defined to the host PSF software, and in the case of S/390 hosts, the I/O device definitions. | X'00' to X'FF' (Hexadecimal notation)<br><br>Default is X'00'. |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| Data Transfer Protocol | This entry specifies the data transfer mode to be used: DC Interlocked or Data-Streaming.<br><br>If two channels are installed, both channels use the same protocol. | • <u>Interlocked</u><br>• Data Streaming |
| Data Streaming Rate | This entry specifies the data rate being used if you select the Data-Streaming Data Transfer Protocol. Use the highest rate that is supported by your system.<br><br>If two channels are installed, both channels use the same data rate. | • <u>3.0 MB/sec</u><br>• 4.5MB/sec |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Attachments → ESCON** | | |
| ESCON Link A Installed | This entry specifies if ESCON Channel Link A is installed. | • Yes<br>• <u>No</u> |
| ESCON Link B Installed | This entry specifies if ESCON Channel Link B is installed. | • Yes<br>• <u>No</u> |
| Device Address | This entry specifies the 2-digit hexadecimal channel address which includes the device address.<br><br>**Notes:**<br><br>1. In dual simplex mode, each printer requires a unique device address. Printer 1 requires an even number (for example, X'30'); Printer 2 requires the next consecutive number (for example, X'31').<br><br>2. The duplex system does not require a unique number. It can use either of the addresses used for dual simplex Printer 1 or dual simplex Printer 2. However, it is often easier from an operational viewpoint to assign duplex a separate address (so the duplex and simplex printers look like unique devices to the operating system). The general convention in this case is to assign the duplex system the next consecutive address (even) after the address for simplex Printer 2.<br><br>For example, if you define Printer 1 in dual simplex as X'30', you should then define Printer 2 in dual simplex as X'31', and, optionally, define the complete system in duplex as X'32'.<br><br>3. The device addresses specified above must match the device addresses defined to the host PSF software, and in the case of S/390 hosts, the I/O device definitions. | X'00' to X'FF' (hexadecimal notation)<br><br>Default is X'00'. |
| Multi-Host Environment Flag | This entry indicates whether a multiple host printer-sharing system exists. (Multi-Host Environment support increases configuration flexibility and simplifies operational procedures for ESCON-attached printers.)<br><br>Notes regarding ESCON attachment:<br>• Do not enable this flag unless all hosts sharing the printer have:<br>    – OS/390 V1 Release 3.0 or higher<br>    – PSF ASSIGN/UNASSIGN support (PSF 3.1.0 for OS/390 or APAR OW29992 to PSF/MVS 2.2).<br><br>If these conditions are not satisfied, and Multi-Host Environment is enabled on the printer, PSF may not be able to access the printer.<br><br>• The Multi-Host configuration item is available only on printer control units that have newer ESCON adapters. The Multi-Host configuration item is grayed out and not accessible on older control units. | • True<br>• <u>False</u> |
| Maximum Block Length | The maximum size of data blocks sent to the printing system.<br>**Note:**  PSF for OS/390 V3.1.0 or higher is required for 64K data transmission. | • <u>32K</u><br>• 64K |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Attachments → FICON** | | |
| FICON Link A Installed | This entry specifies if FICON Channel Link A is installed. | • Yes<br><br>• No |
| Device Address | This entry specifies the 2-digit hexadecimal channel address which includes the device address.<br><br>**Notes:**<br><br>1. In dual simplex mode, each printer requires a unique device address. Printer 1 requires an even number (for example, X'30'); Printer 2 requires the next consecutive number (for example, X'31').<br><br>2. The duplex system does not require a unique number. It can use either of the addresses used for dual simplex Printer 1 or dual simplex Printer 2. However, it is often easier from an operational viewpoint to assign duplex a separate address (so the duplex and simplex printers look like unique devices to the operating system). The general convention in this case is to assign the duplex system the next consecutive address (even) after the address for simplex Printer 2.<br><br>For example, if you define Printer 1 in dual simplex as X'30', you should then define Printer 2 in dual simplex as X'31', and, optionally, define the complete system in duplex as X'32'.<br><br>3. The device addresses specified above must match the device addresses defined to the host PSF software, and in the case of S/390 hosts, the I/O device definitions. | X'00' to X'FF' (hexadecimal notation)<br><br>Default is X'00'. |
| Multi-Host Environment Flag | This entry indicates whether a multiple host printer-sharing system exists. (Multi-Host Environment support increases configuration flexibility and simplifies operational procedures for FICON-attached printers.)<br><br>Notes regarding FICON attachment:<br><br>• Do not enable this flag unless all hosts sharing the printer have:<br>  – OS/390 V1 Release 3.0 or higher<br>  – PSF ASSIGN/UNASSIGN support (PSF 3.1.0 for OS/390 or APAR OW29992 to PSF/MVS 2.2).<br><br>If these conditions are not satisfied, and Multi-Host Environment is enabled on the printer, PSF may not be able to access the printer. | • True<br>• False |
| Maximum Block Length | The maximum size of data blocks sent to the printing system.<br>**Note:** PSF for OS/390 V3.1.0 or higher is required for 64K data transmission. | • 32K<br>• 64K |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| Printer Definition → Attachments → TCP/IP Token Ring | | |
| Installed | This entry specifies if the Token Ring adapter is installed. | • Yes<br>• No |
| TCP Port | This entry specifies the TCP socket address of the attachment.<br><br>**Notes:**<br>1. In dual simplex mode, each printer requires a unique device address. If you use the default value of 5001 for simplex Printer 1, IBM recommends using 5002 as the value for simplex Printer 2.<br>2. The duplex printing system does not require a unique port number. It can use either of the TCP port numbers specified for simplex Printer 1 or simplex Printer 2. However, it is often easier from an operational viewpoint to assign duplex a separate TCP port number. If 5001 and 5002 are used for simplex Printer 1 and simplex Printer 2, IBM recommends that the duplex system be assigned TCP port number 5003.<br>3. The TCP Port numbers specified in the printer configuration must match the PORT numbers assigned in the host PSF system. | 5001 to 65535 |
| IP Address | This entry specifies the Internet protocol (IP) address of the printer in dotted decimal format. Get this value from your LAN administrator. This value must match the IP address value in the host PSF configuration.<br><br>This value is unique to a duplex system, and is the same regardless of whether the printer is in duplex or dual-simplex mode. | X.X.X.X where X ≤ 255 |
| Subnet Mask | This entry specifies the mask that identifies the local subnet in dotted decimal format. Get this value from your LAN administrator. If you do not have a local subnet, leave this field blank. | X.X.X.X where X ≤ 255 |
| Default Gateway Address | This entry specifies the IP address of the default gateway in dotted decimal format. Get this value from your LAN administrator. | X.X.X.X where X ≤ 255 |
| MTU Size | This entry specifies the Maximum Transmission Unit (MTU) – maximum allowable length of IP packets. | 60 to 4096 |
| Hardware Address | This entry specifies the TCP/IP Token Ring adapter ROM address. | This address cannot be changed. |
| Alternate Hardware Address | This entry sets the unique LAN adapter address for the network. The address must be different from other addresses on the LAN. New cards are restricted to X'4000 0000 0000' to X'FFFF FFFF FFFF'. | X'0' to X'FFFF FFFF FFFF' |
| Ring Speed | This entry specifies the ring speed of the network to which the adapter attaches. The value must match the speed of the network or the network may stop operating. | • 4<br>• 16 |
| Confine Broadcast | This entry specifies if broadcast packets (that is, Address Resolution Protocol packets) are enabled to cross bridges to other rings. | • Yes<br>• No |

*Table 34. Printer Definition Items (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Attachments → Ethernet** | | |
| Installed for (AFCCU microcode level 12.0 and later) | This entry specifies the purpose of this Ethernet adapter. If this attachment will be used for receiving print data, select **Print Data (IPDS)**. If this attachment will be used for a network connection for SNMP, IPM, or e-mail traces, select **Network Connection**. For IBM service representatives, select **Laptop** to use this attachment for a laptop connection.<br><br>Multiple purposes may be selected if the attachment will be used for more than one purpose. For example, if this attachment will be used to connect to Infoprint Manager, select both **Print Data** and **Network Connection**. Or if this attachment is to provide an SNMP connection to a printer that prints from a mainframe channel, select only **Network Connection**. Only one attachment may be selected for **Print Data** at a given time. | • Print Data (IPDS)<br>• Network Connection (SNMP, IPM, e-mail)<br>• Laptop (service port)<br><br>The default is off. |
| Installed (AFCCU microcode level 11.x and earlier) | This entry specifies if the Ethernet adapter is installed. | • Yes<br>• No |
| TCP Port | This entry specifies the TCP socket address of the attachment.<br><br>**Notes:**<br>1. In dual simplex mode, each printer requires a unique device address. If you use the default value of 5001 for simplex Printer 1, IBM recommends using 5002 as the value for simplex Printer 2.<br>2. The duplex printing system does not require a unique port number. It can use either of the TCP port numbers specified for simplex Printer 1 or simplex Printer 2. However, it is often easier from an operational viewpoint to assign duplex a separate TCP port number. If 5001 and 5002 are used for simplex Printer 1 and simplex Printer 2, IBM recommends that the duplex system be assigned TCP port number 5003.<br>3. The TCP Port numbers specified in the printer configuration must match the PORT numbers assigned in the host PSF system. | 5001 to 65535 |
| IP Address | This entry specifies the Internet Protocol (IP) address of the printer in dotted decimal format. Get this value from your LAN administrator. This value must match the IP address value in the host PSF configuration.<br><br>This value is unique to a duplex system, and is the same regardless of whether the printer is in duplex or dual-simplex mode. | X.X.X.X where X ≤ 255 |
| Subnet Mask | This entry specifies the mask that identifies the local subnet in dotted decimal format. Get this value from your LAN administrator. If you do not have a local subnet, leave this field blank. | X.X.X.X where X ≤ 255 |
| Default Gateway Address | This entry specifies the IP address of the default gateway in dotted decimal format. Get this value from your LAN administrator. | X.X.X.X where X ≤ 255 |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| MTU Size | This entry specifies the Maximum Transmission Unit (MTU) size.<br><br>Gigabit Ethernet supports MTU sizes larger than 1500 bytes (jumbo frames) for improved performance. However, since this is not part of IEEE802.3 standards, it is not recommended for use except in point-to-point Gigabit Ethernet connections that use the same adapter on each end. | If Type is Standard, the range is 60 to 1500 (or up to 9000 for GigaBit Ethernet)<br><br>If Type is IEEE802.3, the range is 60 to 1492. |
| Hardware Address | This entry specifies the Ethernet adapter ROM address. | This address cannot be changed. |
| Alternate Hardware Address | This entry sets the unique LAN adapter address for the network. The address must be different from other addresses on the LAN. New cards are restricted to X'4000 0000 0000' to X'FFFF FFFF FFFF' | X'0' to X'FFFF FFFF FFFF' |
| Ethernet Type | This entry specifies either the Standard or the IEEE802.3 Ethernet type. | Standard or IEEE802.3 |
| Media Speed | **Notes:**<br>1.  In most cases, the Auto Negotiation setting should be used. Explicit media mode and speed settings can be used if:<br> • There is very slow Ethernet throughput<br> • The LED indicators are incorrect<br> • The printer cannot be contacted using the Ping command<br><br> Due to different Auto Sensing standards used by manufactures of Ethernet adapters, this may cause them to not work correctly in all combinations. The quick way to determine this type of problem is to see if the Duplex and 10/100/1000 indicators are inconsistent between the printer and the switch.<br>2.  Check the LED's on the printer Ethernetadapter card when enabled. Note the values for each of the indicators on the adapter.<br><br> • FDX (Full Duplex) indicator is on when operating in Full Duplex Mode and off when operating Half Duplex.<br><br> • 100 indicator is on when operating at 100 Megabit and off when operating at 10 Megabits.<br><br> • RCV (Receive) indicator is on when receiving packets from the network.<br><br> • ACT (Activity) or LNK (LINK) indicators are on when packets are being received or transmitted over the network.<br>3.  There should be similar indicators on the switch or system that the printer is connected to and their values should be noted. The Full/Half Duplex and 10/100/1000indicator values must agree between the printer and the switch that the printer is connected to. To resolve this, you must take the switch out of auto negotiation mode and explicitly set the mode and speed at the switch. On the printer, the media mode can be either half or full duplex and the speed can be either 10 or 100Mbps. These settings must match those of the switch. | • Auto Negotiation<br>• 10 Half Duplex<br>• 10 Full Duplex<br>• 100 Half Duplex<br>• 100 Full Duplex |

*Table 34. Printer Definition Items (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| Card | This entry provides details about the network interface adapter. The displayed information can help locate the adapter interface for connecting a network cable. | N/A |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Attachments → TCP/IP FDDI** | | |
| Installed | This entry specifies if a FDDI adapter is installed. | • Yes<br>• <u>No</u> |
| TCP Port | This entry specifies the TCP socket address of the attachment.<br><br>**Notes:**<br><br>1. In dual simplex mode, each printer requires a unique device address. If you use the default value of 5001 for simplex Printer 1, IBM recommends using 5002 as the value for simplex Printer 2.<br><br>2. The duplex printing system does not require a unique port number. It can use either of the TCP port numbers specified for simplex Printer 1 or simplex Printer 2. However, it is often easier from an operational viewpoint to assign duplex a separate TCP port number. If 5001 and 5002 are used for simplex Printer 1 and simplex Printer 2, IBM recommends that the duplex system be assigned TCP port number 5003.<br><br>3. The TCP Port numbers specified in the printer configuration must match the PORT numbers assigned in the host PSF system. | 5001 to 65535 |
| IP Address | This entry specifies the Internet protocol (IP) address of the printer in dotted decimal format. Get this value from your LAN administrator. This value must match the IP address value in the host PSF configuration.<br><br>This value is unique to a duplex system, and is the same regardless of whether the printer is in duplex or dual-simplex mode. | X.X.X.X where X ≤ 255 |
| Subnet Mask | This entry specifies the mask that identifies the local subnet in dotted decimal format. Get this value from your LAN administrator. If you do not have a local subnet, leave this field blank. | X.X.X.X where X ≤ 255 |
| Default Gateway Address | This entry specifies the IP address of the default gateway in dotted decimal format. Get this value from your LAN administrator. | X.X.X.X where X ≤ 255 |
| MTU Size | This entry specifies the Maximum Transmission Unit (MTU) – maximum allowable length of IP packets. | 256 to <u>4352</u> |
| Hardware Address | This entry specifies the FDDI adapter ROM address. | This address cannot be changed. |
| Alternate Hardware Address | This entry sets the unique LAN adapter address for the network. The address must be different from other addresses on the LAN. New cards are restricted to X'4000 0000 0000' to X'FFFF FFFF FFFF' | X'0' to X'FFFF FFFF FFFF' |
| Confine Broadcast | This entry specifies if broadcast packets (that is, Address Resolution Protocol packets) are enabled to cross bridges to other rings. | • Yes<br>• <u>No</u> |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Pre/postprocessing→Pre/postprocessing** | | |
| **Note:** You can access the following items by selecting **Edit** or **Add**. | | |
| Name | | 12 characters |
| State | This entry specifies the state of the processor. | • Enabled<br>• Disabled |
| Printer | When the Printer Definition item is set to **Simplex** mode, this field is grayed out in the **Printer Definition** window. All devices configured while in **Simplex** mode are automatically configured for the printer you are currently using. | • 1<br>• 2 |
| Port | The physical connection between the printer and the pre/postprocessing device.<br><br>For Infoprint 4000 models the Side 2 Verify sensor is always in Printer 2 Port 3 of a duplex printing system.<br><br>*Infoprint 4100 model HD3/4 only | • Printer 1 Port 1<br>• Printer 1 Port 2<br>• Printer 1 Port 3<br>• Printer 1 Port 4*<br>• Printer 2 Port 1<br>• Printer 2 Port 2<br>• Printer 2 Port 3*<br>• Printer 2 Port 4* |
| Type | Specify a **Coupled** type when the Port to be used has a **Pre/Post**type adaptor installed (RPQ8B4710).<br><br>Specify an **Advanced Postprocessor** type when the Port to be used has a **AF Post** type adaptor installed (RPQ8B4720).<br><br>Different types have different **Pre/Postprocessor Characteristics** configuration items listed. | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Barcode Checking |
| Extended NPRO | This entry is listed for all Pre/Postprocessor Types.<br><br>Extends the NPRO. Enter a non-zero value to extend the fixed NPRO length because of Pre-processing or Post-processing device usage.<br><br>Setting the "NPRO Length" configuration item under Printer Definition → Printer → Setup also sets this function. The "Pre/Postprocessor Extended NPRO" value overrides the "Configure Printer NPRO Length" value if both are set to non-zero values. | 0 to 800 inches<br><br>Default is 150. |
| Busy Timer | This entry is listed only for "Coupled" Pre/Postprocessor Types.<br><br>Specifies the length of time in seconds that follows a Pre-processing or Post-processing device going to "Busy" status before the status automatically changes to "Not Ready." The printer does not report "Busy" status to the host system, but does report "Not Ready" status.<br><br>This time must be set to less than the Missing Interrupt Handler timer at the Host Channel Interface. | 1 to 999 seconds<br><br>Default is 300. |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| Tag Type | This entry is listed only for "Coupled" pre/postprocessor types.<br><br>Specify a **Coupled** tag type for all postprocessing devices not manufactured by Roll System, Inc.<br><br>Specify an **RSI Compatible** tag type for all postprocessing devices manufactured by Roll System, Inc. | • Coupled<br>• RSI Compatible<br><br>This item is ignored if you are configuring a preprocessing device interface. |
| Distance to Postprocessor | This entry is listed only for "Advanced Postprocessor" pre/postprocessor types.<br><br>If two AF postprocessors are installed, the distance of the second postprocessor must exceed that of the first. If the first postprocessor is a Troy MICR 3900, add an extra 102 inches to the actual measured distance from the printer to the second postprocessor. If the first postprocessor is a Troy MICR 3900 High Speed, add an extra 148 inches to the actual measured distance from the printer to the second postprocessor. For more information, see *Using the IBM 3835 Page Printers and the IBM 3900 Advanced Function Printers with the Troy MICR Printers*, GA32-0261. | • 24 to 800 inches<br>  Default is 99.<br>• 24 to 1200 inches (second postprocessor)<br>  Default is 99. |
| Error Page Stop | This entry is listed only for "Advanced Postprocessor - MICR" pre/postprocessor type. This entry allows you to stop and verify print quality X pages after error. | 0 to 100 pages |
| Verify Alignment Page Stop | This entry is listed only for "Advanced Postprocessor - MICR" pre/postprocessor type. This entry allows you to stop and verify print quality every X pages. | 0 to 5000 pages |
| Baud Rate in Kbps | This entry is listed only for "Advanced Postprocessor" pre/postprocessor types. | • 19.2 (default for Advanced Color)<br>• 62.5 (default for non-color) |
| **Printer Definition → Pre/postprocessing → Postprocessing Options** | | |
| Use Internal Stacker ‡ | This entry indicates whether an internal stacker is enabled or disabled. A setting of **Yes** enables the internal stacker if there are no enabled postprocessing devices (either UP $^3$I or non-UP$^3$I). For printer models HS2 and HD3/HD4, the following apply:<br>1. An internal stacker must be installed (feature 4770).<br>2. The printer mode must be set to **Simplex** ( **Printer Definitions->Printer->Basic->Printer Mode**).<br>3. The printer speed must be set to **Low** (**Printer Definitions->Printer->Basic->Printer Speed**). | • Yes<br>• No |
| Offsetter Enabled ‡ | This entry indicates whether an installed offsetter postprocessing device is to be used. The host system will send "Alternate Offset Stacker" commands if the offsetter is enabled and the print job contains these commands | • Yes<br>• No |
| BTS Enabled ‡ | This entry indicates whether an installed Burster/Trimmer Stacker (BTS) postprocessing device is being used. The host system will not send eject-to-front-facing commands if the BTS is enabled. | • Yes<br>• No |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| Offset on Mark Forms ‡ | If **Yes** is selected, offset commands are sent to an enabled postprocessor only for pages that contain Mark Forms. Any "Alternate Offset Stacker" commands that are sent from the host are ignored. | • Yes<br>• No |
| UP$^3$I Enabled | This entry indicates whether an installed UP $^3$I postprocessing device is being used. | • Yes<br>• No |
| **Printer Definition → Pre/postprocessing → UP $^3$I Devices** | | |
| UP$^3$I Devices | Use this entry to select the UP $^3$I device that you want to view or edit.<br><br>When you **edit** a UP$^3$I device, you will be prompted for the device name. The name you enter will override the name communicated over the UP$^3$I network with one that is more appropriate for your installation.<br><br>You can specify the approximate **distance** (in inches) between this postprocessor and the printer (in inches).<br><br>For the **operations** that the device supports, you can specify what the default operation should be if the job does not specify:<br>• Cutter (Separation)<br>• Cutter (Perforation)<br>• Cutter (Cross)<br>• Stacker (Bins) | • Edit |
| **Printer Definition → Pre/postprocessing → UP $^3$I Paper Sequences** | | |
| UP$^3$I Paper Sequences | This entry specifies the path of UP $^3$I devices that printed output can take.<br><br>When you **add** a new paper sequence you will be prompted for the name of the paper sequence and can mark the checkbox for the currently powered on UP $^3$I devices that are involved in the sequence.<br><br>When you **delete** a paper sequence the curently highlighted paper sequence is deleted.<br><br>When you **edit** a previously defined paper sequence is changed.<br><br>The **set as default** paper sequence is where unspecified postprocessing jobs are sent | • Add<br>• Delete<br>• Edit<br>• Set as Default |

*Table 34. Printer Definition Items  (continued)*

| Definition Item | Description | Value Options |
|---|---|---|
| **Printer Definition → Remote Access → SNMP** | | |
| SNMP Agent Enabled | Select **Yes** to allow (enable) any SNMP functions, including monitoring and Forward/Backward space control. | • Yes<br>• <u>No</u> |
| Allow SNMP to Configure the Printer | Select **Yes** to allow (enable) Infoprint Manager to Forward/Backward space through SNMP and for Network Print Manager to change printer defaults. | • Yes<br>• <u>No</u> |
| SNMP Community Name | See Table 35 on page 165.<br>**Note:**  For a community to be recognized, the **IP address** and **Netmask** values cannot be blank. They must each have a value of 0.0.0.0 or greater. | Alphanumeric characters |
| Access | This entry is set for each SNMP community name.<br><br>Select **Write** to allow (enable) Infoprint Manager to Forward/Backward space through SNMP and for Network Print Manager to change printer defaults. | • <u>Read</u><br>• Write<br>• None |
| IP Address | This entry is set for each SNMP community name.<br><br>This entry specifies address traps are sent to if **Trap manager** is set to **Yes**. | X.X.X.X where X ≤ 255<br>**Note:**  This entry cannot be blank. |
| Subnet Mask | This entry is set for each SNMP community name.<br><br>This entry specifies the net mask of the local network to determine if the trap needs to go through a gateway. | X.X.X.X where X ≤ 255<br>**Note:**  This entry cannot be blank. |
| Trap Manager | This entry is set for each SNMP community name. | • Yes<br>• <u>No</u> |
| **Printer Definition → Remote Access →E-mail** | | |
| Enable E-mail | Select **Yes** to enable e-mail so that printer traces may be sent using e-mail. If this combo box is grayed out, make sure you have checked a Network Connection checkbox in at least one of the Ethernet attachments (Printer Definition → Attachments → Ethernet → Installed For). | • Yes<br>• <u>No</u> |
| Internet Name of Local Host | If this field is left blank, the default host name will be used. To change the host name, type a new host name into this field. | |
| IP Address of Name Server | This entry specifies the internet protocol (IP) address of the name server for the local host. To add a name server to the existing list of name servers used to resolve names into internet addresses, type in the internet address (in dotted decimal format) of a new name server. Changing the host name of the local host to an unreliable or nonexistent name server may adversely affect its operation. | X.X.X.X where X ≤ 255 |
| Domain Name | If this field is left blank, the default domain of the local host will be used. To change the default domain, type the internet address (in dotted decimal format) of the local domain into this field. | X.X.X.X where X is an alphanumeric character |
| Default E-mail Destination | Type in the e-mail destination that should be used as a default when sending traces by e-mail. | |

*Table 35. SNMP Community Names*

| Community | Values | Description |
|---|---|---|
| public | **IP address**<br>  0.0.0.0<br><br>**Netmask**<br>  0.0.0.0<br><br>**Access**<br>  Read<br><br>**Trap manager**<br>  No | This is a standard community. |
| qx9zypwd | **IP address**<br>  0.0.0.0<br><br>**Netmask**<br>  0.0.0.0<br><br>**Access**<br>  Write<br><br>**Trap manager**<br>  No | This community is used for Infoprint Manager. |
| ibmpsc_admin | **IP address**<br>  0.0.0.0<br><br>**Netmask**<br>  0.0.0.0<br><br>**Access**<br>  Write<br><br>**Trap manager**<br>  No | This community is used for Network Printer Manager. |
| *additional name added by user* | **IP address**<br>  X.X.X.X<br><br>**Netmask**<br>  X.X.X.X<br><br>**Access**<br>  Read/Write/None<br><br>**Trap manager**<br>  Yes/No | Additional community names can be defined as needed. |

# Defining the Host Attachments

This procedure lets you view or edit the definition settings of an installed attachment.

**Note:** The printer can have multiple sets of definition data: one for each mode in which the printer can run. To update a definition for a particular mode, the printer must be running in that mode (for example, POD mode or Duplex mode).

The following host attachments are available:
* Parallel Channel
* ESCON Channel
* FICON Channel
* Token Ring TCP/IP
* 10/100BaseT Ethernet TCP/IP
* GigaBit Ethernet TCP/IP
* FDDI TCP/IP (AFCCU microcode levels 11.x and earlier only)

Table 7 on page 50 defines the host attachments available.

Before you change a definition value, please review the information in Table 34 on page 139 for the attachment definition you are changing.

Before you print the attachment configuration, ensure that all attachments are disabled. See "Enabling and Disabling Attachments" in the *Operator's Guide* for more information. You do not need to disable attachments if you are viewing or changing the configuration.

---

**Defining Host Attachments**

**Printer Definition → Attachments→ Parallel channel|ESCON channel|FICON channel|TCP/IP token ring|TCP/IP Ethernet|TCP/IP FDDI**

---

**Note**

Selecting **Restart** requires one of the following:
* Certain configuration items require restart for a change in the parameter to take effect. If restart is required, the console will notify you.
* All ESCON, FICON, Parallel, and Resource Utilization configurations require restarting both printers in dual-simplex mode.

---

# Defining Interfaces and Preprocessing or Postprocessing Devices

## Options for Duplex Models

Printer 1 of a duplex system has three Preprocessing/Postprocessing interface ports and Printer 2 has two interface ports. Port 1 in each printer has an interface adaptor installed as a standard feature that may used either for a preprocessing or postprocessing device (hereafter called **Pre/Post**).

One or two additional optional **Pre/Post** device interface adaptors may be installed in Ports 2 and 3 of Printer 1, or an optional Advanced Function Postprocessing device interface (**AF Post**) may be installed in either Port 2 of each printer or Port 3 of Printer 1. Printer 2 uses Port 3 for Side 1/Side 2 Verify. Allowable combinations for each printer are shown in Table 36.

**Notes:**

1. The Forms Identification Barcode feature uses a port in Printer 1 and could use an additional port in Printer 2 if you are printing in dual simplex mode.
2. Infoprint 4100 models HS2, H3/4 can have up to four pre-/postprocessing device interfaces per engine.

*Table 36. Preprocessing/postprocessing interface options for duplex models*

| Port | Configuration Options | | | | | |
|------|------|------|------|------|------|------|
| 1 | Pre/Post | Pre/Post | Pre/Post | Pre/Post | Pre/Post | Pre/Post |
| 2 | — | Pre/Post | Pre/post | AF Post | Pre/Post | AF Post |
| 3 | — | — | Pre/Post | — | AF Post | Pre/Post |

## Options for Simplex Models

Each has an interface adaptor installed as a standard feature that may be used for either a preprocessing or a postprocessing device (**Pre/Post).** One or two additional optional **Pre/Post** device interface adaptors may be installed in Ports 2 and 3, or an optional Advanced Function Postprocessing device interface (hereafter called **AF Post**) may be installed in either Port 2 or Port 3 of each model. Allowable combinations are shown in Table 37.

**Note:** The Forms Identification Barcode feature uses a port in Printer 1 and could use an additional port in Printer 2 if you are printing in dual simplex mode.

*Table 37. Preprocessing/postprocessing interface options for simplex models*

| Port | Configuration Options | | | | | | | |
|------|------|------|------|------|------|------|------|------|
| 1 | Pre/Post | Pre/Post | Pre/Post | AF Post | AF Post | AF Post | Pre/Post | Pre/Post |
| 2 | — | Pre/Post | Pre/Post | — | Pre/Post | Pre/Post | Pre/Post | AF Post |
| 3 | — | — | Pre/Post | — | — | Pre/Post | AF Post | Pre/Post |

**Defining Preprocessing or Postprocessing Devices/Interfaces**
**Printer Definition → Pre/Postprocessing**

# Defining Remote Access

This procedure lets you enable and define remote access to the printer for both SNMP and the optional
Productivity Tracking feature.

---

**Defining Remote Access**

**Printer Definition → Remote Access→ Enable SNMP|Allow SNMP to Configure Printer|SNMP Communities**

---

# Chapter 8. Establishing Form Settings

> **Setting form values**
> **Forms → Form Settings**

Before you can print forms, you must establish settings for the form or determine which of the default forms settings already established (Snapshots) match the forms you intend to use.

You must identify all forms used in the printer before you can complete the form-loading procedure. You can identify and store forms before you attempt to load them into the printer, or you can identify and store them while you load them. Identify forms with the values for the settings described in Table 39 on page 170.

Once you identify and save the form settings in a snapshot, all future uses of that form need only identify the snapshot name during the loading procedure.

Table 38 shows the default read only snapshots that are established in the printer at the factory.

*Table 38. Default Snapshots*

| Snapshot Name | Description-Length x Width |
| --- | --- |
| IBM-2up Letter | 2–Up 8.5 in. x 11 in. |
| IBM-2up Letter Tractorless | 2–Up 8.5 in. x 11 in. |
| IBM-2up A4 | 210 mm x 297 mm |
| IBM-2up A4 Tractorless | 210 mm x 297 mm |

Table 39 on page 170 describes the required form settings and the values you can enter for a form.

*Table 39. Forms Settings*

| Setting | Description | Value Options |
|---------|-------------|---------------|
| **Forms → Form Settings** | | |
| Length | Specify the length dimension of the printed output as measured in the process direction (parallel to the tractor holes). You can specify this dimension in millimeters or inches and in lengths from 76 to 432 millimeters (3 to 17 in.).<br>**Note:** The printer can stack only forms that are prefolded at lengths between 178 to 432 mm (7 to 17 in.) between the fold perforations. To stack printed forms lengths of less than 7 inches or greater than 17 inches, see "Stacking Forms" on page 133.<br><br>Specify the length either in millimeters as a whole number or in inches to two decimal places. The printer rounds to the nearest $1/_6$ inch the length you enter and displays it on the screen.<br>**Notes:**<br>1. You can define the forms length at 25 or 28 in. if either of the following features has been installed.<br>For 25-in. forms length, select **Feature 8B3929**.<br>For 28-in. forms length, select **Feature 8B3930**.<br>2. You can define forms lengths up to 54 in. if the Signature Page feature has been installed<br>**Note:** Any of these features can affect performance.<br><br>For related information, see "Valid Form Lengths in Inches" on page 135 or Table 33 on page 136. | See "System Characteristics" on page 3 for detailed information about minimum and maximum lengths for each model. |
| Width | Specify the total physical form widths (including the 0.5-inch tractor hole carrier strips on either side of the form). For information about the form widths supported by different printer models, see "System Characteristics" on page 3.<br><br>When you enter a value in inches, use a decimal for fractional dimensions (for example, 13.5). When you enter a value in millimeters, do not use a decimal point (use whole numbers only). | See "System Characteristics" on page 3 for detailed information about minimum and maximum widths for each model. |
| Tractorless Side Verify Mark Location | Specify the location of the side verify marks. This entry specifies the vertical distance of the side verify marks (measured from the leading edge of the form). | • Inches<br>• Millimeters |
| Units | This entry is for both Width and Length. | • Inches<br>• Millimeters |
| Form Name | This entry must be a unique identifier.<br><br>**Note:** This field is case sensitive. | 12 characters maximum |

*Table 39. Forms Settings (continued)*

| Setting | Description | Value Options |
|---|---|---|
| Host Setup ID | This entry is defined by your company to tell the host system if the form loaded in the printer is the correct form for the print job being sent to the printer. The host system checks the form loaded in the printer and compares the form definition in the Host Setup ID.<br><br>If the loaded form is the form required by the Host Setup ID, the job is sent to the printer. If the loaded form is not the form required by the Host Setup ID, an error message is posted on the host system console.<br><br>Use **0** if no checking is to be done. | 0 to 65535 |
| Form Barcode | This entry is used to specify the alphanumeric value of a barcode preprinted on special forms. These forms require the installation of the Form Barcode Checking feature.<br><br>Use **0000** for all forms that do not have a preprinted barcode. | 0000 to FFFF |
| Tractorless | Select **Yes** if you are using paper without tractor strips. Select **No** if you are using paper with tractor strips.<br>**Note:** Requires RPQ 8B4265. | • Yes<br><br>• <u>No</u> |
| Marks | This entry specifies the toner mark position in reference to the top of the form (for tractorless forms only).<br>**Note:** Requires RPQ 8B4265. | • Set **Print registration mark** for Printer 1 to **Yes** if you want Printer 1 to print a registration mark, which is typically read by Printer 2.<br><br>• Set **Print registration mark** for Printer 2 to **Yes** if you want Printer 2 to print a registration mark, which is sometimes required by post processing equipment.<br><br>• Set **Preprinted registration marks** to **Yes** for Printer 1 if the form that you are using has a preprinted registration mark on the page for registering printer 1.<br><br>• Set **Preprinted registration marks** to **Yes** if the form that you are using has a preprinted registration mark on the page for registering printer 2. |
| Oversize Paper | This entry indicates whether printing is to extend into each carrier strip 3.8 mm (0.15 in.). Selecting **Yes** also turns off any other printing in the carrier strips, including side verify marks and copy edit marks.<br>**Note:** For code levels higher than version 11.4, RPQ 8B4287 is required. It provides the ability to disable Side 2 Verify so that the Oversize Paper function can be used. RPQ 8B4285 may be desired. It provides the ability to suppress yellow warning messages on the console when Side 2 Verify is disabled for oversize paper. | • Yes<br><br>• <u>No</u> |

*Table 39. Forms Settings (continued)*

| Setting | Description | Value Options |
|---------|-------------|---------------|
| Paper Weight | This entry indicates to the printer the weight of the form you are defining. This enables the printer to compensate for the form weight during printing.<br>• Light: 12–15 pound (39–48 kg or 45–51g)<br>• Normal: 16–22 pound (51–71 kg or 60–80 g) forms<br>• Heavy: 23–42 pound (61–135 kg or 83–157 g) forms | • Light<br>• <u>Normal</u><br>• Heavy |

# Chapter 9. Creating a Snapshot

Snapshots allow you to ″take a picture″ of some of the essential printer configuration items that you set in the **Printer Definition** tab and the form settings that you specify in the **Forms** tab. Snapshots allow you to save printer and form settings that you may use frequently in your environment. Table 40 shows the settings that you can save in a Snapshot.

Creating or updating a Snapshot involves setting values for a form and setting other printer definition values, including values for Print Quality, Basic printer definitions, Registration, and Pre/Post Processing. Table 40 lists the values that you see in a snapshot.

**Note:** The CE can specify whether to save all the following configuration settings or whether to save only form settings in a Snapshot on the **Printer Definition → Printer → Advanced → Snapshot Mode** configuration item.

*Table 40. Snapshot values*

| Forms → Form Settings | Printer Definition → Print Quality | Printer Definition → Printer → Basic | Forms → Print Registration | Printer Definition → Pre/Post-processing |
|---|---|---|---|---|
| • Length<br>• Width<br>• Unit of measure for the width and length<br>• Tractorless Side Verify Mark Location<br>• Form Name<br>• Host Setup ID<br>• Form Barcode<br>• Form type (tractorless or with tractor holes)<br>• Oversize Paper<br>• Paper Weight | • Contrast<br>• Boldness<br>• Preheat Temperature<br>• Fuser Temperature<br>• Oil Rate<br>• Oil Belt speed<br>• Backup Idler Roll usage | • POD Mode *<br>• Printer Speed *<br>• POD Mode *<br>• Cutsheet Emulation<br>• Printhead Resolution<br>• IPDS Resolution<br>• Front Sheet Sequence<br>• Same Side Printing *<br>• Eject to Front Facing<br>• Auto NPRO at EOF<br>• Reprint Pages after Jams<br>• Direct Attach | • Paper Feed Direction for Printer 2<br>• Paper Feed direction for Printer 1<br>• Across Paper Feed direction for Printer 2<br>• Across Paper Feed direction for Printer 1 | • Use Internal Stacker<br>• Offsetter Enabled<br>• BTS Enabled<br>• Offset on Mark Forms |
| * Indicates features that may or may not be installed on your printer. | | | | |

Snapshots affect how the print job is printed. You can create and save your own Snapshot using the default Snapshots as a template. And you can select and load a specific Snapshot when you want to print a job that has the same requirements as those specified in a particular Snapshot. You can also make changes to your Snapshots and saved them on your printer. You can view the Snapshot settings by selecting the **Show Details...** button on the **Snapshots** panel.

**Notes:**

1. Loading snapshots changes the printer configuration.
2. Printer configuration changes cause NACKs to the host.
3. The host will reprint any pages that need to be reprinted due to configuration changes.

# Appendix A. Obtaining Supplies

---

**Chapter Overview**

This chapter describes the printer supplies and how you can order and store them; and it provides estimates for the quantity of forms (in feet) that each supply item can process.

---

## Supplies

For optimum print quality and reliability, use IBM supplies, which are engineered specifically for IBM printers. Use Table 41 on page 177 and Table 42 on page 179 to help you order supplies for the printer before the system is delivered, and to maintain a stock of supplies for continuous operation.

When a printer runs low on a supply item, it displays a status message on the touchscreen, sounds an alarm, and turns on the operator alert light on top of the printer.

IBM recommends that you keep the following quantities on hand per print engine:

| Item | Suggested Quantity |
|---|---|
| **Toner (Infoprint 4000)** | 48 bottles |
| **Toner (Infoprint 4100)** | 24 cartridges |
| **Developer mix** | 4 bottles |
| **Fuser oil** | 4 bottles |
| **Oiler belt** | 2 belts |
| **Fine filter** | 2 filters |
| **Splicing tape** | 72 rolls |

The estimated quantities are approximations for planning purposes only, and do not represent a warranty, a guarantee, or a minimum. The actual consumption depends on variables such as machine toner settings, job-stream percent toner coverage, form characteristics, temperature, and humidity.

Also ensure that a toner-certified vacuum cleaner (see page 112) is available for printer operators to use when cleaning the printer.

# IBM Supplies Work Sheet

**Important Notes Concerning Supplies**

**Notes:**

1. Make sure to use the correct part numbers when you order new supplies. Different models use different supplies (such as toner, developer, fuser oil, oiler belts, and fine filters). Using the wrong developer or toner, for example, causes serious print quality problems and will require a service call to restore correct print quality.

2. The toner bottle can also be used as a waste toner collection bottle.

   **Note:** Do not reuse waste toner.

3. The yields listed in Table 41 on page 177 and Table 42 on page 179 are approximations. They are not a warranty or guarantee of minimum life, and are provided only to assist in supplies planning. Toner yield is affected by many factors, including print coverage per page, contrast setting, paper type and size, model type, and environmental conditions. More dense applications, such as extensive bar codes, or images, or solid area fill, or printing with a higher contrast setting can expect to achieve yields lower than those achieved with the average text page. Your actual usage data should be used to establish the life of the supply product in your specific application.

4. Yield estimates shown in Table 41 on page 177 and Table 42 on page 179 are based on four square inches of toner coverage per foot of forms (see note 6).

   a. For MICR toner, approximate yields are based on an average signal strength setting of 120%.

   b. For most toners, approximate yields are based on an optical density setting of 1.20.

   c. For Infoprint 4000 Enhanced Printing Toner Version III, approximate yields are based on an optical density setting of 1.15.

   d. for Infoprint 4100 Enhanced Printing Toner Version III, approximate yields are based on an optical density setting of 1.05.

5. The life of the absorbent pad for the oil pan varies according to the way you run your printer. In general, the more often the printer is idle, the more often you may need to replace the pad. IBM recommends that you check the absorbent pad weekly. The *Infoprint 4000/4100 Operator's Guide* contains instructions for checking the pad. Contact your service representative for replacement pads.

6. When calculating yields for multiple-up printing, you must calculate for the side-by-side placement of the page on the form. For example, when printing 2-up on 8.5 x 11 inch paper, four square inches must be multiplied by 11/12, which equals 3.67 square inches. So for 2-up printing, you must divide 3.67 by two, which equals 1.835 squares inches per page.

Table 41 on page 177 and Table 42 on page 179 are work sheets that list IBM supplies and their part numbers. Make copies of these work sheets to use when you order supplies.

# Infoprint 4000 Supplies Work Sheet

Table 41. IBM supplies work sheet for Infoprint 4000

| IBM Supply Item | Approximate Forms Processed | Part Number | Minimum Order Quantity | Quantity Needed |
|---|---|---|---|---|
| Toner (**blue** cap) 1.360-kg (3.0-lb) bottle<br><br>(All Infoprint 4000 models except ID5/ID6) | 37,800 - 42,000 feet per bottle (See note 4b on page 176) | 1402822 | 1 carton (8 bottles per carton) | |
| Developer (**blue** cap) 3.5-kg (7.7-lb) bottle<br><br>(All Infoprint 4000 models except ID5/ID6) | Models IS1, ID1/2: 1.4 million feet per bottle<br><br>Models IS2, ID3/4: 1.2 million feet per bottle<br><br>Models IR3/IR4: 1.0 million feet per bottle | 1402823 | 1 carton (2 bottles per carton) | |
| Enhanced Printing Toner (**green** cap) 1.5-kg (3.30-lb) bottle<br><br>Requires RPQ 8B4343 (RPQ 8B4269 for Model ID5/6) | 43,600 to 48,500 feet per bottle (See note 4b on page 176) | 1402833 | 1 carton (8 bottles per carton) | |
| Enhanced Printing Developer (**green** cap) 3.5-kg (7.7-lb) bottle<br><br>Requires RPQ 8B4343 (RPQ 8B4269 for Model ID5/6) | 2.0 million feet per bottle<br><br>(except Model IR1/IR2, which is 1.75 million feet) | 69G7379 | 1 carton (2 bottles per carton) | |
| Enhanced Printing Toner Version III (**hexagonal** symbol on cap) 1.5-kg (3.30-lb) bottle | 55,000 feet per bottle (See note 4c on page 176) | 57P1888 | 1 carton (8 bottles per carton) | |
| Enhanced Printing Developer Version III (**hexagonal** symbol on cap) 4.0-kg (8.8-lb) bottle | 1.6 million feet per bottle | 57P1892 | 1 carton (2 bottles per carton) | |
| Blue Infoprint 4000 Toner 1.5 kg (3.3 lb) bottle | 50,000 feet per bottle | 57P1881 | 1 carton (8 bottles per carton) | |
| Blue Infoprint 4000/4100 Developer 4.0 kg (8.8 lb) bottle | 1,000,000 feet per bottle | 57P1889 | 1 carton (2 bottles per carton) | |
| Green Infoprint 4000 Toner 1.5 kg (3.3 lb) bottle | 50,000 feet per bottle | 57P1883 | 1 carton (8 bottles per carton) | |
| Green Infoprint 4000/4100 Developer 4.0 kg (8.8 lb) bottle | 1,000,000 feet per bottle | 57P1890 | 1 carton (2 bottles per carton) | |
| Red Infoprint 4000 Toner 1.5 kg (3.3 lb) bottle | 50,000 feet per bottle | 57P1885 | 1 carton (8 bottles per carton) | |

*Table 41. IBM supplies work sheet for Infoprint 4000 (continued)*

| IBM Supply Item | Approximate Forms Processed | Part Number | Minimum Order Quantity | Quantity Needed |
|---|---|---|---|---|
| Red Infoprint 4000/4100 Developer 4.0 kg (8.8 lb) bottle | 700,000 feet per bottle | 57P1891 | 1 carton (2 bottles per carton) | |
| MICR Toner (All Infoprint 4000 models except IR1/IR2/IR3/IR4) | 55,000 feet per bottle (See note 4a on page 176) | 1402824 | 1 carton (8 bottles per carton) | |
| MICR Developer (All Infoprint 4000 models except IR1/IR2/IR3/IR4) | 800,000 feet per bottle | 1402825 | 1 carton (2 bottles per carton) | |
| Fuser Oil 1-kg (2.2-lb) bottle (All Infoprint 4000 models except IR3/IR4) | 700,000 feet per bottle | 1372463 | 1 carton (1 bottle per carton) | |
| Fuser Oil 1-kg bottle (Infoprint 4000 Models IR3/IR4) | 450,000 feet per bottle | 1402819 | 1 carton (1 bottle per carton) | |
| Oiler Belt (All Infoprint 4000 models except IR3/IR4) | 1.2 million feet | 69G7314 or 1372459 | 1 carton (1 belt per carton) | |
| Oil Pan Absorbent Pad | See note 5 on page 176 | Contact Service Representative | 1 pad (1 pad per pack) | |
| Fine Filter | 3.5 million feet per filter | 1372464 | 1 carton (1 filter per carton) | |
| Splicing Tape | 45 feet of tape per roll | 4165880 | 1 carton (72 rolls per carton) | |

# Infoprint 4100 Supplies Work Sheet

*Table 42. IBM supplies work sheet for Infoprint 4100*

| IBM Supply Item | Approximate Forms Processed | Part Number | Minimum Order Quantity | Quantity Needed |
|---|---|---|---|---|
| Enhanced Printing Toner 2.72 kg (6 lb) cartridge<br><br>(Infoprint 4100 models HS1, PS1, HD1/HD2, PD1/PD2 only) | 85,500 feet per cartridge (See note 4b on page 176) | 69G7377 | 1 carton (4 cartridges per carton) | |
| Enhanced Printing Developer (**hexagonal** symbol on cap) 4.0-kg (8.8-lb) bottle<br><br>(Infoprint 4100 models HS1, PS1, HD1/HD2, PD1/PD2) | 1.6 million feet per bottle | 69G7370 | 1 carton (2 bottles per carton) | |
| Enhanced Printing Toner Version III 3.0 kg (6.6 lb) cartridge<br><br>(Infoprint 4100 models HS2, HD3/4) | 100,000 feet per cartridge (See note 4d on page 176) | 57P1887 | 1 carton (4 cartridges per carton) | |
| Enhanced Printing Developer (**hexagonal** cap) 4.0 kg (8.8 lb) bottle<br><br>(Infoprint 4100 models HS2, HD3/4) | 1.6 million feet per bottle | 57P1892 | 1 carton (2 bottles per carton) | |
| Green Infoprint 4100 Toner 3.0 kg (6.6 lb) cartridge | 100,000 feet per cartridge | 57P1884 | 1 carton (4 cartridges per carton) | |
| Green Infoprint 4000/4100 Developer 4.0 kg (8.8 lb) bottle | 1,000,000 feet per bottle | 57P1890 | 1 carton (2 bottles per carton) | |
| Blue Infoprint 4100 Toner 3.0 kg (6.6 lb) cartridge | 100,000 feet per cartridge | 57P1882 | 1 carton (4 cartridges per carton) | |
| Blue Infoprint 4000/4100 Developer 4.0 kg (8.8 lb) bottle | 1,000,000 feet per bottle | 57P1889 | 1 carton (2 bottles per carton) | |
| Red Infoprint 4100 Toner 3.0 kg (6.6 lb) bottle | 100,000 feet per bottle | 57P1886 | 1 carton (4 cartridges per carton) | |
| Red Infoprint 4000/4100 Developer 4.0 kg (8.8 lb) bottle | 700,000 feet per bottle | 57P1891 | 1 carton (2 bottles per carton) | |
| MICR Toner<br><br>(Infoprint 4100 Models HS1, HD1/HD2, HS2, HD3/HD4) | 101,000 feet per cartridge (See note 4a on page 176) | 57P2074 | 1 carton (4 cartidges per carton) | |

*Table 42. IBM supplies work sheet for Infoprint 4100  (continued)*

| IBM Supply Item | Approximate Forms Processed | Part Number | Minimum Order Quantity | Quantity Needed |
|---|---|---|---|---|
| MICR Developer<br><br>(Infoprint 4100 Models HS1, HD1/HD2, HS2, HD3/HD4) | Models HS2, HD3/4: 1.6 million feet per bottle<br><br>Models HS1, HD1/2: 1.2 million feet per bottle | 57P2100 | 1 carton (2 bottles per carton) | |
| Fuser Oil 1-kg (2.2-lb) bottle<br><br>(Infoprint 4100 models HS2 and HD 3/4) | 700,000 feet per bottle | 1372463 | 1 carton (1 bottle per carton) | |
| Fuser Oil 1-kg bottle<br><br>(Infoprint 4100 Models HS1, HD1/HD2, PS1, PD1/PD2) | 450,000 feet per bottle | 1402819 | 1 carton (1 bottle per carton) | |
| Oiler Belt<br><br>(Infoprint 4100 models HS2, HD3/4) | 1.5 million feet | 57P2249 | 1 carton (1 belt per carton) | |
| Oil Pan Absorbent Pad | See note 5 on page 176 | Contact Service Representative | 1 pad (1 pad per pack) | |
| Fine Filter | 3.5 million feet per filter | 1372464 | 1 carton (1 filter per carton) | |
| Splicing Tape | 45 feet of tape per roll | 4165880 | 1 carton (72 rolls per carton) | |
| Teflon Mat (with RPQ 8B5023) | N/A | 10R4309 | 1 package (4 mats per package) | |
| Wear Strip (with RPQ 8B5023) | N/A | 10R4308 | 1 package (4 wear strips per package) | |

## Ordering Supplies

You can order supplies directly from your IBM representative, who can assist you in the procedure for placing your first order of supplies.

## Maintenance Supply Items

In the U.S.A., Latin America, and EMEA, the IBM Monthly Maintenance Charge includes the fuser oil, oiler belt, and fine filter. Approximately a 90-day stock of these items are supplied with each printer.

In the U.S.A., you can order these maintenance items by calling 1-800-346-3939 if you have an IBM Maintenance Contract.

## Customer-replaceable Supply Items

In North America, you can order supplies from the IBM Supplies Fulfillment Operation (ISFO) at 888-426-7746 (888-IBM-PRINT). For information about ordering supplies for other locations, see www.printers.ibm.com and select "Supplies and paper".

## Warranty Returns

If the supplies you receive are defective, return them to the place of purchase during the warranty period for a free replacement.

Include a copy of your invoice, a description of the problem, print-quality samples, and an estimate of the amount of printing already done with that supply.

This information applies only to supplies purchased in the U.S. In other countries, contact your point of purchase for information about returns.

# Storing Supplies

Store printer supplies in the printer operating environment for at least one day before you use them. At other times, you can store supplies in an environment that does not exceed the following requirements:

**Temperature**                     −25° to 40°C (−13° to 104°F)

**Relative Humidity**               5% to 90%

Forms have different storage requirements. Store forms in an area where temperature and humidity are similar to the environment in which they will be used. If forms do not adapt to moisture changes, wrinkles and voids can occur during printing.

Avoid areas of extreme heat or humidity. Extended exposure to these extremes can damage the materials permanently. Relative humidity levels above 65% may reduce print quality.

# Appendix B. Work Sheets

---
**Chapter Overview**

This chapter contains work sheets on which you can record your installation requirements, configuration choices, and forms definitions for the Infoprint 4000 and Infoprint 4100 printers. Fill in a copy of these work sheets and give a copy of the completed form to the service representative when the printer is installed.

---

You can specify some configurations within the printer and some characteristics of its function. For example, you can select the language in which messages will be displayed. These options are known as *configuration information.*

The printer AFCCU needs to know all of the current configuration information to operate the system accurately. Initially, the service representative sets configuration options when the printer is installed. You can change any of the configuration options later if the physical configuration changes or if the operating characteristics change.

You can change all configuration information by using the touchscreen windows.

# Installation Planning Work Sheet

Before your printer is delivered, prepare a site installation plan. Use the following work sheet to ensure that all of the pre-installation requirements are met.

*Table 43. Infoprint 4000 and Infoprint 4100 installation planning work sheet*

| Requirements | Meets Requirements: | Needs Attention: | Assigned to: | Date Due: | Date Completed: |
|---|---|---|---|---|---|
| **Environmental** | | | | | |
| Ventilation | | | | | |
| Temperature | | | | | |
| Relative Humidity | | | | | |
| **Space** | | | | | |
| Layout | | | | | |
| Storage space for supplies | | | | | |
| Clearances | | | | | |
| Delivery rout | | | | | |
| **Electrical** | | | | | |
| *Outlets:* | | | | | |
| Can be reached by cables? | | | | | |
| Correctly grounded? | | | | | |
| Meet local and national codes? | | | | | |
| *Building branch circuit:* | | | | | |
| Correctly grounded? | | | | | |
| Is there a separate ground wire (**not** just conduit) for all connections from the printer and pre/postprocessors that go to the ground bus bar of the circuit breaker box? See Figure 44 on page 132. | | | | | |
| Are the ground wire and the neutral wire between the circuit breaker box and the source (building ground) separate wires? See Figure 44 on page 132. | | | | | |
| Are the printer engine power and the control unit power going to the same circuit breaker box? | | | | | |
| Enough power to meet needs? | | | | | |
| Meets local and national codes? | | | | | |
| **Host System Attachment** | | | | | |
| System/370 channel cables | | | | | |
| ESCON channel cables | | | | | |
| FICON channel cables | | | | | |
| Ethernet cables and connectors | | | | | |

*Table 43. Infoprint 4000 and Infoprint 4100 installation planning work sheet  (continued)*

| Requirements | Meets Requirements: | Needs Attention: | Assigned to: | Date Due: | Date Completed: |
|---|---|---|---|---|---|
| Token Ring cables and connectors | | | | | |
| FDDI cables and connectors | | | | | |
| **Security** | | | | | |

# Physical Planning Work Sheet

The physical planner:

* Identifies the location for the printer when the system is ordered
* Plans the electrical wiring and outlet requirements
* Schedules installing and testing of the electrical wiring and outlets before the printer arrives.

Use Table 44 as a work sheet when preparing the site for the printer.

*Table 44. Infoprint 4000 and Infoprint 4100 physical planning work sheet*

| Weeks before Delivery | Task | Assigned to: | Scheduled Completion Date: |
|---|---|---|---|
| 15 | 1. Identify the location for the printer and arrange for any necessary changes to the site.<br>2. Identify a delivery route to the location of the printer.<br>3. Prepare a layout plan.<br>4. Determine the requirements for electrical outlets. If you are installing a Hunkeler Buffer Flipper WT4 or an Infoprint 4100 HS2 or HD3/4, you will need additional outlets. See "Power Outlet and Cable Summary" on page 107 for more information.<br>5. Order the 'H' configuration unique items, such as the turnbar/flipper and adapter piece (RPQ 8B4056).<br>6. Order the 'U' configuration unique items, such as the Hunkeler Buffer Flipper WT4 and longer interconnecting cables (either RPQ 8B5018 22-Meter Fiber Channel Cables or RPQ 8B4283 25-Meter SSA Cables). | _____<br>_____<br>_____<br>_____<br>_____ | _____<br>_____<br>_____<br>_____<br>_____ |
| 10 | 1. Install and test the electrical wiring and outlets.<br>2. Verify that a forklift and operator will be available when the printer arrives. | _____<br>_____ | _____<br>_____ |
| Arrival | 1. Unpack the printer and inspect it for external damage.<br>2. Move the printer to the prepared site. | _____<br>_____ | _____<br>_____ |

# Duplex Definition Work Sheet

Record your configuration choices on this work sheet, and give a copy of the completed form to the service representative when the printer is being installed. See Chapter 7, "Setting Printer Definition Values," on page 137 for detailed information about each item.

*Table 45. Duplex configuration work sheet*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Print Quality** | | | | |
| Printer 1 Contrast | 1 to 7 | | | |
| Printer 2 Contrast | 1 to 7 | | | |
| Printer 1 Boldness | 0% to 100% | | | |
| Printer 2 Boldness | 0% to 100% | | | |
| Printer 1 Preheat Temperature | 1 to 100 | | | |
| Printer 2 Preheat Temperature | 1 to 100 | | | |
| Printer 1 Fuser Temperature | 1 to 100 | | | |
| Printer 2 Fuser Temperature | 1 to 100 | | | |
| Printer 1 Oil Rate | 1 to 100 | | | |
| Printer 2 Oil Rate | 1 to 100 | | | |
| Printer 1 Oil Belt | 1 to 100 | | | |
| Printer 2 Oil Belt | 1 to 100 | | | |
| Printer 1 Use Backup Idler Roll | Yes / No | | | |
| Printer 2 Use Backup Idler Roll | Yes / No | | | |
| Example Settings | Light / Medium / Heavy | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Print Quality → Beam Adjustments** | | | | |
| Printer 1 Beam 1 Offset Adjustment (only for printers with multi-beam printheads) | Cannot be changed. | N/A | N/A | N/A |
| Printer 1 Beam 2 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Beam 3 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Beam 4 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Beam 5 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Beam 1 Offset Adjustment (only for printers with multi-beam printheads) | Cannot be changed. | N/A | N/A | N/A |
| Printer 2 Beam 2 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Beam 3 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Beam 4 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Beam 5 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A | N/A | N/A |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|------|-----------------|-----------------|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Print Quality → PQE Adjustments** | | | | |
| Printer 1 Beam Number | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Current Vector | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Vector Boldness | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Horizontal High | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Horizontal Low | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Vertical High | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Vertical Low | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Beam Number | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Current Vector | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Vector Boldness | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Horizontal High | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Horizontal Low | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Vertical High | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Vertical Low | (CE Change Only) | N/A | N/A | N/A |

*Table 45. Duplex configuration work sheet (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Printer → Basic** | | | | |
| Printer Mode | Duplex / Simplex | | | |
| Printer Speed (HS2, HD3/4 only) | High/Low | | | |
| POD Mode | Yes / No | | | |
| Cut Sheet Emulation | • None<br>• Normal Left-to-Right<br>• Normal Right-to-Left<br>• Inverted Left-to-Right<br>• Inverted Right-to-Left | | | |
| Printhead Resolution<br><br>Depending on the value selected, these items appear:<br>• IPDS Resolution<br>• Font Enhancement (Single-byte Font / Double-byte Font | 240, 300, 480, 600 DPI<br><br><br>• Automatic, 240, 300, 600 DPI<br>• Yes / No | | | |
| IPDS Resolution<br><br>The values available depend on the model of the printer. | • Automatic<br>• 240<br>• 300<br>• 600 | | | |
| Front Sheet Sequence (duplex mode only) | • Front First<br>• Front Second | | N/A | N/A |
| Eject to Front Facing | • Enabled<br>• Disabled | | | |
| Auto NPRO at EOF | Yes / No | | | |
| Reprint Pages After Jams | • Yes<br>• No recovery for MICR pages<br>• No | | | |
| Direct Attach | Yes / No | | | |
| Language | • English<br>• Spanish<br>• German<br>• Japanese Kanji<br>• French<br>• Italian<br>• Brazilian Portuguese<br>• Simplified Chinese<br>• Traditional Chinese<br>• Korean<br>• Russian<br>• Hungarian | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| Keyboard Language | • English<br>• Spanish<br>• German<br>• Japanese Kanji<br>• French<br>• Italian<br>• Brazilian Portuguese<br>• Simplified Chinese<br>• Traditional Chinese<br>• Korean<br>• Russian<br>• Hungarian | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|------|------------------|--------|---------|---------|
| | | | Simplex | |
| | | Duplex | Printer 1 | Printer 2 |
| **Printer Definition → Printer → Advanced** | | | | |
| Snapshot Mode | (CE Only Change | N/A | N/A | N/A |
| Logical Page Increment | 0 to 20 pels | | | |
| MICR Installed | Both / Printer 1 / Printer 2 / None | | | |
| 3130 Barcode Emulation | Yes / No | | | |
| Simulate Color with Gray | Yes / No | | | |
| Line Mode Enabled | Yes / No | | | |
| Single-Byte Font Smoothing | Yes / No | | | |
| Double-Byte Font Smoothing | Yes / No | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|------|-----------------|-----------------|--|--|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Printer → Setup** | | | | |
| Autostart | Yes / No | | | |
| Side Verify Page Numbers (duplex mode only) | Yes / No | | N/A | N/A |
| Form Feed Length (duplex mode only) | 17 to 250 inches | | N/A | N/A |
| Jam Recovery Point Distance | 0 to 500 inches | | | |
| Printer 1 to Printer 2 Distance (duplex mode only) | 150 to 800 inches | | N/A | N/A |
| NPRO Length | 0 to 1200 inches | | | |
| Fuser Sleep Timeout | • None<br>• 1 Hour<br>• 2 Hours<br>• 4 Hours | | | |
| Clear Memory for Security | Yes / No | | | |
| Audible Alarm | Yes / No | | | |
| Date and Time | (CE Change Only) | N/A | N/A | N/A |
| Side 2 Verify | (CE Change Only) | N/A | N/A | N/A |
| Auto Align | Yes / No | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
| --- | --- | --- | --- | --- |
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Printer → Setup → Advanced** | | | | |
| Suppress Off Page Errors | 0 to 100 Pels | | | |
| Movable Side Verify Marks | Yes / No | | | |
| Stop on toner low | Yes / No | | | |
| Open Clear Buffers Alert | Yes / No | | | |
| Dual sensor installed | Yes / No | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Printer → Service** | | | | |
| Machine Serial for Printer 1 | (CE change on initial configuration only) | N/A | N/A | N/A |
| Machine Serial for Printer 2 | (CE change on initial configuration only) | N/A | N/A | N/A |
| Printer 1 Print Counter | (CE Change Only) | | | N/A |
| Printer 2 Print Counter | (CE Change Only) | | N/A | |
| Printer 1 BIR Installed | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 BIR Installed | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Scan Factory Adjustment | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Scan Factory Adjustment | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Process Factory Adjustment | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Process Factory Adjustment | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Ozone Filter Installed | (CE Change Only) | N/A | N/A | N/A |
| Printer 1 Ozone Filter Installed | (CE Change Only) | N/A | N/A | N/A |
| Printer 2 Side Verify Factory Adjust | (CE Change Only) | N/A | N/A | N/A |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Printer → Resource Utilization** | | | | |
| Font Usage | • Low<br>• Medium<br>• High | | | |
| Page Segment and Overlay Usage | • Low<br>• Medium<br>• High | | | |
| Overlay Cache Usage | • High<br>• Medium<br>• Low<br>• None | | | |
| Input Buffer Size | • Low<br>• Medium<br>• High | | | |
| Output Buffer Size | • Low<br>• Medium<br>• High | | | |
| Large Trace Size | 0 to 100 000 000 bytes | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Attachments → Parallel** | | | | |
| Parallel Link A Installed | Yes / No | | | |
| Parallel Link B Installed | Yes / No | | | |
| Device Address | 00 to FF | | | |
| Second Channel | Static / Dynamic | | | |
| Data Transfer Protocol | Interlocked / Data Streaming | | | |
| Data Streaming Rate | • MCA Bus: 1.9 / 2.7 / 3.4 / 4.5 MB/sec<br>• PCI Bus: 3.0 / 4.5 MB/sec | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
| --- | --- | --- | --- | --- |
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Attachments → ESCON** | | | | |
| ESCON Link A Installed | Yes / No | | | |
| ESCON Link B Installed | Yes / No | | | |
| Device Address | X'00' to X'FF' | | | |
| Multi-host Environment Flag | True / False | | | |
| Maximum Block Length | 32K / 64K | | | |
| **Printer Definition → Attachments → FICON** | | | | |
| FICON Link A Installed | Yes / No | | | |
| Device Address | X'00' to X'FF' | | | |
| Multi-host Environment Flag | True / False | | | |
| Maximum Block Length | 32K / 64K | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Attachments → TCP/IP Token Ring** | | | | |
| Installed | Yes / No | | | |
| TCP Port | 5001 to 65535 | | | |
| IP Address | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Subnet Mask | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Default Gateway Address | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| MTU Size | 60 to 4096 | | | |
| Hardware Address | Cannot be changed | | | |
| Alternate Hardware Address | X'0' to X'FFFF FFFF FFFF' | | | |
| Ring Speed | 4 or 16 | | | |
| Confine Broadcast | Yes / No | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Attachments → Ethernet** | | | | |
| Installed for | • Print Data (IPDS)<br>• Network Connection (SNMP, IPM, e-mail)<br>• Laptop (IBM service representatives) | | | |
| TCP Port | 5001 to 65535 | | | |
| IP Address | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Subnet Mask | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Default Gateway Address | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| MTU Size | • Standard: 60 to 1500 (or up to 9000 for GigaBit)<br>• IEEE802.3: 60 to 1492 | | | |
| Hardware Address | Cannot be changed | | | |
| Alternate Address | X'0' to X'FFFF FFFF FFFF' | | | |
| Ethernet Type | • Standard<br>• IEEE802.3 | | | |
| Media Speed | • Auto negotiation<br>• 10 Half Duplex<br>• 10 Full Duplex<br>• 100 Half Duplex<br>• 100 Full Duplex | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|------|------------------|-----------------|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Attachments → FDDI** | | | | |
| Installed | Yes / No | | | |
| TCP Port | 5001 to 65535 | | | |
| IP Address | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Subnet Mask | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Default Gateway Address | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| MTU Size | 256 to 4352 | | | |
| Hardware Address | Cannot be changed | | | |
| Alternate Address | X'0' to X'FFFF FFFF FFFF' | | | |
| Confine Broadcast | Yes / No | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Pre/Postprocessing** | | | | |
| ***DEVICE Number_____*** | | | | |
| Name | 1-12 alphanumeric characters (including spaces) | | | |
| State | • Enabled<br>• Disabled | | | |
| Printer | 1 / 2 | | N/A | N/A |
| Port<br><br>* Infoprint 4100 model HD3/4 only | • Printer 1 Port 1<br>• Printer 1 Port 2<br>• Printer 1 Port 3<br>• Printer 1 Port 4*<br>• Printer 2 Port 1<br>• Printer 2 Port 2<br>• Printer 2 Port 3*<br>• Printer 2 Port 4* | | | |
| Type | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Form Barcode | | | |
| Extended NPRO | 0 to 800 inches | | | |
| Busy Timer | 1 to 999 seconds | | | |
| Tag Type (postprocessor only) | • Coupled<br>• RSI Compatible | | | |
| Distance to Postprocessor | • 24 to 800 inches<br>• 24 to 1200 inches (two postprocessors) | | | |
| Error Page Stop | 0 to 100 pages | | | |
| Verify Alignment Page Stop | 0 to 5000 pages | | | |
| Baud Rate in Kbps | 19.2 or 62.5 | | | |
| Use Internal Stacker | Yes / No | | | |
| Offsetter Enabled | Yes / No | | | |
| BTS Enabled | Yes / No | | | |
| Offset on Mark Forms | Yes / No | | | |
| UP$^3$I Enabled | Yes / No | | | |

*Table 45. Duplex configuration work sheet (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **DEVICE Number_____** | | | | |
| Name | 1-12 alphanumeric characters (including spaces) | | | |
| State | • Enabled<br>• Disabled | | | |
| Printer | 1 / 2 | | N/A | N/A |
| Port<br><br>* Infoprint 4100 model HD3/4 only | • Printer 1 Port 1<br>• Printer 1 Port 2<br>• Printer 1 Port 3<br>• Printer 1 Port 4*<br>• Printer 2 Port 1<br>• Printer 2 Port 2<br>• Printer 2 Port 3*<br>• Printer 2 Port 4* | | | |
| Type | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Form Barcode | | | |
| Extended NPRO | 0 to 800 inches | | | |
| Busy Timer | 1 to 999 seconds | | | |
| Tag Type (postprocessor only) | • Coupled<br>• RSI Compatible | | | |
| Distance to Postprocessor | • 24 to 800 inches<br>• 24 to 1200 inches (two postprocessors) | | | |
| Error Page Stop | 0 to 100 pages | | | |
| Verify Alignment Page Stop | 0 to 5000 pages | | | |
| Baud Rate in Kbps | 19.2 or 62.5 | | | |
| Use Internal Stacker | Yes / No | | | |
| Offsetter Enabled | Yes / No | | | |
| BTS Enabled | Yes / No | | | |
| Offset on Mark Forms | Yes / No | | | |
| UP[3]I Enabled | Yes / No | | | |

*Table 45. Duplex configuration work sheet (continued)*

| Item | Available Values | Selected Values | | |
|------|------------------|---------|--------|--------|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **DEVICE Number_____** | | | | |
| Name | 1-12 alphanumeric characters (including spaces) | | | |
| State | • Enabled<br>• Disabled | | | |
| Printer | 1 / 2 | | N/A | N/A |
| Port<br><br>* Infoprint 4100 model HD3/4 only | • Printer 1 Port 1<br>• Printer 1 Port 2<br>• Printer 1 Port 3<br>• Printer 1 Port 4*<br>• Printer 2 Port 1<br>• Printer 2 Port 2<br>• Printer 2 Port 3*<br>• Printer 2 Port 4* | | | |
| Type | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Form Barcode | | | |
| Extended NPRO | 0 to 800 inches | | | |
| Busy Timer | 1 to 999 seconds | | | |
| Tag Type (postprocessor only) | • Coupled<br>• RSI Compatible | | | |
| Distance to Postprocessor | • 24 to 800 inches<br>• 24 to 1200 inches (two postprocessors) | | | |
| Error Page Stop | 0 to 100 pages | | | |
| Verify Alignment Page Stop | 0 to 5000 pages | | | |
| Baud Rate in Kbps | 19.2 or 62.5 | | | |
| Use Internal Stacker | Yes / No | | | |
| Offsetter Enabled | Yes / No | | | |
| BTS Enabled | Yes / No | | | |
| Offset on Mark Forms | Yes / No | | | |
| UP[3]I Enabled | Yes / No | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **DEVICE Number_____** | | | | |
| Name | 1-12 alphanumeric characters (including spaces) | | | |
| State | • Enabled<br>• Disabled | | | |
| Printer | 1 / 2 | | N/A | N/A |
| Port<br><br>* Infoprint 4100 model HD3/4 only | • Printer 1 Port 1<br>• Printer 1 Port 2<br>• Printer 1 Port 3<br>• Printer 1 Port 4*<br>• Printer 2 Port 1<br>• Printer 2 Port 2<br>• Printer 2 Port 3*<br>• Printer 2 Port 4* | | | |
| Type | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Form Barcode | | | |
| Extended NPRO | 0 to 800 inches | | | |
| Busy Timer | 1 to 999 seconds | | | |
| Tag Type (postprocessor only) | • Coupled<br>• RSI Compatible | | | |
| Distance to Postprocessor | • 24 to 800 inches<br>• 24 to 1200 inches (two postprocessors) | | | |
| Error Page Stop | 0 to 100 pages | | | |
| Verify Alignment Page Stop | 0 to 5000 pages | | | |
| Baud Rate in Kbps | 19.2 or 62.5 | | | |
| Use Internal Stacker | Yes / No | | | |
| Offsetter Enabled | Yes / No | | | |
| BTS Enabled | Yes / No | | | |
| Offset on Mark Forms | Yes / No | | | |
| UP$^3$I Enabled | Yes / No | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **DEVICE Number_____** | | | | |
| Name | 1-12 alphanumeric characters (including spaces) | | | |
| State | • Enabled<br>• Disabled | | | |
| Printer | 1 / 2 | | N/A | N/A |
| Port<br><br>* Infoprint 4100 model HD3/4 only | • Printer 1 Port 1<br>• Printer 1 Port 2<br>• Printer 1 Port 3<br>• Printer 1 Port 4*<br>• Printer 2 Port 1<br>• Printer 2 Port 2<br>• Printer 2 Port 3*<br>• Printer 2 Port 4* | | | |
| Type | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Form Barcode | | | |
| Extended NPRO | 0 to 800 inches | | | |
| Busy Timer | 1 to 999 seconds | | | |
| Tag Type (postprocessor only) | • Coupled<br>• RSI Compatible | | | |
| Distance to Postprocessor | • 24 to 800 inches<br>• 24 to 1200 inches (two postprocessors) | | | |
| Error Page Stop | 0 to 100 pages | | | |
| Verify Alignment Page Stop | 0 to 5000 pages | | | |
| Baud Rate in Kbps | 19.2 or 62.5 | | | |
| Use Internal Stacker | Yes / No | | | |
| Offsetter Enabled | Yes / No | | | |
| BTS Enabled | Yes / No | | | |
| Offset on Mark Forms | Yes / No | | | |
| UP$^3$I Enabled | Yes / No | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Pre/Postprocessing → UP³I Devices** | | | | |
| UP³I Devices | Edit UP3I Device | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Pre/Postprocessing → UP³I Paper Sequences** | | | | |
| UP³I Paper Sequences | • Add<br>• Delete<br>• Edit<br>• Set as default | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|---|---|---|---|---|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Remote Access → SNMP** | | | | |
| SNMP agent enabled | Yes / No | | | Match Printer 1 |
| Allow SNMP to Configure Printer | Yes / No | | | Match Printer 1 |
| SNMP Community Name (See Note) | Alphanumeric characters | | | Match Printer 1 |
| Access (See Note) | Read / Write / None | | | Match Printer 1 |
| IP Address (See Note) | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Net Mask (See Note) | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Trap Manager (See Note) | Yes / No | | | Match Printer 1 |
| **Note:**  See "Remote Access" on page 164 and Table 35 on page 165 for details. | | | | |

*Table 45. Duplex configuration work sheet  (continued)*

| Item | Available Values | Selected Values | | |
|------|------------------|---------|---------|---------|
| | | Duplex | Simplex | |
| | | | Printer 1 | Printer 2 |
| **Printer Definition → Remote Access →E-mail** | | | | |
| Enable E-mail | Yes / No | | | Match Printer 1 |
| Internet Name of Local Host | Alphanumeric characters | | | Match Printer 1 |
| IP Address of Name Server | X.X.X.X where X ≤ 255 | | | Match Printer 1 |
| Domain Name | X.X.X.X where X is any alphanumeric character | | | Match Printer 1 |
| Default E-mail Destination | Alphanumeric characters | | | Match Printer 1 |

# Simplex Definition Work Sheet

Record your configuration choices on this work sheet, and give a copy of the completed form to the service representative when the printer is being installed. See Chapter 7, "Setting Printer Definition Values," on page 137 for detailed information about each item.

*Table 46. Simplex configuration work sheet*

| Item | Available Values | Selected Value |
|------|------------------|----------------|
| **Printer Definition → Print Quality** | | |
| Contrast | 1 to 7 | |
| Boldness | 0% to 100% | |
| Preheat Temperature | 1 to 100 | |
| Fuser Temperature | 1 to 100 | |
| Oil Rate | 1 to 100 | |
| Oil Belt | 1 to 100 | |
| Use Backup Idler Roll | Yes / No | |
| Example Settings | Light / Medium / Heavy | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Print Quality → Beam Adjustments** | | |
| Beam 1 Offset Adjustment (only for printers with multi-beam printheads) | Cannot be changed. | N/A |
| Beam 2 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A |
| Beam 3 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A |
| Beam 4 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A |
| Beam 5 Offset Adjustment (only for printers with multi-beam printheads) | (CE Change Only) | N/A |
| **Printer Definition → Print Quality → PQE Adjustments** | | |
| Printer | (CE Change Only) | N/A |
| Beam Number | (CE Change Only) | N/A |
| Current Vector | (CE Change Only) | N/A |
| Vector Boldness | (CE Change Only) | N/A |
| Horizontal High | (CE Change Only) | N/A |
| Horizontal Low | (CE Change Only) | N/A |
| Vertical High | (CE Change Only) | N/A |
| Vertical Low | (CE Change Only) | N/A |

*Table 46. Simplex configuration work sheet (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Printer → Basic** | | |
| Printer Speed (HS2, HD3/HD4 only) | High / Low | |
| POD Mode | Yes / No | |
| Cut Sheet Emulation | • None<br>• Normal Left-to-Right<br>• Normal Right-to-Left<br>• Inverted Left-to-Right<br>• Inverted Right-to-Left | |
| Printhead Resolution<br><br>Depending on the value selected, these items appear:<br>• IPDS Resolution<br>• Font Enhancement (Single-byte Font / Double-byte Font | 240, 300, 480, 600 DPI<br><br><br>• Automatic, 240, 300, 600 DPI<br>• Yes / No | |
| IPDS Resolution<br><br>The values available depend on the model of the printer. | • Automatic<br>• 240<br>• 300<br>• 600 | |
| Eject to Front Facing | • Enabled<br>• Disabled | |
| Auto NPRO at EOF | Yes / No | |
| Reprint Pages After Jams | • Yes<br>• No recovery for MICR pages<br>• No | |
| Direct Attach | Yes / No | |
| Language | • English<br>• Spanish<br>• German<br>• Japanese Kanji<br>• French<br>• Italian<br>• Brazilian Portuguese<br>• Simplified Chinese<br>• Traditional Chinese<br>• Korean<br>• Russian<br>• Hungarian | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| Keyboard Language | • English<br>• Spanish<br>• German<br>• Japanese Kanji<br>• French<br>• Italian<br>• Brazilian Portuguese<br>• Simplified Chinese<br>• Traditional Chinese<br>• Korean<br>• Russian<br>• Hungarian | |

*Table 46. Simplex configuration work sheet (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Printer → Advanced** | | |
| Snapshot Mode | (CE Change Only) | N/A |
| Logical Page Increment | 0 to 20 pels | |
| MICR Installed | Both / Printer 1 / Printer 2 / None | |
| 3130 Barcode Emulation | Yes / No | |
| Simulate Color with Gray | Yes / No | |
| Line Mode Enabled | Yes / No | |
| Single-Byte Font Smoothing | Yes / No | |
| Double-Byte Font Smoothing | Yes / No | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition ￫ Printer ￫ Set Up** | | |
| Autostart | Yes / No | |
| Jam Recovery Point Distance | 0 to 500 inches | |
| NPRO Length | 0 to 1200 inches | |
| Fuser Sleep Timeout | • None<br>• 1 Hour<br>• 2 Hours<br>• 4 Hours | |
| Clear Memory for Security | Yes / No | |
| Audible Alarm | Yes / No | |
| Date and Time | (CE Change Only) | N/A |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Printer → Set Up → Advanced** | | |
| Suppress Off Page Errors | 0 to 100 Pels | |
| Movable Side Verify Marks | Yes / No | |
| Stop on toner low | Yes / No | |
| Open Clear Buffers Alert | Yes / No | |
| Dual sensor installed | Yes / No | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Printer → Service** | | |
| Machine Serial | (CE change on initial configuration only) | N/A |
| Print Count | (CE Change Only) | |
| BIR Installed | (CE Change Only) | N/A |
| Scan Factory Adjustment | (CE Change Only) | N/A |
| Process Factory Adjustment | (CE Change Only) | N/A |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Printer → Resource Utilization** | | |
| Font Usage | • Low<br>• Medium<br>• High | |
| Page Segment and Overlay Usage | • Low<br>• Medium<br>• High | |
| Overlay Cache Usage | • High<br>• Medium<br>• Low<br>• None | |
| Input Buffer Size | • Low<br>• Medium<br>• High | |
| Output Buffer Size | • Low<br>• Medium<br>• High | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|------|------------------|----------------|
| **Printer Definition → Attachments → Parallel** | | |
| Parallel Link A Installed | Yes / No | |
| Parallel Link B Installed | Yes / No | |
| Device Address | 00 to FF | |
| Second Channel | Static / Dynamic | |
| Data Transfer Protocol | Interlocked / Data Streaming | |
| Data Streaming Rate | • MCA Bus: 1.9 / 2.7 / 3.4 / 4.5 MB/sec<br>• PCI Bus: 3.0 / 4.5 MB/sec | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|------|------------------|----------------|
| **Printer Definition → Attachments → ESCON** | | |
| ESCON Link A Installed | Yes / No | |
| ESCON Link B Installed | Yes / No | |
| Device Address | X'00' to X'FF' | |
| Multi-host Environment Flag | True / False | |
| Maximum Block Length | 32K / 64K | |
| **Printer Definition → Attachments → FICON** | | |
| FICON Link A Installed | Yes / No | |
| Device Address | X'00' to X'FF' | |
| Multi-host Environment Flag | True / False | |
| Maximum Block Length | 32K / 64K | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Attachments → TCP/IP Token Ring** | | |
| Installed | Yes / No | |
| TCP Port | 5001 to 65535 | |
| IP Address | X.X.X.X where X ≤ 255 | |
| Subnet Mask | X.X.X.X where X ≤ 255 | |
| Default Gateway Address | X.X.X.X where X ≤ 255 | |
| MTU Size | 60 to 4096 | |
| Hardware Address | Cannot be changed | |
| Alternate Hardware Address | X'0' to X'FFFF FFFF FFFF' | |
| Ring Speed | 4 or 16 | |
| Confine Broadcast | Yes / No | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Attachments → Ethernet** | | |
| Installed for | • Print Data (IPDS)<br>• Network Connection (SNMP, IPM, e-mail)<br>• Laptop (IBM service representatives) | |
| TCP Port | 5001 to 65535 | |
| IP Address | X.X.X.X where X ≤ 255 | |
| Subnet Mask | X.X.X.X where X ≤ 255 | |
| Default Gateway Address | X.X.X.X where X ≤ 255 | |
| MTU Size | • Standard: 60 to 1500 (or up to 9000 for GigaBit)<br>• IEEE802.3: 60 to 1492 | |
| Hardware Address | Cannot be changed | |
| Alternate Address | X'0' to X'FFFF FFFF FFFF' | |
| Ethernet Type | • Standard<br>• IEEE802.3 | |
| Media Speed | • Auto negotiation<br>• 10 Half Duplex<br>• 10 Full Duplex<br>• 100 Half Duplex<br>• 100 Full Duplex | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Attachments → FDDI** | | |
| Installed | Yes / No | |
| TCP Port | 5001 to 65535 | |
| IP Address | X.X.X.X where X ≤ 255 | |
| Subnet Mask | X.X.X.X where X ≤ 255 | |
| Default Gateway Address | X.X.X.X where X ≤ 255 | |
| MTU Size | 256 to 4352 | |
| Hardware Address | Cannot be changed | |
| Alternate Address | X'0' to X'FFFF FFFF FFFF' | |
| Confine Broadcast | Yes / No | |

*Table 46. Simplex configuration work sheet (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Pre/Postprocessing** | | |
| ***DEVICE Number_____*** | | |
| Name | 1-12 alphanumeric characters (including spaces) | |
| State | • Enabled<br>• Disabled | |
| Port<br><br>*Infoprint 4100 model HS2 only | • Port 1<br>• Port 2<br>• Port 3<br>• Port 4* | |
| Type | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Form Barcode | |
| Extended NPRO | 0 to 800 inches | |
| Busy Timer | 1 to 999 seconds | |
| Tag Type (postprocessor only) | • Coupled<br>• RSI Compatible | |
| Distance to Postprocessor | • 24 to 800 inches<br>• 24 to 1200 inches (two postprocessors) | |
| Error Page Stop | 0 to 100 pages | |
| Verify Alignment Page Stop | 0 to 5000 pages | |
| Baud Rate in Kbps | 19.2 or 62.5 | |
| Use Internal Stacker | Yes / No | |
| Offsetter Enabled | Yes / No | |
| BTS Enabled | Yes / No | |
| Offset on Mark Forms | Yes / No | |
| $UP^3I$ Enabled | Yes / No | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| ***DEVICE Number_____*** | | |
| Name | 1-12 alphanumeric characters (including spaces) | |
| State | • Enabled<br>• Disabled | |
| Port | • Port 1<br>• Port 2<br>• Port 3 | |
| Type | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Form Barcode | |
| Extended NPRO | 0 to 800 inches | |
| Busy Timer | 1 to 999 seconds | |
| Tag Type (postprocessor only) | • Coupled<br>• RSI Compatible | |
| Distance to Postprocessor | • 24 to 800 inches<br>• 24 to 1200 inches (two postprocessors) | |
| Error Page Stop | 0 to 100 pages | |
| Verify Alignment Page Stop | 0 to 5000 pages | |
| Baud Rate in Kbps | 19.2 or 62.5 | |
| Use Internal Stacker | Yes / No | |
| Offsetter Enabled | Yes / No | |
| BTS Enabled | Yes / No | |
| Offset on Mark Forms | Yes / No | |
| UP$^3$I Enabled | Yes / No | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **DEVICE Number**_____ | | |
| Name | 1-12 alphanumeric characters (including spaces) | |
| Printer | 1 / 2 | |
| State | • Enabled<br>• Disabled | |
| Port | • Port 1<br>• Port 2<br>• Port 3 | |
| Type | • Preprocessor<br>• Postprocessor<br>• Advanced Select Medium Modification (SMM)<br>• Advanced MICR<br>• Advanced Color<br>• Form Barcode | |
| Extended NPRO | 0 to 800 inches | |
| Busy Timer | 1 to 999 seconds | |
| Tag Type (postprocessor only) | • Coupled<br>• RSI Compatible | |
| Distance to Postprocessor | • 24 to 800 inches<br>• 24 to 1200 inches (two postprocessors) | |
| Error Page Stop | 0 to 100 pages | |
| Verify Alignment Page Stop | 0 to 5000 pages | |
| Baud Rate in Kbps | 19.2 or 62.5 | |
| Use Internal Stacker | Yes / No | |
| Offsetter Enabled | Yes / No | |
| BTS Enabled | Yes / No | |
| Offset on Mark Forms | Yes / No | |
| UP[3]I Enabled | Yes / No | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Pre/Postprocessing → UP³I Paper Sequences** | | |
| UP³I Devices | Edit UP³I Devices | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Pre/Postprocessing → UP³I Paper Sequences** | | |
| UP³I Paper Sequences | • Add<br>• Delete<br>• Edit<br>• Set as default | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Remote Access → SNMP** | | |
| SNMP Agent Enabled | Yes / No | |
| Allow SNMP to Configure the Printer | Yes / No | |
| SNMP Community Name (See Note) | Alphanumeric characters | |
| Access (See Note) | Read / Write / None | |
| IP Address (See Note) | X.X.X.X where X ≤ 255 | |
| Netmask (See Note) | X.X.X.X where X ≤ 255 | |
| Trap Manager (See Note) | Yes / No | |
| **Note:**  See "Remote Access" on page 164 and Table 35 on page 165 for details. | | |

*Table 46. Simplex configuration work sheet  (continued)*

| Item | Available Values | Selected Value |
|---|---|---|
| **Printer Definition → Remote Access → E-mail** | | |
| Enable E-mail | Yes / No | |
| Internet Name of Local Host | Alphanumeric characters | |
| IP Address of Name Server | X.X.X.X where X ≤ 255 | |
| Domain Name | X.X.X.X where X ≤ 255 | |
| Default E-mail Destination | Alphanumeric characters | |

# Snapshots Work Sheet

Use the work sheet on page 233 to record Snapshot settings. You have the option of saving all settings or of saving only form settings (**Forms → Form Settings**). Make copies of the work sheets as necessary.

You may also find it helpful to make notes about loading techniques, adjusting print values, or other information that may be particular to certain Snapshots.

*Table 47. Snapshots work sheet*

| Snapshot: | Setting | Value: | Notes: |
|---|---|---|---|
| | **Forms → Form Settings** | | |
| | • Length<br>• Width<br>• Tractorless Side Verify Mark Location<br>• Unit of Measure<br>• Form Name<br>• Host Setup ID<br>• Form Barcode<br>• Tractorless/Mark<br>• Oversize Paper<br>• Paper Weight | • _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____ | |
| | **Printer Definition → Print Quality** | | |
| | • Contrast<br>• Boldness<br>• Preheat Temperature<br>• Fuser Temperature<br>• Oil Rate<br>• Oil Belt Speed<br>• Backup Idler Roll Usage | • _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____ | |
| | **Printer Definition → Printer →Basic** | | |
| | • Printer Mode<br>• Printer Speed<br>• POD Mode<br>• Cutsheet Emulation<br>• Printhead Resolution<br>• IPDS Resolution<br>• Front Sheet Sequence<br>• Same Side Printing<br>• Eject to Front Facing<br>• Auto NPRO at EOF<br>• Reprint Pages after Jams<br>• Direct Attach<br>• Language | • _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____<br>• _____ | |
| | **Forms → Print Registration → Advanced** | | |
| | • Simplex Side<br>• Duplex Long-Edge Binding Front Side<br>• Duplex Long-Edge Binding Back Side<br>• Duplex Short-Edge Binding Front Side<br>• Duplex Short-Edge Binding Back Side | • _____<br>• _____<br>• _____<br>• _____<br>• _____ | |
| | **Printer Definition → Pre/Postprocessing→Postprocessing Options** | | |

*Table 47. Snapshots work sheet  (continued)*

| Snapshot: | Setting | Value: | Notes: |
|---|---|---|---|
| | **Forms → Form Settings** | | |
| | • Use Internal Stacker<br>• Offsetter Enabled<br>• BTS Enabled<br>• Offset on Mark Forms<br>• UP$^3$I Enabled | • _____<br>• _____<br>• _____<br>• _____ | |

# Appendix C. Standard Power Plug Listings

┌─ **Chapter Overview** ─────────────────────────────────────────────────────┐
│  This chapter lists standard power plugs by country for the Infoprint 4100 Models HS2 and HD4
│  printer control unit, the HD3 printer utility module, and the Hunkeler Buffer Flipper Unit.
└────────────────────────────────────────────────────────────────────────────┘

Table 48 shows the applicable standard and a diagram of the power plug for common plug types. Diagrams show the contact arrangement and dimensions. Plug dimensions are nominal and are given for reference purposes only. Pole and wire configurations are 2-pole, 3-wire plugs. Diagrams of power plugs requiring polarization are so marked. Single-phase plugs may be marked with the E, G, or earth symbol for protective earth, and N or W for neutral.

Devices are rated for 10 Amperes and you should ensure that the appropriate service is provided.
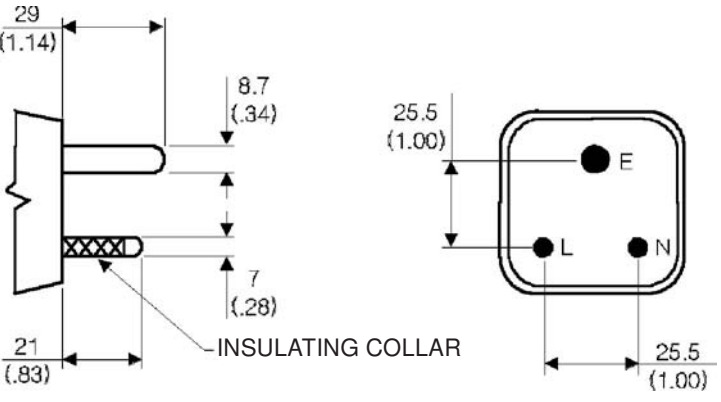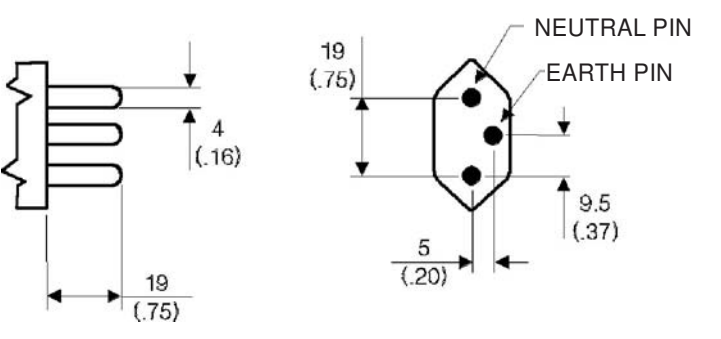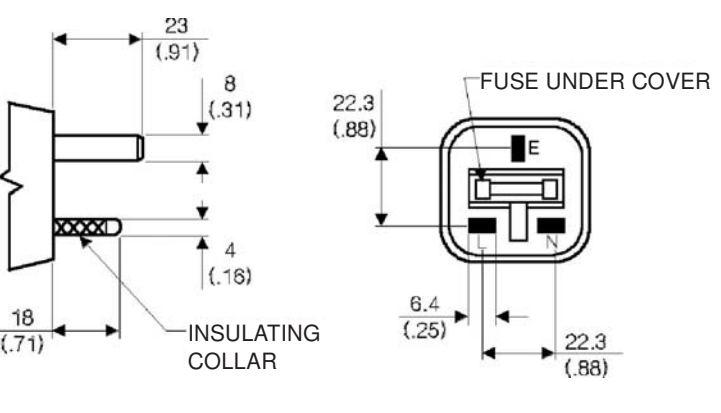
*Table 48. Standard power plugs for control unit, printer utility module, and Hunkeler Buffer Flipper Unit*

| Country or Region | Standard | Power Plug Diagram |
|---|---|---|
| Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Columbia, Costa Rica, Domican Republic, Ecuador, El Salvador, Guatemala, Guayana, Haiti, Honduras, Jamaica, Japan, South Korea, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Phillipines, Puerto Rico, Saudi Arabia, Suriname, Trinidad, Taiwan, U.S.A., Venezuela | NEMA WD-1 6–15P |  |
| Argentina, Australia, Columbia, New Zealand, Paraguay, Uruguay | IEC 83–A5 1957 |  |

*Table 48. Standard power plugs for control unit, printer utility module, and Hunkeler Buffer Flipper Unit  (continued)*

| Country or Region | Standard | Power Plug Diagram |
|---|---|---|
| Denmark | NORMBLAD 4 | |
| Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, South Korea, Lebanon, Luxembourg, China (Macao S.A.R.), Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia | CEE7 VII | |
| Israel | SII-32–1971 | |
| Chile, Ethiopia, Italy | CEI 23–16 | |

*Table 48. Standard power plugs for control unit, printer utility module, and Hunkeler Buffer Flipper Unit  (continued)*

| Country or Region | Standard | Power Plug Diagram |
|---|---|---|
| Bangladesh, Burma, Pakistan, South Africa, Sri-Lanka | SABS 164, BS 546 |  |
| Switzerland | SEV SN 416534 |  |
| Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, China (Hong Kong S.A.R.), India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Singapore, Tanzania, Uganda, United Arab Emirates, United Kingdom, Zambia | BS 1363 |  |

# Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property rights may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter in this publication. The furnishing of this publication does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
North Castle Drive
Armonk, NY 10504-1785 U.S.A.

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION ″AS IS″ WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

All models of the printer meet the requirements of IEC 950, First Edition, Amendments 1 and 2. The laser used in the printer complies with IEC 825 and EN 60825.

This information may contain examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names or individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Any performance data contained in this document was obtained in a controlled environment based on the use of specific data. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data in their specific environment.

## Trademarks

The following terms, used in this publication, are trademarks of the IBM Corporation in the United States or other countries or both:

| | |
|---|---|
| AFCCU | IPDS |
| AFP | Micro Channel |
| Advanced Function Presentation | Microsoft |
| AIX® | MVS |
| AIX/6000 | OS/400® |
| AS/400® | Personal System/2® |
| BCOCA | Print Services Facility |
| Bar Code Object Content Architecture | PSF |
| DB2® | RISC System/6000® |
| ESCON® | RS/6000 |
| ES/3090 | System/370 |
| ES/4381 | S/370 |
| ES/9000 | Windows |
| ES/9370 | XGA |
| FICON® | |
| IBM® | |
| Infoprint | |
| Infoprint Manager | |
| Infoprint® Productivity Suite | |

Other company, product, or service names may be the trademarks or service marks of others.

# Product Recycling and Disposal

This unit may have lead-containing materials – such as circuit boards and connectors – that require special handling. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. This book contains specific information on batteries and refrigerant where applicable.

This product may contain a sealed, lead-acid battery; lithium battery; nickel-metal-hydride battery; or nickel-cadmium battery. Batteries of these types must be recycled or disposed of properly. Recycling facilities may not be available in your area.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used batteries and battery packs from IBM equipment. For information on proper disposal of the batteries in this product, please contact IBM at 1-800-426-4333.

For information on disposal of batteries outside the United States, contact your local waste disposal facility.

IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of programs and services to assist equipment owners in recycling their IT products. Information on these product recycling offerings can be found on IBM's Internet site at http://www.ibm.com/ibm/environment/products/prp.shtml.

# Communication Statements

*Federal Communications Commission (FCC) Statement*

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
1-919-543-2193

**European Standard Statement:** This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

---

**Warning**

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

---

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

*Industry Canada Compliance Statement*

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conform à la norme NMB-003 du Canada.

**Statement for CISPR 22 Edition 2 Compliance:** Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

**Japanese VCCI Class A:**

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

**German Conformity Statement**

**Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richtlinie 89/336)**

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart.

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:
″Warnung: dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.″

EN 50082–1 Hinweis:
″Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082–2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu vergrößern.″

Anmerkung:
Um die Einhaltung des EMVG sicherzustelle sind die Geräte wie in den IBM Handbüchern angegeben zu installieren und zu betreiben.

**Taiwanese EMC:**

警告使用者：
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

**European Community (EC) Conformity Statement:** This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

**The United Kingdom Telecommunications Act 1984:** This apparatus is approved under the approval No. NS/G/1234/J/100003 for the indirect connections to the public telecommunications systems in the United Kingdom.

**Shielded Cables (European Statement):** Properly shielded and grounded cables must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

**Federal Communications Commission (FCC) Statement**

**Attention:**  This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. As temporarily permitted by regulation it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

**CAUTION:**
**This product is equipped with a 3-wire power cord and plug for the user's safety. Use this power cord in conjunction with a properly grounded electrical outlet to avoid electrical shock.**

# Glossary

The following terms are defined as they are used in printer documentation. If you do not find the term you need, refer to the index or to the *IBM Dictionary of Computing*, SC20-1699.

The following cross-references are used in this glossary:

- Contrast with. This refers to a term that has an opposed or substantively different meaning.
- Synonym for. This indicates that the term has the same meaning as another term, which is defined.
- Synonymous with. This identifies terms that are synonyms for the term that is defined.
- See. This refers to multiple-word terms that have the same last word.
- See also. This refers to related terms that have a similar, but not synonymous, meaning.

## A

**adaptive bi-level image compression (ABIC).**  A 4-bit image capable of displaying up to 16 shades of gray.

**Advanced Function Common Control Unit (AFCCU).**  An IBM RISC-based control unit with code common to all printers that use the AFCCU.

**Advanced Function Image and Graphics (AFIG).**  A integral facility within the printer to directly process IOCA image and GOCA graphics data streams.

**all-points addressability.**  The capability to address, reference, and position text, overlays, and images at any defined point on the printable area of a page.

**application.**  The use to which an information processing system is put; for example, a payroll application, an airline reservation application, a network application.

**application program.**  A program written for or by a user that applies to the user's work, such as a program that does inventory control or payroll.

**application programmer.**  A person who develops application programs. Contrast with *system programmer*.

**auto load.**  In the printer, the automatic forms threading facility.

## B

**bar code.**  A code representing characters by sets of parallel bars of varying thickness and separation that are read optically by transverse scanning.

**basis weight.**  The weight in pounds of a ream (500 sheets) of paper cut to a given standard size for that grade; for example, 25 x 38 inches for book papers, 17 x 22 inches for bond papers, and other sizes for other grades. The basis weight of continuous forms for computer output is based on the size for bond papers.

**binder holes.**  A series of holes or slots punched at set intervals that allows the form to be inserted in a loose-leaf or ring binder.

**bond (paper).**  Paper formulated with at least 80% wood pulp. Bond-paper forms work best in the printer.

## C

**calender.**  A process to make paper smooth or glossy by passing it through a series of metal rollers during the last steps of a paper-making machine.

**calender cut.**  Slits, glazed lines, or discolored lines across the paper caused when wrinkles pass through the calender rollers.

**caliper.**  The thickness of forms. This is usually expressed in thousandths of an inch.

**chad.**  (1) The material separated from a data medium when punching a hole. (2) The residue separated from the carrier holes in continuous forms.

**change.**  As used in printer action messages, instructs the printer operator to remove and discard a used component and then install a new one. For example, the `CHANGE TONER COLLECTOR` message indicates that the operator should take out the toner-collector bottle, throw it away, and put in a new one.

**channel command.**  An instruction directing a data channel, control unit, or device to perform an operation or set of operations.

**character.**  A letter, number, punctuation mark, or special graphic used for the production of text.

**character set.**  (1) A finite set of different characters that is complete for a given purpose; for example, the character set in ISO Standard 646, "7-bit Coded Character Set of Information Processing Interchange." (2) A group of characters used for a specific reason; for example, the set of characters a printer can print.

**245**

**check.**   As used in printer action messages, instructs the printer operator to inspect a component. For example, the CHECK TONER COLLECTOR message indicates that the operator should look at the toner-collector bottle and ensure that it is physically present, in the proper place, and correctly installed.

**clear.**   As used in printer action messages, instructs the printer operator to remove crumpled forms, paper scraps, and other debris from the printer. For example, the CLEAR UPPER TRACTOR message indicates that forms are wedged in the transfer station area, and the operator must remove them before the printer can operate.

**coated paper.**   Paper that has had a surface coating applied to produce smoothness.

**Code Page Global Identifier (CPGID).**   A unique code page identifier that can be expressed as either a two-byte binary or a five-digit decimal value.

**configuration.**   (1) The arrangement of a computer system or network as defined by the nature, the number, and the chief characteristics of its functional units. More specifically, the term configuration may refer to a hardware configuration or a software configuration. (2) The devices and programs that make up a system, subsystem, or network.

**configure.**   The procedure used to customize the printer to a specific operating and communication environment.

**connector.**   A means of establishing electrical flow.

**constant data.**   Data that does not change; for example, the company letterhead and standard text in form letters, or the headings and boxes on a preprinted form. Contrast with *variable data*.

**continuous forms.**   A series of connected forms that feed continuously through a printing device. The connection between the forms is perforated to allow the user to tear them apart.

**controlled-access area.**   An area where access is limited to authorized personnel.

**controlling computer.**   The processing unit to which the printer is attached through a channel interface.

**controlling computer system.**   The data-processing system to which a network is connected and with which the system can communicate.

**corner cut.**   In a form, a cut or opening of any size containing one or more right angles.

**corona.**   A small diameter wire (or wires, depending on the function) to which a high voltage is applied, causing ionization of the air. The ionization creates an electrical charge to perform various functions during the printing process.

**cure.**   The process of drying ink sufficiently for minimum transfer of the ink to any parts of the printer it contacts.

**cut.**   The severed part of a perforation. Cuts are separated by ties. See also *perforation*.

**cutout.**   A part of the form that has been eliminated or perforated for subsequent removal; for example, corner cuts and binder holes.

# D

**data streaming.**   A non-interlocked method of data transfer used by the printer channel to decrease data transfer time during write operations.

**developed image.**   The image that has been exposed onto the photoconductor and covered with toner by the developer.

**developer mix.**   A combination of carrier beads and toner in which the beads electrically charge the toner.

**diagnostic.**   Pertaining to the detection and isolation of errors in programs and faults in equipment.

**diagnostic mode.**   The operational mode in which the printer can check itself in case of a malfunction. When the printer is in diagnostic mode, it is not accepting information from the attached controlling computer system. In the printer, only service representatives can use diagnostic mode. Contrast with *print mode*.

**direct attach.**   The environment in which an application program directly allocates the printer.

**dishing.**   The curve a stack of forms takes when folded or refolded at the fold perforation.

**diskette.**   A thin, flexible, magnetic disk enclosed in a protective jacket.

**Document Composition Facility (DCF).**   An IBM licensed program that provides text formatting for the printer.

**down fold.**   Fanfold forms are alternately folded. When fanfold forms are unfolded and held horizontally, a fold is a down fold if it points down from the horizontal surface.

**drag.**   The resistance to forms feeding freely into the printer; for example, the form rubbing against the carton.

**duplex printing.**   A mode of printing on both sides of a form. Contrast with *simplex printing*.

# E

**electronic overlay.** A collection of constant data electronically composed in the controlling computer. Can be merged with variable data on a page during printing. An electronic overlay defines its own environment. It can be in coded form or raster pattern form. See also *preprinted form*.

**electrophotographic process.** The creation of an image on forms by uniformly charging the photoconductor, creating an electrostatic image on the photoconductor, attracting negatively charged toner to the discharged areas of the photoconductor, and transferring and fusing the toner to forms.

**emboss.** To press and raise the surface of paper into a design. Embossed paper appears thicker than non-embossed paper, can increase printer wear, and can degrade print quality.

**end-of-forms sensor.** A sensor that detects when the last sheet of a form enters the printer.

**error log.** (1) A data set or file in a product or system where error information is stored for later access. (2) A record of machine checks, device errors, and volume statistical data.

**ESCON channel.** A channel having an Enterprise Systems Connection channel-to-control unit I/O interface that uses serial-by-bit optical cable as a transmission medium.

# F

**fanfold.** Continuous forms that are alternately folded at regular intervals, usually on a perforation.

**Fiber Distributed Data Interface (FDDI).** An ANSI standard for a 100Mbps LAN using optical fiber cables.

**FICON.** Fiber connection.

**fold memory.** The ability of a form to refold at the fold perforation after exposure to heat during the fusing process.

**fold perforation.** The perforation on which a form is folded during manufacture and refolded after printing. See also *page perforation*.

**Font Library Service Facility (FLSF).** A licensed program that provides a way to make changes to a font while retaining its correct format, as defined by the architecture and as required by Print Services Facility.

**Font Typeface Global Identifier (FGID).** A unique font identifier that can be expressed as either a two-byte binary or a five-digit decimal value. The FGID is used to identify a type style and the following characteristics: posture, weight, and width.

**format.** (1) The arrangement or layout of data on a data medium. (2) The size, style, type of page, margins, printing requirements, and so on, of a printed page.

**forms.** The material on which output data is printed, such as paper. The area between perforations on continuous printer forms. See *electronic overlay* and *preprinted form*.

**forms path.** The entire route that forms travel during processing. The forms path usually begins where the forms are loaded and ends at the stacker. Synonym for *paper path*.

**form definition (FORMDEF).** A statement that specifies the attributes of a physical page, such as the number of copies and one-sided or two-sided printing.

**fuse.** To use heat and pressure to blend toner onto forms to make a permanent bond.

# G

**graphic.** A symbol produced by a process such as handwriting, drawing, or printing. See also *vector graphics*.

**Graphic Character Set Global Identifier (GCSGID).** A unique graphic character set identifier that can be expressed as either a two-byte binary or a five-digit decimal value.

**Graphical Data Display Manager (GDDM).** An IBM licensed program that allows pictures to be defined and displayed through function routines.

# I

**IBM branch office.** The local IBM sales office.

**IBM installation planning representative.** An IBM representative who assists customers in planning and meeting the requirements for installing hardware.

**IBM marketing representative.** An IBM representative who takes your order.

**IBM service representative.** An IBM representative who services IBM products in the field.

**IBM World Trade Corporation.** A subsidiary of IBM that manufactures and markets IBM products outside of the United States of America.

**impact printer.** A printer in which printing is the result of mechanical impacts. Contrast with *nonimpact printer*.

**installation.** (1) In system development, preparing and placing a functional unit in position for use. (2) A particular computing system, including the work it does and the people who manage it, operate it, apply it to problems, service it, and use the results it produces.

**installation verification procedure.** A procedure distributed with IBM licensed programs that tests the newly installed IBM programs to verify that the basic facilities of the programs are functioning correctly.

**Intelligent Printer Data Stream (IPDS).** Information the system sends to printers that contains decision-making capability. Generally, this information contains basic formatting, error recovery, and character data.

**Interface point.** Interface between the public supply network and the user's installation. Other customers may be connected to the public supply network (see EN 6100–3–11 section 3.2).

**ISO sizes.** Pertaining to a set of paper sizes selected from those standardized by the International Organization for Standardization (ISO) for use in data processing.

# J

**jam.** In a printer, a condition where forms have become blocked or wedged in the forms path so the printer cannot operate.

**JES2.** An MVS subsystem that receives jobs into the system, converts them to internal format, selects them for running, processes their output, and purges them from the system. In an installation with more than one processor, each JES2 processor independently controls its job input, scheduling, and output processing. See also *JES3*.

**JES3.** An MVS subsystem that receives jobs into the system, converts them to internal format, selects them for running, processes their output, and purges them from the system. In complexes that have several loosely coupled processing units, the JES3 program manages processors so that the global processor exercises centralized control over the local processors and distributes jobs to them via a common job queue. See also *JES2*.

# L

**landscape orientation.** Text and images that are printed parallel to the longer side of the forms. Contrast with *portrait orientation*.

**laser (light amplification by stimulated emission of radiation).** A device that emits a beam of coherent light.

**latent image.** In a printer, the invisible image that exists in the sensitized material after exposure but before development.

**layout plan.** A list of requirements, such as electrical and space, that must be considered before installing the IBM printer.

**library.** A collection of related files. For example, one line of an invoice may form an item, a complete invoice may form a file, and the collection of inventory control files may form a library. The libraries used by an organization are known as the data bank.

**licensed program.** A separately priced program that bears an IBM copyright and is offered to customers under the terms and conditions of the Agreement for IBM Licensed Programs.

**line printer.** A printer that prints a line of characters as a unit. Contrast with *page printer*.

**logical page.** A presentation space in which the page data is presented.

**logo.** An identifying emblem, statement, or motto of a company.

# M

**microcode.** In the printer, refers to the microprogramming stored on the control unit hard disk. Microcode is used by the control unit to manage the printer and its functions.

**microperforation.** Extremely small perforations. After forms are separated, those with microperforations typically have smoother edges than those with regular perforations.

**Multiple Printer Controller.** Controller used with Infoprint 4000 printers for on-demand printing. Sometimes referred to as a Print On Demand (POD) server.

**Multiple Virtual Storage/System Product (MVS/SP).** Consisting of MVS/System Product Version 1 and the MVS/370 Data Facility Product operating on a System/370 processor.

# N

**network Line Impedance (Z).** Network Impedance at the power frequency.

**nonimpact printer.** A printer in which printing is not the result of mechanical impacts. Contrast with *impact printer*.

**nonprocess runout (NPRO).** An operation that moves forms through the forms path without printing.

# O

**offset paper.**   A grade of paper to which sizing is added to resist moisture and surface during printing by ink presses.

**operating environment.**   The physical environment; for example, temperature, humidity, layout, or power requirements.

**operating requirements.**   A list of requirements, such as environmental, electrical, and space, that must be satisfied before the IBM printer can be installed.

**Operating System/Virtual Storage (OS/VS).** A compatible extension of the IBM System/360 Operating System that supports hardware and the extended control facilities of System/370.

**optical character recognition (OCR).**   Character recognition that uses optical means to identify graphic characters.

**orientation.**   The number of degrees an object is rotated relative to a reference; for example, the orientation of an overlay relative to the page point of origin. See also *text orientation*.

**overlay.**   See *electronic overlay*.

**Overlay Generation Language/370 (OGL/370).**   The licensed program that is used to create electronic overlays.

# P

**page.**   An object that contains presentation data. See also *logical page*.

**page definition (PAGEDEF).**   A statement that specifies attributes of a logical page, such as the width of its margins and the orientation of text.

**page perforation.**   The perforation that defines the page of a form. It may or may not be at a fold in the form. A form may have several pages between each fold. See also *fold perforation*.

**page printer.**   A device that prints one page as a unit. Contrast with *line printer*.

**Page Printer Formatting Aid/370 (PPFA/370).**   A licensed program that creates form definitions (FORMDEFs) and page definitions (PAGEDEFs).

**pallet.**   A portable platform for handling, storing, or moving materials.

**paper break.**   A separation, either at a perforation or from a tear, of the continuous-forms paper.

**paper path.**   The entire route that forms travel while they are being processed. The paper path usually begins where the forms are loaded and ends at the stacker. Because not all forms are paper, the term *forms path* is preferred.

**parallel channel.**   A channel having a System/360 or System/370 channel-to-control unit interface that uses parallel cable bus-and-tag as a transmission medium. Contrast with *ESCON channel*.

**parameter.**   A variable that is given a constant value for a specified application and that may denote the application.

**partition.**   In Basic N_Up printing, the division of the medium presentation space into a specified number of equal-sized areas in manner determined by the current physical medium.

**PC drum.**   A hollow cylinder that is covered with photoconductive material.

**pel (picture element).**   (1) An element of a raster pattern; a point where a toned area on the photoconductor may appear. (2) On an all-points-addressable output medium, each pel is an addressable unit. On a row-column addressable output medium, the only pel addressable is the beginning of a character cell.

**perforation.**   A linear series of unconnected cuts in the continuous-forms paper. The interval between cuts is referred to as a tie. The perforation defines either a fold or page boundary. See also *cut*, *fold perforation*, *microperforation*, and *page perforation*.

**photoconductor.**   The material that is wrapped about the drum. The medium for transferring images to paper.

**physical planner.**   The person in an organization who plans the environmental, electrical, and space requirements for your facility.

**pixel.**   See *pel*.

**planning coordinator.**   The person in your organization who is responsible for coordinating all the planning and installation activities for the printer.

**plant.**   A manufacturing location.

**point of origin.**   The location of the first print position on a logical page. The point of origin is usually stated in terms of X and Y coordinates. The point of origin used by a printer can be affected by factors such as printable area and forms orientation.

**portrait orientation.**   Pertaining to a display or hard copy with greater height than width. Contrast with *landscape orientation*.

**preprinted form.**   A sheet of forms containing a preprinted design of constant data with which variable data can be combined. See also *electronic overlay*.

**Print Management Facility (PMF).** An interactive menu-driven program that can be used to create and modify fonts and to define output formatting for data printed on the printer.

**print mode.** The operational mode in which information is received from the attached controlling computer system and printed output is produced. Contrast with *diagnostic mode*.

**print position.** The physical positions of the characters constituting a print line relative to the form.

**print quality.** The quality of printed output relative to existing standards and in comparison with jobs printed earlier.

**Print Services Access Facility (PSAF).** A menu-driven, print-parameter selection program for page printers controlled by PSF.

**print surface.** The side of a form that receives the printed image.

# R

**raster.** (1) In computer graphics, a predetermined pattern of lines that provides uniform coverage of a display space. (2) The coordinate grid that divides the display area of a display device. (3) In the Printer Subsystem, an on/off pattern of electrostatic images produced by the laser print head under control of the character generator.

**raster pattern.** A series of picture elements (pels) arranged in scan lines to form an image.

**registration.** In printing, refers to the relative print positions of images that are printed at different times. For example, when you process preprinted forms, the registration is good if the new image printed by the printer aligns correctly with the preprinted image. Print that extends beyond box edges and text that overlaps other text are examples of poor registration.

**resource.** (1) People, equipment, or material used to perform a task or a project. (2) Any facility of a computing system or operating system required by a job or task, including main storage, input/output devices, processing units, data sets, and controller processing programs; for example, page printers use resources such as form definitions, page definitions, and fonts.

**reverse heading.** A heading where each character is highlighted by reversing the color of the character with its background; for example, changing a black character on a white background to a white character on a black background.

# S

**scanner.** A device that examines OCR, graphics, MICR, or bar-code patterns and generates electrical signals corresponding to the pattern. It sends the signals to a computing device for processing.

**screen or screening.** In document printing, a sheet of material, usually film, carrying a regular pattern of small dots. When printing, ink adheres only to the dots, and many dots close together appear solid. This method prints large areas of ink on paper but uses much less ink than printing the same area with solid ink.

**security paper.** Specially formulated paper used for negotiable documents, such as checks, which improves the anti-fraud characteristics of the document.

**Service current capacity ($I_{scc}$).** Current per phase, which can be taken continuously by the user at the interface point without exceeding the rating used by the supply authority in the design of its system (or the maximum load current per phase).

**Note:** In practice, the service current capacity is the rating of the main service fuse or over current protection setting of the circuit breaker at the interface point.

**shift.** A scheduled work period. For example, a 24-hour day is often divided into three 8-hour shifts.

**Short circuit ratio ($R_{sce}$).** The ratio of the short circuit power provided by the supply at the interface point to the load apparent power.

**simplex printing.** Pertaining to printing on only one side of a form. Contrast with *duplex printing*.

**sizing.** A process where paper is treated to give it resistance against penetration of liquids.

**special-purpose materials.** Printable items other than blank forms; for example, preprinted forms.

**SRC.** See *system reference code*.

**stack lean.** A measurable slope from the vertical of a stack of forms. Excessive stack lean can cause failures when feeding and refolding forms.

**system reference code.** A code that contains information, such as a failing field-replaceable unit, for a customer engineer.

**system programmer.** A programmer who plans, generates, maintains, extends, and controls the use of an operating system, with the aim of improving overall productivity of an installation. Contrast with *application programmer*.

**System/370.** An upward-compatible extension of the IBM System/360. A large collection of computing system

devices that can be combined to produce a wide range of computing systems that share many characteristics, including a common machine language.

# T

**task.**   A basic unit of work to be accomplished by a device or an operator.

**TCP/IP.**   Transmission Control Protocol/Internet Protocol. A set of communication protocols that supports peer-to-peer connectivity functions for both local and wide area networks.

**tensile strength.**   A measure of the force that the paper forms can withstand without tearing.

**text orientation.**   The position of text as a combination of print direction and baseline direction.

**tie.**   The interval between cuts of a perforation. See also *perforation*.

**toner.**   The material that forms the image on the paper.

**trace.**   (1) A record of the running of a computer program. It exhibits the sequences in which the instructions were executed. (2) To record a series of events as they occur. (3) In the printer, a service representative and customer analysis procedure.

**tractor.**   The mechanism that controls movement of continuous forms by way of holes (see *tractor holes*).

**tractor holes.**   The holes in the side margins on continuous forms. When placed on the tractor pins, the holes maintain form alignment and registration, and control the movement of the forms.

**tractorless.**   The absence of holes in the side margins on continuous forms.

**Two-Channel Switch.**   A device used with the System/370 channel attachment, that allows an input or output device to be attached to two channels.

# U

**up fold.**   Fanfold forms are alternately folded. When fanfold forms are unfolded and held horizontally, a fold is an up fold if it points up from the horizontal surface.

# V

**variable data.**   The data that can vary; for example, the names and addresses in form letters.

**vector graphics.**   Computer graphics in which display images are generated from display commands and coordinate data. Contrast with *raster pattern*.

**Virtual Storage Extended (VSE).**   An operating system that is an extension of Disk Operating System/Virtual Storage.

**Virtual Storage Extended/Advanced Functions (VSE/AF).**   The minimum operating system support for a VSE-controlled installation.

**void.**   (1) A missing part of the printed character. (2) A missing piece of a continuous form.

# Index

## Special characters

'H' Configuration for All Infoprint 4000 Models with Any Buffer/Flipper Unit (both printers facing the same direction)   118

'H' Configuration for All Infoprint 4100 Models with Any Buffer/Flipper Unit (both printers facing the same direction)   124

'U' Configuration for All Infoprint 4000 Models with the Hunkeler Buffer/Flipper Unit WT4 (printers facing each other)   119

'U' Configuration for All Infoprint 4100 Models with the Hunkeler Buffer/Flipper Unit WT4 (printers facing each other)   125

## Numerics

2-up printing   27
240 dpi IPDS resolution mode   43
240/300 switchable printers   42
300 dpi IPDS resolution mode   43
3044 Fiber Optic Channel Extender   97
3130 barcode compatibility, configuration   146
480 dpi font smoothing mode   44
480/600 switchable resolution   42
600 dpi font smoothing mode   44
600 dpi IPDS resolution acceptance   43
600 dpi IPDS resolution mode   43

## A

access, configuration   164
access, defining remote   168
adding
    forms definitions   169
    pre/postprocessing device interfaces   167
Additional Customer Changeable Developers   35
Additional Pre/Postprocessing Interface   34
Advanced Function Image and Graphics   27
Advanced Function Postprocessing Interface   35
Advanced Function Presentation (AFP) software
    bar code   99
    bar codes and optical character recognition
      fonts   101
    BCOCA support   99
    Document Composition Facility   101
    functions   98
    installing and verifying   101
    licensed program numbers   98
    optical character recognition   99
    purpose   23
    resource resolution   44
alarm suppression, configuration   148
aligning the printhead when printing with highlight color   68
all-points addressability   23
allow SNMP to configure printer, configuration   164

application materials
    preprinted forms   134
application programmer
    layout preparation   103
    responsibilities   80
    schedule   81
applications
    bar code   99
    bar codes   45
    combining text and images   23
    converting to Advanced Function Printers   101
    environment   49
    OCR (Optical Character Recognition)   99
    preprinted forms   29
    testing forms   134
applications considerations with highlight color   74
ASHRAE   103
attachment cable, feature codes   91
attachment performance considerations   97
attachments   32
    channel   83
    channel, performance consideration   97
    defining   166
    ESCON channel   52, 85
    ethernet TCP/IP channel   89
    FDDI   53, 54
    FDDI channel   91
    FICON channel   53, 87
    Gigabit Ethernet TCP/IP channel   89
    LAN   53
    local area networks   83
    physical   130
    System/370 channel   52, 84
    token ring TCP/IP channel   89
Attachments   32
auto align, configuration   148
auto load   45
auto NPRO at end of forms, configuration   144
automatic IPDS resolution mode   44
autostart, configuration   147
auxiliary power source recommendations   110

## B

backup idler roll installed, configuration   150
bar code   99
Bar Code Object Content Architecture (BCOCA)   99
    BCOCA support   99, 101
bar codes   45
    BCOCA support   99, 101
    fonts   101
basis weight   39, 133
beam number, configuration   142
beam offset adjustment, configuration   141
belt, oil
    speed
        configuration   139
belt, oiler   176

## V

## W

# Readers' Comments — We'd Like to Hear from You

**Infoprint 4000 and Infoprint 4100 Models with Enhanced Operator Console Planning and Configuration Guide**

**Publication No. G544-5798-07**

**Overall, how satisfied are you with the information in this book?**

|  | Very Satisfied | Satisfied | Neutral | Dissatisfied | Very Dissatisfied |
|---|---|---|---|---|---|
| Overall satisfaction | ☐ | ☐ | ☐ | ☐ | ☐ |

**How satisfied are you that the information in this book is:**

|  | Very Satisfied | Satisfied | Neutral | Dissatisfied | Very Dissatisfied |
|---|---|---|---|---|---|
| Accurate | ☐ | ☐ | ☐ | ☐ | ☐ |
| Complete | ☐ | ☐ | ☐ | ☐ | ☐ |
| Easy to find | ☐ | ☐ | ☐ | ☐ | ☐ |
| Easy to understand | ☐ | ☐ | ☐ | ☐ | ☐ |
| Well organized | ☐ | ☐ | ☐ | ☐ | ☐ |
| Applicable to your tasks | ☐ | ☐ | ☐ | ☐ | ☐ |

**Please tell us how we can improve this book:**

Thank you for your responses. May we contact you?  ☐ Yes  ☐ No

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate without incurring any obligation to you.

Name

Address

Company or Organization

Phone No.

IBM ®

Cut or Fold
Along Line

Fold and Tape              **Please do not staple**              Fold and Tape

Fold and Tape              **Please do not staple**              Fold and Tape

Cut or Fold
Along Line

# IBM