Infoprint 3000 Advanced Function Printers

Introduction and Planning Guide

G544-5563-05

Infoprint 3000 Advanced Function Printers

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G544-5563-05

Note!
Before using this information and the product it supports, read the information in “Notices” on page 127.

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Preface

This publication introduces and summarizes the functions of the

- IBM Infoprint 3000 Advanced Function Printers Model ES1
- IBM Infoprint 3000 Advanced Function Printers Models ED1/ED2

This publication also contains information to help you prepare for installing and using your printer.

The first portion of this publication is written for executives who are thinking about buying an Infoprint 3000 Advanced Function Printer. The remainder of the publication is for the planning team that is responsible for installing the printer and preparing it for regular operation.

About This Publication

This publication contains the following chapters:

- "Chapter 1. Introduction" on page 1 gives an overview of the Infoprint 3000 Printer characteristics and basic concepts.
- "Chapter 2. The Advanced Function Printers Characteristics" on page 21 describes the Infoprint 3000 Printer functions and features in detail.
- "Chapter 3. Organizing the Planning Team" on page 39 describes the installation planning team and specifies the tasks for which each team member is responsible.
- "Chapter 4. Preparing the Processing Environment" on page 45 describes requirements associated with channel attachment, pattern storage, and Advanced Function Presentation licensed programs.
- "Chapter 5. Preparing the Physical Environment" on page 57 specifies the Infoprint 3000 environmental, electrical, and space requirements.
- "Chapter 6. Configuration Information Descriptions" on page 73 describes the configuration options for the Infoprint 3000 printers that can be defined at installation time.
- "Chapter 7. Configuring a Simplex Printing System" on page 99 provides work sheets on which you can record your configuration choices.
- "Chapter 8. Configuring a Duplex Printing System" on page 107 provides work sheets on which you can record your configuration choices.
- "Chapter 9. Defining Forms" on page 115 describes the types of form definitions that are standard on the Infoprint 3000, details what information is needed to define new forms, and provides a work sheet to record form identification names and their characteristics.
- "Chapter 10. Obtaining Supplies" on page 119 lists supplies used in the Infoprint 3000 printers and describes how to order them.
- "Chapter 11. Selecting and Testing Forms" on page 123 describes the basic requirements for forms used with the Infoprint 3000.

Terms

This publication is for the Infoprint 3000 Type 3300 Model ES1 and Infoprint 3000 Type 3300 Models ED1/ED2 Advanced Function Printers. You will find the terms Infoprint 3000, Model ES1, and Models ED1/ED2 used throughout this document.

In Infoprint 3000 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.

For definitions of other terms, see "Glossary" on page 133. This comprehensive reference tool contains not only terms used in this publication, but also terms, abbreviations, and acronyms from other publications in the Infoprint 3000 Library.

Infoprint 3000 Library

The following additional Infoprint 3000 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.
- *Forms Design Reference for Continuous Forms Advanced Function Printers*, G544-3921, which describes the characteristics of forms and special-use media, and their effects on Infoprint 3000 performance.
- *Infoprint 3000 Operator's Guide*, S544–5564, which describes the procedures required to operate the Models ES1, and ED1/ED2.

Related Publications

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

For more information about Advanced Function Presentation, refer to *Guide to Advanced Function Presentation* G544-3876.

Contact your IBM marketing representative for information concerning the Infoprint 3000, their manuals, or associated licensed programs.

Summary of Changes

The following additions and changes were made throughout this book:

- The “u” printer configuration was removed.
- A new toner and developer mix was added to the supplies list.
- Miscellaneous editorial and nontechnical changes were made throughout the document.

Chapter 1. Introduction

Chapter Overview

This chapter presents the characteristics of the Infoprint 3000 Advanced Function Printers. For readers not familiar with nonimpact, all-points-addressable printers, this chapter also defines some basic page-printing concepts.

Printer Characteristics

The Infoprint 3000 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 Table 1 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 and some adhesive labels (see Table 1 on page 3 for more information). 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 the printer. This provides additional input and output capabilities beyond the standard forms input source and output stacker on the printer.

- On a duplex system, each printer has one preprocessing/postprocessing device interface as standard equipment. Model ED1 can have two additional preprocessing/postprocessing device interfaces. Model ED2 can have one additional preprocessing/postprocessing interface. Thus, Models ED1/ED2 can have a total of five preprocessing/postprocessing device interfaces.
- One interface is standard on the Model ES1.
- See “Configuring Preprocessing and Postprocessing Devices or Interfaces” on page 95 for more information.

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 RS/6000 technology and in the standard configuration includes:

- Memory

128MB for Model ES1
256MB for Models ED1/ED2

- An Extended Graphics adapter (XGA) touch-sensitive monitor used as a Display Touch Screen
- Host Attachment choices that include:
  - System/370 parallel channels
  - ESCON channels
  - Token Ring TCP/IP (Transmission Control Protocol/Internet Protocol) Local Area Networks (LAN)
  - Ethernet 10/100 BaseT TCP/IP LANs
  - FDDI (Fiber Distributed Data Interface) TCP/IP LANs.

  (See "Host System Attachment Choices" on page 32 for more information.)

Performance enhancements, such as the Advanced Function Image and Graphics (AFIG) feature, are integral to the AFCCU design. Consequently, the AFCCU provides levels of performance meeting or exceeding those provided on the 3900 Model-001 with the Decompression Performance Enhancement (DPE) and the Improved Memory Performance (IMP) features. 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.

Both models of the printer can be used in MVS, VM, VSE, Infoprint Manager, OS/2, AIX/6000, and OS/400 operating environments, and can be channel-attached to many different processors. For additional information, see "Host System Attachment Choices" on page 32.

Infoprint 3000 Printer and Form Specifications

Printer Specifications

Table 1 on page 3 summarizes the specifications for the various printers in the Infoprint 3000 family.

Table 1. Infoprint 3000 Printer Specification Summary

Model	Mode	Resolution (DPI)	Print Speed (IPM)
ES1	Simplex	480[1], 600 [1] 480/600 [2]	112/172 [3]
ED1/ED2	Duplex [4] Dual Simplex [4]	480[1], 600 [1] 480/600 [2] 480[1], 600 [1] 480/600 [2]	224/344 [3] 112/172 [3]

Notes:

1. Standard resolution (specify feature).
2. Optional feature.
3. Print Speed stated in 1-up mode/2-up mode. (See notes 5 and 6 for more information.)
4. The Print speed for Duplex is the total system speed (2 printers). The Print speed for dual simplex lists individual printer speed (either Printer 1 or Printer 2).
5. 1-up mode (assuming an 8½-inch length page, measured in the forms process direction).
6. 2-up mode (assuming an 11-inch length page, measured in the forms process direction).

Form Specifications

Table 2. Infoprint 3000 Form Specification Summary

Model	Mode	Basis Paper Weights		Forms Width		Forms Length	
		g/m²	lbs	Min. mm (in.)	Max. mm (in.)	Min. mm (in.)	Max. mm (in.)
ES1	Simplex	60-160	16-42	204 (8)	457 (18) [2]	76.2 ± 0.3 (3.0 ± 0.013) [3]	356 ± 0.3 (14.0 ± 0.013) [4, 5]
ED1/ED2	Duplex	60-105	16-28	229 (9)	457 (18) [2]	76.2 ± 0.3 (3.0 ± 0.013) [3]	356 ± 0.3 (14.0 ± 0.013) [4, 5]
	Dual Simplex	60-160	16-42 [1]	204 (8)	457 (18) [2]		

Notes:

1. The maximum paper weight for duplex printers running in simplex mode should be 160 g/m² (42 lb).
2. The maximum print width is 432 mm (17 in.).
3. Forms that are less than 178 mm (7 in.) in length are folded in multiples of 7 in. or greater (that is, forms that are 3.5 in. are folded every 7 in.; forms that are 3 in. are folded every 9 in.). For more information about forms lengths, see "Forms Length and Width Controls" in Chapter 3 and Appendix A "Valid Form Length in Inches" in the *Infoprint 3000 Operator's Guide*.
4. Maximum form length is 356 ±0.3 mm (14 ±0.013 in.) when used with the on-board stacker.
5. Maximum form length is 711 ±0.3 mm (28 ±0.013 in.) when used with preprocessing and postprocessing devices.

   To use forms longer than 711 mm (17 in.), the forms length must be enabled under the Special Features option of the Options pull-down menu. Be aware that when longer forms are in use, there can be an impact on performance, especially on more complex printing jobs that can result in printer back-hitching. Additional memory can help minimize this impact. When longer forms are no longer in use, the feature should be disabled for more efficient printer operation. For more information, see Appendix C "Special Features" in the *Infoprint 3000 Operator's Guide*.

Simplex Printers

Components

A simplex printing system includes the following:

- Printer engine
- Advanced Function Common Control Unit (AFCCU). This unit includes:
  - Operator Alert assembly
  - Power Control panel
  - IBM RS/6000 technology processor
  - XGA touch-screen Display Touch Screen
  - System interconnection electronics and cables
  - Preprocessing/postprocessing device interfaces.

Printing Methods

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

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 at the output of the printer
- From a preprocessing device ahead of the printer to a postprocessing device at the output of the printer.

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 (Optional)" on page 35.

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

See allowable configuration in "Configuration for a Simplex Printing System" on page 9.

Duplex Systems

Components

The major component of the Infoprint 3000 Models ED1/ED2 Advanced Function Duplex Printing System is a pair of duplex printers, hereafter referred to as a duplex printing system.

The duplex printing system can be used for duplex, dual simplex, and simplex printing applications.

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

Printer 1

Printer 1 includes the following:

- Printer engine
- Printer Utility Module (PUM). This unit includes:
  - Operator Alert assembly
  - Power Control panel
  - System interconnection electronics
  - Preprocessing device interface
  - Postprocessing device interface (dual simplex mode only).

Printer 2

Printer 2 includes the following:

- Printer engine
- Advanced Function Common Control Unit (AFCCU). This unit includes:
  - Operator Alert assembly
  - Power Control panel
  - IBM RS/6000 technology processor
  - XGA touch-screen Display Touch Screen
  - System interconnection electronics and cables
  - Preprocessing device interface (dual simplex mode only)
  - Postprocessing device interface.

Buffer/Flipper Unit

This 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
- Left/Right 90° path with 180° inversion.

The unit turns the forms over (flips) so the other side of the forms can be printed by the second printer.

An additional turning/flipping is required for the 'h' configuration. Purchase of this unit is the responsibility of the customer. It must be available when the printing system is installed.

Urge Unit

This 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 IBM-supplied urge unit is installed on Printer 2 and the vendor-supplied urge unit is installed on Printer 1.

An external urge unit may be required for the 'h' printer configuration, depending on such factors as paper weight and customer floor conditions. Purchase of this unit is the responsibility of the customer. It must be available when the printing system is installed.

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.

Allowable printer system configurations are inline (see "Inline Configuration for a Duplex Printing System" on page 9), or a left 90° angle (see "Left Angle Configuration for a Duplex Printing System" on page 10). Only a Buffer/Flipper Unit may be installed between Printer 1 and Printer 2.

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 before 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 rate of impressions per minute (IPM). 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. As an example, 112 impressions per minute in 1-up mode with 8½ form moving in the process direction. The total speed of the subsystem is then up to 344 IPM in 2-up mode, counting both the front and back sides of the forms.

Up to three preprocessing/postprocessing devices may be connected to Model ED1 and up to two preprocessing/postprocessing devices may be attached to Model ED2.

Both printers in the configuration attach to a host system through the AFCCU, 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 a Dual Simplex Printing System” on page 10 supports *simplex* (single-sided) 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.

  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 before 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:

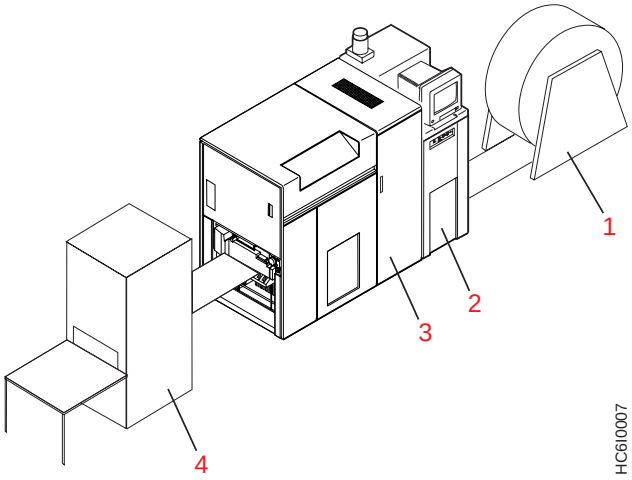
  – From the forms input area of the printer to the output stacker of the printer or to a postprocessing device at the output of the printer

  – From a preprocessing device before the printer to a postprocessing device at the output of the printer.

  Each printer can have its own set (up to three) of preprocessing and postprocessing devices.

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

Configuration for a Simplex Printing System



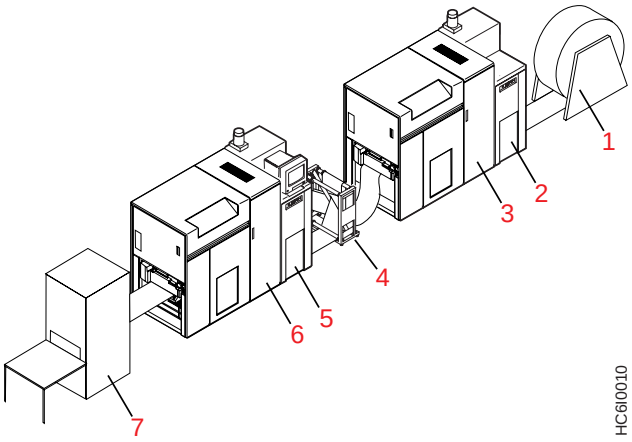
1 Optional preprocessing device

2 AFCCU

3 Model ES1

4 Optional postprocessing device

Inline Configuration for a Duplex Printing System



1 Optional preprocessing device attached to Printer 1

2 Printer Utility Module (PUM) attached to Printer 1

3 Printer 1

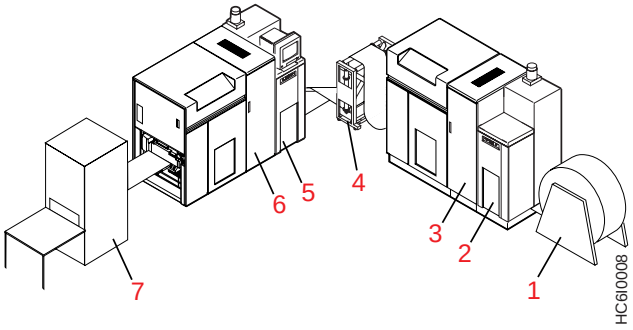
4 Buffer/Flipper Unit

5 AFCCU attached to Printer 2

6 Printer 2

7 Optional postprocessing device attached to Printer 2

Left Angle Configuration for a Duplex Printing System



1 Optional preprocessing device attached to Printer 1

2 Printer Utility Module (PUM) attached to Printer 1

3 Printer 1

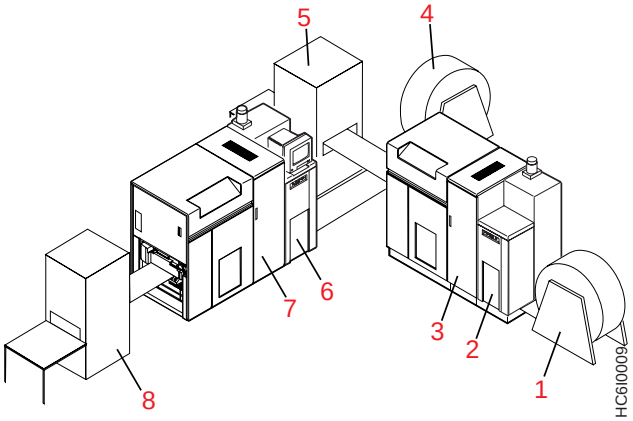
4 Buffer/Flipper Unit

5 AFCCU attached to Printer 2

6 Printer 2

7 Optional postprocessing device attached to Printer 2

Left Angle Configuration for a Dual Simplex Printing System



1 Optional preprocessing device for Printer 1

2 Printer Utility Module (PUM) attached to Printer 1

3 Printer 1

4 Optional preprocessing device for Printer 2

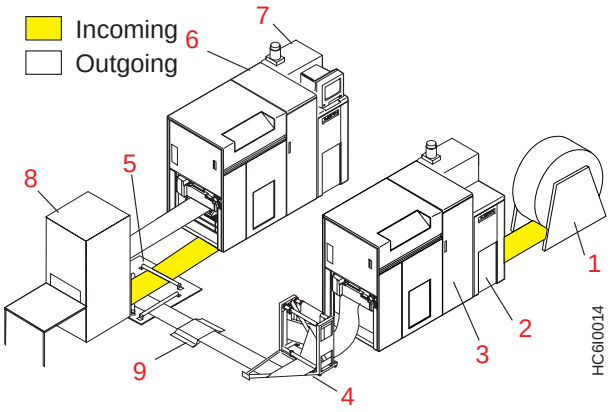
5 Optional postprocessing device for Printer 1

6 AFCCU attached to Printer 2; controls both printers in the configuration.

7 Printer 2

8 Optional postprocessing device for Printer 2

‘h’ Configuration for a Duplex Printing System



1 Optional preprocessing device

2 Printer Utility Module (PUM) attached to Printer 1

3 Printer 1

4 IBM-supplied Buffer/Flipper Unit

5 Customer-supplied turnbar/flipper device

6 Printer 2

7 AFCCU attached to Printer 2

8 Optional postprocessing device

9 Optional walk-over

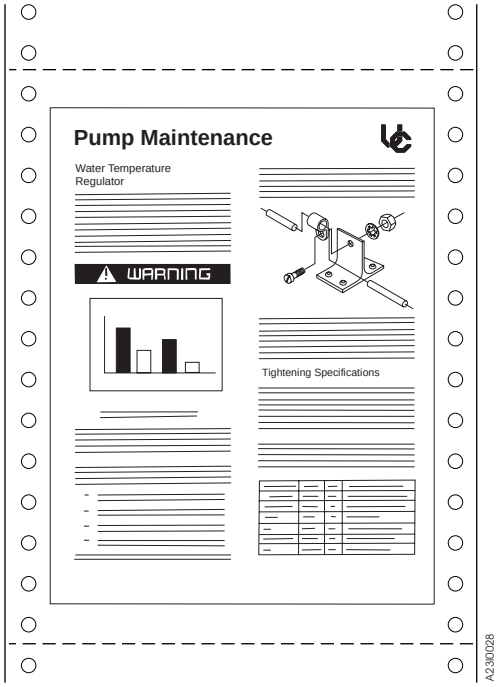
Basic Page-Printing Concepts

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 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

Table 3. Combined Images and Text



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.

Table 3 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.

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 1.

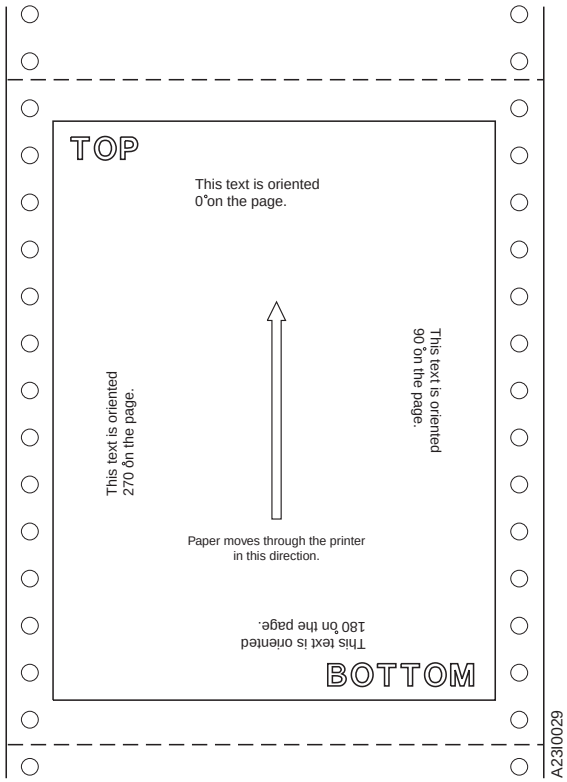


Figure 1. Available Orientations

Portrait Orientation

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

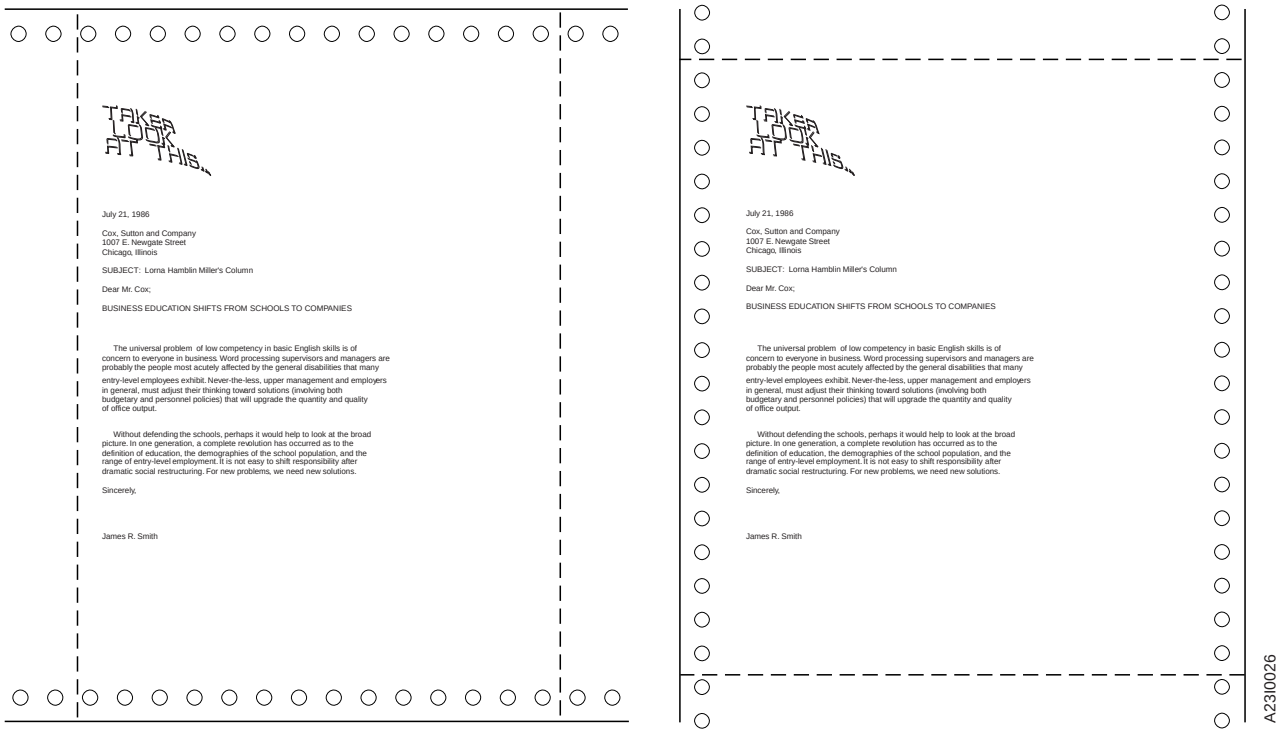


Figure 2. Portrait Orientations

Landscape Orientation

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

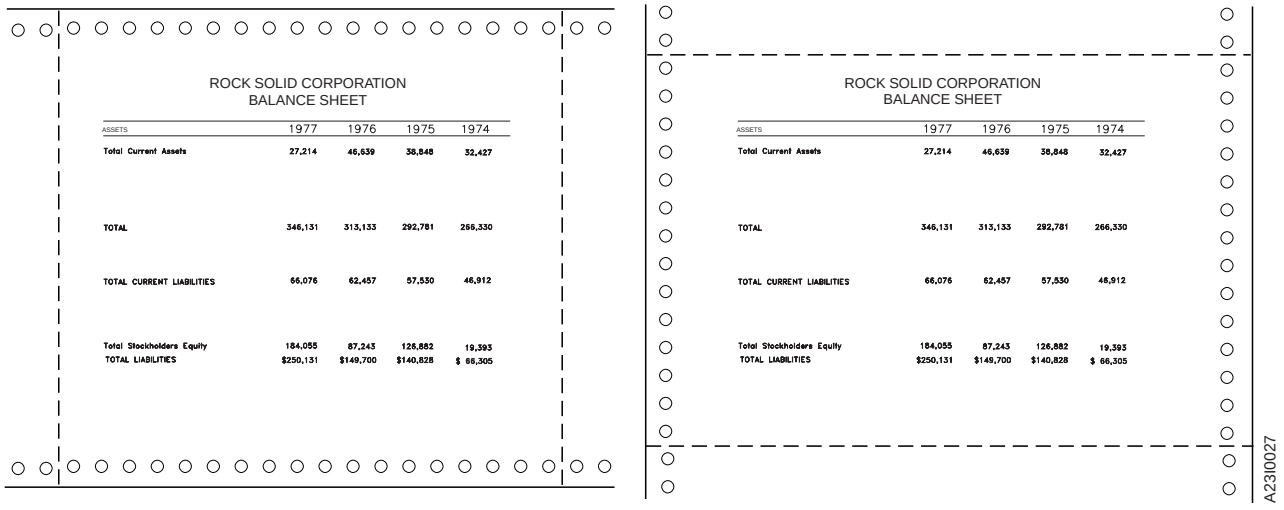


Figure 3. Landscape Orientations

Normal and Tumble Duplex

By using a combination of printing directions and orientations, you can put a document together in four different ways. Figure 4 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.

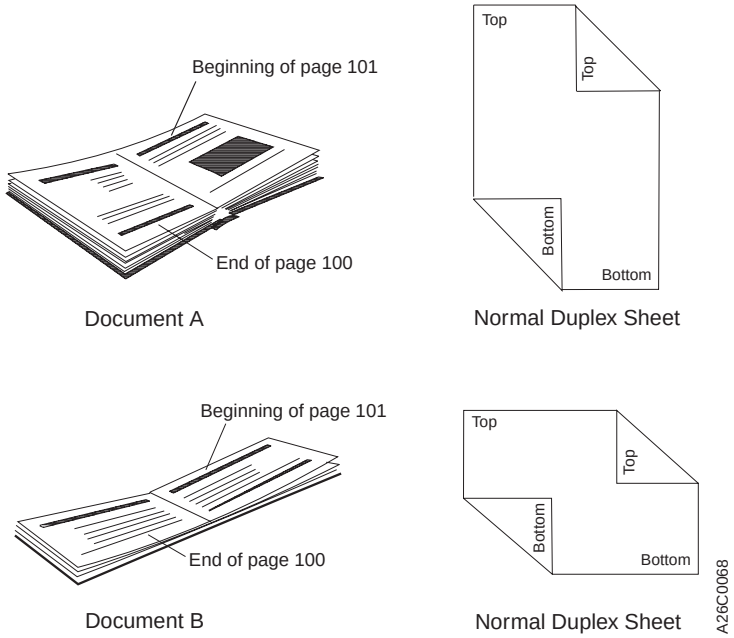


Figure 4. Normal Duplex

Figure 5 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.

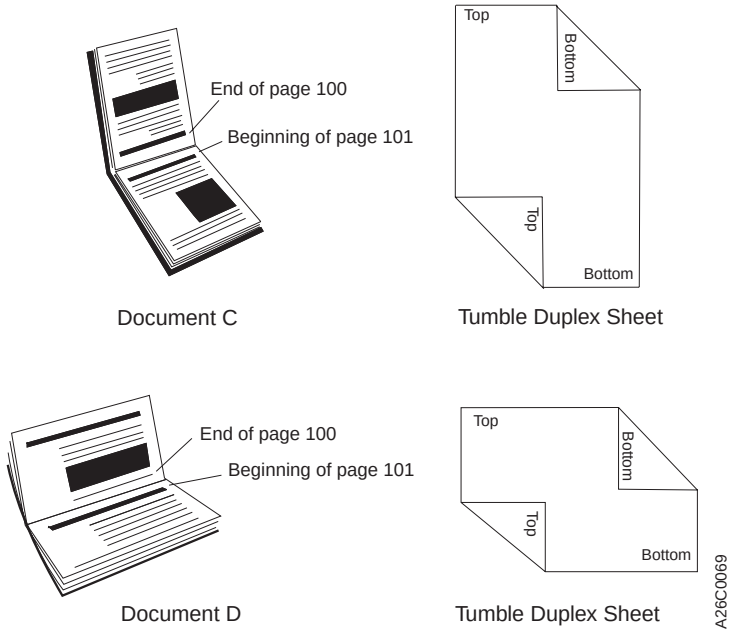


Figure 5. Tumble Duplex

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 4 on page 30 for a listing of Print Services Facility (PSF) software that supports N-Up printing. Figure 6 is an example of 2-up printing.

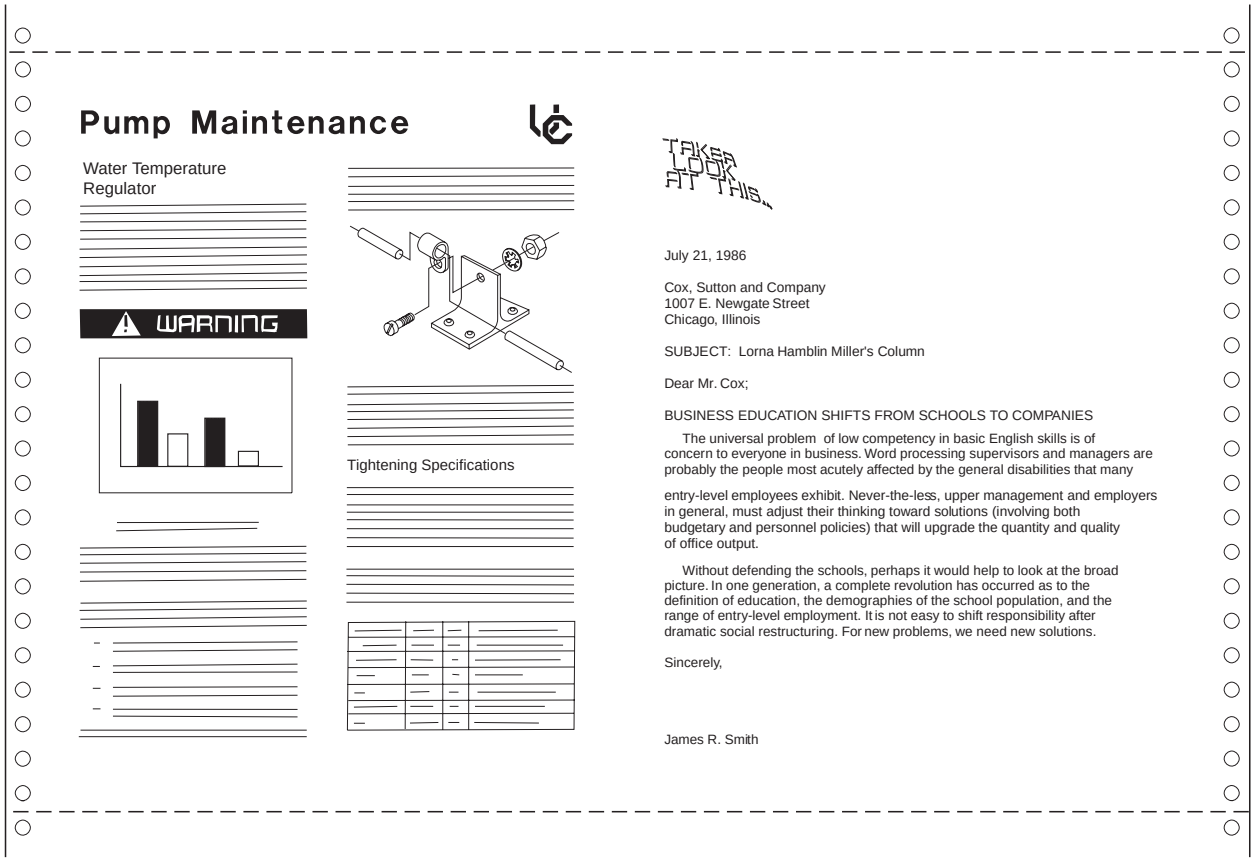


Figure 6. 2-Up Printing

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 4 on page 30 for a listing of PSF software that supports Enhanced N-Up printing.

Cut Sheet Emulation

Cut Sheet Emulation (CSE) is an option on the printer console 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.

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 4 on page 30 for a listing of PSF software that supports CSE printing. For more information on PSF, refer to the appropriate PSF publication.

Note: Cut Sheet Emulation applies to AS/400, VM, and PSF/MVS only.

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 Display Touch Screen.

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 53 for more information about these programs.

Optional Features

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.

This feature can be enabled or disabled by the key operator with the Special Features option of the Options pull-down menu. For printers in dual simplex mode, each printer is enabled or disabled separately.

This feature is available on all printers. It can be installed and enabled by your Customer Engineer.

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 with the Special Features option of the Options pull-down menu. For printers in dual simplex mode, it is enabled or disabled for each printer separately.

This feature is available on all printers. It can be installed and enabled by your Customer Engineer.

Chapter 2. The Advanced Function Printers Characteristics

Chapter Overview

This chapter describes the characteristics, functions, and features of the printer. 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 Table 1 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 activity
- Printhead resolution
- Size of form

See “Performance Considerations” on page 51 for additional information.

AFCCU Processor Performance Options

- RS/6000 Technology Processor – Standard on all models
- Performance Enhancement RS/6000 Technology Processor – Available for all models as a feature

  Selecting the performance enhancement processor improves processing performance over a wide range of applications. Customers with highly complex applications containing very dense text or compressed and complex images or customers that use dual simplex mode extensively will benefit using this option.

Print Material

The size limitations and options for Infoprint 3000 forms are listed in Table 1 on page 3.

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

Note: Printing on adhesive labels is supported only on Model ES1 and Models ED1/ED2 in dual simplex mode.

The *IBM 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 labels and special materials. Refer to "Chapter 11. Selecting and Testing Forms" on page 123 for more information.

Forms must have a basis weight of 60 to 160 g/m^2 (16 to 42 pounds) for simplex operations and 60 to 105 g/m^2 (16 to 28 pounds) for duplex operations. *Basis weight* is the weight in pounds of a ream (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. Form weight is listed in Table 1 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 123.

When you use **fanfold forms in duplex printing mode**, use a postprocessing device behind Printer 2 instead of the printer stacker. This prevents stacking problems caused by the occasional loss of the original fold direction after the paper travels through both printers and the Buffer/Flipper Unit.

Print Quality

The *Infoprint 3000 Operator's Guide* describes how to use the contrast and forms-selection controls on the printer control panel to adjust print quality.

For optimum print quality, you can customize some printer settings, called form characteristics (see "Form Characteristics" on page 117), for special forms that may require unique printing conditions.

The forms you use and the composition of your logical pages significantly affect the quality of 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 11. Selecting and Testing Forms" on page 123 and the *IBM Forms Design Reference for Continuous Forms Advanced Function Printers* for important information about this type of testing.

Print Quality Enhancement

The Infoprint 3000 uses a digital Print Quality Enhancement (PQE) when printing 240 or 300 DPI raster font text. The text is scaled to the printer resolution with an interpolation process. This process uses the extra pels available to eliminate jagged steps, producing smoother text. This enhancement can be turned off if necessary. See Font Enhancement.

Printer Resolution

Outline fonts can be used on all Infoprint 3000 AFCCU printers. 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.

The Infoprint 3000 printers offer additional resolution options:

- Switchable printers: The print resolution can be manually switched between 480 DPI and 600 DPI if the 480/600 DPI switchable feature is installed. See Table 1 on page 3.
- IPDS Resolution Acceptance (600 DPI only).
- Font Enhancement mode.

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

480/600 Switchable Printers

If your printer has a 480/600 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 should keep the printer at 480 DPI resolution all the time for optimum performance and print quality. 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 printer console by selecting the CONFIGURE PRINTER option for Printhead Resolution. The printer normally takes less than 1 minute to complete this operation.

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 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. For printers with 480/600 switchable printheads, jobs that use 240 DPI raster fonts should 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 scaling the dots, both appearance and performance of 240 DPI jobs may be better at 480 DPI resolution than at 600 DPI.

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.

When your printer is in 600 DPI mode, you have an additional capability: the option to specify IPDS Resolution mode.

IPDS Resolution Acceptance (600 DPI Resolution Only)

With the 600 DPI printhead or a 480/600 Switchable printer switched to 600 DPI resolution, the operator is presented with a pop-up window for selecting an IPDS resolution. The choices are:

- 240 DPI IPDS resolution mode
- 300 DPI IPDS resolution mode
- 600 DPI IPDS resolution mode
- Automatic IPDS resolution mode.

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 a 600 DPI 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 Acceptance 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.

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 printer console by selecting the CONFIGURE PRINTER option for Printhead Resolution. 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.

The print resolution is actually 600 DPI. Applications using outline fonts can take full advantage of the 600 DPI resolution in either acceptance mode. The printer renders the outlines at full 600 DPI resolution.

Note that if 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 Printers” on page 23.

600 DPI IPDS Resolution Mode

When a 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 mode does not provide any benefit over either 240 or 300 DPI IPDS 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 mode or in 600 DPI IPDS mode is that when the printer is in 600 DPI IPDS 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 console. 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, if the printer has 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 Printers” on page 23.

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 Enhancement Mode

On 480/600 switchable printers or 600 DPI printers, operators are presented with a pop-up window to select whether font enhancement is desired. The window presents two options:

- Single-byte font enhancement (YES|NO)
- Double-byte font enhancement (YES|NO).

The pop-up window 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

For Infoprint 3000 AFCCU printers, 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 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.

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

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 7.

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 *IBM Forms Design Reference for Continuous Forms Advanced Function Printers*and “Chapter 11. Selecting and Testing Forms” on page 123 for more information.

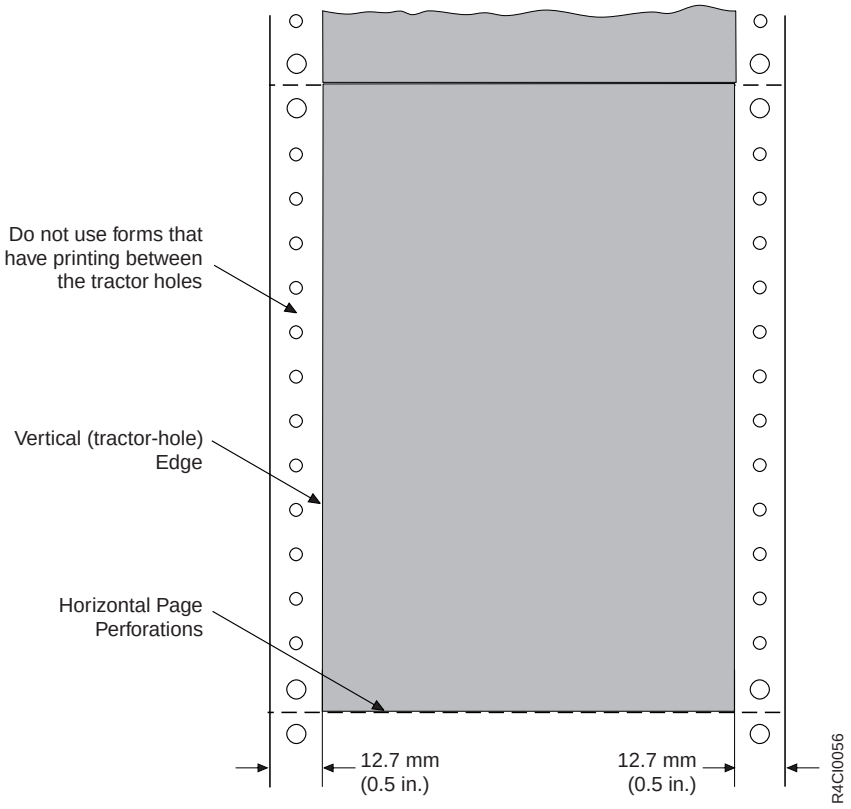


Figure 7. Printable Page Area

Control Unit Processor Memory

Available control unit processor memory for the printers is as follows:

- **Model ES1:** 128MB is standard. 128MB additional memory can be added.
- **Models ED1/ED2:** 256 MB is standard. 256MB additional memory can be added.

Most applications do not need additional memory, but complex applications probably will. Complex applications may print several combinations of fonts, images, page segments, or overlays on each page. Before printing a page of data, the printer must have enough storage in the page buffer to accommodate all the fonts and images appearing on that page.

For printers offering additional memory, ask your IBM marketing representative for assistance in determining if you need additional storage for your planned applications.

Display Touch Screen

The Display Touch Screen is the primary way you input information to the printer and receive status and error messages from the printer in any of several different languages. Both the printer operator and the service representative use this console.

You use the Display Touch Screen to set up and operate the printer. Some of the things you can do from the Display Touch Screen are:

- Change printer configurations
- Change host system channel attachment configurations
- Change preprocessing / postprocessing device configurations
- Define forms to be used in the printer.

Power Control

Simplex Models

The power control panel on the AFCCU frame 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.

Duplex Models

A power control panel on both the printer utility module (PUM) frame on Printer 1 and the Advanced Function Common Control Unit (AFCCU) frame 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 either a printer frame, the AFCCU frame, or the PUM frame Local/Remote switch is set to Local, power for that element 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 AFCCU is controlled from the controlling computer system, and power for either printer or the PUM is controlled from the AFCCU.

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

Software Requirements

IPDS

IPDS 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 4.

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 53 for a listing of AFP software.

Table 4. Software Support for the Respective Attachments and Functions

AFP Licensed Program	**S/370 Parallel Channel**	**ESCON Channel**	**Token Ring or Ethernet TCP/IP**	**FDDI TCP/IP**	**Select Medium Modification (SMM)**	**Basic N-Up**	**Enhanced N-Up**	**Cut Sheet Emulation**
OS/390 and PSF/MVS	Yes	Yes	Yes (See Note)	No	Yes	Yes	Yes	Yes
PSF/VM	Yes	Yes	No	No	No	Yes	Yes	Yes
PSF/VSE	Yes	Yes	No	No	Yes	Yes	Yes	No
PSF/400	No	No	Yes	No	No	Yes	Yes	Yes
PSF/OS2	No	No	Yes	No	No	No	No	No
PSF for AIX	No	No	Yes	Yes	Yes	Yes	Yes	No
Infoprint Manager	No	No	Yes	Yes	Yes	Yes	No	No
Note: Requires additional CPU cycles and may not yield acceptable throughput for data-intensive print applications.								

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

Application Environment

Infoprint 3000 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.

Infoprint 3000 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.

Infoprint 3000 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.

Infoprint 3000 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 53 for a listing of AFP software. Refer to Table 5 on page 32 for a listing of printer model choices as they relate to channel/adapter attachment choices.

Host System Attachment Choices

Infoprint 3000 printers can attach to the following processing systems with the indicated attachment choices, which are marked with **X**:

Table 5. Host Processing Systems and Attachment Choices

Host System	S/370 Parallel Channel	ESCON Channel	Token Ring or Ethernet TCP/IP LAN	FDDI TCP/IP LAN
IBM ES/3090 (Note 1) (Note 3)	X	X		
IBM ES/9000	X	X		
S/390 Multi-prise 2000, G3 Enterprise, Parallel Enterprise Server	X	X		
IBM ES/9370/9371 (Note 2)				
PS/2			X	
AS/400			X	
RS/6000 System/6000			X	X

Notes:

1. Attaches to Models 180J and above, except for Model 250, and to 9000T.
2. A High-Speed Printer Adapter is required when connecting to the Micro Channel on the ES/9371.
3. For ESCON, only model 3090J is supported.

All printers have two ports.

You can intermix these attachments in any combination of two, except that you cannot have two TCP/IP attachments.

See “Chapter 4. Preparing the Processing Environment” on page 45 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 Token-Ring TCP/IP adapter
- An Ethernet TCP/IP adapter
- A FDDI adapter.

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 a PS/2, a RS/6000 System/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 System/370 channel adapter
- A Token-Ring TCP/IP adapter
- An Ethernet TCP/IP adapter
- A FDDI adapter.

Adding a second ESCON adapter allows dynamic channel switching mode with tightly-coupled channels or processing units.

Local Area Network (LAN) Attachments

You can attach the printer to either Token Ring TCP/IP (Transmission Control Protocol/Internet Protocol) or to Ethernet TCP/IP with host systems running ES/9000, PSF/2, PSF/400, PSF for AIX, or Infoprint Manager.

You can attach one Token Ring adapter and one of the following:
- An ESCON channel adapter
- A System/370 channel adapter.

You can attach one Ethernet adapter and one of the following:
- An ESCON channel adapter
- A System/370 channel adapter.

FDDI Attachment

You can attach the printer to FDDI TCP/IP with a host system running PSF for AIX or Infoprint Manager.

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 System/370 channel adapter.

Preprocessing and Postprocessing Device Interfaces (Optional)

Preprocessing / 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, or MICR).

Each of the Infoprint 3000 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.

  One Pre / Post interface is standard on each printer.
- **Advanced Function Postprocessing (AF Post):** Attaches only postprocessing equipment that requires architected software and communications control, such as: printers using non-electrophotographic technology or MICR impact 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 Table 6 on page 53 and Table 4 on page 30 for PSF support details.

In the Duplex Models: Port 1 in each printer has a preprocessing / postprocessing interface, which is standard. You may select optional preprocessing / postprocessing or advanced function postprocessing interfaces to equip Ports 2 and 3 of Printer 1 or Port 2 of Printer 2.

In the Simplex Model: All three interfaces are selectable.

Things to Remember About Preprocessing/Postprocessing Equipment:

1. When using preprocessing equipment, be sure that attachment cables do not interfere with forms under the printer. See “Space Requirements – Duplex Models” on page 64 or “Space Requirements – Simplex Model” on page 63 for cable placement.
2. When using 18-inch (457-mm) wide paper, the distance between the back edge of the paper and the back of the machine is about 0.25 inches (0.6 cm). This means that some of the powered-assist rollers (urge units) used with other IBM printers may not work across the entire spectrum of the Infoprint 3000 family of printers. 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 speed (IPM) 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.).

See “Configuring Preprocessing and Postprocessing Devices or Interfaces” on page 95 for more information concerning the preprocessing / postprocessing interfaces.

Reliability, Availability, and Serviceability

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

- **Message Display**

  The Display Touch Screen windows display messages in the language of your choice:
  - U.S. English
  - Spanish
  - French
  - German
  - Japanese
  - Italian
  - Brazilian Portuguese
  - Chinese Simplified
  - Chinese Traditional.

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

- **Print Samples**

  The AFCCU can print several output print samples. You can print these print samples whenever necessary to sample print quality, solve problems, adjust the printer, or test the printer's 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, refer to the *IPDS Handbook for Printers That Use the Advanced Function Common Control Unit*, G544-3895.

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 41 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 3000 Library (see “Infoprint 3000 Library” on page xi).

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 locally 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?

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 of 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 57 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, 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
- 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 11. Selecting and Testing Forms" on page 123 and the *Forms Design Reference for Continuous Forms Advanced Function Printers* contain information related to testing.

If you are a system or application programmer, read Chapter 4. Preparing the Processing Environment for information about planning for installing licensed programs, and "Chapter 8. Configuring a Duplex Printing System" on page 107 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 *Infoprint 3000 Operator's Guide*, supplied with each printer, contains general operating procedures, and is the primary reference book for printer operators. Printer operators should also read "Supplies" on page 119 for information about printer supplies.

Implementation Plan

This checklist contains many of the major tasks that must be performed before and during the installation of the printer. 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.
3. Orders the IBM Advanced Function Presentation licensed programs.
4. Orders any additional hardware that is required, such as the turnbar/flipper device for the 'h' printer configuration.
5. Verifies the order for the appropriate channel cables, System/370, ESCON, TCP/IP, and for any required channel extender, converter, or switching hardware boxes in the channel interface.
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 of toner and developer for the printer.

Note: Be aware that the only toner and developer mix that are shipped with the printer are used for printer setup.

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 CD documentation. See “CE Toolkit” on page 62 and “CE Documentation” on page 62 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 uncrate the printers.

Note: Uncrate the printers at the installation.

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

Chapter Overview

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 32 and "Application Environment" on page 31.

Channel and Local Area Network Attachments

The Infoprint 3000 printers support a variety of attachments:

- ESCON channel
- System/370 parallel channel
- Token Ring TCP/IP
- Ethernet TCP/IP
- FDDI TCP/IP

See "Host System Attachment Choices" on page 32 for specifics on printers and host systems that support each of these attachments.

The Infoprint 3000 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; or a combination of TCP/IP attachments (for example, one Token Ring attachment and one Ethernet attachment).

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 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—or to a tightly-coupled system—and the attachments are of the same type (for example, both are ESCON or parallel channels), 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— 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.

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

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.

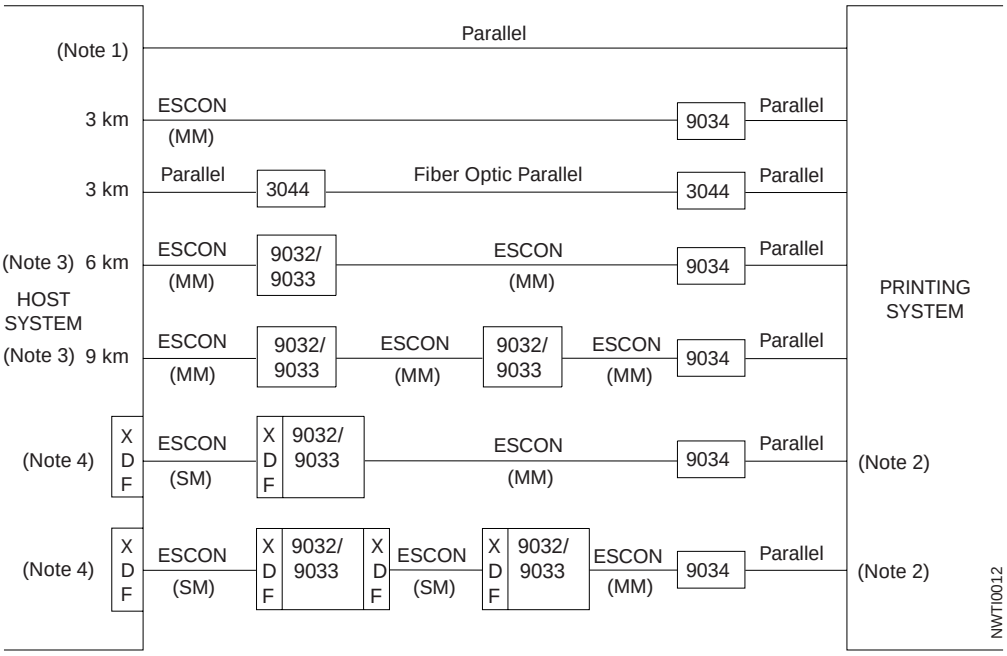


Figure 8. System/370 Parallel Channel Attachment Options

Notes:

1. 61 meters (200 feet) maximum from PS/2 or RISC System/6000 122 meters (400 feet) maximum from 4361, 4381, 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).

ESCON Channel Attachment

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.

Figure 9 shows the details of the above connection options.

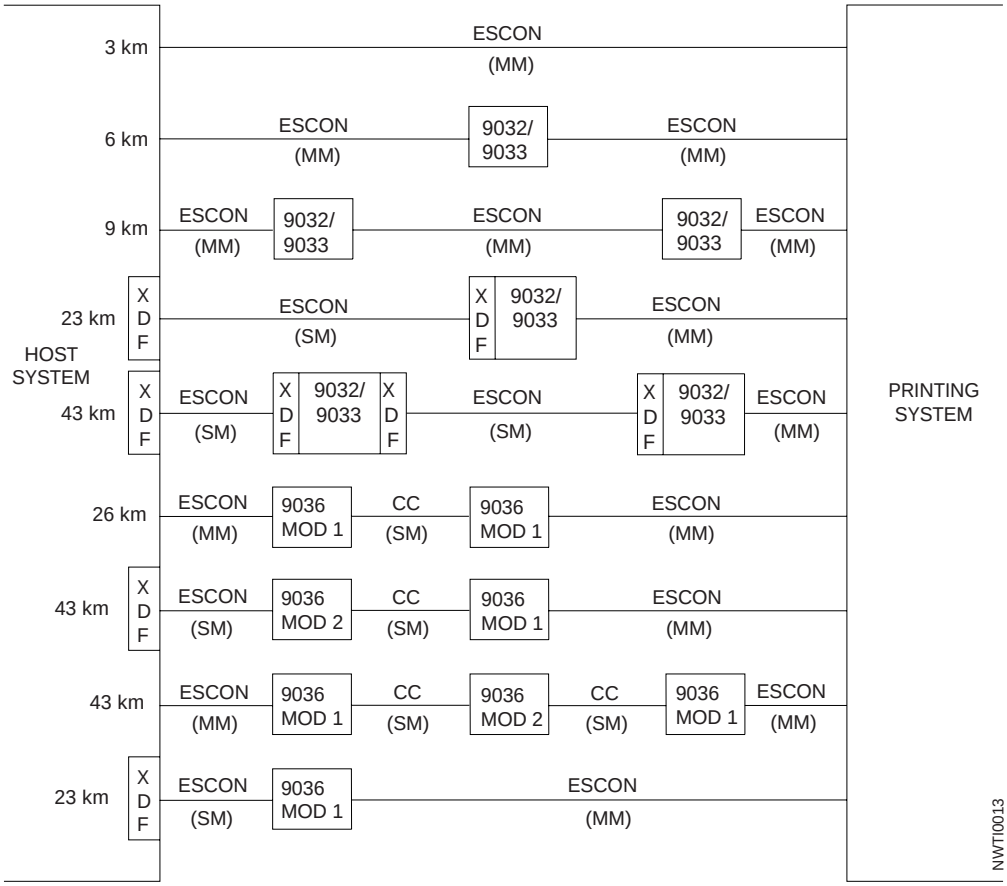


Figure 9. Serial Channel Attachment Options

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. Procedures must be put in place to take the printer offline to the existing PSF host before it can be brought online to another PSF host. If this is not done, unpredictable print results can occur.

The printer ESCON configuration option for Multi-Host Environment ensures that an operator cannot inadvertently vary the printer online to multiple PSF hosts simultaneously. This allows the sharing of ESCON attachments without concern that operator error may 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 with OS/390 V1 R3.0 (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.

The Multi-Host Environment option should not be enabled 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 varied on to the second host successfully until the operator drains and varies it off to the first host.

For more information on PSF/MVS ASSIGN and UNASSIGN support, see the *PSF for OS/390 Customization Guide* or the documentation for APAR OW29992 to PSF/MVS 2.2.

Token Ring TCP/IP Local Area Network

You can attach the printer to a host token ring through IBM token-ring cabling with the IBM Token Ring High-Performance 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.

Ethernet TCP/IP Local Area Network

You can attach the printer to a host Ethernet through the Integrated Ethernet LAN adapter. The adapter is installed in the printer's AFCCU. The AFCCU can attach to 10/100BaseT.

For Ethernet, cabling must meet specifications in *ANSI/IEEE Standard 802.3a, b, c, and e:*

- Ethernet Twisted Pair
  - To connect to 100 BaseT LAN, use category 5 unshielded twisted pair (UTP) cabling supplied by the customer with an RJ45 connector.
  - To connect to 10 BaseT LAN, use category 3, 4, or 5 UTP cabling supplied by the customer with an RJ45 connector.
- The building cabling must conform to EIA-569 standard.

FDDI Local Area Network

You can attach the printer to a host FDDI through the FDDI Single Station fiber adapter. The adapter is installed in the printer AFCCU. 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.

The Infoprint 3000 can be located a maximum distance of 2 kilometers from the 8260 Multiprotocol Intelligent Switching Hub or RS/6000 processor using 62.5/125 micron multimode fiber. For more information, refer to 8260 publications.

The FDDI adapter cable PN 19G4867 (20 meters in length) is included with the printer. This 62.5/125 multimode fiber cable has a Subscriber Connector (also referred to as a SC connector) on each end. There are similar cables with other part numbers that can be ordered in addition to the one that is shipped with the machine. These cables have lengths of 2, 4, 6, 10 meters, and custom lengths. They can be ordered by calling 1-800-388-7080.

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.

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 page 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 112 simplex 8.5-in. forms per minute, changing the application to print 2-Up 11-in. forms increases the maximum throughput to 172 simplex pages per minute. If the application is duplex, the maximum throughput is doubled to 344 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.

  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 Infoprint 3000 is 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 do not use 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 8 on page 47.

  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 strategic 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.

Direct-Attach

You can use the printer as a direct output device (direct-printing) when it is 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. Table 6 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.

Table 6. Advanced Function Presentation Software Summary

AFP Program	Purpose	Licensed Program Number					
		PSF/MVS	PSF/VM	PSF/VSE	PSF/2	PSF for AIX	PSF/400
PSF (Print Services Facility)	Provides device support for advanced function printing.	5695-040	5684-141	5686-040	5622-551(U.S.) 26H1540 [1] 26H1541 [2] 25H8002 [3]	5765-505	5763-SS1 [4] 5716-SS1 [5] 5769-SS1 [6]

Notes:

1. For EMEA (English)
2. For EMEA (all other language versions)
3. OS/2 WARP Server Version 4
4. Version 3 Release 2
5. Version 3 Release 7
6. Version 4 Release 2 (or higher)

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 125 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 7. 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'

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.

Converting

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. It includes 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:

Temperature:	18 to 24°C (65 to 75°F)
Relative Humidity:	40 to 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 drive 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.

Human-health considerations dictate that appropriate ventilation be supplied to the printer area. The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) recommends a minimum of 0.42 to 0.57 cmm (15 to 20 cfm) per person of outdoor air make-up during human occupancy (ASHRAE 62–1989). Adherence to IBM pre-printed forms recommendations and provision of appropriate 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 to a Model ES1.

Table 8. Heat Dissipation and Power for Model ES1

	Idle Ready Mode		Printing		
	50 Hz	60 Hz	50 Hz	60 Hz	
			42 lb	20 lb	42 lb
kVA	1.75	1.75	6.5	5.5	6.5
kW	1.6	1.6	6.0	5.1	6.0
kBTU/Hr	6.0	6.0	22.2	18.8	22.2

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 to a Models ED1/ED2.

Table 9. Heat Dissipation and Power for Models ED1/ED2

	Idle Ready Mode		Printing		
	50 Hz	60 Hz	50 Hz	60 Hz	
			42 lb	20 lb	42 lb
kVA	3.5	3.5	N/A	11.0	N/A
kW	3.2	3.2	N/A	10.2	N/A
kBTU/Hr	12.0	12.0	N/A	37.6	N/A

Notes:

1. 50 Hz printing may be expected to operate within 10% of the 60 Hz values.

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 10. 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	6.5	5.5	63	54	N	N
50 Hz	6.5	5.5	63	54	N	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

Ensure that you have an electrical outlet that supports 12 kVA and meets the power requirements listed in Table 11 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.
- 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 11. Electrical Requirements

Country	AC Voltages			Wiring Information	Phase	Circuit Rating
	Nominal	Minimum	Maximum			
U.S. Canada	60 Hz/208 60 Hz/220 60 Hz/230 60 Hz/240	60 Hz/187 60 Hz/198 60 Hz/207 60 Hz/216	60 Hz/229 60 Hz/242 60 Hz/252 60 Hz/264	4-wire power cable with three phases and ground. Neutral is not required.	3	60 Amperes
Japan	50 Hz/200 60 Hz/200	50 Hz/180 60 Hz/180	50 Hz/220 60 Hz/220	4-wire power cable with three phases and ground. Neutral is not required.	3	60 Amperes
Europe	50 Hz/380 50 Hz/400 50 Hz/415	50 Hz/342 50 Hz/360 50 Hz/374	50 Hz/418 50 Hz/440 50 Hz/456	5-wire power cable with three phases, ground, and neutral. Direct connection of neutral to ground required.	3	25 Amperes

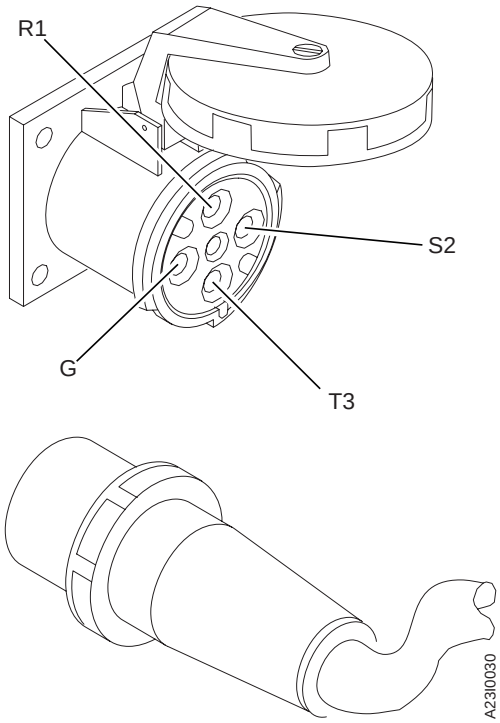
Attention: The 50-Hz 380/400/415 Volt version does not support non-earthed neutral and impedance-grounded neutral power distribution systems. Installation on an impedance-grounded neutral power system (IT Power System) could result in failures of motors and transformers in the printer.

Power 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., Canada, and Japan

Table 12. Hubbell Plug and Receptacle



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)

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 vacuum to cool the motor is not safe.

CE Toolkit

Remind the IBM service representative to order the CE Toolkit, which is not shipped with the printer. For ordering information, refer to these RETAIN tips:

For Infoprint 3000 printers, refer to H165096.

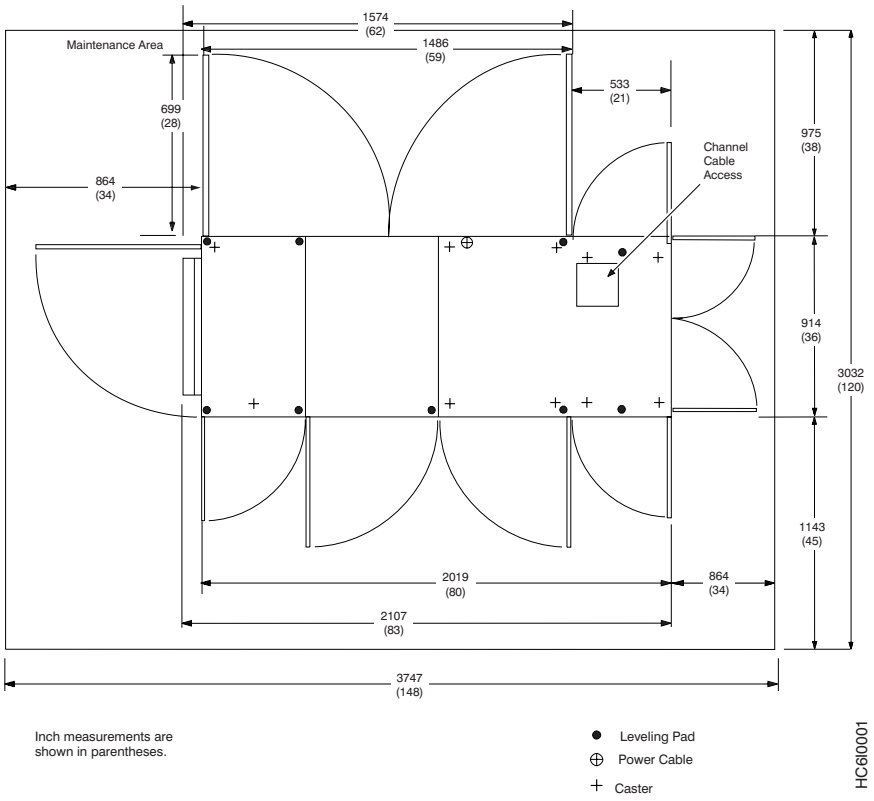
CE Documentation

Remind the IBM service representative to order the CE documentation, which is not shipped with the printer. For ordering information, refer to these RETAIN tips:

For Infoprint 3000 printers, refer to H165098.

Space Requirements – Simplex Model

Table 13. Model ES1 Space Requirements



This figure shows the dimensions of the printer, space and service clearance, and power cable and channel cable locations for Model ES1.

Minimum size for Channel Cable Access opening is 200 x 200 mm (approximately 8 x 8 in.).

Space Requirements – Duplex Models

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 Figure 10 and Figure 11 on page 65 for Models ED1/ED2.

Notes:

1. The minimum size for Channel Cable Access opening is 200 x 200 mm (approximately 8 x 8 in.).

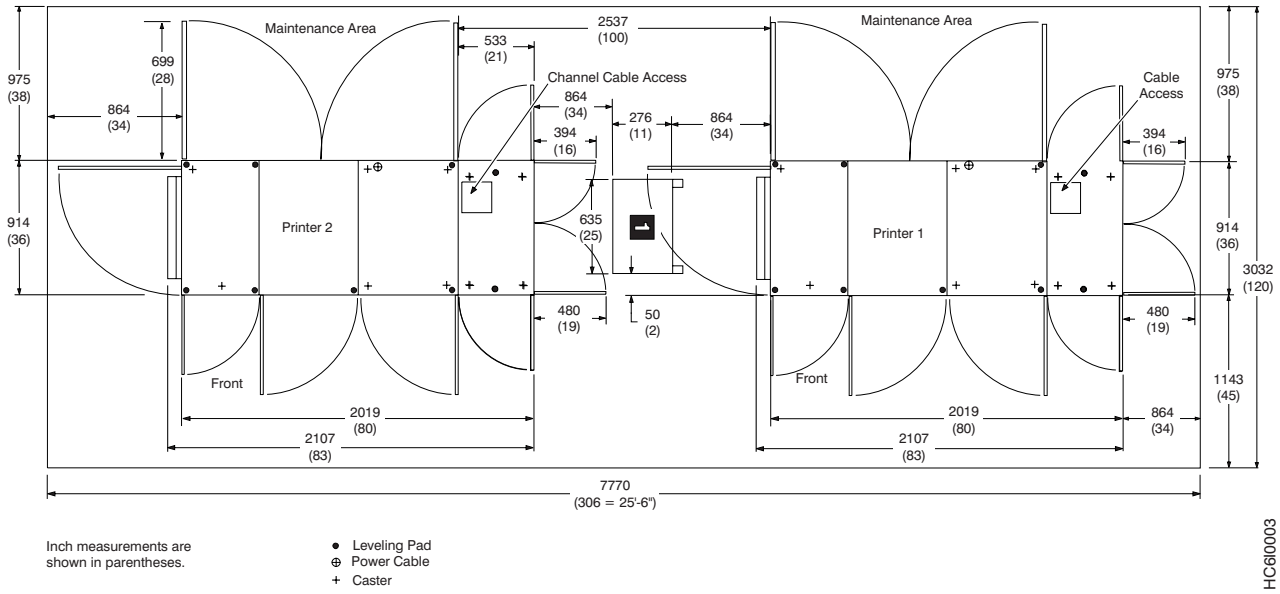


Figure 10. Models ED1/ED2 Inline Configuration

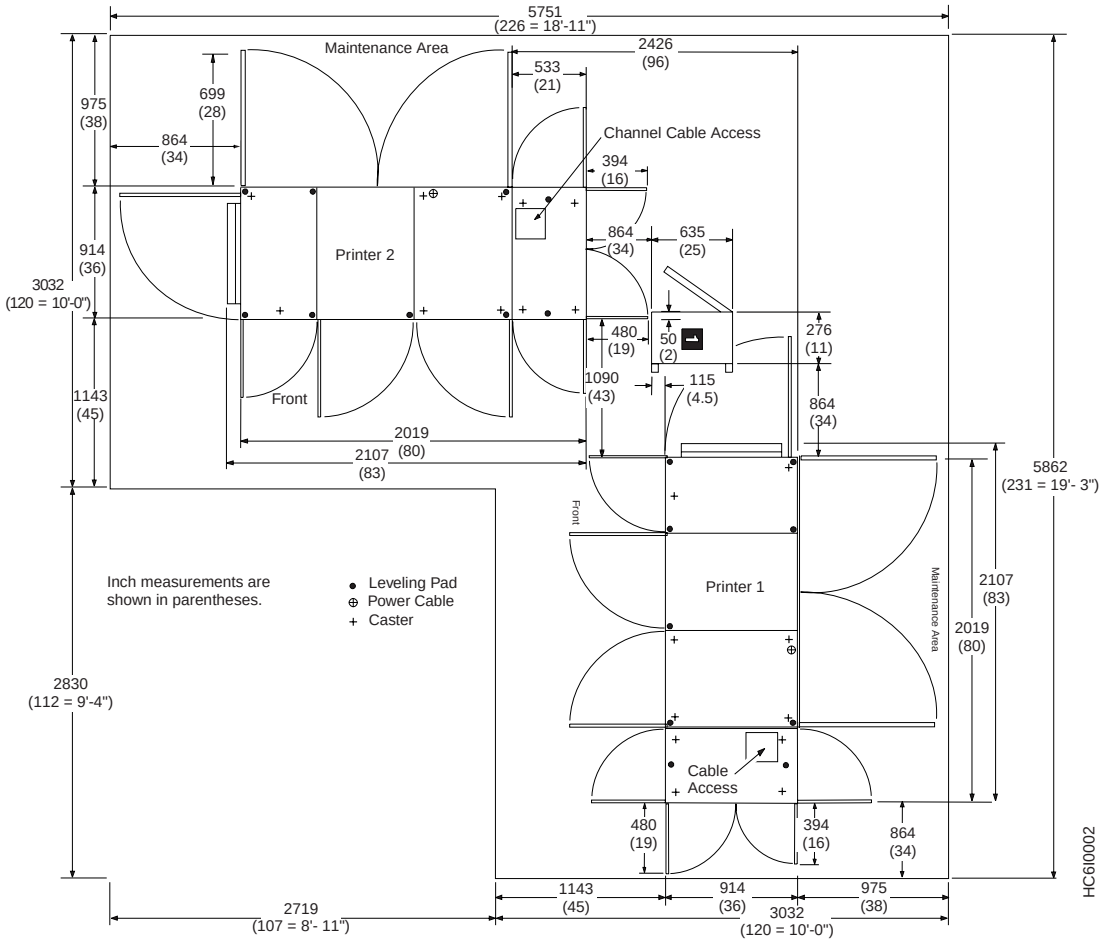


Figure 11. Models ED1/ED2 Left Angle Configuration

For the ‘h’ configuration, in which the printers are parallel, the IBM-supplied Buffer/Flipper Unit is placed next to Printer 1. The turnbar/flipper device supplied by the customer is placed next to Printer 2.

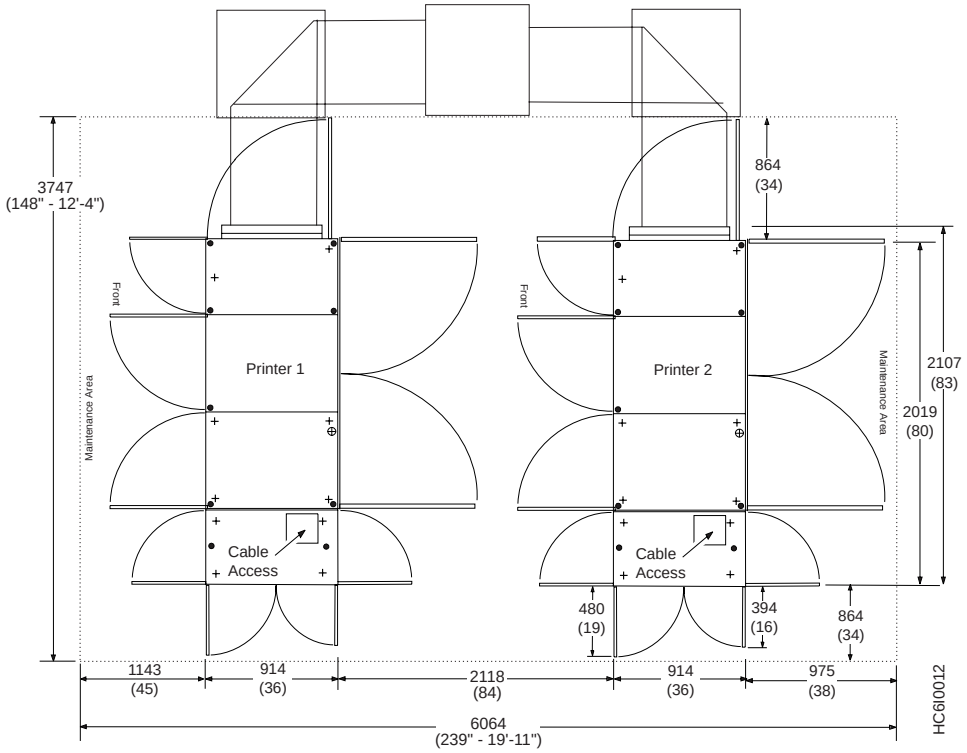


Figure 12. Models ED1/ED2 Duplex ‘h’ Configuration (Both Printers Facing the Same Direction)

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.
- For the **simplex model**, allow 116 cm (46 inches) between any outside surface of the printer and an adjacent wall to prevent ambient heat rise.
- For the **duplex models**, 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 70.

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 AFCCU (or PUM) frame. For sizes and weights, see Table 14 on page 68 and Table 15 on page 68.
- 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.**
- Use the Physical Planning template, GX22-7140 for service clearances and raised floor cutouts.

Physical Dimensions

The dimensions of the printer frames, control units, Buffer/Flipper Unit are shown in Table 14.

Table 14. Approximate Frame Physical Dimensions and Weights Uncrated

Dimension	Print Engine	PUM	AFCCU	Buffer/Flipper Unit
Depth	914 mm (36 in.)	914 mm (36 in.)	914 mm (36 in.)	635 mm (25 in.)
Height	1416 mm (56in.)	1416 mm (56 in.)	1416 mm (56 in.)	838 mm (33 in.)
Length	1486 mm (59 in.)	533 mm (21 in.)	533 mm (21 in.)	276 mm (11 in.)
Weight [1]	618 kg (1363 lb)	148 kg (327 lb)	148 kg (327 lb)	16 kg (36 lb)

Notes:

1. Approximate weights are supplied for planning use only. Actual weights may vary slightly depending on the machine configuration.

Table 15. Printer Frame Physical Dimensions When Crated

Dimension	Simplex Models	Duplex Models
Depth	1066 mm (42 in.)	1066 mm (42 in.)
Height	1676 mm (66 in.)	1676 mm (66 in.)
Length	1626 mm (65 in.)	1626 mm (65 in.)
Weight	745 kg (1643 lb)	745 kg (1643 lb)

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 Channels:** Refer to *Planning for Enterprise Systems Connections*, 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:** Cabling must meet specifications in *ANSI/IEEE Standard 802.3a, b, c, and e*:
  - Ethernet Twisted Pair
    - To connect to 100 BaseT LAN, use category 5 unshielded twisted pair (UTP) cabling supplied by the customer with an RJ45 connector.
    - To connect to 10 BaseT LAN, use category 3, 4, or 5 UTP cabling supplied by the customer with an RJ45 connector.
  - The building cabling must conform to EIA-569 standard, which states that the cabling should be kept away from an EMI source. Some of the minimum distances are:
    - Transformers and electric motors: 1016 mm (40 in.)
    - Power Source at 480 Volts or less, unshielded power lines, or electrical equipment in proximity to open or nonmetal pathways: 610 mm (24 in.)
    - Unshielded power lines or electrical equipment in proximity to grounded metal conduit pathway or power lines enclosed in a grounded metal conduit in proximity to grounded metal conduit pathway: 305 mm (12 in.)
    - Fluorescent lighting: 305 mm (12 in.)
- **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, 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. System/370 channel cables for 3800 printers also operate with Infoprint 3000 printers.

Note: There are data transfer rate restrictions (if running in 3.4 or 4.5MB/sec data streaming) when using certain types of 3800 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 71 to complete this step.
- **With a Duplex Configuration**, if the 60-inch 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 14 on page 68).
  - 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, or ESCON 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 channel cable areas are shown in Table 13 on page 63 for simplex printers and in Figure 10 on page 64 for duplex configurations.
- 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.

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 16. Infoprint 3000 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?					
Enough power to meet needs?					
Meets local and national codes?					
Host System Attachment					
System/370 channel cables					
ESCON channel cables					
Ethernet cables and connectors					
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 17 as a work sheet when preparing the site for the printer.

Table 17. Infoprint 3000 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. 2. Identify a delivery route to the location of the printer. 3. Prepare a layout plan. 4. Determine the requirements for electrical outlets.	_____ _____ _____ _____	_____ _____ _____ _____
10	1. Install and test the electrical wiring and outlets. 2. Verify that a forklift and operator will be available when the printer arrives.	_____ _____	_____ _____
Arrival	1. Unpack the printer and inspect it for external damage. 2. Move the printer to the prepared site.	_____ _____	_____ _____

Chapter 6. Configuration Information Descriptions

Chapter Overview

This chapter provides detailed information on the configuration choices. Please note the tables contain information on all possible choices across the various models. Not all entries are applicable to all models.

You can configure the printer in the categories of information described in the following sections:

- "Changing the Language of Messages"
- "Configuring the Printer" on page 74
- "Configuring the Host Attachments" on page 84
- "Configuring Preprocessing and Postprocessing Devices or Interfaces" on page 95
- "Chapter 9. Defining Forms" on page 115.

Changing the Language of Messages

- From the Display Touch Screen:
  1. Open the **Options** pull-down menu.
  2. Select the **Change Language** procedure window.

This procedure changes the language used for all text within the Display Touch Screen windows, and, except for Japanese, on the printer Display Touch Screen. 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 list box changes 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:

- U.S. English
- French
- German
- Japanese
- Italian
- Spanish
- Brazilian Portuguese
- Chinese Simplified
- Chinese Traditional.

Configuring the Printer

- From the Display Touch Screen:
  1. Open the **Configure** pull-down menu.
  2. Select the **Configure Printer** procedure window.

Printer Configuration Information

Table 18 on page 75 describes all configuration items, what each is used for, and the allowable value options for each item. The factory-set default value options are underlined or separately specified.

Important! Table 18 on page 75 lists all configuration items for all models of the printers. Some items may be greyed out or not shown for your particular model of printer:

- Configuration items that are marked **(D)** appear only for Duplex systems.
- Configuration items that are marked **(S)** appear only for Simplex systems.
- All unmarked items appear for both Duplex and Simplex systems.

Table 18. Printer Configuration Items

Configuration Item	Description	Value Options
Printer Mode (D)	This entry allows setting whether the duplex system is to be operated in duplex or simplex (dual-simplex) mode. (This item applies to Models ED1/ED2.) If you change the Printer Mode, the **Restart** procedure automatically executes a Shutdown procedure.	Duplex or Simplex
Auto Start	If Yes, all current attachment interface status (enable/disable) is saved during a **Shutdown** procedure, and automatically restored at the next power on of the system. Simplex and dual simplex printers are also automatically made Ready at the completion of the power on sequence. The Thread/Align forms procedure must be performed on duplex printers before the system can be made Ready.	Yes or No
PQE boldness for printer 1	This item must not be changed. **Notes:** 1. If this value is changed accidentally, set the value to 85 and inform the CE during the next visit. 2. On printers with code version 9.6 or higher, this item is "grayed out" and cannot be changed.	100%
PQE boldness for printer 2 (D)	See entry for Printer 1.	See entry for Printer 1.
Printer 1 Counter	(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 1 Counter" displayed in the **Printer Status** Display Touch Screen window.	0 to 2 000 000 000
Printer 2 Counter (D)	(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 2 Counter" displayed in the **Printer Status** Display Touch Screen window.	0 to 2 000 000 000
Printhead Resolution	This parameter changes the resolution that the printhead in this printer uses. Not all values are supported on all printers.	Valid values are 480 or 600 DPI. The value you select depends on what features are installed on the printer.
IPDS Resolution	This parameter can be set only when a printhead resolution of 600 DPI is selected.	Automatic, 240 DPI, 300 DPI, or 600 DPI
Font Enhancement	This parameter appears when 480 or 600 DPI is selected for Printhead Resolution and 600 DPI is not selected for IDPS Resolution. This parameter is used to activate or deactivate the edge smoothing algorithm for raster fonts. Set to No if edge smoothing is not desired.	Single Byte: Yes or No Double Byte: Yes or No
Jam Recovery Type	This entry controls under what conditions the host system will automatically retransmit pages after a forms jam has been cleared. • Normal Jam Repositioning - All lost pages are automatically retransmitted and reprinted. • Suppress MICR Repositioning - Lost pages printed with a MICR printer will not be retransmitted. • Suppress All Jam Repositioning - No lost pages will be retransmitted. Any missing or damaged pages must be manually recovered.	• Use Normal Jam Repositioning • Suppress MICR Jam Repositioning • Suppress All Jam Repositioning

Table 18. Printer Configuration Items (continued)

Configuration Item	Description	Value Options
Font Usage	Font usage 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. 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 single-byte character set (SBCS) 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, Medium, or High
Page Segment Usage	This 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, Medium, or High
Overlay Usage	This parameter is used to allocate space for a cache of ready-to-print overlays. Set to Low if a few small overlays are used. Set to High if many or large overlays are used.	Low, Medium, or High
Overlay Cache	This parameter is used to activate or deactivate overlay caching. Set to No if overlays are not reused multiple times or if overlays are not reused in the same location on subsequent pages.	Yes or No
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 System/370 channel or an 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, Medium, or 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: • The pages contain little data • This is a simplex printer • This is a duplex printer with a distance between transfer points of less than 400 inches. Set the value to High if these conditions are met: • The pages contain large amounts of data, especially shaded areas • This is a duplex printer with a distance between transfer points of over 400 inches.	Low, Medium, or High
Direct Attach	This entry shows if printing is to occur in direct-printing mode when connected to an MVS or OS/390 operating system, with no host-assisted recovery procedures such as retransmission of pages after a forms jam. The host system programmer will inform you whether this entry should be set to **Yes**.	Yes or No

Table 18. Printer Configuration Items (continued)

Configuration 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. This entry can be used when an uncoupled (not functionally attached) postprocessing device is installed and it is necessary to extend the NPRO length to be able to easily remove forms at the postprocessing device output. If any installed and enabled preprocessing/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 **Configure Pre/Post** procedure. If several "Pre/postprocessor Extended NPRO" distances are set, then the longest one takes precedence.	Range of 0 to 1200 inches.
Auto NPRO at End of Forms	This entry indicates whether an automatic NPRO is performed when an End of Forms is detected.	Yes or No
Line mode enabled (S)	Allows the printer to enter the 3800 compatibility mode (line mode). Whenever you change this setting, you must restart the printer. (This item applies only to Model ES1, and only when the IPDS resolution is set to 240 DPI and printhead resolution is set to 480 DPI.)	Yes or No
Jam Recovery Point Distance	This entry sets a distance past the printer fuser sufficient for forms to reach an installed postprocessing device, so that those forms will be reprinted following a forms jam recovery. 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. 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**.	Range of 0 to 500 inches.
Form Feed Length (D)	This entry sets the length, in inches, that forms are to be moved forward through Printer 1 when the **Feed Forms** push-button is selected during execution of the **Thread/Align Forms** procedure in duplex mode.	Range of 17 to 250 inches. Default is 60 inches.

Table 18. Printer Configuration Items (continued)

Configuration Item	Description	Value Options
Length of Forms Between Transfer Points (D)	This entry sets the length, in inches, of the forms path length from the alignment mark on the 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 transfer station tractors of Printer 2. This is used during the duplex mode procedure **Thread/Align Forms**. If you are continually feeding paper at either printer in order to get the forms aligned, this configuration item may have to be changed. See "Space Requirements – Duplex Models" on page 64 for physical layout details and dimensions.	Range of 150 to 800 inches. Default is 315 inches.
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. 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. When a postprocessing 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.	Front First or Front Second
Verification Marks (D)	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). The verification numbers can be read by the operator. If the number on side 1 of a form matches that on side 2, then the forms are properly synchronized. Multiple copies of the same page will have the same verification mark numbers.	Yes or No
Logical Page Increment	This entry allows expansion of the logical page size for cases where the printed page is larger than the valid Infoprint 3000 printable area, without errors being set. This case may be encountered when a print job created for a 3800 prints too close to the page edge. 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.	Range of 0 to 20 pels.
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 or No

Table 18. Printer Configuration Items (continued)

Configuration Item	Description	Value Options
Screen Saver Timeout	This entry allows specifying, in minutes, the idle time before the Display Touch Screen monitor screen is blanked out. This extends the life of the monitor screen. A value of 0 means the screen saver is not used. In dual simplex mode, if Printer 1 and Printer 2 are set with different values, the shortest setting time is used even if the associated printer console is not being used. Touching a blank screen caused by this timeout restores the display.	0 to 60 minutes. Default is 10 minutes.
Alarm Suppression	This entry allows suppression of the Operator Alert alarm tone for error and supply-item actions.	Yes or No
Fuser Inactivity Timer	This entry sets the time, in hours, of printer inactivity before the fuser is turned off. This saves electrical power costs and extends the life of the printer. The fuser automatically turns on when printing resumes, with a delay until the fuser has reached operating temperature. A value of 0 means that the timer is not used.	0 to 9 hours. Default is 1 hour.
Eject to Front Facing	This entry allows accepting or rejecting the Eject to Front Facing (EFF) signals sent by the host. A No value will suppress EFFs. If Yes, 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. This option should be set to **No** if either a postprocessing device is installed that bursts and stacks output pages, or if Direct Attach is set to Yes.	Yes or No
Form Definition Order	When **Yes** is selected, the form definitions are listed in the order that they are used, with the current form at the top of the list. When **No** is selected, the forms are listed in the order in which they are defined, with the last form defined at the bottom of the list.	Yes or No
Stacker Enabled	This entry allows setting of whether or not the stacker is to be used. A setting of **Yes** implies that a postprocessing device is not being used and that fanfold forms (not roll-feed forms) are being used. However, if a postprocessing device is installed and enabled, a **Yes** value is ignored. In duplex mode, it refers only to the Printer 2 stacker. In dual simplex mode, it may refer to either Printer 1 or Printer 2.	Yes or No

Table 18. Printer Configuration Items (continued)

Configuration Item	Description	Value Options
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. None implies the cut-sheet emulation is not enabled. 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. 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. 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. 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.	None, Normal Left-to-Right, Normal Right-to-Left, Inverted Left-to-Right, Inverted Right-to-Left
BTS Installed	This entry allows setting whether a Burster/Trimmer/Stacker postprocessing device is installed. It does not show whether it is being used.	Yes or No
BTS Enabled	This entry allows setting whether an installed Burster/Trimmer/Stacker postprocessing device is being used. The host system will not send eject-to-front-facing commands if the BTS is enabled.	Yes or No
Offsetter Installed	This entry allows setting whether an Offsetter postprocessing device is installed. It does not show whether it is being used.	Yes or No
Offsetter Enabled	This entry allows setting whether an installed Offsetter postprocessing device is being used. The host system will send "Alternate Offset Stacker" commands if the offsetter is enabled and the print job contains these commands.	Yes or No
Offset on Mark Forms	If **Yes** is specified, offset commands are sent to an enabled postprocessor only for pages that contain Mark Forms. Any "Alternate Offset Stacker" commands sent from the host are ignored.	Yes or No
3130 Bar Code Compatibility	This entry defines whether bar codes are printed in the standard format or in the format printed by a 3130 printer.	Yes or No

Table 18. Printer Configuration Items (continued)

Configuration Item	Description	Value Options
Printer 1 Contrast	(CE Change Only) This is used by service personnel to adjust the contrast (toner density) of print on the forms. This value is used only when no other value is set during the Define Forms procedure for a specific form.	Range of 1 to 7 Default is 4
Printer 2 Contrast	(CE Change Only) See entry for Printer 1. This value is used only when no other value is set during the Defined Forms procedure for a specific form.	See entry for Printer 1.
Printer 1 Preheat (Platen Temperature)	(CE Change Only) This is used by service personnel 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. This value is used only when no other value is set during the Defined Forms procedure for a specific form.	Range of 1 to 100 Default is 50
Printer 2 Preheat (Platen Temperature)	(CE Change Only) See entry for Printer 1. This value is used only when no other value is set during the Defined Forms procedure for a specific form.	See entry for Printer 1.
Printer 1 Hot Roll (Temperature)	(CE Change Only) This is used by service personnel 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. This value is used only when no other value is set during the Define Forms procedure for a specific form.	Range of 1 to 100 Default is 50
Printer 2 Hot Roll (Temperature)	(CE Change Only) See entry for Printer 1. This value is used only when no other value is set during the Define Forms procedure for a specific form.	See entry for Printer 1.
Printer 1 Oil Rate	(CE Change Only) This is used by service personnel to adjust the amount of oil fed to the oil belt. The value entered is a relative number, not a measure of quantity, with 1 being the lowest rate and 100 being the highest rate. This value is used only when no other value is set during the Define Forms procedure for a specific form.	Range of 1 to 100 Default is 50
Printer 2 Oil Rate	(CE Change Only) See entry for Printer 1. This value is used only when no other value is set during the Define Forms procedure for a specific form.	See entry for Printer 1.
Printer 1 Oil Belt (Speed)	(CE Change Only) This is used by service personnel 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. This value is used only when no other value is set during the Define Forms procedure for a specific form.	Range of 1 to 100 Default is 50
Printer 2 Oil Belt (Speed)	(CE Change Only) See entry for Printer 1. This value is used only when no other value is set during the Define Forms procedure for a specific form.	See entry for Printer 1.

Table 18. Printer Configuration Items (continued)

Configuration Item	Description	Value Options
Scan Factory Adjust for Printer 1	(CE Change Only) This is used by service personnel to adjust the scan direction printing registration.	Range of 0 to 100 units Default is 40 units Unit = 2 pels
Process Factory Adjust for Printer 1	(CE Change Only) This is used by service personnel to adjust the process direction printing registration.	Range of 0 to 60 units Default is 15 units Unit = 1 pel
Scan Factory Adjust for Printer 2 (D)	(CE Change Only) This is used by service personnel to adjust the scan direction printing registration.	Range of 0 to 100 units Default is 40 units Unit = 2 pels
Process Factory Adjust for Printer 2 (D)	(CE Change Only) This is used by service personnel to adjust the process direction printing registration.	Range of 0 to 60 units Default is 15 units Unit = 1 pel
Beam 1 offset adjustment	(CE Change Only). This is used by maintenance personnel to control the vertical alignment or horizontal adjustment of the separate beams of a multi-beam printer.	Range of 0.0 to 15.9 Default is 8.0 units Unit = .1 pel
Beam 2 offset adjustment	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Beam 3 offset adjustment	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Beam 4 offset adjustment	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Beam 5 offset adjustment	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Beam 1 offset adjustment for Printer 2 (D)	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Beam 2 offset adjustment for Printer 2 (D)	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Beam 3 offset adjustment for Printer 2 (D)	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Beam 4 offset adjustment for Printer 2 (D)	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Beam 5 offset adjustment for Printer 2 (D)	(See information in *Beam 1 offset adjustment*)	(See information in *Beam 1 offset adjustment*)
Machine Sequence for Printer 1	(CE Change on Initial Configuration Only) This is the serial number for Printer 1 (7 numeric only characters). Each time the AFCCU hard disk is replaced, this data is lost; the CE must enter the serial number found on the rear inside of the AFCCU frame again.	N / A

Table 18. Printer Configuration Items (continued)

Configuration Item	Description	Value Options
Manufacturing Plant for Printer 1	(CE Change on Initial Configuration Only) This is the code for plant of manufacture of Printer 1 (2 numeric only characters). Each time the AFCCU hard disk is replaced this data is lost; the CE must enter this code again from information saved from the last time Printer Configurations were changed.	N/A
Machine Sequence for Printer 2	(CE Change on Initial Configuration Only) This is the serial number for Printer 1 (7 numeric only characters). Each time the AFCCU hard disk is replaced, this data is lost; the CE must enter the serial number found on the rear inside of the AFCCU frame again.	N/A
Manufacturing Plant for Printer 2	(CE Change on Initial Configuration Only) This is the code for the plant of manufacture of Printer 2 (2 numeric only characters). Each time the AFCCU hard disk is replaced, this data is lost; the CE must enter this code again from information saved from the last time Printer Configurations were changed.	N/A
Date and Time	(CE Change Only). This is in the form of mmddHHMM.ssyy. mm=month dd=day HH=hour MM=minute ss=second yy=year	N/A

Configuring the Host Attachments

- From the Display Touch Screen:
  1. Open the **Configure** pull-down menu.
  2. Select the **Configure Attachments** procedure window.

Attachments include Parallel Channel, ESCON Channel, Token TCP/IP, Ethernet TCP/IP, or FDDI TCP/IP. Table 5 on page 32 defines the host attachments available.

Configuring Parallel Channels

- From the Configure Attachments procedure window:
  1. Select **Parallel Channel: Installed**.
  2. Select the **Configure...** push button.
- The Configure Parallel Channel window appears.

Parallel Channel Configuration Information

Table 19 lists all configuration items, the purpose of each item, and the allowable value options for each item. The factory-set default values are underlined.

Table 19. Parallel Channel Attachment Items

Configuration Item	Description	Value Options
Parallel Link A Installed	Specifies if Parallel Channel Link A is installed.	Yes or No
Parallel Link B Installed	Specifies if Parallel Channel Link B is installed.	Yes or No
Device Address	Specifies the 2-digit hexadecimal channel address which includes the device address. **Notes:** 1. In simplex mode, only one device address is required. 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'). 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. 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'. 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.	00 to FF (Hexadecimal notation). Default is X'00'

Table 19. Parallel Channel Attachment Items (continued)

Configuration Item	Description	Value Options
Second Channel	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. • **Static:** You can enable 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. • **Dynamic:** You can enable 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). You cannot select this item unless two channels are installed.	Static or Dynamic
Data Transfer Protocol	Specifies the data transfer mode to be used: DC Interlocked or Data-Streaming. If two channels are installed, both channels use the same protocol.	Interlocked or Data Streaming
Data Streaming Rate	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. If two channels are installed, both channels use the same data rate.	• 3.0MB/sec • 4.5MB/sec
Card 1 Slot Position	The printer sets this entry automatically at power on time if the system senses the presence of a Parallel Channel card. This item is not selectable.	• 2 or 4 or Not Installed (for Model ES1) • 6 or 8 or Not Installed (for Models ED1/ED2)
Card 2 Slot Position	The printer sets this entry automatically at power on time if the system senses the presence of a Parallel Channel card. This item is not selectable.	• 2 or 4 or Not Installed (for Model ES1) • 6 or 8 or Not Installed (for Models ED1/ED2)

Configuring ESCON Channels

- From the Configure Attachments procedure window:
  1. Select the **ESCON Channel**: **Installed**.
  2. Select the **Configure...** push button.
- The Configure ESCON Channel window appears.

ESCON Channel Configuration Information

Table 20 lists all configuration items, what each item is used for, and the allowable value options for each item. The factory-set default values are underlined.

Table 20. ESCON Channel Attachment Items

Configuration Item	Description	Value Options
ESCON Link A Installed	Specifies if ESCON Channel Link A is installed.	Yes or No
ESCON Link B Installed	Specifies if ESCON Channel Link B is installed.	Yes or No
Device Address	Specifies the 2-digit hexadecimal channel address which includes the device address. **Notes:** 1. In simplex mode, only one device address is required. 2. 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'). 3. 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. 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'. 4. 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.	00 to FF (Hexadecimal notation). Default is X'00'
Multi-host environment flag	Shows whether a multiple host printer-sharing system exists. If this environment flag is set, all hosts are required to use the assign/unassign protocols of the attachment architecture. Do not enable this flag unless all the hosts sharing the printer have the following: • OS/390 V1 Release 3.0 or higher • PSF ASSIGN/UNASSIGN support (PSF 3.1.0 for OS/390 or APAR OW29992 to PSF/MVS 2.2)	True or False

Table 20. ESCON Channel Attachment Items (continued)

Configuration Item	Description	Value Options
Card 1 Slot Position	The printer sets this entry automatically at power on time if the system senses the presence of an ESCON Channel card. This item is not selectable.	• 2 or 4 or Not Installed (for Model ES1) • 6 or 8 or Not Installed (for Models ED1/ED2)
Card 2 Slot Position	The printer sets this entry automatically at power on time if the system senses the presence of an ESCON Channel card. This item is not selectable.	• 2 or 4 or Not Installed (for Model ES1) • 6 or 8 or Not Installed (for Models ED1/ED2)

Configuring Token Ring TCP/IP

- From the Configure Attachments procedure window:
  1. Select the **Token Ring TCP/IP: Installed**.
  2. Select the **Configure...** push button.
- The Configure Token Ring TCP/IP window appears.

Token ring TCP/IP Attachment Information

Table 21 lists all configuration items, what each item is used for, and the allowable value options for each item. The factory-set default values are underlined.

Table 21. Token Ring TCP/IP Attachment Items

Configuration Item	Description	Value Options
Token Ring TCP/IP Installed	Specifies if the Token Ring adapter is installed.	Yes or No
TCP Port	Specifies the TCP socket address of the attachment. **Notes:** 1. Only one address is required for operating a simplex system. 2. If your installation runs in dual simplex and duplex mode, specify the same TCP Port value for duplex mode as you do for Printer 1 in dual simplex mode. (IBM recommends using the default value of 5001.) Also, make sure you specify a unique value for Printer 2 in simplex mode; Printer 1 and Printer 2 cannot use the same value. (If you use the default value of 5001, for Printer 1, IBM recommends using 5002 as the value for Printer 2.) 3. The TCP Port numbers specified in the printer configuration must match the PORT numbers assigned in the host PSF system. 4. Because Printer 1 in a dual simplex system and the complete system in duplex system share a common port number, operational procedures must be defined to distinguish between duplex and dual simplex printing. The easiest way to manage this is to assign separate queues for duplex versus dual simplex output (for PSF/2 and PSF/6000), and to assign at least a unique job class for duplex jobs (for S/390 host PSF systems).	5001 to 65536.
IP Address	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. 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	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	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 21. Token Ring TCP/IP Attachment Items (continued)

Configuration Item	Description	Value Options
MTU Size	Specifies the Maximum Transmission Unit (MTU) – maximum allowable length of IP packets.	60 to 4096
Hardware address	Specifies the TCP/IP Token Ring adapter ROM address.	This address cannot be changed.
Alternate address (Local adapter address)	Sets the unique LAN adapter address for the network. The address must be different from other addresses on the LAN. **Note:** New cards are restricted to values from X'4000 0000 0000' to X'FFFF FFFF FFFF'.	X'0' to X'FFFF FFFF FFFF'
Ring Speed	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 or 16
Confine Broadcast	Specifies if broadcast packets (that is, Address Resolution Protocol packets) are enabled to cross bridges to other rings.	Yes or No

Configuring Ethernet TCP/IP

- From the Configure Attachments procedure window:
  1. Select the **Ethernet TCP/IP: Installed**
  2. Select the **Configure...** push button.
- The Ethernet TCP/IP window appears.

Ethernet TCP/IP Attachment Information

Table 22 lists all configuration items, what each item is used for, and the allowable value options for each item. The factory-set default values are underlined.

Table 22. Ethernet TCP/IP Attachment Items

Configuration Item	Description	Value Options
Ethernet TCP/IP Installed	Specifies if the Ethernet adapter is installed.	Yes or No
TCP Port	Specifies the TCP socket address of the attachment. **Notes:** 1. Only one address is required for operating a simplex system. 2. If your installation runs in dual simplex and duplex mode, specify the same TCP Port value for duplex mode as you do for Printer 1 in dual simplex mode. (IBM recommends using the default value of 5001.) Also, make sure you specify a unique value for Printer 2 in simplex mode; Printer 1 and Printer 2 cannot use the same value. (If you use the default value of 5001, for Printer 1, IBM recommends using 5002 as the value for Printer 2.) 3. The TCP Port numbers specified in the printer configuration must match the PORT numbers assigned in the host PSF system. 4. Because Printer 1 in a dual simplex system and the complete system in duplex system share a common port number, operational procedures must be defined to distinguish between duplex and dual simplex printing. The easiest way to manage this is to assign separate queues for duplex versus dual simplex output (for PSF/2 and PSF/6000), and to assign at least a unique job class for duplex jobs (for S/390 host PSF systems).	5001 to 65536
IP Address	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. 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	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	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 22. Ethernet TCP/IP Attachment Items (continued)

Configuration Item	Description	Value Options
Standard MTU Size	Specifies the Maximum Transmission Unit (MTU) size. The MTU size for Standard Ethernet type ranges from 60 to 1500.	60 to 1500
IEEE802.3 MTU Size	Specifies the MTU size for IEEE802.3 Ethernet type. The range is from 60 to 1492.	60 to 1492
Ethernet Type	Specifies either the Standard or the IEEE802.3 Ethernet type.	Standard or IEEE802.3
Hardware address	Specifies the TCP/IP Token Ring adapter ROM address.	This address cannot be changed.
Alternate address (Local adapter address)	Sets the unique LAN adapter address for the network. The address must be different from other addresses on the LAN. **Note:** New cards are restricted to values from X'4000 0000 0000' to X'FFFF FFFF FFFF'.	X'0' to X'FFFF FFFF FFFF'

Table 22. Ethernet TCP/IP Attachment Items (continued)

Configuration Item	Description	Value Options
Media Speed	This parameter is used only when the Ethernet adapter supports configuration of the media speed. Specific media mode and speed setting can be used if: • There is very slow Ethernet throughput • The LED indicators are incorrect • The printer cannot be contacted using the Ping command. Because of different Auto Sensing standards used by manufacturers of 10/100 Ethernet adapters, this may cause adapters 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 indicators are inconsistent between the printer and the switch. Check the LEDs on the printer 10/100 Ethernet adapter card when it is enabled. Note the values for each of the indicators on the adapter. • The FDX (Full Duplex) indicator is on when operating in Full Duplex Mode and off when operating in Half Duplex. • The 100 indicator is on when operating at 100Mbits and off when operating at 10Mbits. • The RCV (Receive) indicator is on when receiving packets from the network. • The ACT (Activity) or LNK (LINK) indicators are on when packets are being receive or transmitted over the network. There should be similar indicators on the switch or system that the printer is connected to, and you should note their values. The Full/Half Duplex and 10/100 indicator values must agree between the printer and the switch to which the printer is connected. To resolve this, take the switch out of auto negotiation mode an 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 10 or 100Mbps. These setting must match those of the switch. **Note:** If the Ethernet adapter does not support media speed configuration, this item is ignored.	• Auto Negotiation • 100BaseT – Full Duplex • 100BaseT – Half Duplex • 10BaseT – Full Duplex • 10BaseT – Half Duplex

Configuring FDDI TCP/IP

- From the Configure Attachments procedure window:
  1. Select the **FDDI TCP/IP: Installed**.
  2. Select the **Configure...** pushbutton.
- The Configure FDDI TCP/IP window appears.

FDDI TCP/IP Attachment Information

Table 23 lists all configuration items, what each item is used for, and the allowable value options for each item. The factory-set default values are underlined.

Table 23. FDDI TCP/IP Attachment Items

Configuration Item	Description	Value Options
FDDI TCP/IP Installed	Specifies if the FDDI adapter is installed.	Yes or No
TCP Port	Specifies the TCP socket address of the attachment. **Notes:** 1. Only one address is required for operating a simplex system. 2. If your installation runs in dual simplex and duplex mode, specify the same TCP Port value for duplex mode as you do for Printer 1 in dual simplex mode. (IBM recommends using the default value of 5001.) Also, make sure you specify a unique value for Printer 2 in simplex mode; Printer 1 and Printer 2 cannot use the same value. (If you use the default value of 5001, for Printer 1, IBM recommends using 5002 as the value for Printer 2.) 3. The TCP Port numbers specified in the printer configuration must match the PORT numbers assigned in the host PSF system. 4. Because Printer 1 in a dual simplex system and the complete system in duplex system share a common port number, operational procedures must be defined to distinguish between duplex and dual simplex printing. The easiest way to manage this is to assign separate queues for duplex versus dual simplex output (for PSF/2 and PSF/6000), and to assign at least a unique job class for duplex jobs (for S/390 host PSF systems).	5001 to 65536.
IP Address	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. 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	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	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 23. FDDI TCP/IP Attachment Items (continued)

Configuration Item	Description	Value Options
MTU Size	Specifies the Maximum Transmission Unit (MTU) – maximum allowable length of IP packets.	256 to 4352
Hardware address	Specifies the FDDI adapter ROM address.	This address cannot be changed.
Alternate address (Local adapter address)	Sets the unique LAN adapter address for the network. The address must be different from other addresses on the LAN. **Note:** New cards are restricted to values from X'4000 0000 0000' to X'FFFF FFFF FFFF'.	X'0' to X'FFFF FFFF FFFF'
Confine Broadcast	Specifies if broadcast packets (that is, Address Resolution Protocol packets) are enabled to cross bridges to other rings.	Yes or No

Configuring Remote Access

You can use these methods to provide remote access to your printer:

- SNMP (Simple Network Management Protocol)
- RMI (Remote Management Interface)
- Modem.

To configure remote access, follow these steps:

1. From the Display Touch Screen, open the **Configure** pull-down menu.
2. Select the **Remote Access** procedure window.

For additional information, see “Configuring Remote Access” in the *Infoprint 3000 Operator’s Guide.*

Configuring Preprocessing and Postprocessing Devices or Interfaces

From the Configure pull-down menu, select the **Configure Pre/Postprocessor** procedure window. You may configure and store up to ten defined preprocessing / postprocessing devices, but you can enable only three devices at one time on the printer.

Preprocessing/Postprocessing Options for the Simplex Models

Model ES1 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 **Pre/Post**) may be installed in either Port 2 or Port 3 of each model. Allowable combinations are shown in Table 24.

Table 24. Preprocessing/Postprocessing Interface Options for the Simplex Model

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

Preprocessing/Postprocessing Options For Duplex Models

Each duplex printer has three preprocessing / postprocessing interface ports. Port 1 in each printer has an interface adaptor installed as a standard feature, that may be 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, or an optional Advanced Function Postprocessing device interface (**AF Post**) may be installed in either Port 2 or 3 of each printer. *Model ED2 uses Port 3 for Side 1/Side 2 Verify.* Allowable combinations for each printer are shown in Table 25.

Table 25. 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

Pre/Postprocessor Configuration Values

Table 26 lists all configuration items, what each item is used for, and the allowable value options for each item. The factory-set default values are underlined.

Table 26. Pre/Postprocessor Device Configuration Items

Selectable Field/Item	Description	Value Options
Printer (This item does not appear for simplex models.)	When the Configure Printer **Printer Mode** configuration item is set to **Simplex** mode, this **Printer** selectable field is grayed out in the **Configure Pre/Postprocessors** window. All devices configured while in **Simplex** mode are automatically configured for the printer associated with Display Touch Screen you are currently using.	1 or 2
Port	The physical connection between the printer and the preprocessing / postprocessing device.	1 or 2 or 3
Enabled	Enables a device for a port. If a device is already enabled for a specific port number when you select a device that is also configured for that port number, the **Yes** is grayed out so that you cannot attempt to enable a second device for the same port. An error window appears when the restart procedure to activate this change is complete and either of the following conditions exist: • You attempted to enable a device for a port number that does not have an interface adaptor installed or • The adapter has a different type (Pre / Post versus AF Post) adaptor installed than the device type you are enabling.	Yes or No
Pre / Postprocessor Type	Specify a **Coupled** type when the port to be used has a **Pre/Post** type adaptor installed. Specify an **Advanced Postprocessor** type when the port to be used has a **AF Post** type adaptor installed. Different types have different **Pre/Postprocessor Characteristics** configuration items listed.	Options Include: • Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)
Pre/Postprocessor Characteristics:		

Table 26. Pre/Postprocessor Device Configuration Items (continued)

Selectable Field/Item	Description	Value Options
Pre/Postprocessor Extended NPRO (non-process runout)	Listed for all Pre/Postprocessor Types. Extends the NPRO. Enter a non-zero value to extend the fixed NPRO length because of preprocessing or postprocessing device usage. Setting the "NPRO Length" configuration item under the **Configure Printer** 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. Default is 150.
Pre/Postprocessor Busy Timer	Listed only for "Coupled" Pre/Postprocessor Types. Specifies the length of time in seconds that follows a Preprocessing or Postprocessing 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. This time must be set to less than the Missing Interrupt Handler timer at the Host Channel interface.	1 to 999 seconds. Default is 300.
Postprocessor Tag Type	Listed only for "Coupled" Pre/Postprocessor Types. Specify a **Coupled** tag type for all Postprocessing devices not manufactured by Roll System, Inc. Specify an **RSI Compatible** tag type for all Postprocessing devices manufactured by Roll System, Inc..	• Coupled • RSI Compatible This item is ignored if you are configuring a preprocessing device interface.
Distance to Postprocessor	Listed only for "Advanced Postprocessor" Pre/Postprocessor Types. 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. • If the first postprocessor is a Troy MICR 3835, add an extra 99 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. Default is 99. • 24 to 1200 inches. Default is 99.
Postprocessor Error Page Stop	Listed only for "Advanced Postprocessor - MICR" Pre/Postprocessor Type.	0 to 50 pages
Postprocessor Verify Alignment Page Stop	Listed only for "Advanced Postprocessor - MICR" Pre/Postprocessor Type.	0 to 5000 pages
Pre/Postprocessor Baud Rate in Kbps	Listed only for "Advanced Postprocessor" Pre/Postprocessor Types.	19.2 or 62.5

Table 26. Pre/Postprocessor Device Configuration Items (continued)

Selectable Field/Item	Description	Value Options
Side 2 Verify	Indicates if the Side 2 Verify feature is enabled. Available in duplex only. **Note:** In printers with code version 9.608 or higher, the Side 2 Verify feature is enabled at the factory. The operator must have the CE disable the factory-set feature. However, once the factory-set feature has been disabled by the CE, the operator can enable and disable Side 2 Verify as needed.	Yes or No

Chapter 7. Configuring a Simplex Printing System

Chapter Overview

This chapter contains work sheets on which you can record your configuration choices for a Simplex Printing System. 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 in order 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.

The *Infoprint 3000 Operator's Guide* explains in detail the procedures for changing these configuration options.

You can change all configuration information by using the Display Touch Screen display windows.

Configuration Work Sheet for the Simplex Model

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 6. Configuration Information Descriptions” on page 73 for detailed information about each item.

Note: This chapter applies only to Model ES1. This chapter does not apply to Models ED1/ED2 that are operating in dual simplex mode.

Table 27. Configuration Work Sheet – Simplex Model

Item	Available Values	Selected Value
MESSAGE DISPLAY LANGUAGE:	• US English • Spanish • French • German • Japanese • Italian • Brazilian Portuguese • Chinese Simplified • Chinese Traditional	
CONFIGURE PRINTER:		
Auto Start	Yes / No	
PQE boldness	100%	This value must not be changed.
Printer Counter	(CE Change Only) 0 to 2 000 000 000	N/A
Printhead resolution (not all values are supported on all printers)	• 480 DPI • 600 DPI • 480/600 DPI	
IPDS Resolution	• Automatic • 240 DPI • 300 DPI • 600 DPI	
Font Enhancement	• Single Byte: Yes / No • Double Byte: Yes / No	
Jam Recovery Type	• Use Normal Jam Repositioning • Suppress MICR Jam Repositioning • Suppress All Jam Repositioning	
Font Usage	Low / Medium / High	
Page Segment Usage	Low / Medium / High	
Overlay Usage	Low / Medium / High	
Overlay Cache	Yes / No	
Input Buffer Size	Low / Medium / High	
Output Buffer Size	Low / Medium / High	
Direct Attach	Yes / No	
NPRO Length	0 to 1200 inches	
Auto NPRO at EOF	Yes / No	
Line mode enabled (In 480 DPI mode only)	Yes / No	

Table 27. Configuration Work Sheet – Simplex Model (continued)

Item	Available Values	Selected Value
Jam Recovery Point Distance	0 to 500 inches	
Logical Page Increment	0 to 20 pels	
Clear Memory for Security	Yes / No	
Screen Saver Timeout	0 to 60 minutes	
Alarm Suppression	Yes / No	
Fuser Inactivity Timer	0 to 9 hours	
Eject to Front Facing	Yes / No	
Form definition order	Yes / No	
Stacker Enabled	Yes / No	
Cut sheet emulation	• None • Normal Left-to-Right • Normal Right-to-Left • Inverted Left-to-Right • Inverted Right-to-Left	
BTS Installed	Yes / No	
BTS Enabled	Yes / No	
Offsetter Installed	Yes / No	
Offsetter Enabled	Yes / No	
Offset on Mark Forms	Yes / No	
3130 Bar Code Compatibility	Yes / No	
Contrast	(CE Change Only) 1 to 7	N / A
Preheat (Platen Temperature)	(CE Change Only) 1 to 100	N / A
Hot Roll (Temperature)	(CE Change Only) 1 to 100	N / A
Oil Rate	(CE Change Only) 1 to 100	N / A
Oil Belt (Speed)	(CE Change Only) 1 to 100	N / A
Scan Factory Adjust	(CE Change Only)	N / A
Process Factory Adjust	(CE Change Only)	N / A
Beam 1 Offset	(CE Change Only) 0.0 to 15.9	N / A
Beam 2 Offset	(CE Change Only) 0.0 to 15.9	N / A
Beam 3 Offset	(CE Change Only) 0.0 to 15.9	N / A
Beam 4 Offset	(CE Change Only) 0.0 to 15.9	N / A
Beam 5 Offset	(CE Change Only) 0.0 to 15.9	N / A
Machine Sequence	(CE Change Only)	N / A
Manufacturing Plant	(CE Change Only)	N / A
Date and Time	(CE Change Only)	N / A
HOST ATTACHMENTS CONFIGURATION:		
Parallel Channel:		
Parallel Link A Installed	Yes / No	
Parallel Link B Installed	Yes / No	
Device Address	00 to FF (hexadecimal)	
Second Channel	Static / Dynamic	

Table 27. Configuration Work Sheet – Simplex Model (continued)

Item	Available Values	Selected Value
Data Transfer Protocol	Interlocked / Data Streaming	
Data Streaming Rate	3.0 / 4.5MB /sec	
Card 1 Slot Position	2 / 4 / Not Installed	Automatically set at power on, cannot be changed.
Card 2 Slot Position	2 / 4 / Not Installed	Automatically set at power on, cannot be changed.

Table 27. Configuration Work Sheet – Simplex Model (continued)

Item	Available Values	Selected Value
ESCON Channel:		
ESCON Link A Installed	Yes / No	
ESCON Link B Installed	Yes / No	
Device Address	00 to FF (Hexadecimal)	
Multi-host Environmental Flag	True / False	
Card 1 Slot Position	2 / 4 / Not Installed	Automatically set at power on, cannot be changed.
Card 2 Slot Position	2 / 4 / Not Installed	Automatically set at power on, cannot be changed.
Token Ring TCP/IP Configuration:		
Installed	Yes / No	
TCP Port	5001 to 65536	
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 address	X'0' to X'FFFFFFFFFFFF'	
Ring Speed	4 or 16	
Confine Broadcast	Yes / No	
Ethernet TCP/IP Configuration:		
Installed	Yes / No	
TCP Port	5001 to 65536	
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	
Standard MTU Size	60 to 1500	
IEEE8023 MTU Size	60 to 1492	
Ethernet Type	Standard or IEEE8023	
Hardware address	Cannot be changed	
Alternate address	X'0' to X'FFFFFFFFFFFF'	
Media Speed	• Auto Negotiation • 100BaseT – Full Duplex • 100BaseT – Half Duplex • 10BaseT – Full Duplex • 10BaseT – Half Duplex	

Table 27. Configuration Work Sheet – Simplex Model (continued)

Item	Available Values	Selected Value
PREPROCESSING/POSTPROCESSING INTERFACE CONFIGURATIONS:		
DEVICE Number_____		
Port Number	1 / 2 / 3	
Enabled	Yes / No	
Name	1 to 12 alphanumeric characters (including spaces)	
Type	• Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)	
Characteristics:		
Pre / Postprocessor Extended NPRO:	0 to 800 inches	
Pre / Postprocessor Busy Timer:	1 to 999 seconds	
Postprocessor Tag Type:	• Coupled • RSI Compatible	
Distance to Postprocessor	• 24 to 800 inches • 24 to 1200 inches	
Postprocessor Error Page Stop	0 to 50 pages	
Postprocessor Verify Alignment Page Stop	0 to 5000 pages	
Pre / Postprocessor Baud Rate in Kbps	19.2 or 62.5	
DEVICE Number_____		
Port Number	1 / 2 / 3	
Enabled	Yes / No	
Name	1 to 12 alphanumeric characters (including spaces)	
Type	• Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)	
Characteristics:		
Pre / Postprocessor Extended NPRO:	0 to 800 inches	
Pre / Postprocessor Busy Timer:	1 to 999 seconds	
Postprocessor Tag Type:	• Coupled • RSI Compatible • Advanced	
Distance to Postprocessor	• 24 to 800 inches • 24 to 1200 inches	
Postprocessor Error Page Stop	0 to 50 pages	
Postprocessor Verify Alignment Page Stop	0 to 5000 pages	
Pre / Postprocessor Baud Rate in Kbps	19.2 or 62.5	

Table 27. Configuration Work Sheet – Simplex Model (continued)

Item	Available Values	Selected Value
DEVICE Number_____		
Port Number	1 / 2 / 3	
Enabled	Yes / No	
Name	1 to 12 alphanumeric characters (including spaces)	
Type	• Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)	
Characteristics:		
Pre/Postprocessor Extended NPRO:	0 to 800 inches	
Pre/Postprocessor Busy Timer:	1 to 999 seconds	
Postprocessor Tag Type:	• Coupled • RSI Compatible	
Distance to Postprocessor	• 24 to 800 inches • 24 to 1200 inches	
Postprocessor Error Page Stop	0 to 50 pages	
Postprocessor Verify Alignment Page Stop	0 to 5000 pages	
Pre/Postprocessor Baud Rate in Kbps	19.2 or 62.5	
DEVICE Number_____		
Port Number	1 / 2 / 3	
Enabled	Yes / No	
Name	1 to 12 alphanumeric characters (including spaces)	
Type	• Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)	
Characteristics:		
Pre/Postprocessor Extended NPRO:	0 to 800 inches	
Pre/Postprocessor Busy Timer:	1 to 999 seconds	
Postprocessor Tag Type:	• Coupled • RSI Compatible	
Distance to Postprocessor	• 24 to 800 inches • 24 to 1200 inches	
Postprocessor Error Page Stop	0 to 50 pages	
Postprocessor Verify Alignment Page Stop	0 to 5000 pages	
Pre/Postprocessor Baud Rate in Kbps	19.2 or 62.5	

Chapter 8. Configuring a Duplex Printing System

Chapter Overview

This chapter contains work sheets on which you can record your configuration choices for a Duplex Printing System. 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.

The *Infoprint 3000 Operator's Guide* explains in detail the procedures for changing these configuration options.

You can change all configuration information by using the Display Touch Screen display windows.

Configuration Work Sheet for Duplex Models

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 6. Configuration Information Descriptions” on page 73 for detailed information about each item.

Table 28. Configuration Work Sheet – Duplex Models

Item	Available Values	Selected Values		
		Duplex	Dual Simplex	
			Printer 1	Printer 2
MESSAGE DISPLAY LANGUAGE:	• US English • Spanish • French • German • Japanese • Italian • Brazilian Portuguese • Chinese Simplified • Chinese Traditional			
PRINTER CONFIGURATION:				
Printer Mode	Duplex / Simplex			
Auto Start	Yes / No			
PQE boldness for printer 1	100% **Note:** This value must not be changed.	N/A	N/A	N/A
PQE boldness for printer 2	100% **Note:** This value must not be changed.	N/A	N/A	N/A
Printer 1 Counter	(CE Change Only) 0 to 2 000 000 000	N/A	N/A	N/A
Printer 2 Counter	(CE Change Only) 0 to 2 000 000 000	N/A	N/A	N/A
Printhead resolution (not all values are supported on all printers)	• 480 DPI • 600 DPI • 480/600 DPI			
IPDS Resolution	• Automatic • 240 DPI • 300 DPI • 600 DPI			
Font Enhancement	• Single Byte: Yes / No • Double Byte: Yes / No Yes / No			
Jam Recovery Type	• Use Normal Jam Repositioning • Suppress MICR Jam Repositioning • Suppress All Jam Repositioning			
Font Usage	Low / Medium / High			
Page Segment Usage	Low / Medium / High			

Table 28. Configuration Work Sheet – Duplex Models (continued)

Item	Available Values	Selected Values		
		Duplex	Dual Simplex	
			Printer 1	Printer 2
Overlay Usage	Low / Medium / High			
Overlay Cache	Yes / No			
Input Buffer Size	Low / Medium / High			
Output Buffer Size	Low / Medium / High			
Direct Attach	Yes / No			
NPRO Length	0 to 1200 inches			
Auto NPRO at EOF	Yes / No			
Jam Recovery Point Distance	0 to 500 inches			
Form Feed Length (Duplex Mode Only)	17 to 250 inches		N/A	N/A
Length of Forms Between Transfer Points (Duplex Mode Only)	150 to 800 inches		N/A	N/A
Front Sheet Sequence (Duplex Mode Only)	Front First / Front Second		N/A	N/A
Verification Marks (Duplex Mode Only)	Yes / No		N/A	N/A
Logical Page Increment	0 to 20 pels			
Clear Memory for Security	Yes / No			
Screen Saver Timeout	0 to 60 minutes			
Alarm Suppression	Yes / No			
Fuser Inactivity Timer	0 to 9 hours			
Eject to Front Facing	Yes / No			
Form Definition Order	Yes / No			
Stacker Enabled	Yes / No			
Cut Sheet Emulation	• None • Normal Left-to-Right • Normal Right-to-Left • Inverted Left-to-Right • Inverted Right-to-Left			
BTS Installed	Yes / No			
BTS Enabled	Yes / No			
Offsetter Installed	Yes / No			
Offsetter Enabled	Yes / No			
Offset on Mark Forms	Yes / No			
3130 Bar Code Compatibility	Yes / No			
Printer 1 Contrast	(CE Change Only) 1 to 7	N/A	N/A	N/A
Printer 2 Contrast	(CE Change Only) 1 to 7	N/A	N/A	N/A
Printer 1 Preheat (Platen Temperature)	(CE Change Only) 1 to 100	N/A	N/A	N/A

Table 28. Configuration Work Sheet – Duplex Models (continued)

Item	Available Values	Selected Values		
		Duplex	Dual Simplex	
			Printer 1	Printer 2
Printer 2 Preheat (Platen Temperature)	(CE Change Only) 1 to 100	N/A	N/A	N/A
Printer 1 Hot Roll (Temperature)	(CE Change Only) 1 to 100	N/A	N/A	N/A
Printer 2 Hot Roll (Temperature)	(CE Change Only) 1 to 100	N/A	N/A	N/A
Printer 1 Oil Rate	(CE Change Only) 1 to 100	N/A	N/A	N/A
Printer 2 Oil Rate	(CE Change Only) 1 to 100	N/A	N/A	N/A
Printer 1 Oil Belt (Speed)	(CE Change Only) 1 to 100	N/A	N/A	N/A
Printer 2 Oil Belt (Speed)	(CE Change Only) 1 to 100	N/A	N/A	N/A
Scan Factory Adjust for Printer 1	(CE Change Only)	N/A	N/A	N/A
Process Factory Adjust for Printer 1	(CE Change Only)	N/A	N/A	N/A
Scan Factory Adjust for Printer 2	(CE Change Only)	N/A	N/A	N/A
Process Factory Adjust for Printer 2	(CE Change Only)	N/A	N/A	N/A
Beam 1 Offset Adjustment for Printer 1	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 2 Offset Adjustment for Printer 1	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 3 Offset Adjustment for Printer 1	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 4 Offset Adjustment for Printer 1	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 5 Offset Adjustment for Printer 1	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 1 Offset Adjustment for Printer 2	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 2 Offset Adjustment for Printer 2	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 3 Offset Adjustment for Printer 2	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 4 Offset Adjustment for Printer 2	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Beam 5 Offset Adjustment for Printer 2	(CE Change Only) 0.0 to 15.9	N/A	N/A	N/A
Machine Sequence for Printer 1	(CE change on initial configuration only)	N/A	N/A	N/A
Manufacturing Plant for Printer 1	(CE change on initial configuration only)	N/A	N/A	N/A
Machine Sequence for Printer 2	(CE change on initial configuration only)	N/A	N/A	N/A
Manufacturing Plant for Printer 2	(CE change on initial configuration only)	N/A	N/A	N/A
Date and Time	(CE Change Only)	N/A	N/A	N/A

Table 28. Configuration Work Sheet – Duplex Models (continued)

Item	Available Values	Selected Values		
		Duplex	Dual Simplex	
			Printer 1	Printer 2
HOST ATTACHMENTS CONFIGURATION:				
Parallel Channel Attachment:				
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	3.0 / 4.5 MB/sec			
Card 1 Slot Position	6 / 8 / Not Installed	N/A	N/A	N/A
Card 2 Slot Position	6 / 8 / Not Installed	N/A	N/A	N/A
ESCON Channel:				
ESCON Link A Installed	Yes / No			
ESCON Link B Installed	Yes / No			
Device Address	00 to FF			
Multi-host Environmental Flag	True / False			
Card 1 Slot Position	6 / 8 / Not Installed	N/A	N/A	N/A
Card 2 Slot Position	6 / 8 / Not Installed	N/A	N/A	N/A
Token Ring TCP/IP Configuration:				
Installed	Yes/ No			
TCP Port	5001 to 65536			
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	N/A	N/A	N/A
Alternate address	X'0' to X'FFFFFFFFFFFF'			
Ring Speed	4 or 16			
Confine Broadcast	Yes/ No			
Ethernet TCP/IP Configuration:				
Installed	Yes/ No			
TCP Port	5001 to 65536			
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			
Standard MTU Size	60 to 1500			
IEEE8023 MTU Size	60 to 1492			
Ethernet Type	Standard or IEEE8023			
Hardware address	Cannot be changed	N/A	N/A	N/A

Table 28. Configuration Work Sheet – Duplex Models (continued)

Item	Available Values	Selected Values		
		Duplex	Dual Simplex	
			Printer 1	Printer 2
Alternate address	X'0' to X'FFFFFFFFFFFF'			
Media Speed	• Auto Negotiation • 100BaseT – Full Duplex • 100BaseT – Half Duplex • 10BaseT – Full Duplex • 10BaseT – Half Duplex			
FDDI TCP/IP Configuration:				
Installed	Yes / No			
TCP Port	5001 to 65536			
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	N/A	N/A	N/A
Alternate address	X'0' to X'FFFFFFFFFFFF'			
Confine Broadcast	Yes / No			
PREPROCESSING/POSTPROCESSING INTERFACE CONFIGURATIONS:				
DEVICE Number_____				
Printer Number	1 / 2		N/A	N/A
Port Number	1 / 2 / 3			
Enabled	Yes / No			
Name	1 to 12 alphanumeric characters (including spaces)			
Type	• Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)			
Characteristics:				
Pre/Postprocessor Extended NPRO:	0 to 800 inches			
Pre/Postprocessor Busy Timer:	1 to 999 seconds			
Postprocessor Tag Type:	• Coupled • RSI Compatible			
Distance to Postprocessor	• 24 to 800 inches • 24 to 1200 inches			
Postprocessor Error Page Stop	0 to 50 pages			
Postprocessor Verify Alignment Page Stop	0 to 5000 pages			
Pre/Postprocessor Baud Rate in Kbps	19.2 or 62.5			

Table 28. Configuration Work Sheet – Duplex Models (continued)

Item	Available Values	Selected Values		
		Duplex	Dual Simplex	
			Printer 1	Printer 2
DEVICE Number_____				
Printer Number	1 / 2		N/A	N/A
Port Number	1 / 2 / 3			
Enabled	Yes / No			
Name	1 to 12 alphanumeric characters (including spaces)			
Type	• Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)			
Characteristics:				
Pre/Postprocessor Extended NPRO:	0 to 800 inches			
Pre/Postprocessor Busy Timer:	1 to 999 seconds			
Postprocessor Tag Type:	• Coupled • RSI Compatible • Advanced			
Distance to Postprocessor	• 24 to 800 inches • 24 to 1200 inches			
Postprocessor Error Page Stop	0 to 50 pages			
Postprocessor Verify Alignment Page Stop	0 to 5000 pages			
Pre/Postprocessor Baud Rate in Kbps	19.2 or 62.5			
DEVICE Number_____				
Printer Number	1 / 2		N/A	N/A
Port Number	1 / 2 / 3			
Enabled	Yes / No			
Name	1 to 12 alphanumeric characters (including spaces)			
Type	• Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)			

Table 28. Configuration Work Sheet – Duplex Models (continued)

Item	Available Values	Selected Values		
		Duplex	Dual Simplex	
			Printer 1	Printer 2
Characteristics:				
Pre/Postprocessor Extended NPRO:	0 to 800 inches			
Pre/Postprocessor Busy Timer:	1 to 999 seconds			
Postprocessor Tag Type:	• Coupled • RSI Compatible • Advanced			
Distance to Postprocessor	• 24 to 800 inches • 24 to 1200 inches			
Postprocessor Error Page Stop	0 to 50 pages			
Postprocessor Verify Alignment Page Stop	0 to 5000 pages			
Pre/Postprocessor Baud Rate in Kbps	19.2 or 62.5			
DEVICE Number_____				
Printer Number	1 / 2		N/A	N/A
Port Number	1 / 2 / 3			
Enabled	Yes / No			
Name	1 to 12 alphanumeric characters (including spaces)			
Type	• Coupled Preprocessor • Coupled Postprocessor • Advanced Postprocessor - MICR • Advanced Postprocessor - SMM (Select Medium Modification)			
Characteristics:				
Pre/Postprocessor Extended NPRO:	0 to 800 inches			
Pre/Postprocessor Busy Timer:	1 to 999 seconds			
Postprocessor Tag Type:	• Coupled • RSI Compatible • Advanced			
Distance to Postprocessor	• 24 to 800 inches • 24 to 1200 inches			
Postprocessor Error Page Stop	0 to 50 pages			
Postprocessor Verify Alignment Page Stop	0 to 5000 pages			
Pre/Postprocessor Baud Rate in Kbps	19.2 or 62.5			

Chapter 9. Defining Forms

From the Configure pull-down menu **SELECT** the **Define Forms** procedure window.

Identify all forms used in the printer to the AFCCU before completing the Load Forms procedure. You can identify and store forms before you attempt to load them into the printer, or you can identify and store them during the Load Forms procedure. Identify forms with a name, page width (in inches or millimeters), and page length (in inches or millimeters). A short description of the form is optional.

Once you identify and store a form, all future uses of that form need only identify the form name during the Load Forms procedure.

Simplex Printers

The printer can store 1024 form names. The following form names are supplied as defaults when the printer is shipped from the factory:

Table 29. Default Forms – Model ES1

Form Name	**Description** **Length x Width (inches)**
Letter	8.5 x 12
Standard	15 x 11
2-Up Letter	2-Up 8.5 x 11 18 x 11
12 x 18	12 x 18
14 x 18	B4 14 x 18

Duplex Systems

The printers can store 1024 form-name definitions in **Duplex** mode, and 1024 form-name definitions in each printer in **Simplex** mode for a total of 3072 form-name definitions for the complete system.

Select the Form Names you want in both **Duplex** and either Printer 1 or 2 **Simplex** modes, and record on all three Form Identification Work Sheets all of the definition data for each form. The following form names are supplied as defaults in each printer when the printer is shipped from the factory:

Table 30. Default Forms –Models ED1/ED2

Form Name	**Description** **Length x Width (inches)**
Letter	8.5 x 11 8.5 x 12 (form)
Legal	8.5 x 14 8.5 x 15 (form)
Half1	Half Letter Size 5.5 x 9.5
Fullsize	11 x 14 Large 11 x 15 (form)
Half2	Half Fullsize 7 x 11

Most selectable fields on the **Define Forms** window are self-explanatory, but the following fields are not:

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 Table 1 on page 3.

When entering a value in inches, use a decimal for fractional dimensions (for example, 13.5). When entering a value in millimeters, do not use a decimal point.

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 inches). (For Infoprint 3000, the length can be from 76 to 711 millimeters (3 to 28 inches).)

Note: The printer can stack only forms that are prefolded at lengths between 178 to 356 mm (7 to 14 inches) between fold perforations. To stack printed forms lengths of less than 7 inches or greater than 14 inches, see “Stacking Forms” on page 123.

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.

Form Characteristics

Part of the Define Forms procedure is setting values for some form characteristics for optimum fusing and print quality of different types of forms, such as labels or heavy-stock forms, in addition to the most commonly-used types of forms. These characteristics are:

- Contrast
- Preheat platen temperature
- Hot roll temperature
- Fuser oil rate
- Oil belt speed
- Paper weight.

A default value is set for each of these characteristics during initial printer configuration. The printer operator can use the defaults or set other values as they are needed when defining forms or adjust existing form definitions.

For detailed information about defining or adjusting these characteristics, see the *Operator's Guide*.

Using the Forms Identification Work Sheet

Use this sheet to record form identification names with their associated lengths, widths, description, and characteristics. If you are going to be defining numerous forms, copy this work sheet before you begin.

You can define up to 1024 different forms on a simplex printer. On a **duplex system** you can define up to 3072 forms:
- 1024 in duplex mode
- 1024 for each printer in simplex mode.

If you are defining more than 5 forms, make copies of the tables before you fill them out.

You can also use this work sheet to make notes about loading techniques, **Forms Select** settings, adjust print values for both simplex and duplex, and other information you discover as you work with a particular form.

Form Identification Work Sheet

Table 31. Form Identification Work Sheet

Form Number:	Definition	With This Value:	Notes:
	Name **Width (in millimeters or inches)** **Length (in millimeters or inches)** **Description** **Contrast** **Preheat (platen temperature)** **Hot Roll (temperature)** **Oil Rate** **Oil Belt (speed)** **Paper Weight**	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
	Name **Width (in millimeters or inches)** **Length (in millimeters or inches)** **Description** **Contrast** **Preheat (platen temperature)** **Hot Roll (temperature)** **Oil Rate** **Oil Belt (speed)** **Paper Weight**	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
	Name **Width (in millimeters or inches)** **Length (in millimeters or inches)** **Description** **Contrast** **Preheat (platen temperature)** **Hot Roll (temperature)** **Oil Rate** **Oil Belt (speed)** **Paper Weight**	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
	Name **Width (in millimeters or inches)** **Length (in millimeters or inches)** **Description** **Contrast** **Preheat (platen temperature)** **Hot Roll (temperature)** **Oil Rate** **Oil Belt (speed)** **Paper Weight**	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
	Name **Width (in millimeters or inches)** **Length (in millimeters or inches)** **Description** **Contrast** **Preheat (platen temperature)** **Hot Roll (temperature)** **Oil Rate** **Oil Belt (speed)** **Paper Weight**	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____	

Chapter 10. Obtaining Supplies

Chapter Overview

This chapter describes the printer supplies, how you can order and store them, and estimates the quantity of forms (in feet) that each supply item can process.

Supplies

For optimum reliability and print quality use IBM supplies, which are engineered specifically for IBM printers. Use the "IBM Supplies Worksheet" 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 Display Touch Screen screen, sounds an alarm, and turns on an operator intervention light on top of the printer.

IBM recommends that you keep the following quantities on hand per print engine:

Item	Suggested Quantity
Toner	30 cartridges
Developer mix	4 bottles
Fuser oil	4 bottles
Oil 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 is available for printer operators to use when they clean the printer.

IBM Supplies Worksheet

Important Notes Concerning Supplies:

- Make sure to use the correct part numbers when you order new supplies. Using the wrong developer or toner, for example, can cause serious print quality problems and force a service call.
- Do not reuse waste toner or developer mix.
- The yields listed in Table 32 on page 120 are approximations. They are not a warranty or guarantee of minimum life; they are provided only to assist in supplies planning. Analyze your actual usage figures to determine how much of each supply item to stock.

- Toner yield is affected by several factors, including print coverage, contrast setting, form type, and environment. Yields provided by the following formulas are approximate averages only. Toner yield is expressed in impressions per cartridge

  ```
  Yield in impressions per cartridge = (18 020 000 × A) ÷ (W × L × C)
  A = 1.25 for contrast setting 1
  A = 1.00 for contrast setting 4
  A = 0.85 for contrast setting 7

  W = Width of impression in inches
  L = Length of impression in inches
  C = Coverage on impression expressed as a percentage
  ```

  For example, on an 8.5 x 11-inch form with a contrast setting of 1 and a coverage of 4%:

  ```
  Yield = (18 020 000 × 1.25) ÷ (8.5 × 11 × 4) = 60 228 impressions
  ```

- The Fine Filter processing yield is based on 4 square inches of toner coverage per foot of forms with the printer control panel `Contrast` switch in the center `(4)` position. More dense applications, such as extensive bar codes, images, solid area fill, or printing with a higher `Contrast` setting can expect to achieve yields lower than those achieved with the average text page.
- Table 32 is a work sheet that lists IBM supplies and their part numbers. Make copies of this work sheet to use when you order supplies.

Table 32. IBM Supplies Worksheet

IBM Supply Item	Approximate Forms Processed (In Feet)	Part Number	Minimum Order Quantity	Quantity Needed
Toner cartridge [1]	30 000 to 72 000 per cartridge [3]	1402828	1 carton (6 toner cartridges and 3 toner collector bags per carton)	_____
Toner cartridge (version 2) [1] [4]	30 000 to 72 000 per cartridge [3]	1402717	1 carton (6 toner cartridges and 3 toner collector bags per carton)	_____
Developer Mix [1]	850 000 per bottle	1402829	1 carton (2 bottles per carton)	_____
Developer Mix (version 2) [1] [4]	1 000 000 per bottle	1402718	1 carton (2 bottles per carton)	_____
Splicing Tape [1]	45 feet of tape per roll	4165880	1 carton (72 rolls per carton)	_____
Fuser Oil: 1-kilogram (2.2-lb) bottle [2]	800 000 per bottle	1372463	1 carton (1 bottle per carton)	_____
Oil Belt - [2]	1 200 000 per belt	1402827	1 carton (1 belt per carton)	_____
Oil Belt - Teflon [2]	1 200 000 per belt	69G7313	1 carton (1 belt per carton)	_____
Fine Filter [2]	1 200 000 per filter	1402826	1 carton (1 filter per carton)	_____

Notes:

1. This is a customer-replaceable supply item.
2. This is a maintenance supply item.
3. Yield depends on the contrast setting, print coverage, form type, and environment.
4. Use this item only if the printer has a white label with orange printing below the toner cartridge entry area.

Ordering Supplies

You order supplies directly from IBM or from your Lexmark representative. The maintenace supply items you order are paid for under the maintenance contract; customer-replaceable supplies are billed directly to your company. Your IBM representative 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, oil 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

You have these options for ordering supplies:

- You can purchase toner, developer, and other supplies through Lexmark. You can contact Lexmark at 1-800-438-2468 or through any Lexmark International authorized supply dealer.
- You can fax a completed order to Lexmark at 1-800-522-3422.

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 the following with the supplies you are retuning:

- A copy of your invoice
- A description of the problem
- Print-quality samples
- An estimate of the amount of printing already done with that supply

This information applies only to supplies purchased in the U.S.A. In other countries, contact your point of purchase for returns information.

Storing Supplies

Store printer supplies in the printer operating environment for at least one day before using 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.

Chapter 11. Selecting and Testing Forms

Chapter Overview

This chapter reviews the basic requirements for print materials intended for use on an Infoprint 3000 printer.

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 printer 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).

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 cannot be stacked. For these and other applications you must have suitable postprocessing 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 or adhesive labels for production runs, test the jobs that print them to ensure everything works well. Refer to the *Forms Design Reference for Continuous Forms Advanced Function Printers* for more information on labels that can be used with the printer.

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 labels and 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 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.

Adhesive Labels

Note: Adhesive labels cannot be used on duplex systems in duplex mode.

The printer can print on many types of adhesive labels. Use only adhesive labels intended for electrostatic printing applications to prevent:

- Poor fusing
- Toner offsetting in the printed stock
- Peeling labels
- Unreliable feeding and stacking
- Printer contamination.

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.

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Nach der EN 55022: ″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.″

Anmerkung: Um die Einhaltung des EMVG sicherzustellen sind die Geräte, wie in den Handbüchern angegeben, zu installieren und zu betreiben.

Taiwanese EMC:

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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.

The following statement applies to this IBM product. The statement for other IBM products intended for use with this product will appear in their accompanying manuals.

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

ABIC. See *Adaptive Bi-Level Image Compression*.

ac. Alternating current.

adaptive bi-level image compression (ABIC). A 4-bit image capable of displaying up to 16 shades of gray.

adhesive label. Special-application material; typically consists of paper labels coated on one side with an adhesive mixture temporarily affixed to backing material. See also *carrier*.

Advanced Function Common Control Unit (AFFCU). An IBM RISC-based control unit with code common to all printers that use AFFCU.

Advanced Function Image and Graphics. A integral facility within the printer to directly process IOCA image and GOCA graphics data streams.

AEA. Alternate Exception Action.

AFCCU. See *Advanced Function Common Control Unit*.

AFIG. Advanced Function Image and Graphics.

AFP. Advanced Function Printing or Advanced Function Presentation.

AFPF. Advanced Function Print Finishing.

AF Post. Advanced Function Postprocessing.

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.

ANSI. American National Standards Institute.

APA. All-Points Addressable.

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*.

ARQ. Active Record Queue.

ASHRAE. American Society of Heating, Refrigeration, and Air Conditioning Engineers.

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.

BCOCA. Bar Code Object Content Architecture. See also *bar code*.

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.

carrier. The backing material for labels. Labels consist of the printable material, the adhesive, and the carrier.

CCW. Channel Command Word.

CE. Customer Engineer (IBM).

CGPC. Canadian Grocery Product Code.

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.

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 jammed 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 can be perforated to allow the user to tear them apart or can be nonperforated for use with a burster/trimmer/stacker.

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.

CPGID. See *Code Page Global Identifier*.

CSW. Channel Status Word.

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

DASD. Direct Access Storage Device.

data streaming. A non-interlocked method of data transfer used by the printer channel to decrease data transfer time during write operations.

DBCS. Double Byte Character Set.

DCF. See *Document Composition Facility*.

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* and *test mode*.

direct attach. The environment in which an application program directly allocates the Infoprint 3000 Printing Subsystem.

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.

DPE. Decompression Performance Enhancement.

DPI. Dots per inch.

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

EAN. European Article Numbers.

EBCDIC. Extended Binary-Coded Decimal Interchange Code.

EC. Engineering Change.

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. Enterprise System Connection.

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.

ESMM. End Select Medium Modification.

Ethernet. A local area network that allows attachments to transmit on the network without prior coordination.

exchange. As used in the Infoprint 3000 action messages, instructs the printer operator to remove a component and install a new one. For example, the `EXCHANGE MAIN CHARGER` message indicates that the operator should take out the main charger and put in a new one.

F

fanfold. Continuous forms that are alternately folded at regular intervals, usually on a perforation.

FDDI. See *Fiber Distributed Data Interface*.

FGID. See *Font Typeface Global Identifier*.

Fiber Distributed Data Interface (FDDI). An ANSI standard for a 100 Mbps LAN using optical fiber cables.

FLSF. See *Font Library Service Facility*.

FOCA. Font Object Content Architecture.

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.

FORMDEF. See *form definition*.

forms. The material on which output data is printed, such as paper or adhesive labels. 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. In the printer, to use heat and pressure to blend toner onto forms to make a permanent bond.

G

GCSGID. See *Graphic Character Set Global Identifier.*

GDDM. See *Graphical Data Display Manager*.

GOCA. Graphics Object Content Architecture.

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 MMR. Similar to MMR 2-dimensional image compression algorithm. See also *MMR* and *MR*.

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.

IEEE. Institute of Electrical and Electronics Engineers.

IHF. Image Handling Facility.

impact printer. A printer in which printing is the result of mechanical impacts. Contrast with *nonimpact printer*.

IML. Initial Microcode Load.

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.

IOCA. Image Object Content Architecture.

IPDS. See *Intelligent Printer Data Stream*.

IPM. Impressions per minute.

ISO. International Organization for Standardization.

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.

JAN. Japanese Article Numbers.

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*.

K

KB. Kilobyte (1KB=1 024 bytes).

L

LAN. Local Area Network.

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 an 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. (1) The boundary for determining the limits of printing. (2) A presentation space in which the page data is presented. (3) A collection of data that can be printed on a sheet of paper or other type of form. Contrast with *physical page*.

logo. An identifying emblem, statement, or motto of a company.

M

MB. Megabyte (1MB=1 048 576 bytes).

MICR. Magnetic Ink Character Recognition.

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.

MIH. Missing-Interrupt Handler.

MMR. Modified-Modified READ; 2-dimensional image compression algorithm. Also referred to as TSS Group 4.

MPC. See *Multiple Printer Controller*.

MR. Modified READ. See *READ*. 2-dimensional image compression algorithm. Also referred to as TSS Group 3.

Multiple Printer Controller (MPC). Controller used with Infoprint 3000 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.

MVS/SP. See *Multiple Virtual Storage/System Product*.

N

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.

NPRO. See *nonprocess runout*.

O

OCR. See *Optical Character Recognition*.

offset paper. In printing, a grade of paper to which sizing is added to resist moisture and which is treated on the surface to prevent lifting of the paper during printing by ink presses.

OGL. See *Overlay Generation Language*.

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 an 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*.

OS/VS. See *Operating System/Virtual Storage*.

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* and *physical 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. Photoconductor.

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.

PEM. Print-Error Marker.

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 page. The form on which the printer is printing, such as an 11 x 8.5–in. sheet of paper. Contrast with *logical page*.

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.

PMF. See *Print Management Facility*.

POD. Print On Demand.

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. See also *logical page*.

portrait orientation. Pertaining to a display or hard copy with greater height than width. Contrast with *landscape orientation*.

PPFA. Page Printer Formatting Aid.

PQE. Print Quality Enhancement.

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* and *test 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.

PSAF. See *Print Services Access Facility*.

PSF. Print Services Facility.

PUM. Printer Utility Module.

R

RAM. Random Access Memory.

RAS. Reliability, availability, and serviceability.

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.

READ. Relative Element Address Designate.

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.

RPQ. Request for Price Quotation.

S

SBCS. Single Byte Character Set.

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.

SCSW. Subchannel Status Word.

SDLC. See *Synchronous Data Link Control.*

security paper. Specially formulated paper used for negotiable documents, such as checks, which improves the anti-fraud characteristics of the document.

shift. A scheduled work period. For example, a 24-hour day is often divided into three 8-hour shifts.

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.

SMM. Select Medium Modification.

SNA. System Network Architecture.

special-purpose materials. Printable items other than blank forms; for example, adhesive labels and 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.

Synchronous Data Link Control (SDLC). For managing synchronous, code=transparent, serial=by=bit, information transfer over a link connection.

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 support peer-to-peer connectivity functions for both local and wide area networks.

TCS. See *Two-Channel Switch*.

tensile strength. A measure of the force that the paper forms can withstand without tearing.

test mode. The operational mode in which the printer can produce print samples, accept configuration changes, and control traces. When the printer is in test mode, it is not accepting information from the attached controlling computer system. Contrast with *diagnostic mode* and *print mode*.

text orientation. The position of text as a combination of print direction and baseline direction.

token. In a local area network (LAN), a particular message or bit pattern that is passed successively from one attaching device to another to indicate which attachment has permission to transmit.

token ring. A network with a ring topology that passes tokens from one attaching device to another.

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 printer alignment and registration, and control the movement of the paper.

TSS. Telecommunication Standardization Sector.

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.

UPC. Universal Product Code.

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) The missing part of a printed character. (2) The missing piece of a continuous form.

VSE. See *Virtual Storage Extended*.

VSE/AF. See *Virtual Storage Extended/Advanced Functions*.

VSE/SP. Virtual Storage Extended/System Product.

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