

InfoPrint 60
3160 Advanced Function Printer

G544-5242-02

Introduction and Planning Guide



InfoPrint 60
3160 Advanced Function Printer

G544-5242-02

Introduction and Planning Guide

Note

Before using this information and the product it supports, be sure to read the general information under "Notices" on page vii.

Third Edition (September 1996)

This edition, G544-5242-02, applies to the IBM InfoPrint 60 Printer and the 3160 Model 001 Advanced Function Printer.

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Contents

Notices	vii
What's New in This Publication	ix
Communication Statements	x
Trademarks	xi
Related Publications	xii
Chapter 1. InfoPrint 60 and 3160-001 Printers	1
General Description	1
Special Features	1
Host Environments	3
Application Environment	3
Operational Features	4
Data Security	4
Fonts	5
Performance and Print Quality	5
Advanced Function Image and Graphics	5
Print Material and Paper Handling	6
Chapter 2. Planning Overview	7
Sample Implementation Plan	8
Additional Planning Tasks	10
Chapter 3. Preparing the Processing Environment	11
Performance Considerations	11
Compatibility Considerations	12
Attachments	13
Advanced Function Presentation Licensed Programs	13
Installing and Verifying AFP Programs	13
Conversion	13
AS/400 Migration Considerations	14
Bolding Characters	14
Enlarge Print Function	14
Box Draw Function	14
Chapter 4. Preparing the Physical Environment	15
Environmental Requirements	15
Temperature and Humidity	15
Altitude Range	15
Ventilation	15
Heat and Airflow	16
Sound Levels	16
Power Requirements	16
Power Dissipation	17
Physical Requirements	18
Weight and Dimensions	18
Service Clearances	18
Physical Layout and Space Requirements	19
Installation Requirements	20
Installation Planning Worksheet	21

Chapter 5. Configuring the Printer and Its Attachments	23
Printer Configuration	23
System Attachment Worksheets	24
Ethernet TCP/IP Attachment Worksheet	25
SNA Token-Ring Attachment Worksheet	26
TCP/IP Token-Ring Attachment Worksheet	29
System/370 Channel Attachment Worksheet	30
Chapter 6. Ordering and Storing Supplies	31
Printer Supplies	31
How to Order Supplies	31
Selecting Paper	32
Paper Specifications	33
Label Specifications	34
Prepunched Paper	34
Preprinted Paper	35
Selecting, Testing, and Ordering Paper	36
Storing Paper and Supplies	36
Appendix A. 3160 Font Set	39
IBM Core Interchange Resident Scalable Font Set	39
GCSGID Subsets for IBM Core Interchange Fonts	41
IBM Core Interchange Resident Code Page Set	41
4028 Compatibility Resident Font Set	45
4028 Compatibility Resident Code Page Set	47
IBM Coordinated Font Set	48
GCSGID Subsets	48
DBCS Resident Raster Font Set	49
Default Font	51
AS/400 Bolding Function, Native and OfficeVision	52
Appendix B. Software and Hardware Requirements	55
Host Attachments That Support the InfoPrint 60 and the 3160-001 Printer	55
Host Software	56
Host/PSF Software Support	56
PSF Support Notes	59
PSF/MVS Support	59
PSF/VSE Support	60
PSF/VM Support	60
OS/400 and PSF/400 Support	60
PSF/2 Support	61
PSF for AIX Support	61
System Test	61
Applications	61
Host Software References:	61
System Attachment	62
SNA or TCP/IP Token Ring	62
TCP/IP Ethernet	63
System/370 Channel Attachment	64
Attachment Hardware Requirements	66
Bibliography	67
Glossary	69

Acronyms and Abbreviations	77
Index	79

Figures

1. Power Plug and Connector	17
2. Service Clearances	19
3. Prepunched Paper Clearances -- A4, B5, and Letter Size	35
4. Prepunched Paper Clearances -- A3, B4, Legal, and Ledger Size	35
5. Preprinted Paper	36
6. Parallel Channel Attachment Options (3160-001)	65

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The IBM 3160 Advanced Function Printer meets the requirements of IEC 950, First Edition, Amendments 1 and 2. The laser used in the 3160 complies with IEC 825 and EN 60825.

What's New in This Publication

The following machine types and model types are covered in this publication.

Machine Number	Machine Type	Model Number
3160	3160	Model 001
InfoPrint 60	3160	Model 002

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Related Publications

IBM 3160 Advanced Function Printer: User's Guide, S544-5243, describes how to operate and maintain the 3160 printer.

IBM InfoPrint 60: User's Guide, S544-5232, describes how to operate and maintain the InfoPrint 60 printer.

IBM InfoPrint 60; 3130, 3160, and 3935 Advanced Function Printers: Attachment Configuration Handbook, S544-3977, provides information to help you configure your system for the attachment you use.

System/360, System/370, 4300, 9370, and ES900 Processors Input/Output Installation Manual—Physical Planning, GC22-7064 provides information about System/370 parallel channel cables and other installation information.

Important

Before the customer engineer can install the printer, you must complete a configuration worksheet for the attachment you plan to use. Simplified versions of these worksheets are available in this book (see “System Attachment Worksheets” on page 24). However, for detailed worksheets, instructions, and examples, please refer to the *IBM InfoPrint 60; 3130, 3160, 3935 Advanced Function Printer: Attachment Configuration Handbook*, S544-3977. If you do not have a copy of the handbook, ask your marketing representative to obtain one for you.

For a list of publications that describe Advanced Function Page Printers and related printing tools, see “Bibliography” on page 67.

For a more extensive listing of available publications, refer to *Advanced Function Presentation: Printer Information*, G544-3290.

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

Contact your IBM marketing representative for information concerning the InfoPrint 60 and 3160, their documentation, or their associated licensed programs.

Chapter 1. InfoPrint 60 and 3160-001 Printers

Chapter Overview

This chapter describes the characteristics, functions, features, and components of the InfoPrint 60 printer and the 3160-001 Advanced Function Printer.

General Description

These printers are cut-sheet, intermediate speed, non-impact, all-points-addressable printers. They use low-power laser, electrophotographic print technology, and are capable of a volume-capacity of up to 750 000 impressions per month at speeds of up to 60 impressions per minute.

Two models are available, the 3160-001 and the InfoPrint 60. The 3160-001 prints at a resolution of 240 x 240 picture elements (pels) and the InfoPrint 60 at 600 x 600 pels. Both models can be used for text, graphics, optical character recognition (OCR), and bar code printing. Text, images, and electronic overlays can be placed at any defined point on the page areas on which the printer can print.

Note: In this guide, the unspecified term "printer" refers to *both* models. Likewise, if a statement is made without reference to a particular model, it refers to both models.

These printers also feature a high-speed RISC/6000-based control unit, which provides the following benefits:

- The ability to process complex print jobs at high speed
- Expanded network attachment capability
- Improved paper handling

Special Features

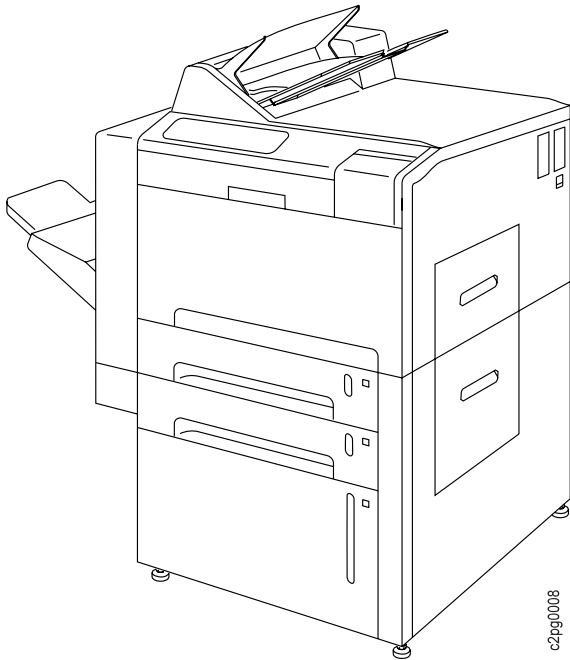
Contact your marketing representative about obtaining these features:

- 2000-sheet (optional) input tray (adjustable for A4 or letter-size paper)
- 3000-sheet side stacker (option) with convenience stapler
- Additional memory (3160-001: 16 MB or 32 MB increment; InfoPrint 60: 32 MB or 64 MB increment)
- Ethernet Transmission Control Protocol/Internet Protocol (TCP/IP) interfaces:
 - 10BaseT (twisted pair)
 - 10Base2 (thin)
 - 10Base5 (thick) (3160-001)
- Token Ring with SNA (3160-001)
- Token Ring for Transmission Control Protocol/Internet Protocol (TCP/IP)
- System/370 Parallel Channel Attachment (3160-001)

The InfoPrint60 and 3160-001 come with the following:

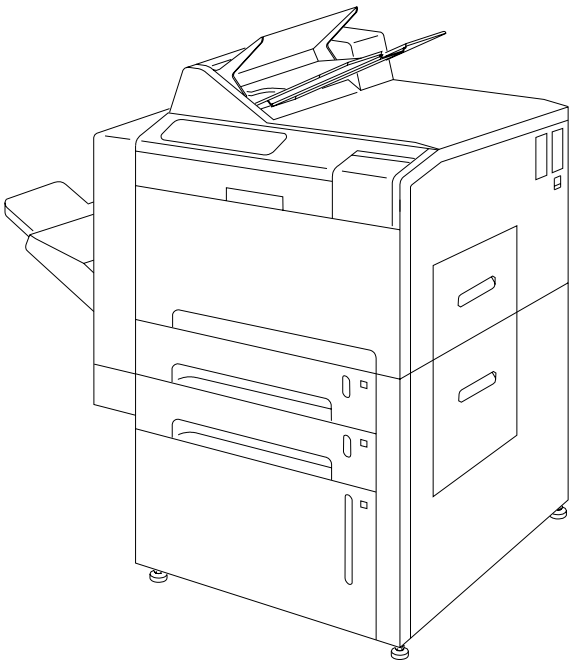
Machine

Comes with This...

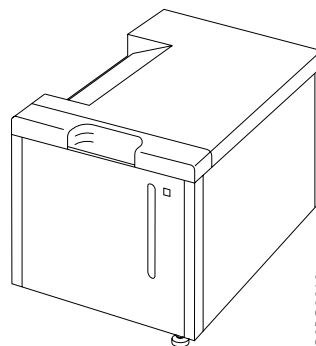


- One 500-sheet top stacker.
- A 1500-sheet side stacker.
- Three paper input sources (3000-sheets total). An optional 2000-sheet tray is available. See “Special Features” on page 1 and the drawing at the bottom of this page.
- Paper sizes: letter, legal, ledger, A3, A4, B4, B5.
- Advanced function common control unit (AFCCU) with 32 MB of storage (3160-001) or 64 MB (InfoPrint 60). Additional memory is available in 16MB increments up to a maximum of 64MB (3160-001) or 32 MB increments up to a maximum of 128MB (InfoPrint 60).
- One attachment feature (see “Special Features” on page 1). You must order at least one.

Standard Printer

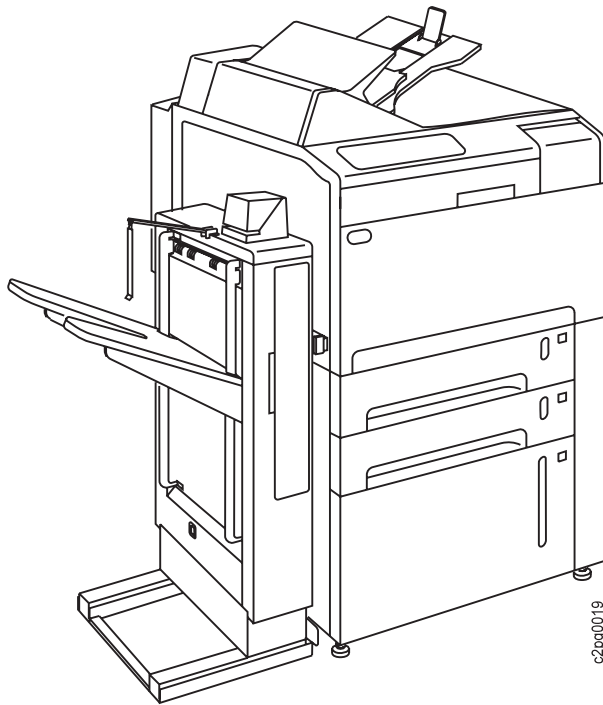


- All of the above, plus a 2000-sheet input tray.



Printer with the Optional 2000-Sheet Input Tray Feature

Machine**Comes with This...**



- The standard machine, plus a 3000-sheet output stacker with convenience stapler.

| *Printer with the Optional 3000-Sheet Side Stacker Feature*

Host Environments

For a summary of host environments and support, see Appendix B, “Software and Hardware Requirements” on page 55. For a summary of PSF support and host software requirements, refer to *Advanced Function Presentation: Printer Information*, G544-3290 and to the *Intelligent Printer Data Stream Reference*, S544-3417.

Application Environment

| The printer supports IBM Advanced Function Presentation (AFP) software, a collection of licensed programs that let application developers take advantage of many special kinds of printing, including bar code and optical character recognition (OCR) output. Two OCR fonts are available from IBM: OCR-A and OCR-B.

Advanced Function Presentation uses the intelligent printer data stream (IPDS) to drive the printer. Refer to the *Guide to Advanced Function Presentation*, G544-3876, and the *Intelligent Printer Data Stream Reference*, S544-3417, for more information.

Operational Features

The following list summarizes some of the operational features of the printer:

- **Standalone operation**—The printer is designed to operate in an unattended office environment. It does not require a dedicated operator for normal printing tasks.
- **Operator messages and actions**— The printer has a 32-character display for messages, operator instructions, setup options, and host-related status.
- **Beeper**— A beeper can alert operators when the printer requires attention.
- **Problem indicators**— LEDs on a printer icon at the left of the operator panel indicate where a problem such as a paper jam occurs.
- **Paper jam auto-eject doors**—After a paper jam, you can usually automatically clear the jammed paper by opening one or two doors.
- **Traces**—The printer can perform several kinds of traces, which record details about printer activities and communications with the control unit and the controlling computer system, to assist service personnel.
- **Print samples**—Several print sample masters are stored in the printer control memory. Key operators can print these print samples whenever necessary to sample print quality and solve problems.
- **Authorization levels**—You can have one or more persons designated as a key operator. The key operator performs tasks such as configuring the printer, cleaning the printer, adding new toner, and replacing supplies.
- **Password protection**—You can specify that certain operator actions be password-protected; in other words, only the person who knows the password can perform certain key operator functions.
- **Toner cartridge**—The printer monitors the toner supply and alerts the operator when it should be replenished. In addition, automatic toner recycling reduces the amount of toner the printer uses.
- **Error log**—Sensors and other error-checking hardware detect status in the printer. Information about errors is displayed to the operator and logged for use in correcting problems.

Data Security

The printer has the following data security features:

- You cannot read data from the printer back to the controlling computer system.
- You cannot print data that remains in memory after a job is finished.
- Images on the photoconductor are cleaned and erased after each print.
- The control unit accepts commands from the host to erase all residual print data and fonts from its memory.
- Characters stored in memory cannot be easily interpreted because they are translated into a form different from 8-bit EBCDIC characters.

If many of the printing applications for your company are confidential, consider placing the printer in a controlled-access area.

Fonts

The printer supports the following:

- The IBM strategic font set, which includes:
 - The IBM Core Interchange Resident Scalable Font Set
 - The 4028 Compatibility Resident Font Set
 - The IBM Coordinated Font Set
- The DBCS Resident Raster Font Set (as a separately-orderable feature)

For a more detailed description of each font set, see Appendix A, “3160 Font Set” on page 39.

Performance and Print Quality

The printer prints up to 60 impressions per minute in either simplex or duplex mode when using long-edge-fed paper; it prints up to 30 impressions per minute for short-edge-fed paper. Table 1 on page 6 summarizes the types of paper you can use and the maximum impressions per minute you can print.

Notes:

1. Actual printer performance is affected by a number of factors, including how you configure the printer, the complexity of the data you print, the performance of the host-system and the attachment you use, and the amount of available memory.
2. The quality of printer output is affected by the paper you use and the composition of the logical pages you print.

Advanced Function Image and Graphics

The printer can directly process advanced Image Object Content Architecture (IOCA) images and Graphics Object Content Architecture (GOCA) graphics data, as described in *Mixed Object Document Content Architecture Reference*, SC31-6802. This provides the following performance benefits:

- The printer can process compressed images and vector graphics data in the GOCA format, thus reducing demand on attachment data transfer and host storage.
- The printer, rather than the host system, decompresses images and rasterizes vectors, thus reducing host system processing cycles.
- The printer can perform arbitrary scaling operations or resolution correction for scanned images, which allows some complex jobs to print at greater throughput by increasing the overall data-processing speed of the printer.

Print Material and Paper Handling

The printer can use paper in a variety of sizes and weights, including preprinted paper, perforated paper, punched paper, drilled paper, color stock, and adhesive labels. The printer can accept paper with a basis weight of 64 to 160 grams per square meter (17 to 42 pounds). Paper is fed automatically from paper trays and, after printing, is automatically placed in output stackers.

Table 1 summarizes the paper sizes the printer can use and indicates the feed orientation and the number of impressions per minute for each paper size. See “Selecting Paper” on page 32 for more information on print materials you can use.

Paper Size	Feed Orientation	Impressions per Minute
A4 (210 x 297 mm) Letter (8.5 x 11 in.)	Long-edge Long-edge	60 60
Legal (8.5 x 14 in.) B4 (257 x 364 mm) Ledger (11 x 17 in.) A3 (297 x 420 mm) B5 (182 x 257 mm)	Short-edge Short-edge Short-edge Short-edge Long-edge	30 30 30 30 60
Note: When the paper (weight) is heavier than 22 pounds (88g/m ²), print speed may be reduced by 17%		

Paper input trays provide automatic, printer-controlled paper tray switching so you can load unused paper trays while the printer is running. Prints are stacked in output stackers that have offsetting capability.

The duplex mode lets you print both sides of the paper without restacking and refeeding the sheets.

Chapter 2. Planning Overview

Chapter Overview

This chapter provides an overview of the planning process for installing an InfoPrint 60 or 3160-001 printer.

There are two basic types of planning required for installing and using the printer: physical planning and system planning.

- Physical planning consists of:
 - Determining the location for the printer.
 - Preparing a layout plan for the printer
 - Making sure all printer environmental, electrical, and space requirements are met

For more information, see Chapter 4, "Preparing the Physical Environment" on page 15. In addition, IBM offers special assistance with physical planning. Contact your IBM branch office for information.

- System planning consists of:
 - Ordering the Advanced Function Presentation licensed programs and updates required to use the printer
 - Installing and testing the licensed programs and AFP resources
 - Verifying that the host operating system is at the correct level
 - Incorporating the printer into the system configuration and completing the configuration worksheets

For more information, see Chapter 3, "Preparing the Processing Environment" on page 11, and Chapter 5, "Configuring the Printer and Its Attachments" on page 23 .

Another useful source of information when you are planning to install an IBM InfoPrint 60 Printer or 3160 Advanced Function Printer is Preventative Service Planning (PSP) "Buckets," accessible through IBM Link. The correct upgrade name is PSF Printers, and the subset is 3160. For help accessing this aid, call the IBM Support Center at 1-800-237-5511.

You can also visit IBM Printer Systems Company on the World Wide Web at <http://www.can.ibm.com/ibmprinters>.

Sample Implementation Plan

Note

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

Also, note that the tasks you need to perform depend on whether or not you are already running Advanced Function Presentation (AFP) programs.

Step One—Identify Team and Plan Layout

- ___ 1. Identify the people who can prepare the physical site, identify and test required software, and configure the host systems. Make sure to plan for the printer **and** the attachment you use to connect it to your host system.
- ___ 2. Order the printer including optional features you require, such as extra memory.
- ___ 3. Order any cabling, lines, equipment, or software you require for the attachment you use to connect the printer to your host system.
- ___ 4. Order the IBM Advanced Function Presentation licensed programs required for your system. If you already use IBM Advanced Function Presentation licensed programs, make sure they are at the service level required to support the printer.
- ___ 5. Make sure the host operating system is at the level required to support the Advanced Function Presentation licensed programs and their updates.
- ___ 6. Determine which printer resolution will be used and make sure the host library resources (fonts, page segments, overlays, FORMDEFs, and PAGEDEFs) are compatible with the printer resolution you select.
- ___ 7. Prepare a plan for selecting and testing forms for use with the printer.
- ___ 8. Determine the location for the printer and arrange for any changes to the site.
- ___ 9. Identify the internal delivery route for the printer
- ___ 10. Prepare a space layout plan.
- ___ 11. Determine who will install the electrical wiring and outlets.
- ___ 12. Create a conversion plan for line-printer data and electronic overlays.
- ___ 13. Prepare a plan for creating, converting, and testing applications that will be used with the printer

Step Two—Review Plans, Order Supplies, and Prepare Site

- ___ 1. Review installation plans with the IBM installation planning representative.
- ___ 2. Order initial supplies for the printer.
- ___ 3. Make sure attachment hardware is on order.
- ___ 4. Schedule the installation of lines and equipment required for the attachment.
- ___ 5. Schedule the installation of electrical wiring and outlets.

- ___ 6. Make sure required host system updates are installed.
- ___ 7. Begin installing and testing the Advanced Function Presentation licensed programs and updates on the host system.

Step Three—Review Progress of Site Preparation

- ___ 1. Review site-preparation progress with the IBM installation planning representative.
- ___ 2. Make sure the electrical wiring and outlets are being installed on schedule.
- ___ 3. Make sure the attachment lines and equipment are being installed on schedule.

Step Four—Make sure Site Preparation is Complete

- ___ 1. Make sure installation and testing of electrical wiring and outlet is complete.
- ___ 2. Make sure all site preparation activity is complete.
- ___ 3. Gather information for the configuration worksheets in Chapter 5, “Configuring the Printer and Its Attachments” on page 23, and schedule an NCP Generation if needed.

Important

Before the customer engineer can install the printer you must complete a configuration worksheet for the attachments you plan to use. Completing the attachment worksheets usually requires input from the personnel responsible for network and device driver configuration.

Simplified versions of these worksheets are available in this book (see “System Attachment Worksheets” on page 24). However, for detailed worksheets, instructions, and examples, please refer to the *IBM InfoPrint 60; 3130, 3160, and 3935 Advanced Function Printers: Attachment Configuration Handbook*, S544-3977. If you do not have a copy of the handbook, ask your marketing representative to obtain one for you.

Step Five—Arrival of the 3160

- ___ 1. Contact the customer engineer and arrange to have the printer installed.
- ___ 2. Arrange to have the printer attached to the host system.
- ___ 3. Complete tests of the Advanced Function Presentation licensed programs, including the IBM-supplied installation verification procedures.

Additional Planning Tasks

Here are some other issues to consider before you install the printer

- **Training**—Who will need training on the printer and AFP? Who will conduct the training sessions? When will training be scheduled?
- **Implementation**—How will the printer be phased into production? Which applications will use the printer first?
- **Documentation**—Which local procedures need to be changed? Who will be responsible for changing local procedures? Who will need copies of IBM hardware and software documents?
- **Supplies**—How large should the initial printer supply order be? What is the local procedure for ensuring that supplies are kept in stock? What is the anticipated usage of the printer

Chapter 3. Preparing the Processing Environment

Chapter Overview

This chapter contains information to help system programmers integrate the printer into the existing processing environment. The basic hardware, software, and application requirements for the printer are described in “Host Environments” on page 3 and “Application Environment” on page 3.

Performance Considerations

- The quality of printer output is affected by the paper you use and the composition of the logical pages you print. To ensure printing legibility in your application, test small (4-point) fonts and special characters such as logos in your application. Refer to the *IBM Advanced Function Printer Cut-Sheet Paper Reference for Use with IBM Electrophotographic Printers*, G544-3915, for information about these considerations.
- The following factors affect the performance of the system and directly affect communication to the printer:
 - Speed of the computer system
 - Amount of available memory
 - Priority of tasks assigned in the system
 - Control program used to drive the printer
 - Attachment type and line speed
 - Workload on the LAN when using a LAN attachment, such as TCP/IP over Token-Ring or Ethernet
- Consider the following when setting up your host-attachment configuration:
 - Before attaching the printer to non-IBM equipment, ensure that the equipment supports the printer. The equipment vendor can answer your questions about configuration options and other attachment issues.
 - High-speed, direct-access storage devices (DASD) are recommended for spool data sets and library data sets, particularly for printing workloads consisting of documents with many fonts and images.
 - Printer performance is best when high-use devices are used on a separate attachment from the printer. Printer throughput can be degraded if the printer is attached with other high-use devices, such as disk units, tape units, or another printer that prints complex documents.
- Printer traces, which you can run to help diagnose problems with the attachment, the software, or the printer microcode, run in the background while the printer performs its normal operations, and may reduce throughput.
- To minimize the downloading of fonts, consider using printer resident fonts when possible.
- When memory can hold fonts and images for several pages at one time, performance improves substantially. Complex documents require more memory and, therefore, can take longer to print.

The printer uses 6 MB of its 32 MB (3160-001) or 64 MB (InfoPrint 60) of standard memory for downloading fonts, page segments, and overlays. To determine if this is enough, calculate the total memory you need for fonts and images on that page.

Depending on the size and number of characters within a font, about 25 kbytes to 37.5 kbytes of memory are needed for each single-byte font. Additionally, at least 7.5 kbytes of memory are needed for each square inch of image data when the resolution is 240 x 240 (3160-001), and 45 kbytes per square inch when the resolution is 600 x 600 (InfoPrint 60). For better performance within a job, consider the font and image memory requirements for all of the pages that comprise the job.

Note: The figures given here reflect memory requirements for normal usage and are provided only as a guideline. Under unusual circumstances, there can be additional considerations. For example, there is a limit to the total number of characters and images that can be stored in memory.

If you need additional memory, contact your IBM marketing representative. The 3160-001 can be upgraded with an additional 16 or 32 MB of memory, and the InfoPrint 60 with 32 or 64 MB.

Compatibility Considerations

Here are some factors to consider if you are sending jobs from other page printers to the InfoPrint 60 or 3160-001 printer.

- The printer supports fonts in the same format as those for the IBM 3130, 3820, 3825, 3827, 3828, 3835, and 3900 printers. User-modified or user-created 3800 printer fonts are not compatible with this printer's fonts.
- Although the printer can print edge to edge, consider paper registration and size variations when defining the margins.
- The printer can print to the paper's edge, but for the best print quality, the following margins are recommended:

Edges: 2.5 mm (0.1 in.)

Punched holes: 3.0 mm (1.2 in.)

- The printer's default point of origin is the top left corner of the short side of the media.

Attachments

important

Attaching your printer to your host system requires configuration changes to the host system. Depending on the type of attachment and the host system you use, you may need to make some configuration changes before you can install the printer. Several printer configuration parameters require values that match values in your host system; at the least, you need to be prepared to provide these values to the customer engineer who installs the printer.

See Chapter 5, “Configuring the Printer and Its Attachments” on page 23 for more details about configuring host systems.

Advanced Function Presentation Licensed Programs

Some Advanced Function Presentation (AFP) licensed programs are required for the operation of the printer; others are optional. Work with your users to determine which optional advanced functions they need. For a list of publications that describe the programs you require for a particular environment, as well as a summary of Advanced Function Presentation concepts, products, and benefits, refer to the *Guide to Advanced Function Presentation*, G544-3876.

Installing and Verifying AFP Programs

Install and verify AFP programs before you install the printer. The licensed programs include verification procedures to help you install the software correctly. In addition, the system programmer is responsible for:

- Creating the resources (page definitions, electronic overlays, form definitions, and page segments) that the resource libraries will contain, beyond the resources shipped with the PSF products being used
- Creating or modifying the PSF startup procedure to include resource libraries and attachment information
- Enabling printer resident fonts, if necessary

Conversion

If Advanced Function Presentation is on another printer, you may begin the conversion effort before you install the printer. Some tasks to consider are:

- 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 InfoPrint 60 or 3160-001 functions
- Investigating applications that have special programming requirements

AS/400 Migration Considerations

Here are some things to consider if you migrate your print workload to an InfoPrint 60 or 3160-001 printer attached to an AS/400 operating in the OS/400 environment.

Bolding Characters

Both OfficeVision and Data Description Specification (DDS, the native OS/400 key word HIGHLIGHT function) enable you to make characters bold by using a font modification parameter. The printer automatically prints the indicated characters bold for any font supported by the printer. The printer supports this same function for the set of fonts resident in the printer that have bold versions.

See “AS/400 Bolding Function, Native and OfficeVision” on page 52 for a list of the printer fonts and what will occur when the bolding function is invoked.

Important

Bolding may cause changes to line length, and in some cases may cause information to exceed the page width.

Enlarge Print Function

OfficeVision/400, the Advanced Function Presentation Utilities/400, and the Data Description Specification (DDS), native OS/400 keyword for CHRSHZ enable you to direct the printer to enlarge characters. This function is not supported on the InfoPrint 60 or 3160-001 using fonts selected by FGID (Font Global ID). This function is supported only under DDS if you use GDDM fonts. GDDM fonts are selected by name, such as ADMVMOB for Multinational Open Block.

Box Draw Function

OfficeVision lets you draw boxes with the cursor and then print them as drawn. The printer supports this function if you specify **ON** for the AS/400 Box Draw Enhancement printer configuration item. If you specify **OFF** for the AS/400 Box Draw Enhancement printer, boxes drawn with OfficeVision will have breaks in them.

Note: To print boxes correctly, the printer substitutes code page 1091 for code page 259.

Chapter 4. Preparing the Physical Environment

Chapter Overview

This chapter describes the environmental, power, physical, and space requirements you must meet before you install the printer. It includes an installation planning worksheet.

Environmental Requirements

Temperature and Humidity

Table 2 lists the permitted temperature and relative humidity values for the printer. Operating the printer above or below these ranges may result in poor print quality and degraded paper handling.

<i>Table 2. 3160 Temperature and Humidity Ranges</i>		
	Temperature (Dry Bulb)	Relative Humidity
Power on operations	10 to 32°C (50 to 90°F)	20% to 80%
Power off	10 to 40°C (50 to 104°F)	8% to 80%
Shipping and storage	-10 to 40°C (14 to 104°F)	5% to 90%

Altitude Range

The altitude range permitted for printer operation is sea level to 2133 meters (7000 feet).

Ventilation

The printer operates best in an air-conditioned computer room with year-round humidity control and recirculated, filtered air. Dust and other contamination can cause machine problems.

To reduce any health risks associated with preprinted forms, follow IBM preprinted forms recommendations and provide appropriate ventilation to the printer area. The American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) recommends a minimum of 0.42-0.57 meters³/minute (15-20 ft³/minute) per person of outdoor air make-up for an office size of 12 ft x 12 ft x 8 ft (32.4 Meter³) during human occupancy (ASHRAE 62-1989).

For information about selecting and safely using preprinted forms, refer to the *IBM Advanced Function Printer: Cut-Sheet Paper Reference for Use with IBM Electrophotographic Printers*, G544-3915.

Heat and Airflow

Average heat dissipation of the printer while printing is less than 27 kcal/minute (107 BTU/minute), based on 1.5 kVA for the printer.

No airflow restrictions apply if the printer is installed according to the guidelines and floor plans established in this document.

Sound Levels

The upper limits for sound level are listed in Table 3.

<i>Table 3. Sound Levels</i>	
Printer Condition	Sound Level
Idle	6.5 bels (54 dBA)
Operating	7.2 bels (60 dBA)

Power Requirements

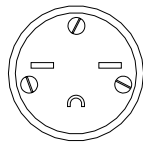
Warning

Do not connect the printer to any 380—415 IT power distribution system (impedance grounded neutral system).

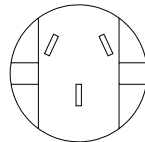
Make sure your installation meets the electrical power requirements listed in Table 4 on page 17 before the printer is delivered. In addition:

- Reserve a dedicated circuit to support the printer and to allow the printer to be disconnected from power. If you order the 3000-sheet side stacker (option), reserve another dedicated circuit for it or put it on the same circuit as the printer. Do not put anything else on the circuits dedicated to the printer, to the stacker, or to the printer and stacker.
- Provide electrical outlets for auxiliary equipment, such as modems or communication modules. If necessary, make sure a telephone line and jack are available.
- For your safety, the printer is equipped with a plug required and approved by UL and CSA. Use it in conjunction with a properly grounded receptacle.

<i>Table 4. Power Source Requirements</i>	
Item	Requirements
Volts ac	200V to 240V ac \pm 10%, single phase, two wires plus ground
Nominal frequency	48 to 62 Hz \pm 1.0%
Input current Printer 3000-sheet side stacker (option)	9.0 amperes 0.093 amperes
Power input Printer 3000-sheet side stacker (option)	0.8 kVA (maximum standby) 1.5 kVA (maximum printing) 0.02 kVA (maximum standby) 0.07 kVA (maximum printing)
Power cord plug	NEMA 6-15R (in-line connector) NEMA 6-15P (plug)
Notes:	
<ol style="list-style-type: none"> 1. Grounded neutral is required for the 50 Hz, 200-240 volt version of the printer. 2. Non-earthed neutral and impedance grounded neutral are NOT supported by the 50 Hz, 200-240 volt version of the printer and could damage components. 	



United States
(NEMA 6-15P)



Australia
New Zealand
(EANSW)

C 3 P 10 0 0 1

Figure 1. Power Plug and Connector

Power Dissipation

The printer can enter a power-save mode after a specified time has elapsed with no printer activity. When the printer enters power-save, it removes power from all printer subsystems. Normal operation resumes when the printer receives a host command.

<i>Table 5. Power Dissipation</i>	
Mode	Power Usage
Printing (fuser on)	1200 watts
Standby (fuser off)	340 watts

Physical Requirements

Weight and Dimensions

<i>Table 6. Weight</i>		
Unit	Weight (kilograms)	Weight (pounds)
3160-001	223	492
InfoPrint 60	227	500
1500-sheet side stacker	13	29
3000-sheet side stacker (option)	35	77

Figure 2 on page 19 shows the dimensions of the printer, except the height, which is 130 cm (51.2 in.).

Service Clearances

Refer to Figure 2 on page 19.

Physical Layout and Space Requirements

Figure 2 shows the space requirements for a permanent installation.

As you plan your physical layout:

- Install the printer away from the main traffic pattern. Allow space for key operators and customer engineers to perform their tasks. This space should not extend into walkways.
- Install the printer in a location that is convenient for the key operator and other users. For example, consider whether the planned location is close to printer supply storage areas and to output distribution areas.
- Allow 2.1 meters (83 in.) 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 customer engineers space in which to work.
- Check the route that the printer must travel from your loading dock to the location where it will be installed, to ensure that it fits through the doorways and halls. When possible, move the printer from the dock to its installation location on its shipping pallet.

Note: Install the printer permanently in the service position if you attach it to a System/370 parallel channel (available only with 3160-001).

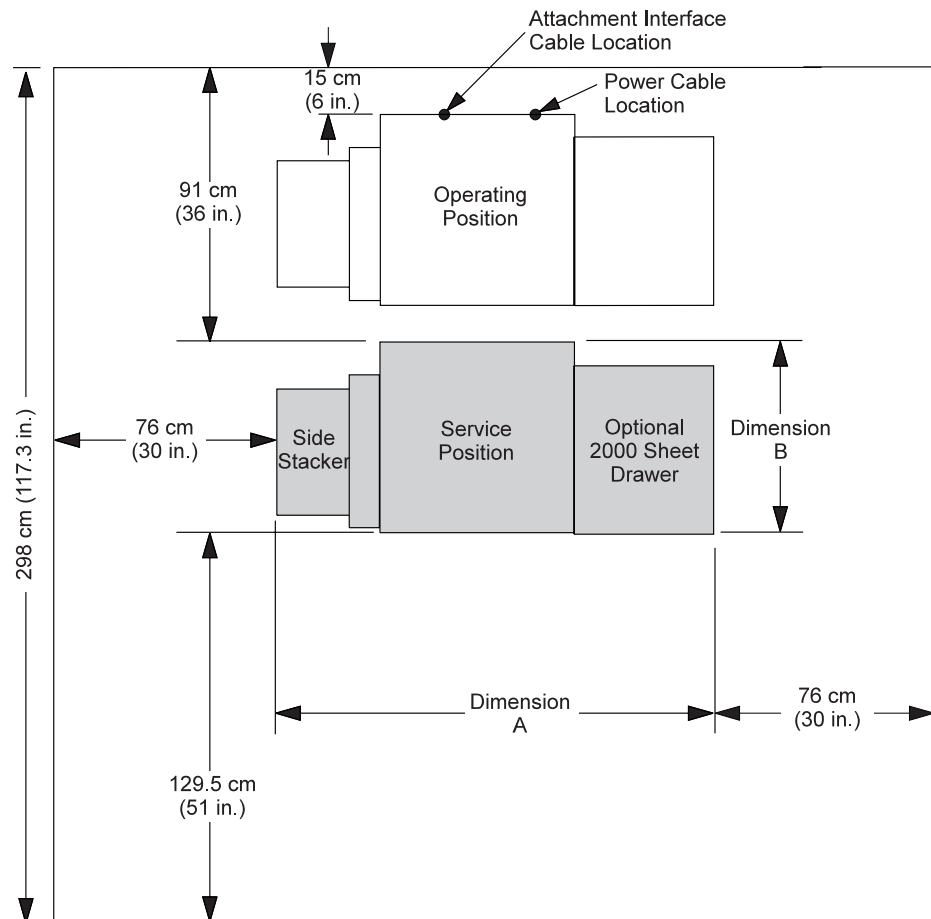


Figure 2. Service Clearances

Dimension A Values:

Dimension A	Configuration
65 cm (25.6 in.)	Base printer without side stacker and 2000-sheet tray
40.5 cm (15.9 in.)	Add to base printer for side stacker with short paper
50.2 cm (19.8 in.)	Add to base printer for side stacker with long paper (A3 and Ledger)
46 cm (18 in.)	Add to base printer for optional 2000-sheet tray
70.2 cm (27.6 in.)	Add to base printer for 3000-sheet side stacker (option). This dimension includes 6 inches of travel when stacker is pulled away from printer to remove paper jams.

Dimension B Values:

Dimension B	Model
69.5 cm (27.4 in.)	3160-001
77 cm (30.3 in.)	InfoPrint 60

Installation Requirements

Procedures for installing the printer are included with the printer and in the *IBM InfoPrint 60; 3160 Advanced Function Printer: Maintenance Information*, 30H7534. Although a service person installs the printer, the customer is responsible for the following pre-installation tasks:

- Make sure the environmental, electrical, and space requirements specified in this chapter are met. Use the “Installation Planning Worksheet” on page 21 to complete this step.
- Make sure the receiving area and internal delivery route contain no obstacles that might interfere with moving the printer to its planned location:
 - Halls and doorways must be large enough for the printer to pass through, and corners and angles must be large enough to permit the printer to turn. For example, the minimum doorway opening through which this printer can pass from a 91.5 cm (36 in.) wide aisle is 75 cm (30 in.).
 - Ramps must have no more than 12 degrees, 50 minutes incline to allow clearance for the lower edge of the printer with its supporting feet retracted.
 - Elevators and elevator doorways must be able to accommodate the size and weight of the printer and the people who are moving it.
 - Stairs, sills, and gaps, and carpeting can make rolling the printer difficult.
- Do not tilt the printer more than 15°.
- Make sure that the floor is level within $\pm 1.5^\circ$ from earth horizontal in any plane.
- Make sure that an approved electrical outlet with correct power is reserved for the printer (and another for the 3000-sheet stacker (option), if appropriate), and that it can be reached with the power cable.
- If the printer is being installed in an area with a raised floor, make sure the access hole in the raised floor is large enough for both the communication attachment cables and the power cable.

Installation Planning Worksheet

Before your printer is delivered, prepare a site installation plan. Use the following worksheet (Table 7) to ensure that all of the pre-installation requirements are met.

<i>Table 7. Installation Planning Worksheet</i>					
Requirements	Meets Requirements	Needs Attention	Assigned to	Date Due	Date Completed
Environmental <ul style="list-style-type: none"> • Ventilation • Temperature • Relative humidity 	_____	_____	_____	_____	_____
Space <ul style="list-style-type: none"> • Layout • Supplies storage space • Clearances • Delivery route 	_____	_____	_____	_____	_____
Electrical <ul style="list-style-type: none"> • Voltage • Outlets: <ul style="list-style-type: none"> – Reached by cables? – Correctly grounded? – Meet local and national codes? • Building branch circuit: <ul style="list-style-type: none"> – Correctly grounded? – Enough power to meet needs? – Meets local and national codes? 	_____	_____	_____	_____	_____
Host Attachment <ul style="list-style-type: none"> • Cables • Lines • Other equipment 	_____	_____	_____	_____	_____
Security	_____	_____	_____	_____	_____

Chapter 5. Configuring the Printer and Its Attachments

Chapter Overview

This chapter contains worksheets you can use to configure the printer and the attachments you use to connect host systems to the printer.

Printer Configuration

Fill in the information on Table 8, and give a copy of the completed form to the customer engineer when the printer is installed. The customer engineer will use the worksheet to configure the printer. You can change some of these options later.

The procedures for configuring the printer are in *IBM InfoPrint 60; 3160 Advanced Function Printer: Maintenance Information*, 30H7534. The procedures for updating the configuration are in *IBM InfoPrint 60: User's Guide*, G544-5232, and *IBM 3160 Advanced Function Printer: User's Guide*, G544-5243.

Item	Available Values	Selected Value
AUTOSTART	YES or NO	
DUPLEX	ENABLE or DISABLE	
DEFAULT FONT	Several	
AS/400 BOX DRAW ENHANCEMENT	ON or OFF	
LOGICAL PAGE INCREMENT	0 PELS to +20 PELS	
BEEPER	ERROR: TIMED, CONTINUOUS, OFF KEYS: ON or OFF	
SLEEP TIME	Up to 3 digits (minutes)	
LANGUAGE (For operator panel display only)	ENGLISH, FRENCH, GERMAN, JAPANESE (KATAKANA), ITALIAN, SPANISH, DUTCH, BRAZILIAN PORTUGUESE	
3935 EMULATION	ON or OFF	
OPTICAL DENSITY	NORMAL or HIGH	

Autostart

A yes or no indication of whether the printer performs an autostart during power-on. With autostart, the printer automatically enables the attachment that was enabled at the time of the last power-off. The printer then makes itself ready.

Note: When *Autostart* has been defined NO, TCP/IP communication defaults to *disabled* after an unexpected shutoff (for example, a power outage, pressing the off switch inadvertently). This results in messages declaring that PSF cannot communicate with the printer. Therefore, in distributed LAN environments using TCP/IP protocols, you will probably decide to define *Autostart* YES.

Duplex

An indication of whether the printer is enabled for duplex printing

Default font

The font that is used when no font is designated by the host. Unless you specify otherwise, the default font is Courier Roman Medium 12 pitch (10 point) using code page 500, version 1.

AS/400 Box Draw Enhancement

If set ON, the printer can correctly print boxes drawn with OfficeVision. If set to OFF, boxes drawn with OfficeVision will have breaks in them.

Note: To print boxes correctly, the printer substitutes code page 1091 for code page 259.

Logical page increment

This number expands the logical page for cases in which the printable page is larger than the logical page (or printed sheet).

Beeper

A beeper sounds when the printer detects an error or when keys are pressed during menu mode:

- You can set the *error* beeper to:
 - Beep until any operator panel key is selected
 - Beep for three minutes and then stop
 - Never beep at all
- You can set the *keys* beeper to on or off.

Sleep time

The number of minutes the printer waits before it goes into *power-save mode*. Specify a value from 0 to 999. '0' means the printer will never go into power-save mode.

Language

The language used to display operator console text for general users and key operators. Text for customer engineers is in English only.

3935 Emulation

This function is used for AS/400 installations. When it is turned on, the printer communicates with the host. When it is turned off, the printer responds as an InfoPrint 60 or 3160 Advanced Function Printer. This emulation is required if the host system does not support the InfoPrint 60 or 3160-001 printer.

Note: This printer will not emulate 3935 function.

Optical Density

This indicates the degree of print darkness of a printed page. You can choose a lighter print density to add detail to a fine line, or darker print density to enhance graphics or images. The recommended density is medium. The darker selection (dark) uses more toner, and the lighter selection (light), less toner.

System Attachment Worksheets

Important

Appendix B, "Software and Hardware Requirements" on page 55 summarizes the host environments that support this printer and the attachments that run under each.

Before the customer engineer can install the printer you must complete the appropriate attachment configuration worksheets. Simplified versions of these worksheets are available in the sections that follow. For detailed worksheets, instructions, and examples, refer to the *IBM InfoPrint 60; 3130, 3160, and 3935 Advanced Function Printers: Attachment Configuration Handbook, S544-3977*. If you do not have a copy, ask your marketing representative to get you one.

Ethernet TCP/IP Attachment Worksheet

Important

Installing an Ethernet attachment requires changes to your host system configuration. For detailed worksheets, instructions, and examples, refer to the *IBM InfoPrint 60; 3130, 3160, and 3935 Advanced Function Printers: Attachment Configuration Handbook, S544-3977*.

The printer is connected to a host Ethernet using the Integrated Ethernet LAN adapter contained in the control unit.

The control unit can be attached directly to standard Thick (10Base5) Ethernet coaxial cable (Feature Code 4163) (3160-001). The output connector is a thick, 15-pin, D-shell "slide-latch" type that is compatible with IEEE 802.3 Section 7.6. Connection to thick Ethernet media is through an Ethernet/IEEE 802.3 AUI cable available from OEM vendors. Attachment to thin (10Base2) or twisted-pair (10BaseT) Ethernet media is through external transceivers.

The coaxial T connector is used in addition to the 10Base2 transceiver to connect to the thin Ethernet coaxial cable. You should use a customer-supplied RJ45 unshielded twisted-pair cable (must meet IEEE 802.3 requirements) to attach the 10BaseT transceiver to the Ethernet twisted-pair hub.

Table 9. Ethernet TCP/IP Configuration

Item	Available Values	Selected Value
Install Status	Installed or Not Installed	
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 (bytes)	
IEEE802.3 MTU Size	60 to 1492 (bytes)	
Ethernet Type	Standard or IEEE802.3	
Alternate Address	0000 0000 0001 to FFFF FFFF FFFE ¹	
MAC (Medium Access Control)	Read-only field	
Note:		
¹ Do not enter the spaces shown; they are included here as a visual aid.		

Install status An indication of whether the attachment is installed.

TCP port The TCP socket address of the attachment. This value must match the corresponding host parameter.

IP address The Internet Protocol address of the printer in dotted decimal format.

Subnet mask The mask identifying the local subnet in dotted decimal format. If there is no local subnet, leave this field blank.

Default gateway address The IP address of the default gateway in dotted decimal format.

Standard MTU size MTU is an abbreviation for maximum transmission unit. This TCP/IP Ethernet type ranges from 60 to 1500.

IEEE802.3 MTU size

This TCP/IP Ethernet type ranges from 60 to 1492.

Ethernet type

The Ethernet type, either standard or IEEE802.3.

Alternate Address (Local Adapter Address)

The LAN adapter unique address for the printer. The address must be different from other addresses on the LAN.

MAC (Medium Access Control)

Read-only field.

SNA Token-Ring Attachment Worksheet

Note: SNA token-ring attachment is available on the 3160-001 only.

Important

Installing a token-ring attachment requires changes to your host system configuration. For detailed worksheets, instructions, and examples, refer to the *IBM InfoPrint 60; 3130, 3160, and 3935 Advanced Function Printers: Attachment Configuration Handbook, S544-3977*.

The printer can be attached to a host system using a 4 Mbps or 16 Mbps token-ring local area network (LAN), with the IBM Token-Ring cabling and Token-Ring High-Performance Adapter contained in the printer control unit (or Auto Token-Ring LANstreamer adapter contained in the printer control unit for the InfoPrint 60).

The maximum allowable distance of the printer from the 8228 Multistation Access Unit or 8230 Controlled Access Unit depends on several factors. In general, a maximum distance of 100 meters (328 feet) is allowed. However, to calculate the exact maximum distance, refer to *IBM Token-Ring Network Introduction and Planning Guide, GA27-3677*. An 8219 or 8220 Optical Fiber Repeater can be used to increase this distance.

Table 10 (Page 1 of 2). SNA Token-Ring Attachment Worksheet

Item	Available Values	Selected Value
Install Status	Installed or Not Installed	
XID Number	0000 0000 to FFFF FFFF ³	
Remote Network Name	Up to 8 characters ¹	
SNA Intervention Timer	0 to 99 (Minutes), Default=99	
Local LU Name	Up to 8 characters ¹	
Remote LU Name	Up to 8 characters ¹	
Mode Name	Up to 8 characters ¹ or null	
Remote Address	4000 0000 0000 to 7FFF FFFF FFFF ³	
Local Network Name	Up to 8 characters ¹	
Control Point Name	Up to 8 characters ¹	
Alternate Address (Local Adapter Address)	4000 0000 0000 to 7FFF FFFF FFFF ³	
Ring Speed	4 or 16 (Mbps)	
SSCP ID (0500 0000 xxxx)	0000 to FFFF ²	
Local LU Address	0 to 255 (0 for Independent LU, 1 to 255 for Dependent LU)	
Call Type	Listen or Call	

Table 10 (Page 2 of 2). SNA Token-Ring Attachment Worksheet

Item	Available Values	Selected Value
MAC (Medium Access Control)	Read-only field	
Notes: ¹ Eight characters maximum; 0–9, A–Z, \$, #, and @ permitted, but the first character cannot be 0-9. ² Printer prefixes with 0500 0000. ³ Do not enter the spaces shown; they are included here as a visual aid.		

- Install status** An indication of whether the attachment is installed.
- XID number** An ID that distinguishes a specific piece of equipment from all other similar pieces of equipment on the network.
- Remote network name** The network name associated with the remote logical unit. The first character of this name cannot be 0-9.
- SNA intervention timer** The amount of time the operator is allowed to correct recovery-required errors (such as paper jams) before the printer notifies the host that the attachment is not operating. The timer can be set from 0 to 98 minutes. To turn the timer off, specify 99 (the default value).
- Local LU name** The name of the local logical unit involved in the session.
- Remote LU name** The name of the remote logical unit involved in the session. The first character of this name cannot be 0-9.
- Mode name** The name of the SNA mode that describes the characteristics of a session. The first character of this name cannot be 0-9.
- Remote address** The remote host Token-Ring adapter card address.
- Local network name** The name of the network associated with the local logical unit. If you enter a local network name, you must also enter a control point name. The first character of this name cannot be 0-9.
- Control point name** The name of the application control point. The first character of this name cannot be 0-9.
- Alternate address (Local Adapter Address)** The LAN adapter unique address for the printer. The address must be different from other addresses on the LAN.
- Ring speed** The ring speed of the network the adapter is attached to. An incorrect value can cause the network to stop operating.
- SSCP ID** The ID of the controlling system services control point in the SNA network. The 3160 uses this ID to send information to the host system's Netview programs. If the host does not use Netview, set SSCP ID to 0000.
- Note:** Specify SSCP ID as a hexadecimal value. If the corresponding host value is in decimal, you must convert it to hexadecimal.
- Local LU address** The destination address used by other systems to send information to the local logical unit.

Call type An indication of how the printer identifies itself to the host system. LISTEN, the default value, means that the printer waits until the host asks for (or polls) its identification. CALL means that the printer identifies itself to the host during printer initialization.

MAC (Medium Access Control)
Read-only field.

TCP/IP Token-Ring Attachment Worksheet

Important

Installing a token-ring attachment requires changes to your host system configuration. For detailed worksheets, instructions, and examples, please refer to the *IBM InfoPrint 60; 3130, 3160, and 3935 Advanced Function Printers: Attachment Configuration Handbook, S544-3977*.

The following table lists the configuration attachment parameters for a TCP/IP Token-Ring attachment:

Item	Available Values	Selected Value
Install Status	Installed or Not Installed	
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	
Ring Speed	4 or 16 (Mbps)	
Confine Broadcast	Yes or No	
Alternate Address	0000 0000 0001 to FFFF FFFF FFFE ¹	
MAC (Medium Access Control)	Read-only field.	
Note:		
¹ Do not enter the spaces shown; they are included here as a visual aid.		

- Install status** An indication of whether the attachment is installed.
- TCP port** The TCP socket address of the attachment. This value must match the corresponding host parameter.
- IP address** The Internet protocol (IP) address of the printer in dotted decimal format.
- Subnet mask** The mask identifying the local subnet in dotted decimal format. If there is no local subnet, leave this field blank.
- Default gateway address**
The IP address of the default gateway in dotted decimal format.
- MTU size** The maximum allowable length of IP packets.
- Ring speed** The ring speed of the network the adapter attaches to. This value must match the speed of the network; an incorrect value can cause the network to stop operating.
- Confine broadcast** A yes or no indication of whether broadcast packets—notably ARP (Address Resolution Protocol) packets—are enabled to cross bridges to other rings. Specify NO to allow ARP packets to cross bridges.
- Alternate Address (Local Adapter Address)**
The LAN adapter unique address for the printer. The address must be different from other addresses on the LAN.
- MAC (Medium Access Control)**
Read only field.

System/370 Channel Attachment Worksheet

Note: System/370 channel attachment is available on the 3160-001 only.

<i>Table 12. System/370 (Parallel) Channel Attachment</i>		
Item	Available Values	Selected Value
Channel A Install Status	Installed or Not Installed	
Device Address	X'00' to X'FF'	
Data Transfer Protocol	Interlocked or Data Streaming	
Data Streaming Rate	1.9 MB per second 2.7 MB per second 3.4 MB per second 4.5 MB per second	

Channel A Install Status

An indication of whether the attachment is installed.

Device Address Address of the printer. Valid values are X'00' to X'FF'.

Data Transfer Protocol

Either Interlocked or Data Streaming.

Data Streaming Rate

If Data Streaming is selected, this field sets the speed of transfer.

Valid values are:

- 1.9 MB per second
- 2.7 MB per second
- 3.4 MB per second
- 4.5 MB per second

Chapter 6. Ordering and Storing Supplies

Chapter Overview

This chapter describes how to order and store the supplies that the printer uses.

Printer Supplies

Table 13 lists printer supplies, the part numbers you use to order them, and an estimate of how often they need to be replaced. The yields listed in the table are approximations. They are not a warranty or guarantee of minimum life, and are provided only to assist in supplies planning. Analyze your actual usage figures to determine how much of each supply item to stock.

Actual supply life varies according to printer usage, toner settings, paper characteristics, temperature, and humidity. In addition, special applications (such as adhesive labels, extensive graphics, bar codes, landscape applications, and pre-printed forms) may significantly reduce supply life.

When the printer runs low on a particular supply, it displays a message on the operator panel.

Table 13. Printer Supplies

Supply Item	Part Number	Replace Every...
Cleaner unit	1402683	300 000 to 500 000 Impressions
Developer mix ¹	1402681	1 000 000 impressions
Fuser unit	1402821	1 000 000 impressions
Toner cartridge ²	1402680	50 000 impressions per cartridge at 4 percent coverage
Transfer belt unit	1402684	1 000 000 impressions
Staple cartridge ³	1402820	As needed

Note: ¹One bottle per carton

²Package of six cartridges

³5 000 staples per cartridge, 4 cartridges per box

How to Order Supplies

To order supplies for the printer in the United States, use any of the following methods:

- Contact a Lexmark International Inc. authorized supply dealer.
- Call Lexmark Telemarketing at 1-800-438-2468 from 8 a.m. to 8 p.m. Eastern Standard Time.
- Write Lexmark Telemarketing at:

Lexmark Telemarketing
1221 Alverser Drive
Midlothian, Virginia 23113 U.S.A.

Lexmark Telemarketing can take your order or help you locate dealers that sell supplies for these printers. Supplies are warranted to be free of defects in materials and workmanship. If you believe you are due a replacement, return the supply, in its original package or a package from the replacement supply, to the point of purchase. If purchased from a dealer, return it to that dealer. Include the following with the return:

- A brief explanation of the problem
- The approximate number of prints run with the supply
- A copy of your invoice
- Print-quality samples
- An estimate of the amount of the defective supplies used

In the United States, defective supplies purchased from Lexmark by telephone or catalog should be mailed to:

Attention: Supplies Returns
Lexmark International, Inc.
Building 988
1126 Russel Cave Rd
Lexington, Kentucky 40505

In other countries, contact your point of purchase for information about where to return items.

Selecting Paper

Printing on paper that does not comply with paper specifications may result in paper jams and print quality degradation. The printer uses xerographic white paper, pastel-colored paper, prepunched paper, preprinted paper, cardstock, and adhesive labels.

Xerographic paper is required to satisfy various electrical, heat, and mechanical characteristics. Select only high quality papers and forms to avoid print quality and printer paper handling problems. IBM recommends that you initially test several reams of special use materials in your printer before you purchase large quantities for a given application. For more detailed information regarding paper characteristics and pretesting, refer to *Advanced Function Printer Cut-Sheet Paper Reference for Use with IBM Electrophotographic Printers, G544-3915*; *IBM 3160 Advanced Function Printer: User's Guide, G544-5243*; and *IBM InfoPrint 60: User's Guide, S544-5432*.

For more detailed information about paper, cardstock, labels, and other forms refer to to *Advanced Function Printer Cut-Sheet Paper Reference for Use with IBM Electrophotographic Printers, G544-3915*.

Table 14 on page 33 summarizes the paper sizes the printer can use and indicates the feed orientation and the number of impressions per minute for each paper size.

Paper Size	Feed Orientation	Impressions per Minute
A4 (210 x 297 mm)	Long-edge	60
Letter (8.5 x 11 in.)	Long-edge	60
Legal (8.5 x 14 in.)	Short-edge	30
B4 (257 x 364 mm)	Short-edge	30
Ledger (11 x 17 in.)	Short-edge	30
A3 (297 x 420 mm)	Short-edge	30
B5 (182 x 257 mm)	Long-edge	60

Paper Specifications

Table 15 summarizes recommendations that can help you and your paper supplier choose paper that is most suitable for your printer. This table contains parameters that you should consider when purchasing paper supplies for your Page Printer.

Parameter	Recommendation
Paper Grade	No. 1 or No. 4 Xerographic
Fiber Composition	Preferred: 100% chemical wood pulp Acceptable: Recycled or with cotton content
Color	White or Pastel Colors
Filler	Kaolin or china clay (aluminosilicate) or calcium carbonate. To improve brightness, paper may contain titanium dioxide or magnesium silicate.
Grain Direction	Parallel to the long dimension (grain long)
Cutting Method	Rotary Precision cut (Lennox, Will, or equivalent)
Cutting Tolerances	Length and Width: ± 0.787 mm (± 0.031 in.) Squareness: All corners $90^\circ \pm 0^\circ 6'$
Basis Weight	Preferred: 75g/m ² (20 lb bond) Acceptable: 64 to 160g/m ² (17 to 42 lb bond) and 110 lb index paper (200g/m ²)
Caliper	20 to 24 lbs (75 to 90g/m ²): 3.5 to 5.0 mils (90 to 127 micrometers) 17 to 19 lbs (64 to 72g/m ²): 3.2 to 4.0 mils (81 to 102 micrometers)
Smoothness (Sheffield)	100 to 200 Sheffield units (75 to 90 g/m ² (20 to 24 lbs))
Porosity (Gurley)	10 sec/100 ml minimum
Surface Sizing	Starch—do not use synthetic surface sizing
Internal Sizing	Acid rosin or synthetic (alkylketene dimer or alkyl-succinic anhydride)
Coefficient of Static Friction	0.35 to 0.62
Stiffness (Tabor Method)	Machine direction: 1.7 minimum Cross direction: 0.8 minimum
Moisture Content	3.4 to 5.5 percent
Surface Resistivity	5×10^9 to 2×10^{12} ohms

Label Specifications

The printer can also print on paper face self-sticking adhesive-backed labels in simplex mode. Because the use of labels may cause more problems than printing on plain xerographic paper, IBM recommends that you and your label supplier consider the following parameters when purchasing labels:

Parameter	Recommendation
Total Basis Weight	280 g/m ²
Caliper	254 microns (0.010 in) maximum
Face Stock Smoothness	100 to 200 Sheffield units

Attention: When printing labels, observe the following:

- USE ONLY THE BASE STACKER. Using the side stacker for labels may damage the printer.
- Disable the side stacker.
- Load labels face down in the upper sub tray, lower sub tray, or main tray.
- Run labels only in simplex mode.
- Before ordering large quantities of your labels, run several small jobs to be sure they work properly.
- Refer to *InfoPrint 60: User's Guide, S544-5432*, and *IBM 3160 Advanced Function Printer: User's Guide, G544-5243*, for more details about printing on labels.

Prepunched Paper

Prepunched paper should be flat and without deformation. Discard paper with ragged or damaged hole edges. Do not allow chad (the little paper bits that result from punching) or paper dust to adhere to the paper.

Supplies with prepunched holes must conform to the following specifications:

- Maximum of four holes
- Maximum hole diameter of 10 mm (0.39 in.)
- Holes may not be located in, or protrude into the area marked by the diagonal lines in the following figures; otherwise, the paper sensor detects the holes and may give false paper jam errors.

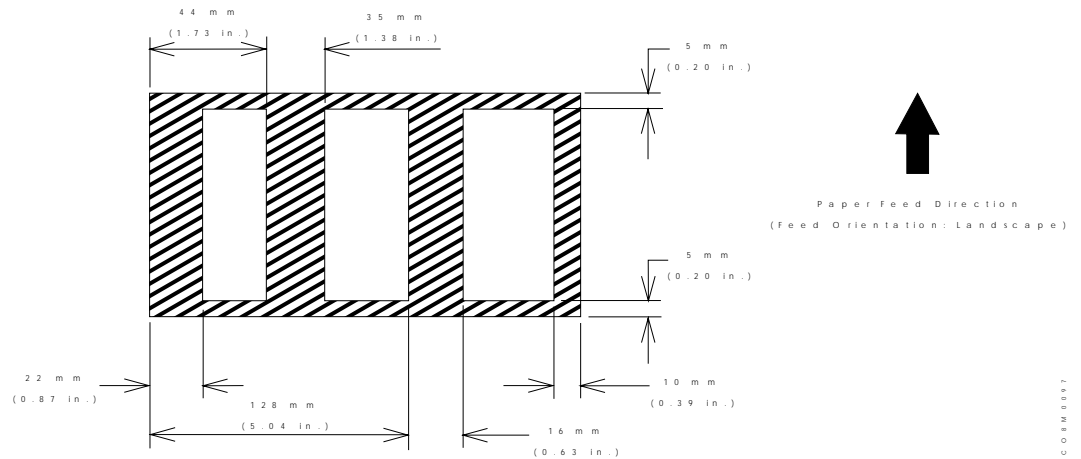


Figure 3. Prepunched Paper Clearances -- A4, B5, and Letter Size

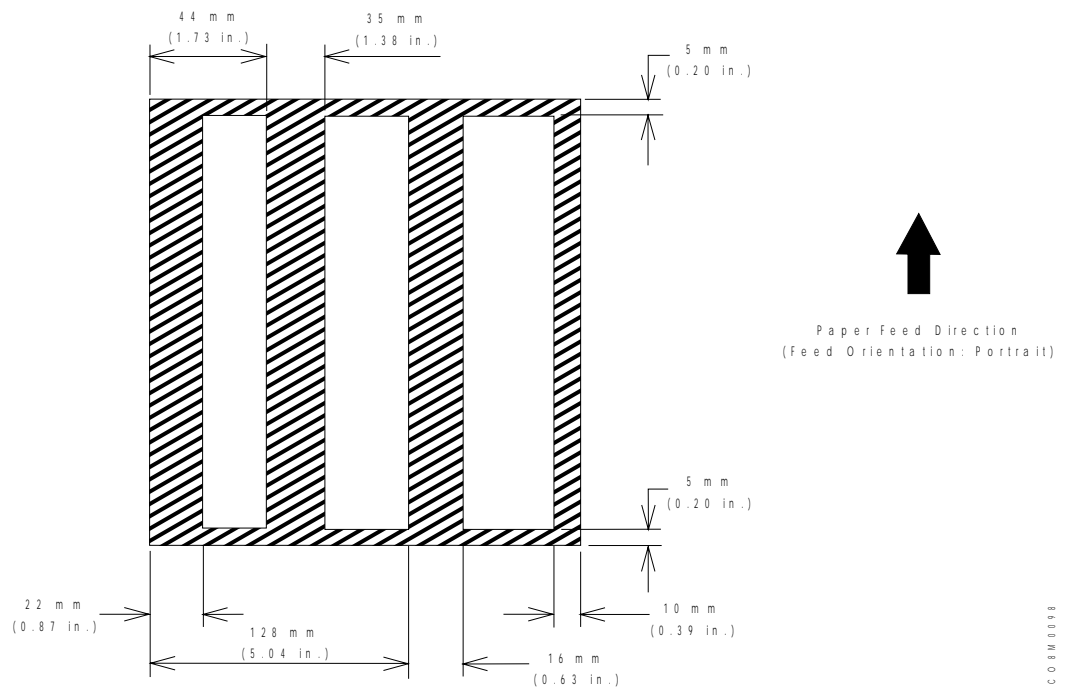


Figure 4. Prepunched Paper Clearances -- A3, B4, Legal, and Ledger Size

Preprinted Paper

Preprinted paper has ink applied before the printer prints on it. Be sure that ink used in preprinting is non-volatile and does not contain drying or resin oils. Ink must not transfer when fusing temperatures are 200°C (392°F) and pressures are 450kPA (65 lbs/in²) for several seconds. IBM recommends the following inks:

- Cured by ultraviolet
- Cured by heat (Tinplate ink)
- Dried by oxidative polymerization

The shaded area in the following figures should not contain printing. Printing in this area can cause false double-sheet feeds.

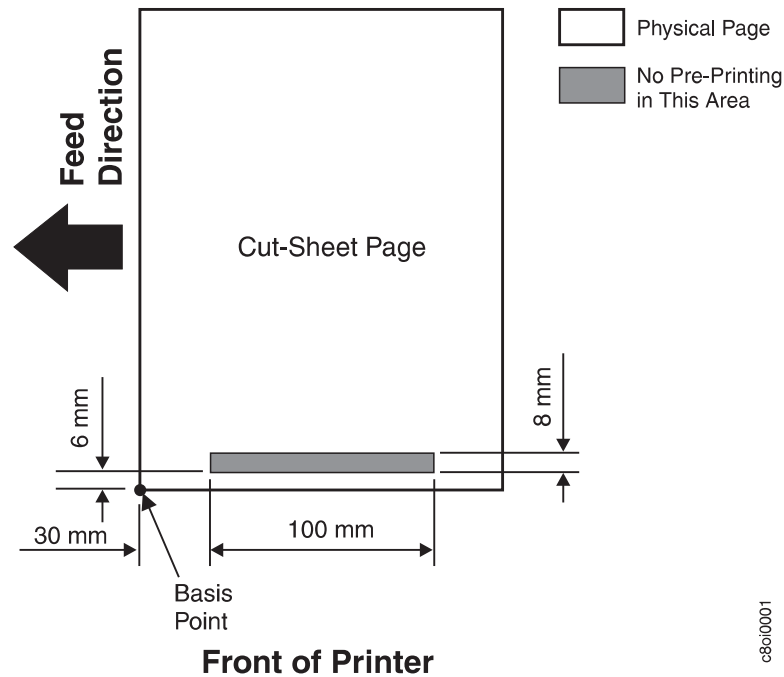


Figure 5. Preprinted Paper

Selecting, Testing, and Ordering Paper

To get the maximum print quality and reliability from your 3160, IBM recommends that you rely on the *Advanced Function Printer Cut-Sheet Paper Reference for Use with IBM Electrophotographic Printers, G544-3915*, your paper supplier, and your marketing representative to help you choose the best forms and special-purpose materials for your applications.

Storing Paper and Supplies

Store paper and supplies that you intend to use soon near the printer, both for convenience and to condition the paper.

Otherwise, store paper and supplies:

- In their original wrappers away from heat or dampness
- On a flat surface such as a shelf, but not on the floor
- In a closable cabinet for protection and monitoring

Store forms and special-purpose materials in an area where the temperature and humidity are similar to the environment where you will use them. Avoid areas with extreme heat or humidity. Extended exposure to extremes can permanently damage the materials. Storing forms in an area where relative humidity is above 65% may result in reduced print quality.

To condition IBM printer supplies, store them in the same environment as the printer for at least 24 hours before you use them. At other times, supplies may be stored in an environment that does not exceed the following requirements:

Temperature -10° to 40°C (14° to 104°F)

Relative Humidity 5% to 80%

For additional information on storing and conditioning supplies, refer to *Advanced Function Printer Cut-Sheet Paper Reference for IBM Electrophotographic Printers*, G544-3915.

Appendix A. 3160 Font Set

Chapter Overview

This appendix describes single-byte character set (SBCS) and double-byte character set (DBCS) font support, including:

- The contents of the IBM Strategic Font Set:
 - “IBM Core Interchange Resident Scalable Font Set”
 - “4028 Compatibility Resident Font Set” on page 45
 - “IBM Coordinated Font Set” on page 48
 - “DBCS Resident Raster Font Set” on page 49
- A description of the printer default font, as well as other fonts you can select as the default font. See “Default Font” on page 51.
- Support of the AS/400 “bolding” function. See “AS/400 Bolding Function, Native and OfficeVision” on page 52.

IBM Core Interchange Resident Scalable Font Set

Table 17 lists the type faces in the IBM Core Interchange Resident Scalable Font Set, the 3160 resident typefaces, as well as the valid Font Global ID (FGID) and Graphic Character Set Global ID (GCSGID) for each typeface.

Notes:

1. Table 18 on page 41 lists the valid GCSGID subsets for each GCSGID listed in Table 17.
2. Table 19 on page 41 lists the code pages that correspond to each typeface.

Table 17 (Page 1 of 3). IBM Core Interchange Resident Scalable Font Set

Typeface	FGID	GCSGID
Latin 1/2/3/4/5		
Times New Roman Medium	2308	1269
Times New Roman Bold	2309	1269
Times New Roman Italic Medium	2310	1269
Times New Roman Italic Bold	2311	1269
Helvetica Roman Medium	2304	1269
Helvetica Roman Bold	2305	1269
Helvetica Italic Medium	2306	1269
Helvetica Italic Bold	2307	1269
Courier Roman Medium	416	1269
Courier Roman Bold	420	1269
Courier Italic Medium	424	1269

Table 17 (Page 2 of 3). IBM Core Interchange Resident Scalable Font Set

Typeface	FGID	GCSGID
Courier Italic Bold	428	1269
Symbols		
Times New Roman Medium	2308	1275
Times New Roman Bold	2309	1275
Helvetica Roman Medium	2304	1275
Helvetica Roman Bold	2305	1275
Courier Roman Medium	416	1275
Courier Roman Bold	420	1275
Cyrillic Greek		
Times New Roman Medium	2308	1300
Times New Roman Bold	2309	1300
Times New Roman Italic Medium	2310	1300
Times New Roman Italic Bold	2311	1300
Helvetica Roman Medium	2304	1300
Helvetica Roman Bold	2305	1300
Helvetica Italic Medium	2306	1300
Helvetica Italic Bold	2307	1300
Courier Roman Medium	416	1300
Courier Roman Bold	420	1300
Courier Italic Medium	424	1300
Courier Italic Bold	428	1300
Arabic		
ITC Boutros Setting Medium	2308	1264
ITC Boutros Setting Bold	2309	1264
ITC Boutros Setting Italic Medium	2310	1264
ITC Boutros Setting Italic Bold	2311	1264
ITC Boutros Modern Rokaa Medium	2304	1264
ITC Boutros Modern Rokaa Bold	2305	1264
ITC Boutros Modern Rokaa Italic Medium	2306	1264
ITC Boutros Modern Rokaa Italic Bold	2307	1264
Boutros Typing Medium	416	1264
Boutros Typing Bold	420	1264
Boutros Typing Italic Medium	424	1264
Boutros Typing Italic Bold	428	1264
Hebrew		
Narkissim Medium	2308	1265
Narkissim Bold	2309	1265
Narkissim Italic Medium	2310	1265

<i>Table 17 (Page 3 of 3). IBM Core Interchange Resident Scalable Font Set</i>		
Typeface	FGID	GCSGID
Narkissim Italic Bold	2311	1265
Narkiss Tam Medium	2304	1265
Narkiss Tam Bold	2305	1265
Narkiss Tam Italic Medium	2306	1265
Narkiss Tam Italic Bold	2307	1265
Shalom Medium	416	1265
Shalom Bold	420	1265
Shalom Italic Medium	424	1265
Shalom Italic Bold	428	1265

GCSGID Subsets for IBM Core Interchange Fonts

Table 18 lists the valid GCSGID subsets for each GCSGID listed in Table 17 on page 39.

<i>Table 18. GCSGID Subsets for IBM Core Interchange Fonts</i>	
GCSGID	Valid GCSGID Subsets
1269	0101, 0103, 0119, 0251, 0265, 0269, 0273, 0277, 0281, 0285, 0288, 0289, 0293, 0297, 0301, 0305, 0309, 0313, 0317, 0321, 0325, 0329, 0337, 0341, 0611, 0697, 0919, 0959, 0965, 0980, 0982, 0983, 0987, 0990, 0991, 0993, 0995, 1111, 1132, 1133, 1145, 1146, 1149, 1152, 1166, 1167, 1174, 1188, 1189, 1198, 1220, 1232, 1233, 1237, 1256, 1258, 1259, 1260, 1261, 1268, 1286, 1301, 1302, 2039
1275	0340, 0630, 0909, 1191, 1257
1264	0235, 0994, 1154, 1162, 1177, 1244
1265	0941, 0687, 0986, 0992, 1147, 1199, 1217, 1218
1300	0218, 0925, 0960, 0981, 0985, 0996, 0998, 1150, 1190, 1231, 1235, 1249, 1251, 1276, 1401

IBM Core Interchange Resident Code Page Set

Table 19 lists the code pages used with the IBM Core Interchange Resident Fonts.

<i>Table 19 (Page 1 of 4). IBM Core Interchange Resident Code Page Set</i>		
CPGID	GCSGID	Language Supported
Latin 1 Country Extended Code Pages		
037	697	US English, Canadian English, Canadian French, Dutch, Brazilian Portuguese, Portuguese
273	697	German
274	697	Belgian
275	697	Brazilian
277	697	Danish, Norwegian
278	697	Finnish, Swedish

<i>Table 19 (Page 2 of 4). IBM Core Interchange Resident Code Page Set</i>		
CPGID	GCSGID	Language Supported
280	697	Italian
281	697	Japanese
282	697	Portuguese
284	697	Castillian Spanish, Latin American Spanish
285	697	UK English
297	697	French, Catalan
500	697	Multinational, Belgian French, Belgian Dutch, Swiss French, Swiss German, Swiss Italian
871	697	Icelandic
Latin 1 EBCDIC Publishing Code Pages		
361	1145	Multinational, Belgian French, Belgian Dutch, Swiss French, Swiss German, Swiss Italian
382	1145	German
383	1145	Belgian
384	1145	Brazilian Portuguese
385	1145	Canadian French
386	1145	Danish, Norwegian
387	1145	Finnish, Swedish
388	1145	French, Catalan
389	1145	Italian
390	1145	Japanese
391	1145	Portuguese
392	1145	Castillian Spanish
393	1145	Latin American Spanish
394	1145	UK English
395	1145	US English, Canadian English
Latin 1 ASCII Code Pages		
437	919	Multinational, US English, UK English, Dutch, German, Finnish, French, Italian, Spanish, Swedish
850	980	Multinational PC
860	990	Portuguese (Primary = 850)
861	991	Icelandic (Primary = 850)
863	993	Canadian French (Primary = 850)
865	995	Nordic (Primary = 850)
1004	1146	IBM PC Desktop Publishing
819	697	ISO Latin 1
Latin 2/3/4/5 EBCDIC and ASCII Code Pages		
852	982	Croatian, Czech, East German, Hungarian, Polish, Romanian, Slovak, Slovenian

<i>Table 19 (Page 3 of 4). IBM Core Interchange Resident Code Page Set</i>		
CPGID	GCSGID	Language Supported
870	959	Latin 2 Multilingual
912	959	Latin 2 ISO/ ANSI 8 Bit
853	983	Latin 3 Multilingual PC
905	1286	Latin 3 Multilingual
1069	1256	Latin 4 ISO/ASCII
914	1256	Latin 4 EBCDIC
857	987	Latin 5 PC
920	1152	Latin 5 ISO/ANSI 8 Bit
1026	1152	Latin 5
Latin EBCDIC DCF Code Pages		
1002	1132	DCF Release 2 Compatibility
1003	1133	US Text Subset
1068	1259	Text with Numeric Spacing
1039	1258	GML List Symbols
Cyrillic and Greek EBCDIC and ASCII Code Pages		
880	960	Cyrillic Multilingual (Primary = 1025)
915	1150	Cyrillic ISO/ASCII 8 Bit
855	985	Cyrillic PC
866	996	Cyrillic #2 PC
1025	1150	Cyrillic Multilingual
423	218	Greek 183 (Primary = 875)
813	925	Greek ISO/ASCII 8 Bit
851	981	Greek PC (Primary = 869)
869	998	Greek PC
875	925	Greek
1039	1258	GML List Symbols
Arabic EBCDIC and ASCII Code Pages		
420	235	Arabic Bilingual
864	994	Arabic PC
1008	1162	Arabic ISO/ASCII 8 Bit
1029	1154	Arabic Extended ISO/ASCII 8 Bit
1046	1177	Arabic Extended ISO/ASCII 8 Bit
1039	1258	GML List Symbols
Hebrew EBCDIC and ASCII Code Pages		
916	941	Hebrew ISO/ASCII 8 Bit
1028	1199	Hebrew Publishing
424	941	Hebrew
803	1147	Hebrew Character Set A (Primary = 424)

<i>Table 19 (Page 4 of 4). IBM Core Interchange Resident Code Page Set</i>		
CPGID	GCSGID	Language Supported
856	986	Hebrew PC (Primary = 862)
862	992	Hebrew PC
1039	1258	GML List Symbols
Symbols		
259	340	Symbols, Set 7
899	340	Symbols, Set 7 ASCII
1087	1257	Symbols, Adobe
1038	1257	Symbols, Adobe ASCII
1091	1191	Symbols, Modified Set 7
1092	1191	Symbols, Modified Set 7 ASCII
363	630	Symbols, Set 8
829	909	Math Symbols

4028 Compatibility Resident Font Set

Table 20 describes the 4028 Compatibility Resident Font Set.

Notes:

1. The printer substitutes Times New Roman (from the IBM Core Interchange Set) for the Times Roman fonts listed in Table 20.
2. Table 21 on page 47 describes the code pages that correspond to the **Code Page** column in Table 20.
3. Fonts with a Code Page ID (CPGID) of 259 are mapped to the Courier Roman Medium Symbols font.
4. The Prestige Proportional Spaced font (FGID 164) is NOT supported as a resident font.

Typeface	FGID	Alt FGID	Pitch	Point Size	Font Width	Code Pages
APL	76		12	10	120	310
Boldface	159	20224	Proportional	12	120	A, B
Courier	11		10	12	144	259, A, B
Courier	85		12	10	120	259, A, B
Courier	223		15	9	96	A, B
Courier	254		17.1	8.5	84	A, B
Courier Bold	46		10	12	144	A, B
Courier Italic	18		10	12	144	A, B
Courier Italic	92		12	10	120	A, B
Letter Gothic	281		20	7.5	72	A, B
OCR A	19		10	12	144	892
OCR B	03		10	12	144	893
Prestige	86		12	10	120	259, A, B
Prestige	221		15	9	96	A, B
Prestige	256		17.1	8.5	84	A, B
Prestige Pica	12		10	12	144	259, A, B
Prestige Elite Bold	111		12	10	120	A, B
Prestige Elite Italic	112		12	10	120	A, B
Times Roman	5687	760	Typo	6	40	A
Times Roman	5687	751	Typo	8	53	A
Times Roman	5687	1051	Typo	10	67	A
Times Roman	5687	1351	Typo	12	80	A
Times Roman Bold	5707	1053	Typo	10	67	A

Table 20 (Page 2 of 2). 4028 Compatibility Resident Font Set

Typeface	FGID	Alt FGID	Pitch	Point Size	Font Width	Code Pages
Times Roman Bold	5707	761	Typo	12	80	A
Times Roman Bold	5707	762	Typo	14	93	A
Times Roman Bold	5707	1803	Typo	18	120	A
Times Roman Bold	5707	2103	Typo	24	160	A
Times Roman Italic	5815	1056	Typo	10	67	A
Times Roman Italic	5815	763	Typo	12	80	A
Times Roman Bold Italic	5835	764	Typo	10	67	A
Times Roman Bold Italic	5835	765	Typo	12	80	A

4028 Compatibility Resident Code Page Set

Table 21 provides an explanation of the groups as used in the Code Pages column of Table 20 on page 45.

<i>Table 21. 4028 Compatibility Resident Code Page Set</i>	
CPGID	GCSGID
Group A	
037, 273, 274, 277, 278, 280, 281, 284, 285, 297, 500, 871	697
038, 367	103
260	341
276	277
286	317
287	321
288	325
1002	1132
Group B	
256 (Replaced by 500)	337
289 (Replaced by 500, but missing obsolete "Peseta" character)	329
Miscellaneous	
310	963
259	340
892	968
893	969

IBM Coordinated Font Set

Table 22 lists the IBM Coordinated font set typefaces resident in 3160. All of the listed fonts are scalable.

Where the IBM Core Interchange code pages are referenced in Table 19 on page 41, only the Latin 1 Country Extended, Latin 1 EBCDIC Publishing, Latin 1 ASCII and Latin EBCDIC DCF code pages are supported.

Typeface	FGID	GCSGID	Code Pages
APL	307	1304	293, 310, 910
APL Bold	322	1304	293, 310, 910
Boldface	20224	2039	See Table 19 on page 41
Gothic Text	304	2039	See Table 19 on page 41
Letter Gothic	400	2039	See Table 19 on page 41
Letter Gothic Bold	404	2039	See Table 19 on page 41
OCR A	305	968	876, 892
OCR B	306	969	877, 893
Prestige	432	2039	See Table 19 on page 41
Prestige Bold	318	2039	See Table 19 on page 41
Prestige Italic	319	2039	See Table 19 on page 41
Katakana Gothic	304	1306	290, 897, 1027, 1041

GCSGID Subsets

Table 23 maps the valid subsets of the GCSGIDs listed for the IBM Strategic Font Set 2.

GCSGID	Valid GCSGID Subsets
1304	0380, 0963, 1113
2039	0101, 0103, 0119, 0251, 0265, 0269, 0273, 0277, 0281, 0285, 0288, 0289, 0293, 0297, 0301, 0305, 0309, 0313, 0317, 0321, 0325, 0329, 0337, 0341, 0611, 0697, 0919, 0980, 0990, 0991, 0993, 0995, 1132, 1133, 1145, 1146, 1149, 1198, 1220, 1258, 1259, 1260
1306	0332, 1164, 1172, 1187

DBCS Resident Raster Font Set

The following tables list the DBCS resident fonts that are available as a separately-orderable feature for the 3160. These fonts provide 240-pel capability for Japanese (Katakana), Korean, Simplified Chinese, Traditional Chinese, and Thai languages.

Notes:

1. These fonts are available only in raster form at 240 pel.
2. The 5 Japanese/Kanji DBCS fonts supported by 3820 ROM Font RPQ #8A5014 are included in the Japanese font set.

The following tables list the resident DBCS fonts by typeface and size.

Typeface	Box Size	Point Size	Font Width	GCSGID	CPGID	FGID
Mincho (M16F)	16x16	4.8	96	370	300	53559
Mincho (M24F)	24x24	7	140	370	300	53559
Mincho (Z24F)	24x24	7.2	144	370	300	53559
Mincho (M26F)	26x26	7.8	156	370	300	53559
Mincho (M32F)	32x32	10	180	370	300	53559
Mincho (M36F)	36x36	10.8	216	370	300	53559
Mincho (M40F)	40x40	12	240	370	300	53559
Mincho (M44F)	44x44	13.2	264	370	300	53559
Mincho (M48F)	48x48	14.4	288	370	300	53559
Mincho (M52F)	52x52	15.6	312	370	300	53559
Mincho (M64F)	64x64	19.2	384	370	300	53559
Gothic (G16F)	16x16	5	100	370	300	53815
Gothic (G20F)	20x24	7.2	120	370	300	53813
Gothic (G24F)	24x30	7	140	370	300	53813
Gothic (G32F)	32x32	9.6	192	370	300	53815
Gothic (G36F)	36x36	10.8	216	370	300	53815
Gothic (G40F)	40x40	12	240	370	300	53815
Gothic (G48F)	48x48	14.4	288	370	300	53815
Gothic (G64F)	64x64	19.2	384	370	300	53815
R-Gothic (R36F)	36x36	10.8	216	370	300	54071
R-Gothic (R40F)	40x40	12	240	370	300	54071
R-Gothic (R48F)	48x48	14.4	288	370	300	54071
R-Gothic (R64F)	64x64	19.2	384	370	300	54071

Table 25. Korean Font Set

Typeface	Box Size	Point Size	Font Width	GCSGID	CPGID	FGID
Mincho (M24K)	24x24	7.2	144	934	834	53559
Mincho (M32K)	32x32	9.6	192	934	834	53559
Mincho (M36K)	36x36	10.8	216	934	834	53559
Mincho (M40K)	40x40	12	240	934	834	53559
Mincho (M48K)	48x48	14.4	288	934	834	53559
Mincho (M64K)	64x64	19.2	384	934	834	53559
Gothic (G16K)	16x16	4.8	96	934	834	53815
Gothic (G24K)	24x30	9	144	934	834	53813

Table 26. Traditional Chinese Font Set

Typeface	Box Size	Point Size	Font Width	GCSGID	CPGID	FGID
Ming (M24T)	24x24	7.2	144	935	835	54583
Ming (M32T)	32x32	9.6	192	935	835	54583
Ming (M40T)	40x40	12	240	935	835	54583
Gothic (G16T)	16x16	4.8	96	935	835	53815

Table 27. Simplified Chinese Font Set

Typeface	Box Size	Point Size	Font Width	GCSGID	CPGID	FGID
Song (S26P)	26x26	7.8	156	937	837	54327
Song (S32P)	32x32	9.6	192	937	837	54327
Song (S40P)	40x40	12	240	937	837	54327
Gothic (G16P)	16x16	4.8	96	937	837	53815

Table 28. Thai Font Set

Typeface	Box Size	Point Size	Font Width	GCSGID	CPGID	FGID
Official (O40F)	24x40	12	144	939	839	57655
Official (O60F)	24x60	18	144	939	839	57655
Italics (I60F)	24x60	18	144	939	839	58039

Default Font

The default font for the 3160 is Courier Roman Medium 12 pitch (10 point) using code page 500, version 1.

The printer operator can change the default font and code page by selecting from the code pages listed below.

Table 29. Selectable Default Fonts

Code Page	Description
500	Belgian, Swiss / International
037	US, Canadian, Dutch, Portuguese
038	US English ASCII
260	Canadian French
273	Austrian / German
274	Belgian
277	Danish / Norwegian
278	Finnish / Swedish
280	Italian
281	Japanese
284	Spanish
285	UK English
286	Austrian / German (alternate)
287	Danish / Norwegian (Alternate)
288	Finnish / Swedish (Alternate)
290	Japanese / Katakana
297	French
420	Arabic
423	Greek
424	Hebrew
870	Latin 2 Multilingual
871	Icelandic
880	Cyrillic
892	OCR - A
893	OCR - B
905	Turkish
1026	Turkish
875	Greek

AS/400 Bolding Function, Native and OfficeVision

The following tables show the typeface substitutions that occur on the printer when an application running in native OS/400 or OfficeVision uses the “bolding” function. The tables list the original typeface, the typeface that the printer substitutes, and the FGIDs of both.

Notes:

1. This support is available for resident fonts only.
2. The bold font may have different metrics than the original font; this can affect line endings.

<i>Table 30 (Page 1 of 2). IBM Core Interchange Resident Scalable Font Set</i>			
Requested Font	FGID	Result	FGID
Latin 1/2/3/4/5			
Times New Roman Medium	2308	Times New Roman Bold	2309
Times New Roman Italic Medium	2310	Times New Roman Italic Bold	2311
Helvetica Roman Medium	2304	Helvetica Roman Bold	2305
Helvetica Italic Medium	2306	Helvetica Italic Bold	2307
Courier Roman Medium	416	Courier Roman Bold	420
Courier Italic Medium	424	Courier Italic Bold	428
Symbols			
Times New Roman Medium	2308	Times New Roman Bold	2309
Helvetica Roman Medium	2304	Helvetica Roman Bold	2305
Courier Roman Medium	416	Courier Roman Bold	420
Cyrillic Greek			
Times New Roman Medium	2308	Times New Roman Bold	2309
Times New Roman Italic Medium	2310	Times New Roman Italic Bold	2311
Helvetica Roman Medium	2304	Helvetica Roman Bold	2305
Helvetica Italic Medium	2306	Helvetica Italic Bold	2307
Courier Roman Medium	416	Courier Roman Bold	420
Courier Italic Medium	424	Courier Italic Bold	428
Arabic			
ITC Boutros Setting Medium	2308	ITC Boutros Setting Bold	2309
ITC Boutros Setting Italic Medium	2310	ITC Boutros Setting Italic Bold	2311
ITC Boutros Modern Rokaa Medium	2304	ITC Boutros Modern Rokaa Bold	2305
Boutros Typing Medium	416	Boutros Typing Bold	420
Boutros Typing Italic Medium	424	Boutros Typing Italic Bold	428
Hebrew			
Narkissim Medium	2308	Narkissim Bold	2309
Narkissim Italic Medium	2310	Narkissim Italic Bold	2311
Narkiss Tam Medium	2304	Narkiss Tam Bold	2305

<i>Table 30 (Page 2 of 2). IBM Core Interchange Resident Scalable Font Set</i>			
Requested Font	FGID	Result	FGID
Narkiss Tam Italic Medium	2306	Narkiss Tam Italic Bold	2307
Shalom Medium	416	Shalom Bold	420
Shalom Italic Medium	424	Shalom Italic Bold	428

<i>Table 31. 4028 Compatibility Resident Font Set</i>			
Requested Font	FGID	Result	FGID
APL	76	None	None
Boldface	159/20224	None	None
Courier	11	Courier Roman Bold	420
Courier	85	Courier Roman Bold	420
Courier	223	Courier Roman Bold	420
Courier	254	Courier Roman Bold	420
Courier Italic	18	Courier Italic Bold	428
Courier Italic	92	Courier Italic Bold	428
Letter Gothic	281	Letter Gothic Bold	404
OCR B	03	None	None
Prestige	86	Prestige Bold	318
Prestige	221	Prestige Bold	318
Prestige	256	Prestige Bold	318
Prestige Pica	12	Prestige Bold	318
Prestige Elite Italic	112	None	None
Times Roman	5687	Times New Roman Bold	2309
Times Roman	5687/751	Times New Roman Bold	2309
Times Roman	5687/1051	Times New Roman Bold	2309
Times Roman	5687/1351	Times New Roman Bold	2309
Times Roman Italic	5815/1056	Times New Roman Italic Bold	2311
Times Roman Italic	5815	Times New Roman Italic Bold	2311

<i>Table 32. IBM Coordinated Font Set</i>			
Requested Font	FGID	Result	FGID
APL	307	APL Bold	322
Gothic Text	304	None	None
Letter Gothic	400	Letter Gothic Bold	404
OCR A	305	None	None
OCR B	306	None	None
Prestige	432	Prestige Bold	318
Prestige Italic	319	None	None
Katakana Gothic	304	None	None

Appendix B. Software and Hardware Requirements

Important

This appendix summarizes the support that various versions of PSF provide the printer. Note that the information it contains is subject to change, and therefore should be used for general planning only. For more detailed information about host software requirements, refer to *Advanced Function Presentation: Printer Information*, G544-3290.

The proper system software and hardware are required when attaching to the host system and for creating the IPDS data stream. In most cases, system software is the same set of AFP programs that are used for the 38xx family of printers.

Host Attachments That Support the InfoPrint 60 and the 3160-001 Printer

The following central processing unit (CPU) configurations support the 3160:

- AS/400
- PS/2
- RISC System/6000
- ES/4381
- 308X
- ES/3090
- ES/9000

Connectivity to the host processors is through the following architectures:

- S/370 Parallel Channel (3160-001)
- Token-Ring (SNA) (3160-001)
- Token-Ring (TCP/IP)
- Ethernet (TCP/IP)

Table 33. MVS Support

System	Parallel Channel	Token-Ring (SNA)	Token-Ring (TCP/IP)	Ethernet (TCP/IP)
ES/4381	Yes*	Yes*	Yes	Yes
308X	No	Yes *	Yes	Yes
ES/3090	Yes*	Yes*	Yes	Yes
ES/9000	Yes*	Yes*	Yes	Yes

Note: *3160-001

<i>Table 34. VSE Support (3160-001)</i>		
System	Parallel Channel	Token-Ring (SNA)
ES/4381	Yes	Yes
308X	No	Yes
ES/3090	Yes	Yes
ES/9000	Yes	Yes

<i>Table 35. VM Support (3160-001)</i>		
System	Parallel Channel	Token-Ring (SNA)
ES/4381	Yes	Yes
308X	No	Yes
ES/3090	Yes	Yes
ES/9000	Yes	Yes

<i>Table 36. Other Support</i>				
System	Parallel Channel	Token-Ring (SNA)	Token-Ring (TCP/IP)	Ethernet (TCP/IP)
AS/400	No	Yes*	Yes	Yes
PS/2	No	Yes*	Yes	Yes
RISC/6000	No	No	Yes	Yes
Note: *3160-001				

Host Software

Host/PSF Software Support

The 3160-001 will be supported by the latest releases of the operating system environments specified in Table 37 on page 57.

The InfoPrint 60 will be supported by the latest releases of the operating system environments specified in Table 38 on page 58.

Programming versions, releases, and modification levels will be specified prior to General Availability (GA).

Function	MVS (PSF/MVS V2.2.0)	MVS (PSF/MVS V2.1)	VSE (PSF/VSE V2.2.1)	VM (PSF/VM V2.1.1)	OS/400 (PSF/400 V3.1)	OS/400 V2.3/V3.0.5	PSF for AIX (V1.2/V2.1)	PS/2 (PSF/2 V2.0)
Multiple Inputs (Sources)	Yes	Yes	Yes	Yes	Yes	Yes	Yes/Yes	Yes
Multiple Outputs (Stackers)	Yes	No	Yes	Yes ²	Yes	No	No/Yes	Yes ² ³
IPDS Towers	All	All	All	All	All	All	All/All	All
Basic N_Up	Yes	No	Yes	No	Yes	No	No/Yes	Yes ² ³
Enhanced N_UP	Yes	No	Yes	No	No	No	No/Yes	Yes ² ³
<u>Printer Attachment</u>								
- SNA Token-Ring	Yes	Yes	Yes	Yes	Yes	Yes	No/No	Yes
- TCP/IP Ethernet	Yes ¹	Yes	No	No	Yes	No	Yes/Yes	Yes
- TCP/IP Token-Ring	Yes ¹	Yes	No	No	Yes	No	Yes/Yes	Yes
- Parallel Channel	Yes	Yes	Yes	Yes	No	No	No/No	No
<u>Font Support</u>								
- Download Raster Fonts (SBCS & DBCS)	Yes	Yes	Yes	Yes	Yes	Yes	Yes/Yes	Yes
- Download Outline Fonts (SBCS & DBCS)	Yes	No	Yes	No	No	No	No/Yes ²	Yes ²
- Resident Raster Fonts								
- Core Interchange	Yes	Yes	Yes	Yes ²	Yes	Yes	No Yes	Yes
- 4028 Compatibility	Yes	Yes	Yes	Yes ²	Yes	Yes	No/Yes	Yes
- Coordinated	Yes	Yes	Yes	Yes ²	Yes	Yes	No/Yes	Yes
- DBCS	Yes	Yes	Yes	Yes ²	Yes ¹	No	No/Yes ²	Yes ²
- Resident Outline Fonts								
- Core Interchange	Yes	Yes	Yes	Yes ²	Yes	Yes	No/Yes	Yes
- 4028 Compatibility	Yes	Yes	Yes	Yes ²	Yes	Yes	No/Yes	Yes
- Coordinated	Yes	Yes	Yes	Yes ²	Yes	Yes	No/Yes	Yes
- DBCS	Yes	No	Yes	Yes ²	Yes ¹	No	No/Yes ²	Yes ²
Note:								
¹ Requires an APAR	³ PSF Direct only							
² Requires a PTF								

Table 38. InfoPrint 60 Support

Function	MVS (PSF/MVS V2.2.0)	MVS (PSF/MVS V2.1)	OS/400 (PSF/400 V3.1 & V3.6/V3.2)	OS/400 V3.0.5	PSF for AIX (V1.2/V2.1)	PS/2 (PSF/2 V2.0)
Multiple Inputs (Sources)	Yes	Yes	Yes/Yes	Yes	Yes/Yes	Yes
Multiple Outputs (Stackers)	Yes	No	Yes/Yes	No	No/Yes	Yes ² ³
IPDS Towers	All	All	All/All	All	All/All	All
Basic N_Up	Yes	No	Yes/Yes	No	No/Yes	Yes ² ³
Enhanced N_UP	Yes	No	No/Yes	No	No/Yes	Yes ² ³
<u>Printer Attachment</u>						
- TCP/IP Ethernet	Yes ¹	Yes	Yes/Yes	Yes ³	Yes/Yes	Yes
- TCP/IP Token-Ring	Yes ¹	Yes	Yes/Yes	Yes ³	Yes/Yes	Yes
<u>Font Support</u>						
- Download Raster Fonts ⁴ (SBCS & DBCS)	Yes	Yes	Yes/Yes	Yes	Yes /Yes	Yes
- Download Outline Fonts (SBCS & DBCS)	Yes	No	No/ 12/96	No	No/Yes ²	Yes ²
- Resident Raster Fonts ⁴						
- Core Interchange	Yes	Yes	Yes/Yes	Yes	No/Yes	Yes
- 4028 Compatibility	Yes	Yes	Yes/Yes	Yes	No/Yes	Yes
- Coordinated	Yes	Yes	Yes/Yes	Yes	No/Yes	Yes
- DBCS	Yes	Yes	Yes/Yes	No	No/Yes ²	Yes ²
- Resident Outline Fonts						
- Core Interchange	Yes	Yes	Yes/Yes	Yes	No/Yes	Yes
- 4028 Compatibility	Yes	Yes	Yes/Yes	Yes	No/Yes	Yes
- Coordinated	Yes	Yes	Yes/Yes	Yes	No/Yes	Yes
- DBCS	Yes	No	No/ 12/96	No	No/Yes ²	Yes ²
Note:						
¹ Requires an APAR ³ PSF Direct only						
² Requires a PTF ⁴ If available						

PSF Support Notes

Basic N_Up and Enhanced N_Up Printing:

- Basic N_UP

Enables printing output that places one, two, three, or four pages in sequence in equal-sized partitions on each side of a sheet. Two 8.5 X 11 inch application pages can print two-up on a single 11 X 17 inch paper sheet. For duplex operations, each side of the form or sheet of paper can have up to four pages.

- Enhanced N_UP (Page Positioning)

Enables the following:

- Page Orientation – places individual pages in any position on either side of the sheet in any orientation and in any size that fits on the sheet.
- Overlays – places overlays relative to any partition origin with or without variable page data from the application program. You can specify different overlays for each page.
- Offsets – specifies different offsets for each page.
- Page Ejection – ejects to a new partition or a new sheet.

PSF/MVS Support

- APAR OW08127 is required for five input bin support for PSF/MVS V2.1 and later.
- PSF/MVS 2.2.0 with APAR OW12840 supports TCP/IP (Token Ring¹ and Ethernet).
- PSF/MVS 2.2.0 supports N_UP.

Enhanced N_Up support is available by using APAR OW03243.

- Under PSF/MVS 2.2.0 with APAR OW08340 and *IBM Font Collection for Operating Systems* installed, you can:
 - Activate the proper resident fonts without using the APSRMARK utility.
 - Use downloaded and printer-resident outline fonts.
- Under PSF/MVS 2.1 and later, the resident 3160 Core Set outline fonts are activated by host library raster fonts if you have identified them using the APSRMARK utility.
- PSF/MVS 2.1 does not support multiple input bins at the copy subgroup level.
- PSF/MVS 2.2 Media-Destination Selection Function (Multiple Output Bin) support applies to:
 - MVS/ESA Versions 4.2.0, 4.3.0, and 5.1.0.
 - MVS/ESA JES3 4.2.1 in support of PSF/MVS 2.2.0.

For multiple output bin support:

- PSF/MVS 2.2. requires APAR OW07348.
- MVS/ESA 4.2.0, 4.3.0, and 5.1.0 require APAR OW04349.
- MVS/ESA JES3 4.2.1 requires APAR OW07286.

¹ 3160-001

PSF/VSE Support

To use resident fonts, identify them to PSF/VSE using the APSRMARK utility. Resident fonts are not supported when using DFP.

PSF/VM Support

PSF/VM does not support resident fonts. However, you can print with fully-described downloaded fonts.

OS/400 and PSF/400 Support

- Version 3.1:
 - Requires a PTF for native 3160 and InfoPrint 60 support
 - Supports Basic N_Up but not Enhanced N_Up
 - Requires a PTF for DBCS resident font support
- Version 3.0.5:
 - Requires Cum Tape C4263305
 - Does not support N_Up or Enhanced N_Up
 - Configure the printer as a 3935
 - Supports outline font scaling only for whole font sizes (for example, 10, 12, 15 CPI ...)
- Version 2.3
 - Requires Cum Tape CA193230
 - Requires PTF C4193230
 - Does not support N_Up or Enhanced N_Up
 - Configure the printer as a 3935
 - Supports outline fonts scaling only for whole font sizes (for example, 10, 12, 15 CPI ...).
- Version 2.2
 - This version went out of service on 31 March 95; it is included for reference only.
 - Requires PTF SF16030 and SF16187.
 - Only letter (8.5 X 11 in.) and legal (8.5 X 14 in.) size paper are supported.
 - IBM AFP Multiple-up page capability is not supported. Multiple-up page capability is available only by using the OS/400 function.
 - Only the printer default output stacker (the top stacker) is supported.
 - Supports outline font scaling only for whole font sizes (for example, 10, 12, 15 CPI ...).
- Printing with the large print function for OfficeVision/400 on the AS/400 is not supported by these printers, nor is the AS/400 (DDS) key word CHRSIZ function.
- Bolding is not supported on the following fonts when using OfficeVision/400 or the AS/400 (DDS) key word HIGHLIGHT function: Boldface, Gothic Text, Gothic Katakana, OCR A, OCR B, Prestige Italic, or fonts that are already bold-faced fonts.

PSF/2 Support

- Resident fonts are not supported when using the DPF function of PSF/2.
- When using “PSF Direct,” the function supported is equivalent to that provided by the Host PSF, so resident fonts are supported.

PSF for AIX Support

When using “PSF Direct,” the function supported is equivalent to that provided by the Host PSF.

System Test

SNA Token-Ring (3160-001) uses NETVIEW for recording errors. Token-Ring uses the Self-Test Frame on the ring itself.

For AS/400 use the Verify Print (VFYPRT) command to obtain the printer type and send a test print. The AS/400 uses ERAPs to log errors.

Applications

The 3160 and InfoPrint 60 print text data referred to as Coded Information, image data referred to as Non-Coded Information, and GDDM raster graphics. You can print all of these at any location on the printed page and in any combination. Printing the mixture or combination of data at any printed page location is called All Points Addressable or APA printing.

Host Software References:

- *Print Services Facility/MVS: Application Programming Guide*, S544-3673
- *Print Services Facility/VSE: Application Programming Guide*, S544-3666
- *Print Services Facility/VM: Application Programming Guide*, S544-3677
- *Print Services Facility/6000: Print Services Facility for AIX Users*, G544-3814
- *Guide to Using PSF/2 V2R0.0*, G544-5225
- *PSF/2 V2R0.0 Printer Attachment Guide*, G544-5215
- *AS/400 Guide to Programming for Printing*, SC41-8194

System Attachment

For all of the attachments listed below the data received for printing is in the form of the IPDS described in *Intelligent Printer Data Stream Reference*, S544-3417.

SNA or TCP/IP Token Ring

Note: SNA token-ring connectivity is available for the 3160-001 only.

The 3160 connects to a Host Token-Ring through the IBM Token-Ring cabling. It uses the 'Token-Ring High-Performance Adapter' which is in the AFCCU. The adapter and an 8-foot long external cable are provided when this feature is ordered. The external cable is connected to an IBM 8228 Token-Ring Multistation Access Unit or an IBM 8230 Token-Ring Network Controller Access Unit which is connected as follows:

- Directly to a PS/2, AS/400, or RISC System/6000 CPU, or
- To a 3172, 3174, 3720, 3725, or 3745, which in turn is connected directly to a ES/4381, 308X, ES/3090, or ES/9000 CPU

The control unit can attach to either a 16 Mbit/sec or a 4 Mbit/sec Token-Ring Local Area Network.

The attachment adheres to the IBM Token-Ring Network OEMI. The following documents, together, comprise the IBM Token-Ring Network Other Equipment Manufacture 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
- *Carrier Sense Multiple Access with Collision Detection*, IEEE Std 802.3-1985
- *Token-Ring Access Method and Physical Layer Specification*, IEEE Standard 802.5-1989

The maximum allowable distance of the printer from the 8228 Multistation Access Unit or 8230 Controlled Access Unit depends on several factors. In general, a maximum distance of 100 meters (328 feet) is allowed. However, to calculate the exact maximum distance, refer to *IBM Token-Ring Network Introduction and Planning Guide*, GA27-3677. For cable attachment options from the 8228/8230 to the host system CPU, refer to the specific CPU cabling information.

TCP/IP Ethernet

For details on TCP/IP attachment, see *IBM InfoPrint 60; 3130, 3160, and 3935 Advanced Function Printers: Attachment Configuration Handbook*, S544-3977.

The printer offers one of three Ethernet Attachment types as an optional feature:

10Base-T (Twisted Pair)

The printer can attach to standard Twisted Pair (10BaseT) cable. The feature attachment includes the type 10BaseT transceiver and the transceiver cable used to connect the transceiver to the printer. RJ45 unshielded twisted pair cable (which must meet IEEE 802.3 requirements) is required to attach the 10BaseT transceiver to the Ethernet Twisted Pair Network. A wrap plug is included with the feature for diagnostic purposes.

Connection can be either directly to a RISC System/6000, or to a 8250 or 8260 Twisted Pair Hub which connects to a RISC System/6000 or a PS/2.

10Base2 (Thin Coaxial)

The printer can attach to standard Thin type 10Base2 Ethernet coaxial cable. The attachment includes the type 10Base2 transceiver and the transceiver cable used to connect the transceiver to the printer. The transceiver attaches to standard Thin Ethernet Network. A wrap plug is included with the feature for diagnostic purposes.

Connection is made directly to a RISC System/6000, PS/2, or AS/400.

10Base5 (Thick Coaxial)

(3160-001)

The 3160-001 can be attached to standard Thick type 10Base5 Ethernet coaxial cable. A type 10Base5 cable is required to connect the D-connector on the printer to the 10Base5 network. A wrap plug is included with the feature for diagnostic purposes.

Connection is made directly to a RISC System/6000, PS/2, or AS/400.

System/370 Channel Attachment

Note: System/370 channel attachment is available for 3160-001 only.

A System/370 Parallel Channel can be configured 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:

- 1.9 MB per second
- 2.7 MB per second
- 3.4 MB per second
- 4.5 MB per second

The highest data-streaming mode rate supported on the attaching host system is the recommended transfer mode; use it if possible.

When connecting to a System/370 channel, locate the printer 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 can connect the printer to the remote end of either an IBM 3044-II Fiber Optic Channel Extender (RPQ approval required), 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 ES/4381, IBM 308X, IBM ES/3090, and IBM ES/9000 processing systems only.

Also, you can use the IBM 9034 with either an IBM 9032 or 9033 ESCON Director to further extend 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).

Also, you can use the Extended Distance Feature (XDF) on the 9032/9033 ESCON Directors to increase the distance. Contact your IBM Marketing Representative for information about ordering cables.

Figure 6 shows the details of the above connection options, with the distance extensions shown on the Host System side of the diagram.

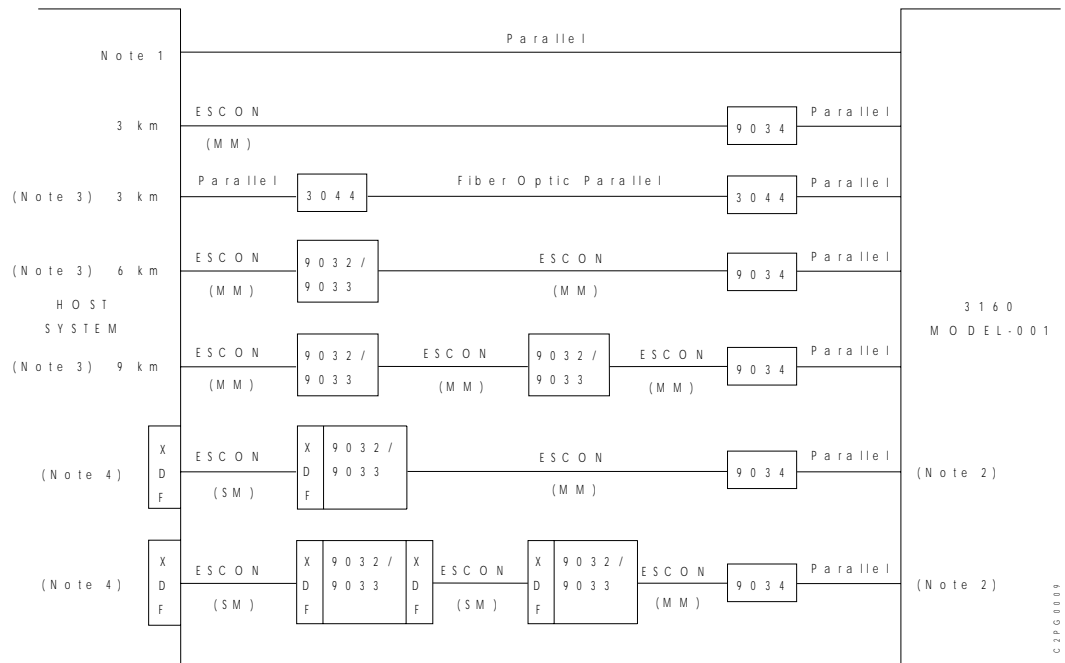


Figure 6. Parallel Channel Attachment Options (3160-001)

Notes:

1. 122 meters (400 ft) maximum from ES/4381, 308X, ES/3090, or ES/9000.
2. When attached to an IBM 3044 Fiber Optic Channel or an IBM 9034 ESCON Converter, configure the printer for one of the Data-Streaming transfer modes, not the DC Interlock transfer mode.

Note: An exception to the above is when XDF is used in the interface and the distance between the host and the printer exceeds 10 km. In this case, use the DC Interlock mode. And to keep the performance in an acceptable range, the cable length from the 9034 to the printer should be less than 100 feet (30.5 meters).
3. RPQ approval is required for this configuration/distance.
4. RPQ approval is required. The maximum distance for the environment will be specified with the approval.
5. SM = Single Mode (Laser Driver - 20 km (12.4 miles) maximum distance).
MM = Multi Mode (LED Driver - 3 km (1.86 miles) maximum distance).

Attachment Hardware Requirements

- The Ethernet TCP/IP interface attaches to the following network configurations:
 - RS/6000 and PS/2 Ethernet 10BaseT Networks
 - RS/6000 and PS/2 Ethernet 10Base2 Networks
 - RS/6000 and PS/2 Ethernet 10Base5² Networks.
- The Token-Ring TCP/IP interface attaches to 4/16 Mbps token ring networks through the following devices:
 - 8228 Token-Ring Multistation Access Unit attached to a PS/2 or RS/6000
 - 8230 Token-Ring Multistation Access Unit attached to a PS/2 or RS/6000
- The SNA token-ring interface (3160-001) attaches to 4/16 Mbps token ring networks through the following devices:
 - 8228 Token-Ring Multistation Access Unit attached to an AS/400 or PS/2 processor
 - 8230 Token-Ring Network Controller Access Unit attached to an AS/400 or PS/2 processor
 - 8228 Token-Ring Multistation Access Unit attached to 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, 308X or 4381 processor
 - 8230 Token-Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, 308X or 4381 processor
- The S/370 Parallel Channel (3160-001) attaches to the following devices:
 - 3094 ESCON converter attached to a 3090 or ES/9000 processor
 - 3090, ES/9000, or 4381 processor

² 3160-001

Bibliography

The documentation listed in this bibliography contain detailed information related to subjects discussed in the 3160 Documentation Library. For information about how to order these documents, contact your local IBM branch office.

Document Title	Order Number
<i>About Type: IBM's Technical Reference for Digitized Type</i>	S544-3516
<i>About Type: IBM's Typographic Primer for Digitized Type Program Products</i>	G544-3183
<i>About Type: IBM's Guide for Type Users</i>	G544-3122
<i>About Type: IBM's Typographic Primer for Digitized Type Supplement</i>	G544-3186
<i>Advanced Function Printing: Managing the Presentation of Information</i>	G544-3825
<i>Advanced Function Presentation: Printer Summary</i>	G544-3135
<i>Advanced Function Presentation: Printer Information</i>	G544-3290
<i>Advanced Function Image and Graphics</i>	G221-3075
<i>Guide to Advanced Function Presentation</i>	G544-3876
<i>IBM Bar Code Fonts User's Guide</i>	S544-3190
<i>Bar Codes Brochure</i>	G320-9875
<i>IBM Document Composition Facility: Bar Code User's Guide</i>	S544-3115
<i>Advanced Function Printer Cut-Sheet Paper Reference for use with IBM Electrophotographic Printers</i>	G544-3915
<i>IBM InfoPrint 60; 3130, 3160, and 3935 Advanced Function Printers: Attachment Configuration Handbook</i>	S544-3977
<i>3160 Advanced Function Printer User's Guide</i>	G544-5243
<i>IBM InfoPrint 60: User's Guide</i>	G544-5432
<i>IBM InfoPrint 60; 3160 Advanced Function Printer: Maintenance Information (Volumes 1 & 2)</i>	30H7534*
<i>IBM 3160 Advanced Function Printer Safety Notices</i>	S544-3978
<i>Document Composition Facility and Document Library Facility General Information</i>	GH20-9158
<i>IBM Dictionary of Computing</i>	ZC20-1699
<i>Graphical Data Display Manager General Information</i>	GC33-0319
<i>Graphical Data Display Manager Guide for Users</i>	SC33-0327
<i>Graphical Data Display Manager Installation and System Management for MVS</i>	SC33-0321
<i>Graphical Data Display Manager Installation and System Management for VSE</i>	SC33-0322
<i>IPDS Handbook for Printers That Use the Advanced Function Common Control Unit</i>	G544-3895
<i>IBM Intelligent Printer Data Stream Reference</i>	S544-3417
<i>OGL/370: Getting Started</i>	G544-3691
<i>IBM System/360, System/370, 4300 Processors: Input/Output Equipment Installation Manual—Physical Planning</i>	GC22-7064
<i>Page Printer Formatting Aid/370 User's Guide and Reference</i>	S544-3700
<i>AS/400 Guide to Programming for Printing</i>	SC41-8194
<i>IBM Print Services Facility/VSE: System Programming Guide</i>	S544-3665
<i>IBM Print Service Facility/MVS Program Directory</i>	G544-3668
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<i>IBM Print Service Facility/MVS: Application Programming Guide</i>	S544-3673
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Glossary

The following terms are defined as they are used in InfoPrint 60 and 3160 documentation. If you do not find the term you need, refer to the index or to the *IBM Dictionary of Computing*, ZC20-1699.

A

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 Image and Graphics. This allows the printer to directly process IO1 subset of the IO-image command set and GR1 subset of the graphics command set data streams.

Advanced Function Presentation (AFP). The ability of programs to use the all-points-addressable concept to print text and images with a printer.

all-points addressability. The ability to address, reference, and position text, overlays, and images at any defined point on the printable area of a page.

application. The use to which an information processing system is put; for example, a payroll application, an airline reservation application, a network application.

application program. A program written for or by a user that applies to the user's work, such as a program that does inventory control or payroll.

application programmer. A person who develops application programs. Contrast with *system programmer*.

B

bar code. A code representing characters by sets of parallel bars of varying thickness and separation that are read optically by transverse scanning.

Bar Code Object Content Architecture (BCOCA). An IPDS command set that provides data control information to print bar-code information on a page, page segment, or overlay.

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.

binder holes. A series of holes or slots punched at set intervals that allows the paper to be inserted in a loose-leaf or ring binder.

bond (paper). Paper formulated with at least 80% wood pulp. Bond-paper works best in the IBM 3160.

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 paper. 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.

chad. (1) The material separated from a data medium when a hole is punched. (2) The residue separated from the carrier holes in continuous forms.

channel. (1) A path along which signals can be sent; for example, data channel, output channel. (2) In the printer environment, the communication attachment.

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.

coated paper. Paper that has had a surface coating applied to produce smoothness.

code page. A font library member that associates code points and character identifiers.

coded font. A set of graphic characters to which code points from a code page and character-representations font have been assigned. A coded font may be stored in a library for later use, or used immediately as a collection of data that specifies the character pattern of zero or more graphic characters. A coded font associates the graphic characters with code points, and provides some of the control information the printer

needs to place the character patterns on a page. Coded fonts are typically used where typographic quality is required.

code point. An element of a code page or a site in a code table to which a character can be assigned.

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.

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*.

constant spaced font. A font in which the graphic characters are contained in character cells of uniform size. The distance between reference points of adjacent graphic characters is constant in the inline progression. The white spaces between graphic characters may vary. Synonymous with *fixed space font*. Contrast with *proportionally spaced font*.

control storage. In the InfoPrint 60 and 3160, a portion of storage that contains microcode and other data.

control unit (CU). (1) A device that controls input and output operations at one or more devices. (2) In the InfoPrint 60 and 3160, the electronics and code that control the printhead and the attachment to the host processor.

controlling computer. The processing unit to which the printer is connected through a communication attachment.

controlling computer system. The data-processing system to which a network is connected and with which the system can communicate.

corner cut. On a page, 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.

copy group. One or more copies of a sheet of paper. Each may have modifications applied; for example, overlays and text suppression.

copy modification. The process of adding, deleting, or replacing data on selected copies of certain sheets of paper.

copy separation. The mechanism for distinguishing consecutive copies of a single data set. In the stacker, it consists of offset stacking.

cure. The process of drying ink sufficiently for minimum transfer of the ink to any parts of the printer it contacts.

customer engineer. See *service representative*

cut. The severed part of a perforation. Cuts are separated by ties. See also *perforation*.

cutout. A part of a page that has been eliminated or perforated for subsequent removal; for example, corner cuts and binder holes.

D

developed image. The image that has been exposed onto the photoconductor and covered with toner by the developer.

developer. The unit in the process assembly that supplies a flow of developer mix (toner) over the photoconductor to develop the electrostatic image.

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 InfoPrint 60 and 3160, 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 printer.

disabled mechanism. If necessary, the operator can disable some printer functions to continue operation until a problem can be corrected. In the InfoPrint 60 and 3160, the mechanisms that can be disabled are the top paper supply, the bottom paper supply, the duplex mechanism, and the offset-stacker mechanism.

diskette. A flexible, magnetic disk enclosed in a protective container.

diskette-storage device. A direct-access-storage device that uses diskettes as the storage medium.

Document Composition Facility (DCF). An IBM licensed program that provides text formatting for the InfoPrint 60 and 3160.

double-byte character set. A type of character set required to print unique characters, such as Japanese Kanji.

double-byte coded font. A font in which the characters are defined by two bytes; the first defines a coded-font section, the second defines a code point. Contrast with *single-byte coded font*.

double-byte font. See *double-byte coded font*.

drum count. The number of revolutions of the drum.

dry ink. The material that forms the image on the paper. Synonymous with toner.

duplex printing. Printing on both sides of a sheet of paper. Synonym for *two-sided printing*. Contrast with *simplex printing*.

E

electronic form. See *electronic overlay*.

electronic overlay. (1) A collection of constant data that is electronically composed in the host system and may be combined with variable data on a sheet during printing. (2) The library member that contains the definition of the electronic overlay. See *overlay*.

electrophotographic process. The creation of an image on paper 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 paper.

electrostatic image. The invisible image consisting of discharged areas of the photoconductor as a result of exposure from digital data.

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.

Enhanced N_UP Printing. To divide a sheet into a maximum of 8 partitions, anywhere on the sheet. See also N_UP Printing.

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.

error-recovery procedure. Procedures designed to help isolate and, where possible, to recover from errors in equipment. The procedures are often used in conjunction with programs that record the statistics of machine malfunctions.

exception. (1) An invalid or unsupported data-stream construction. (2) In IPDS, a condition requiring host notification or requiring the host to resend data.

F

font. (1) A family or assortment of characters of a given size and style; for example, 9-point Bodoni modern. A font has a unique name and may have a registry number. (2) A font is data used to create an image of each graphic character; for example, a raster pattern.

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 section. A subdivision of a double-byte font character set. The section consists of a maximum of 256 characters.

form definition (FORMDEF). In Print Services Facility (PSF), a resource object that defines the characteristics of the form, which include overlays to be used, text suppression, position of page data on the form, and number and modifications of a page.

format. (1) The arrangement or layout of data on a data medium. (2) The size, style, type of page, margins, printing requirements, and so on, of a printed page.

forms. The material on which output data is printed, such as paper or adhesive labels. See *electronic overlay* and *preprinted form*.

forms overlay. In the InfoPrint 60 and 3160, that function of the printer that allows customer-prepared data to be printed with variable-page data.

fuse. To use heat and pressure to blend toner onto paper to make a permanent bond.

fuser. The assembly that bonds the toned image to the paper using heat and pressure.

G

graphic. A symbol produced by a process such as handwriting, drawing, or printing. See also *vector graphics*.

graphic character. A character that is normally represented by a graphic, independent of code points or fonts. A graphic character is often in the form of a spatial arrangement of adjacent or connected strokes; for example, a letter or digit.

Graphic Object Content Architecture (GOCA). An IPDS command set that provides data control information for printing graphics on a page, page segment, or overlay.

Graphical Data Display Manager (GDDM). An IBM licensed program that allows pictures to be defined and displayed through function routines.

H

host system. (1) The primary or controlling computer in a multiple-computer installation. (2) A computer used to prepare programs for use on another computer or on another data-processing system; for example, a computer used to compile, link edit, or test programs to be used on another system.

I

ideographic. Pertaining to 2-byte characters consisting of pictograms, symbolic characters, and other types of symbols.

image. (1) A string of picture elements organized in scan lines to represent the contrasting portions of a picture. (2) A likeness or imitation of an object. (3) In this printer, an image comprises a string of pels organized in scan lines to represent the contrasting portions of a picture. The image may consist of any data stored as a raster pattern. The term image is interchangeable with impression and is printed on one side of a sheet of paper.

Image Object Content Architecture (IOCA). An IPDS command set to print image data on a page, page segment, or overlay.

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

impression. An implied or physical page. Used when calculating the reduction of printer output caused by switching the printer between duplex and simplex

modes or upper and lower paper supplies. The term impression is interchangeable with image.

initial machine load (IML). A procedure that prepares the printer for use.

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). An architected *host-to-printer* data stream that contains both data and controls defining how the data is to be presented. Generally, this information contains basic formatting, error recovery, and character data.

interface. A shared boundary. An interface might be a hardware component to link two devices or it might be a portion of storage or registers accessed by two or more computer programs.

interlocked mode. Prevents a machine or device from initiating further operations until an operation in process is completed.

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 paper has become blocked or wedged in the paper path so the printer cannot operate.

JIS. Japanese Industry Standards. Used in reference to paper standards for size.

job separation. (1) The hardware mechanism that uses the mark form sequence to distinguish jobs, which are consecutively stacked in the output stacker. (2) In the InfoPrint 60 and 3160, job offset stacking is used to indicate job termination. See also *offset stacking*.

K

Kanji. A graphic character set consisting of symbols used in Japanese ideogram alphabets. Each character requires two bytes of data (double-byte characters).

L

landscape orientation. Text and images that are printed parallel to the longer side of the forms. Contrast with *portrait orientation*.

laser (light amplification by stimulated emission of radiation). A device that emits a beam of coherent light.

latent image. In a printer, the invisible image that exists in the sensitized material after exposure but before development.

layout plan. A list of requirements, such as electrical and space, that must be considered before installing the IBM InfoPrint 60 or 3160 Advanced Function 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. The print on the page, such as composed text, graphics, and fonts within defined margins. Contrast with *physical page*.

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

M

memory. 1) All of the addressable storage space in a processing unit and other internal storage that is used to execute instructions. 2) Main storage.

microcode. In the InfoPrint 60 and 3160, refers to the microprogramming stored on the microcode diskette. Microcode is used by the control unit to manage the printer and its functions.

N

non-impact printer. A printer in which printing is not the result of mechanical impacts. Contrast with *impact printer*.

N_Up Printing. In Basic N_UP, the ability to print more than one logical page on a single side by using a

control in the form definition. See also Enhanced N_UP.

O

offline. Pertaining to the operation of a functional unit when not under the direct control of a computer. Contrast with *online*.

offset paper. A grade of paper to which sizing is added to resist moisture during printing by ink presses.

offset stacking. The jogged stacking of output media in the output stacker so that jobs protrude from the balance of the stack to give physical identification. See also *job separation*.

online. Pertaining to the operation of a functional unit when under the direct control of a computer. Contrast with *offline*.

operating environment. The physical environment; for example, temperature, humidity, layout, or power requirements.

operating requirements. A list of requirements, such as environmental, electrical, and space, that must be satisfied before the printer can be installed.

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*.

outboard recorder (OBR). A feature that records pertinent data on the system recorder file when an unrecoverable I/O exception occurs.

output stacker. The part of the printer where the printed sheets are collected.

overlay. (1) A collection of predefined data, such as lines, shading, text, boxes, or logos, that can be combined with variable data on a page while printing. (2) The library member that contains the definition of an overlay. See also *electronic overlay*.

Overlay Generation Language (OGL). The licensed program that is used to create electronic overlays that are included in the IPDS data.

overrun condition. Loss of data because a receiving device is unable to accept data at the rate it is transmitted.

overstrike. The merging of two or more graphic characters in the same position on a sheet of paper.

P

page. A collection of information bound by the beginning page control and its associated end control. A page of printing is one side of a sheet of paper or form. See also *logical page* and *physical page*.

page-buffer storage. Writable control storage in which data to be printed is stored. The data is stored one line at a time until a page is complete and ready to print.

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 printer. A device that prints one page at a time (for example, xerographic printer, cathode-ray-tube printer, film printer). Contrast with *line printer*.

page-printer data stream. A data stream that enables a printer to format a complete page at one time, including text, images, and page segments. It is characterized by a composed-page data-stream format.

Page Printer Formatting Aid (PPFA). A licensed program that creates form definitions (FORMDEFs) and page definitions (PAGEDEFs).

page segment. (1) An object that can include text and images and that can be printed on any addressable point on a page or electronic overlay. It assumes the environment of the object in which it is included. (2) The library member which contains the definition of a page segment.

pallet. A portable platform for handling, storing, or moving materials.

paper path. The entire route that paper travels while it is being processed. The paper path usually begins where the paper is loaded and ends at the stacker.

parameter. A variable that is given a constant value for a specified application and that may denote the application.

pattern storage. In the InfoPrint 60 and 3160, a part of storage that contains the fonts and images used for printing the character data, overlays, and segments contained in the page buffer.

partition. In Basic N_Up printing, the division of the medium presentation space into a specified number of equal-sized areas in a manner determined by the current physical medium.

PC drum. A hollow cylinder that is covered with photoconductive material.

pel (picture element). (1) An element of a raster pattern; a point where a toned area on the photoconductor may appear. (2) On an all-points-addressable output medium, each pel is an addressable unit. On a row-column addressable output medium, the only pel addressable is the beginning of a character cell.

photoconductor. The material that is wrapped about the PC drum. The medium for transferring images to paper.

physical page. The print medium on which the printer is printing, such as an 8-1/2 x 11-inch 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.

pica. A unit of about 1/6 inch used to measure typographical material.

pitch. A unit of measurement for the width of a printed character. It identifies the number of graphic characters per inch; for example, 10-pitch has ten graphic characters per inch. Uniformly spaced fonts are measured in pitch. Contrast with *point*.

planning coordinator. The person in your organization who is responsible for coordinating all the planning and installation activities for the printer.

point. A unit of measurement for describing type sizes. There are 12 points to a pica, about 72 points to an inch.

point of origin. The location of the first print position on a logical page. The point of origin is usually stated in terms of X and Y coordinates. The point of origin used by a printer can be affected by factors such as printable area and forms orientation.

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

preprinted form. A sheet of print medium containing a preprinted design of constant data with which variable data can be combined. See also *electronic overlay*.

Presentation Text Object Content Architecture (PTOCA). OPDS control sequences used to present text information on a page, page segment, or overlay.

print-error marker (PEM). Small, black, rectangular marks that indicate incorrectly placed data in the valid printable area.

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 IBM InfoPrint 60 and 3160 Advanced Function Printer.

print mode. The operational mode in which information is received from the attached controlling computer system and printed output is produced. Contrast with *test mode* and *diagnostic mode*.

print position. The physical positions of the characters constituting a print line relative to the page.

print quality. The quality of printed output relative to existing standards and in comparison with jobs printed earlier.

Print Service Facility (PSF). The access method that supports the printing of text and images on a page.

Print Services Access Facility (PSAF). A menu-driven, print-parameter selection program for page printers controlled by PSF.

print surface. The side of a page that receives the printed image.

proportionally spaced font. A font in which the graphic characters are contained in character cells that may vary with the size of each graphic character and have varying character increments. This allows for even spacing between printed characters and eliminates excess white space around narrow characters. Contrast with *constant spaced font*.

R

random-access memory (RAM). A storage device into which data is entered and from which data is retrieved in a non-sequential matter.

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 InfoPrint 60 and 3160, an on/off pattern of electrostatic images produced by the laser printhead under control of the character generator.

raster pattern. A series of picture elements (pels) arranged in scan lines to form an image.

raster scan. A technique of generating or recording the elements of an image by a line-by-line sweep across the entire output medium.

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 aligns correctly with the preprinted image. Print that extends beyond box edges and text that overlaps other text are examples of poor registration.

resident font. Those font data-sets that are resident within the printer. They usually reside on the printer diskette media (floppy or hard disk). These font sets are commonly used fonts, and having them resident reduces font load time. These fonts may also be used during offline testing of the printer.

resource. (1) People, equipment, or material used to perform a task or a project. (2) Any facility of a computing system or operating system required by a job or task, including main storage, input/output devices, processing units, data sets, and controller processing programs; for example, page printers use resources such as form definitions, page definitions, and fonts.

reverse heading. A heading where each character is highlighted by reversing the color of the character with its background; for example, changing a black character on a white background to a white character on a black background.

S

scanner. A device that examines OCR, graphics, MICR, or bar-code patterns, and generates electrical signals corresponding to the pattern. It sends the signals to a computing device for processing.

screen or screening. In document printing, a sheet of material, usually film, carrying a regular pattern of small dots. When printing, ink adheres only to the dots, and many dots close together appear solid. This method prints large areas of ink on paper but uses much less ink than printing the same area with solid ink.

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

sense byte. A byte that contains sense (exception) information.

sense data. Sense information used to indicate the causes of command-stream and device exceptions and to direct the host program to the appropriate exception-recovery actions.

service representative. The person responsible for installing and repairing the printer. Synonymous with *customer engineer*.

sheet. In reference to paper, a single sheet may be printed on one side (simplex) or both sides (duplex).

simplex printing. Printing on one side of a sheet of paper. Contrast with *duplex printing*.

single-byte coded font. A font in which the characters are defined by one byte. A single-byte coded font has only one coded-font section. Contrast with *double-byte coded font*.

sizing. A process where paper is treated to give it resistance against penetration of liquids.

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

SRC. See system reference code.

stacker. A device used to hold paper or other media; usually used to refer to the output device of a printer.

stack lean. A measurable slope from the vertical of a stack of forms. Excessive stack lean can cause failures when feeding forms.

storage. (1) The retention of data in a storage device. (2) In word processing, a unit into which recorded text can be entered, in which it can be retained and processed, and from which it can be retrieved. (3) A device, or part of a device, that can retain data.

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

System Application Architecture (SAA). A set of software interfaces, conventions, and protocols resident in the host system, used for designing and developing applications that are consistent across systems.

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 reference code (SRC). A code that contains information, such as a failing part or component, for a customer engineer.

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.

tensile strength. A measure of the force that paper 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 *print mode* and *diagnostic mode*.

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

throughput. Amount of work performed by a printer or computer over a period of time, for example, number of jobs per day.

toner. The material that forms the image on the paper. Synonymous with *dry ink*.

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 InfoPrint 60 and 3160, a customer engineer and customer analysis procedure.

two-sided printing. Printing on both sides of a sheet of paper. Synonymous with *duplex printing*. Contrast with *simplex printing*.

V

variable data. The data that can vary; for example, the names and addresses in form letters. Contrast with *constant data*.

vector graphics. Computer graphics in which display images are generated from display commands and coordinate data. Contrast with *raster pattern*.

void. A missing part of the printed character.

Acronyms and Abbreviations

This list explains the acronyms and abbreviations used in this document and in other documents that are part of the InfoPrint 60 and 3160 documentation libraries.

ABIC	Adoptive Bi-Level Image Compression.	ISO	International Organization for Standardization.
AEA	Alternate Exception Action.	LAN	Local Area Network.
AFIG	Advanced Function Image and Graphics.	LF	Load Font (command).
AFP	Advanced Function Printing.	LU	Logical Unit.
AFPDS	Advanced Function Printing Data Stream.	MB	Megabyte (1 MB=1 048 576 bytes).
AFPF	Advanced Function Print Finishing.	MICR	Magnetic Ink Character Recognition.
APA	All-Points Addressable.	MIH	Missing-Interrupt Handler.
ARQ	Active Record Queue.	MMR	Modified-Modified READ (2-dimensional image).
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers.	MO:DCA	Mixed Object Document Content Architecture.
BCOCA	Bar Code Object Content Architecture.	MR	Modified READ; (READ=Relative Element Address Designate) 2-dimensional image compression algorithm. Also referred to as CCITT Group 3.
CCITT	Comite Consultatif International Telegraphique et Telephonique.	MVS	Multiple Virtual Storage.
CPGID	Code Page Identifier.	NCP	Network Control Program
CE	Customer Engineer (IBM).	OCR	Optical Character Recognition.
CEE	International Commission for Conformity Certification of Electrical Equipment.	OGL	Overlay Generation Language.
CSA	Canadian Standards Association.	OS	Operating System
CU	Control Unit.	PAGEDEF	Page Definition.
DASD	Direct Access Storage Device.	PC	Photoconductor.
DCF	Document Composition Facility.	PEL	Picture Element.
DPE	Decompression Performance Enhancement.	PEM	Print-Error Marker.
EBCDIC	Extended Binary-Coded Decimal Interchange Code.	PMF	Print Management Facility.
EC	Engineering Change.	PPFA	Page Printer Formatting Aid.
EHC	Exception Handling Control (command).	PSAF	Print Services Access Facility.
ESA	Enterprise System Architecture.	PSF	Print Services Facility.
ESMM	End Select Medium Modification.	RAM	Random Access Memory.
FLSF	Font Library Service Facility.	RRL	Request Resource List.
FGID	Font Global Identifier.	SAA	System Application Architecture.
FORMDEF	Form Definition.	SDLC	Synchronous Data Link Control.
GCSGID	Graphic Character Set Global Identifier.	SMM	Select Medium Modification.
GDDM	Graphical Data Display Manager.	SNA	System Network Architecture.
HAID	Host-Assigned ID.	SSCP	System Services Control Point.
IHF	Image Handling Facility.	TCP/IP	Transmission Control Protocol/Internet Protocol.
IML	Initial Microcode Load.	UL	Underwriter's Laboratory.
IPDS	Intelligent Printer Data Stream.	VSE	Virtual Storage Extended.
		XA	Extended Architecture.
		XID	Exchange Station Identification.

Index

Numerics

4028 Compatibility Resident Font Set 45

A

abbreviations 77
acronyms 77
adhesive labels 34
Advanced Function Image and Graphics 5
airflow 16
altitude 15
applications
 converting to 3160 13
 environment 3
AS/400 Bolding Function 52
ASHRAE 15
attachment
 Ethernet TCP/IP 25
 hardware requirements 66
 SNA Token-Ring 26
 TCP/IP Token-Ring 29
audible alarm 4
authorization levels 4
auto eject 4
auto load 6

B

bar-code
 edge tolerance 12
 positioning and size 14
Basic N_Up Printing 59
basis weight 6
bibliography 67
bolding characters 14
Bolding Function 52

C

cables
 locations 19
 power 16
cassettes 1
characteristics of the 3160 6
characteristics of the 3160. 1
characteristics of the InfoPrint 60. 1
checklists and work sheets
 Ethernet TCP/IP attachment 25
 implementation plan 8
 installation planning worksheet 21
 SNA Token-Ring attachment 26
 TCP/IP Token-Ring attachment 29

cleaner unit 31
common features 2
Compatibility Resident Font Set, 4028 45
configuration
 Ethernet TCP/IP attachment 25
 of the printer 23
 SNA Token-Ring attachment 26
 TCP/IP Token-Ring attachment 29
 work sheet 23
converting applications to the 3160 13
Coordinated Font Set 48
Core Interchange Resident Scalable Font Set 39
current, input 17

D

data security 4
DBCS Resident Raster Font Set 49
default font 51
developer mix 31
dimensions 19

E

electrical
 power requirements 16
 requirements 16
 safety 16
Enhanced N_Up Printing 59
environment
 application 3
 requirements 15
environments 3, 55
error log 4
Ethernet TCP/IP attachment 25

F

features
 Advanced Function Image and Graphics 5
 common 2
 operational 4
 optional 1
fire safety 16
fonts
 4028 Compatibility Resident Code Page Set 47
 4028 Compatibility Resident Font Set 45
 AS/400 Bolding Function 52
 DBCS Resident Raster Font Set 49
 default 51
 GCSGID Subsets 48
 GCSGID Subsets for IBM Core Interchange
 Fonts 41

fonts (*continued*)

- IBM Coordinated Font Set 48
- IBM Core Interchange Resident Code Page Set 41
- IBM Core Interchange Resident Scalable Font Set 39
- supported 39—54

forms

- basis weight 6
- requirements 6
- sizes and types used 6

frequency, nominal 17

functional overview 1—6

fuser unit 31

G

graphics performance 5

H

handling paper 6

heat

- dissipation 16
- output 16

host environments 3, 55

humidity 15

I

IBM Coordinated Font Set 48

IBM Core Interchange Resident Scalable Font Set 39

images 5

implementation plan 8

input trays 1

installation

- licensed programs 13
- planning worksheet 21
- requirements 20

Interchange Resident Scalable Font Set, IBM CORE 39

L

labels 34

large print function 14

layout considerations 19

levels, sound 16

Lexmark International 31

line-printer data conversion 13

M

measurements, clearance 19

N

N_Up Printing 59

noise levels 16

O

operating requirements

- attachment hardware 66
- electrical 16
- environmental 15
- space 19

operational features 4

options, printer 1

ordering supplies 31

output trays 1

output, heat 16

overview 1—6

P

paper

- handling 6
- input trays 6
- sizes 6, 32, 33
- storage 36
- weight ranges 6, 32

performance

- factors affecting 5
- image and graphics 5

physical layout 19

point of origin 12

power

- consumption 17
- dissipation 16, 17
- input 17
- plug 17
- voltage 17

pre-installation tasks 20

print

- density 5
- material 6
- supplies 31

printer

- cleaner unit 31
- common features 2
- configuration 23
- developer mix 31
- dimensions 19
- fuser unit 31
- host environments 3, 55
- operational features 4
- supplies 31
- toner cartridge 31
- transfer belt unit 31

product summary 1—6
publications xii

R

related publications xii
relative humidity, permitted values 15
requirements
 Advanced Function Presentation (AFP) licensed
 programs 13
 airflow 16
 altitude 15
 attachment hardware 66
 electrical 16
 environmental 15
 humidity 15
 installation 20
 paper 6
 sound levels 16
 space 19
 special-purpose materials 6
 system attachment 24
 temperature 15
 ventilation 15
Resident Raster Font Set, DBCS 49
Resident Scalable Font Set, IBM CORE
Interchange 39

S

safety 16
Scalable Font Set, IBM CORE Interchange 39
security, data 4
SNA Token-Ring SNA attachment 26
sound levels 16
space requirements 19
special-purpose materials
stackers 1
storage
 forms 36
 paper 36
 supplies 36
supplies
 ordering 31
 special-purpose materials 6
 storage 36
supported environments 3

T

temperature 15
threading, automatic 6
token-ring SNA attachment 26
toner cartridge 31
traces 4

training 10
transfer belt unit 31

V

ventilation 15
verifying licensed programs 13
voltage
 input current 17
 nominal 17
 requirements 16

W

wiring information 16
work sheets and checklists
 implementation plan 8
 installation planning worksheet 21

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3160 Advanced Function Printer
Introduction and Planning Guide
Publication No. G544-5242-02

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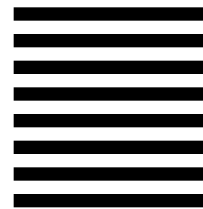
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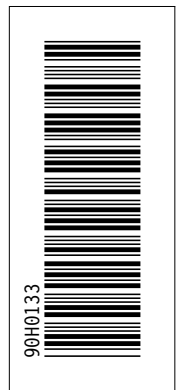
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Artwork Definitions			
---------------------	--	--	--

<u>id</u>	<u>File</u>	<u>Page</u>	<u>References</u>
ABC	C2PI2SET	i	

Table Definitions			
-------------------	--	--	--

<u>id</u>	<u>File</u>	<u>Page</u>	<u>References</u>
SITE	C2PI2C4	21	21, 21, 21
HEADR	C2PI2C4	21	21
C4A	C2PI2C5	23	23, 25, 26, 29, 30
SHA	C2PI2C5	23	
FONTHD3	C2PI2APA SCRIPT	39	39
FONTBD3	C2PI2APA SCRIPT	39	39, 40, 40, 40, 40, 40
FONTBD4	C2PI2APA SCRIPT	39	39, 40, 40, 40, 40, 52, 52, 52, 52, 52
CPHD1	C2PI2APA SCRIPT	41	41, 48
CPHD2	C2PI2APA SCRIPT	41	41, 42, 42, 42, 43, 43, 43, 43, 44, 47, 47, 47
CPBD	C2PI2APA SCRIPT	41	41, 48, 48, 48
CPHD3	C2PI2APA SCRIPT	41	41
CPBD2	C2PI2APA SCRIPT	41	41, 42, 42, 42, 43, 43, 43, 43, 44
FONTHD	C2PI2APA SCRIPT	45	45, 49, 49, 50, 50, 50
FONTBD	C2PI2APA SCRIPT	45	45, 45, 49, 50, 50, 50, 50
CPBD3	C2PI2APA SCRIPT	47	47, 47, 47, 47
FONTHD1	C2PI2APA SCRIPT	48	48
FONTBD1	C2PI2APA SCRIPT	48	48, 48
FONTHD5	C2PI2APA SCRIPT	52	52, 53, 53
FONTHD2	C2PI2APA SCRIPT	52	52, 53, 54
FONTBD5	C2PI2APA SCRIPT	52	52, 52, 52, 52, 52, 53, 54
HEADS	C2PI2BIB SCRIPT	67	67

Figures			
---------	--	--	--

<u>id</u>	<u>File</u>	<u>Page</u>	<u>References</u>
PLUG	C2PI2C4	17	1
STACONF	C2PI2C4	19	2
ZZ1	C2PI2C6	35	18, 18, 19
ZZ2	C2PI2C6	35	3
PRPZNT	C2PI2C6	36	4
PARA	C2PI2APB SCRIPT	36	5
		65	6
			65

Headings

id	File	Page	References
NOTICES	C2PI2\$\$ SCRIPT	vii	Notices ii
PPL	C2PI2\$\$ SCRIPT	xii	Related Publications
INTR	C2PI2C1	1	Chapter 1, InfoPrint 60 and 3160-001 Printers
FEAT	C2PI2C1	1	Special Features 2, 2
OPENV	C2PI2C1	3	Host Environments 11
APPENV	C2PI2C1	3	Application Environment 11
PRIMED	C2PI2C1	6	Print Material and Paper Handling
TEAM	C2PI2C2	7	Chapter 2, Planning Overview
IMPLAN	C2PI2C2	8	Sample Implementation Plan
AFP	C2PI2C3	11	Chapter 3, Preparing the Processing Environment 7
PERF	C2PI2C3	11	Performance Considerations
INSAFP	C2PI2C3	13	Advanced Function Presentation Licensed Programs
DOCCNV	C2PI2C3	13	Conversion
PHYS	C2PI2C4	15	Chapter 4, Preparing the Physical Environment 7
ENVRQ	C2PI2C4	15	Environmental Requirements
HEAT	C2PI2C4	16	Heat and Airflow
SOUND	C2PI2C4	16	Sound Levels
POWER	C2PI2C4	16	Power Requirements
PWRDIS	C2PI2C4	17	Power Dissipation
PRREQ	C2PI2C4	18	Physical Requirements
DIMEN	C2PI2C4	18	Weight and Dimensions
SVCCLR	C2PI2C4	18	Service Clearances
LAYOUT	C2PI2C4	19	Physical Layout and Space Requirements
INSTREQ	C2PI2C4	20	Installation Requirements
INSTWS	C2PI2C4	21	Installation Planning Worksheet 20
CONF	C2PI2C5	23	Chapter 5, Configuring the Printer and Its Attachments 7, 9, 13
PTRCFG	C2PI2C5	23	Printer Configuration
PREPCA	C2PI2C5	24	System Attachment Worksheets xii, 9
SUPP	C2PI2C6	31	Chapter 6, Ordering and Storing Supplies
Q4B	C2PI2C6	31	How to Order Supplies
PAS	C2PI2C6	32	Selecting Paper 6
PAPPAR	C2PI2C6	33	Paper Specifications
LABPAR	C2PI2C6	34	Label Specifications
APXFONT	C2PI2APA SCRIPT		

		39	Appendix A, 3160 Font Set 5
APX1	C2PI2APA SCRIPT	39	IBM Core Interchange Resident Scalable Font Set 39
SAACP	C2PI2APA SCRIPT	41	IBM Core Interchange Resident Code Page Set
4028	C2PI2APA SCRIPT	45	4028 Compatibility Resident Font Set 39
4028CP	C2PI2APA SCRIPT	47	4028 Compatibility Resident Code Page Set
APX2	C2PI2APA SCRIPT	48	IBM Coordinated Font Set 39
SSETS2	C2PI2APA SCRIPT	48	GCSGID Subsets
RESRF	C2PI2APA SCRIPT	49	DBCS Resident Raster Font Set 39
DF	C2PI2APA SCRIPT	51	Default Font 39
FB	C2PI2APA SCRIPT	52	AS/400 Bolding Function, Native and OfficeVision 14, 39
APXX	C2PI2APB SCRIPT	55	Appendix B, Software and Hardware Requirements 3, 24
370ATT	C2PI2APB SCRIPT	64	System/370 Channel Attachment
AHR	C2PI2APB SCRIPT	66	Attachment Hardware Requirements
BIB	C2PI2BIB SCRIPT	67	Bibliography xii

Index Entries

<u>id</u>	<u>File</u>	<u>Page</u>	<u>References</u>
APPL	C2PI2IND SCRIPT	i	(1) applications 3, 13
ATTACH	C2PI2IND SCRIPT	i	(1) attachment 25, 26, 29, 66
BARCODE	C2PI2IND SCRIPT	i	(1) bar-code 12, 14
CABLE	C2PI2IND SCRIPT	i	(1) cables 16, 19
CWS	C2PI2IND SCRIPT	i	(1) checklists and work sheets 8, 21, 25, 26, 29
CONFIG	C2PI2IND SCRIPT	i	(1) configuration 23, 23, 25, 26, 29
ENVIRON	C2PI2IND SCRIPT	i	(1) environment 3, 15
ELEC	C2PI2IND SCRIPT	i	(1) electrical 16, 16, 16
FEAT	C2PI2IND SCRIPT	i	(1) features 1, 2, 4, 5
FONT	C2PI2IND SCRIPT	i	(1) fonts 39, 39, 41, 41, 45, 47, 48, 48, 49, 51, 52, 54
FORMS	C2PI2IND SCRIPT	i	(1) forms 6, 6, 6
HEAT	C2PI2IND SCRIPT	i	(1) heat 16, 16
INSTALL	C2PI2IND SCRIPT	i	(1) installation

OPRREC	C2PI2IND SCRIPT		13, 20, 21
		i	(1) operating requirements 15, 16, 19, 66
PAPER	C2PI2IND SCRIPT		
		i	(1) paper 6, 6, 6, 6, 32, 32, 33, 36
PERFORM	C2PI2IND SCRIPT		
		i	(1) performance 5, 5
PWR	C2PI2IND SCRIPT		
		i	(1) power 16, 17, 17, 17, 17, 17
PRINT	C2PI2IND SCRIPT		
		i	(1) print 5, 6, 31
PRINTER	C2PI2IND SCRIPT		
		i	(1) printer 2, 3, 4, 19, 23, 31, 31, 31, 31, 31, 31, 55
PUBS	C2PI2IND SCRIPT		
		i	(1) publications
REQ	C2PI2IND SCRIPT		
		i	(1) requirements 6, 6, 13, 15, 15, 15, 15, 15, 16, 16, 16, 19, 20, 24, 66
STOR	C2PI2IND SCRIPT		
		i	(1) storage 36, 36, 36
SUPPLY	C2PI2IND SCRIPT		
		i	(1) supplies 31, 36
IBMSUP	C2PI2IND SCRIPT		
		i	(1) supplies 6, 31, 36
VOLT	C2PI2IND SCRIPT		
		i	(1) voltage 16, 17, 17
WSC	C2PI2IND SCRIPT		
		i	(1) work sheets and checklists 8, 21
SAM	C2PI2C1	6	(1) special-purpose materials

Revisions

<u>id</u>	<u>File</u>	<u>Page</u>	<u>References</u>
MSH815	C2PI2SET		
		i	
MSH1	C2PI2SET		
		i	67, 67, 67, 67
MSH831	C2PI2SET		
		i	45, 45, 51, 51
MSH1108	C2PI2SET		
		i	23, 23, 23, 23, 23, 23, 23, 23, 23, 23, 23, 23, 23, 24, 24, 24, 24, 26, 26, 27, 28, 31, 31, 31, 31
MSH1208	C2PI2SET		
		i	23, 23
CTMQ	C2PI2SET		
		i	
CTM1025	C2PI2SET		
		i	
CTM0714	C2PI2SET		
		i	xii, xii, 2, 2, 4, 4, 8, 8, 8, 8, 9, 9, 9, 9, 9, 16, 16, 17, 17, 17, 17, 17, 17, 23, 23, 25, 25, 26, 26, 26, 27, 28, 28, 29, 29, 29, 29, 31, 31, 32, 32, 32, 32, 32, 33, 33, 33, 33, 33, 33, 33, 34, 34, 34, 34, 34, 35, 35, 35, 36, 37, 37, 39, 39, 54, 66, 67, 67, 68, 68, 71, 71, 71, 71, 73, 73, 74, 74
CTM0827	C2PI2SET		
		i	
01	C2PI2SET		
		i	ii, ii, ii, ii, ii, xi, xi, xi, xi, 1, 1, 1, 1, 1, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 6, 6, 6, 6, 7, 7, 11, 11, 12, 12, 12, 12, 13, 13, 15, 15, 15, 15, 16, 16, 17, 17, 18, 18, 19, 19,

19, 19, 19, 20, 20, 20, 23, 23, 23, 23, 24, 24, 24, 24, 24,
 24, 24, 24, 25, 25, 25, 25, 26, 26, 26, 26, 26, 26, 26, 26,
 29, 29, 30, 30, 30, 30, 31, 31, 31, 31, 31, 31, 31, 31, 31, 32,
 32, 32, 32, 32, 32, 32, 34, 34, 35, 35, 36, 36, 36, 36, 55,
 55, 55, 55, 56, 56, 56, 56, 56, 56, 56, 56, 57, 57, 57, 57,
 57, 57, 57, 57, 57, 57, 58, 58, 59, 59, 61, 61, 61, 61, 61,
 61, 62, 62, 62, 62, 63, 63, 64, 64, 65, 65, 65, 65, 65, 65,
 66, 66, 66, 66, 66, 66

02

C2PI2SET

i

ii, ii, vii, ix, xi, xi, xii, xii, xii, xii, xii, xii, xii, xii, xii, xii, xii,
 xii, xii, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2,
 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,
 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,
 5, 5, 6, 6, 6, 6, 6, 6, 6, 6, 6, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7,
 8, 9, 9,
 9, 9, 9, 9, 9, 9, 9, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,
 10, 10, 10, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11,
 11, 11, 11, 11, 11, 11, 11, 12, 12, 12, 12, 12, 12, 12, 12,
 12, 12, 12, 12, 12, 12, 12, 12, 12, 13, 13, 13, 13, 13, 13,
 13, 13, 13, 13, 13, 13, 14, 14, 14, 14, 14, 14, 14, 14, 14,
 14, 14, 14, 15, 15, 15, 15, 15, 15, 15, 15, 16, 16, 16, 16,
 16, 16, 16, 16, 16, 16, 17, 17, 17, 17, 17, 17, 17, 17, 17,
 17, 17, 17, 18, 18, 18, 18, 18, 18, 18, 19, 19, 19, 19, 19, 19,
 19, 19, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20,
 20, 21, 21, 21, 23, 23, 23, 23, 23, 23, 23, 23, 23, 23, 24, 24,
 24, 24, 24, 24, 24, 24, 24, 24, 24, 24, 24, 24, 24, 24, 25,
 25, 25, 25, 26, 26, 26, 26, 26, 26, 29, 29, 31, 31, 31, 31,
 31, 31, 32, 32, 32, 32, 32, 32, 32, 32, 32, 32, 33, 33, 34,
 34, 34, 34, 34, 36, 36, 37, 37, 39, 39, 39, 39, 39, 39,
 45, 45, 52, 52, 52, 52, 55, 55, 55, 55, 56, 56, 58, 58, 58,
 58, 58, 58, 58, 58, 60, 60, 60, 60, 60, 60, 60, 60, 61, 61,
 63, 63, 63, 63, 63, 63, 63, 63, 64, 64, 64, 64, 64, 64, 67,
 67, 67, 67, 67, 69, 69, 69, 69, 69, 69, 70, 70, 70, 70,
 70, 70, 70, 70, 70, 70, 70, 70, 70, 70, 71, 71, 71,
 71, 72, 72, 72, 72, 73, 73, 73, 73, 73, 73, 73, 73, 74,
 74, 74, 75, 75, 75, 75, 75, 75, 76, 76, 76, 76, 77, 77

Spots			
-------	--	--	--

<u>id</u>	<u>File</u>	<u>Page</u>	<u>References</u>
PIPLAN	C2PI2C2	8	(no text)
ITPOWR	C2PI2C4	16	(no text)
CHA	C2PI2C5	24	(no text)
GLOS	C2PI2GLS SCRIPT	69	(no text)
ACR	C2PI2GLS SCRIPT	77	(no text)
ABREV	C2PI2GLS SCRIPT	77	(no text)

Tables			
--------	--	--	--

<u>id</u>	<u>File</u>	<u>Page</u>	<u>References</u>
PSTBL	C2PI2C1	6	1 5, 6
TAH	C2PI2C4	15	2 15
SOUND	C2PI2C4	16	3 16
VOLTTAB	C2PI2C4	17	4 16
PWRSAB	C2PI2C4	17	5
WEIGHT	C2PI2C4	18	6
WKSHT	C2PI2C4		

		21	7	21
CONFWK	C2PI2C5			
		23	8	23
CONFWK2	C2PI2C5			
CONFWK3	C2PI2C5	25	9	
CONFWK5	C2PI2C5	26	10	
CONFWK6	C2PI2C5	29	11	
PRTSUP	C2PI2C6	30	12	
		31	13	31
PSTBL1	C2PI2C6			
		33	14	32
PAP1	C2PI2C6			
		33	15	33
PAP3	C2PI2C6			
SAAFN	C2PI2APA SCRIPT	34	16	
		39	17	39, 39, 41
SUBSET1	C2PI2APA SCRIPT			
		41	18	39, 41
CPID3	C2PI2APA SCRIPT			
		41	19	39, 41, 48, 48, 48, 48, 48, 48, 48, 48
FONTTB	C2PI2APA SCRIPT			
		45	20	45, 45, 45, 47
CPID	C2PI2APA SCRIPT			
		47	21	45, 47
FONTTB1	C2PI2APA SCRIPT			
		48	22	48
SUBSET2	C2PI2APA SCRIPT			
		48	23	48
AGB	C2PI2APA SCRIPT			
		49	24	
AFW	C2PI2APA SCRIPT			
		50	25	
AFZ	C2PI2APA SCRIPT			
		50	26	
AEK	C2PI2APA SCRIPT			
		50	27	
AEN	C2PI2APA SCRIPT			
		50	28	
XX	C2PI2APA SCRIPT			
		51	29	
SOFT	C2PI2APB SCRIPT			
		57	37	56
SOFT2	C2PI2APB SCRIPT			
		58	38	56

Processing Options

Runtime values:

Document fileid	C2PI2\$\$ SCRIPT
Document type	USERDOC
Document style	IBMXAGD
Profile	EDFPRF40
Service Level	0030
SCRIPT/VS Release	4.0.0
Date	96.10.04
Time	15:44:22
Device	PSA
Number of Passes	4
Index	YES
SYSVAR D	YES
SYSVAR G	INLINE
SYSVAR V	BOULDER
SYSVAR X	YES

Formatting values used:

Annotation	NO
Cross reference listing	YES
Cross reference head prefix only	NO
Dialog	LABEL
Duplex	YES
DVCF conditions file	(none)
DVCF value 1	(none)
DVCF value 2	(none)
DVCF value 3	(none)
DVCF value 4	(none)
DVCF value 5	(none)
DVCF value 6	(none)
DVCF value 7	(none)
DVCF value 8	(none)
DVCF value 9	(none)
Explode	NO
Figure list on new page	NO
Figure/table number separation	YES
Folio-by-chapter	NO
Head 0 body text	(none)
Head 1 body text	Chapter
Head 1 appendix text	Appendix
Hyphenation	NO
Justification	NO
Language	ENGL
Keyboard	395
Layout	OFF
Leader dots	YES
Master index	(none)
Partial TOC (maximum level)	4
Partial TOC (new page after)	INLINE
Print example id's	NO
Print cross reference page numbers	YES
Process value	(none)
Punctuation move characters	,
Read cross-reference file	(none)
Running heading/footer rule	NONE
Show index entries	NO
Table of Contents (maximum level)	3
Table list on new page	YES
Title page (draft) alignment	RIGHT
Write cross-reference file	(none)

Imbed Trace

Page 0	C2PI2SET
Page 0	C2PI2IND SCRIPT
Page vii	C2PI2SOA.
Page xii	C2PI2C1
Page 6	C2PI2C2
Page 10	C2PI2C3
Page 14	C2PI2C4
Page 21	C2PI2C5
Page 30	C2PI2C6
Page 38	C2PI2APA SCRIPT
Page 54	C2PI2APB SCRIPT
Page 66	C2PI2BIB SCRIPT
Page 69	C2PI2GLS SCRIPT
Page 82	RCFADDR
Page 83	RCFADDR