



IBM Printing Systems: Printer Information



IBM Printing Systems: Printer Information

Note

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Chapter 1. Introducing IBM Printing Systems Printers

IBM Printing Systems offers printing hardware and software technology. Printing Systems specializes in print solutions for the enterprise delivering customized, comprehensive solutions that go beyond the printed page. Printing Systems provides innovative, efficient, and cost-effective printing solutions that link information with output across any enterprise, large or small, worldwide.

This publication is intended to help you identify differences between IBM printers and the software used to drive the printers.

Printers Described in This Publication

This publication describes the following printers:

- Chapter 2. Network Printer 12 (4312)
- Chapter 3. Network Printer 17 (4317)
- Chapter 4. Infoprint Color 8 Printer (4308)
- Chapter 5. Infoprint 12 Printer (4912)
- Chapter 6. Infoprint 20 Printer (4320)
- Chapter 7. Infoprint 21 Printer (4322)
- Chapter 8. Infoprint 32 and Infoprint 40 Printers (4332)
- Chapter 9. Infoprint 60 Printer (3160-002)
- Chapter 10. Infoprint 70 Printer (2770)
- Chapter 11. Infoprint 2000 NP1 and RP1 Printers (2710-NP1, 2710-RP1)
- Chapter 12. Infoprint 2000-DP1 Printer (2710-DP1)
- Chapter 13. Infoprint 3000-ES1 and -ED1/ED2 Printers (3300)
- Chapter 14. Infoprint 4000 IS1- and -IS2 Printers (4000-IS1 and -IS2)
- Chapter 15. Infoprint 4000-IR1/IR2 and -IR3/IR4 Printers (4000-IR1/IR2 and -IR3/IR4)
- Chapter 16. Infoprint 4000-ID1/ID2 and -ID3/ID4 Printers (4000-ID1/ID2 and -ID3/ID4)
- Chapter 17. Infoprint 4000-ID5/ID6 Printer (4000-ID5/ID6)
- Chapter 18. InfoColor 70 Printer (3170-002)
- Chapter 19. Infoprint Color 100 Printer (3170-003)
- Chapter 20. Infoprint Color 130 Printer (3170-004)
- Chapter 21. Infoprint Color 130 Plus Printer (3170-005)
- Chapter 22. 4230 Printer (4230)
- Chapter 23. 4232 Impact Printer (4232)
- Chapter 24. 4247 Printer (4247)
- Chapter 25. 4400 Thermal Label Printer (4400)
- Chapter 26. 6400 Line Matrix Printer (6400)
- Chapter 27. Infoprint 62 Printer (4370)

Finding Additional Information About Printing

For more information about IBM printers and printing software, visit the IBM Printing Systems Internet page at:

<http://www.ibm.com/printers>

Advanced Function Common Control Unit (AFCCU)

The Advanced Function Common Control Unit (AFCCU) is the printer controller used in IPDS production printers. The heart of the AFCCU is a RISC System/6000 processor devoted to controlling printer functions and interpreting the IPDS data stream, and a set of microcode that runs on this processor. The same microcode is used across printer models, providing common IPDS functionality. However, since new functions are continually added to IPDS, newer printer models may have functions that were not shipped on older models. For details on IPDS functions available on AFCCU printers, see the *IPDS Handbook for*

Printers that Use the AFCCU, G544-3895. For a summary of IPDS functions available on AFCCU and non-AFCCU printers, see Table 13 on page 14 and Table 14 on page 15. The AFCCU printers described in this publication are:

- Chapter 9. Infoprint 60 Printer (3160-002)
- Chapter 12. Infoprint 2000-DP1 Printer (2710-DP1)
- Chapter 27. Infoprint 62 Printer (4370)
- Chapter 13. Infoprint 3000-ES1 and -ED1/ED2 Printers (3300)
- Chapter 14. Infoprint 4000 IS1- and -IS2 Printers (4000-IS1 and -IS2)
- Chapter 15. Infoprint 4000-IR1/IR2 and -IR3/IR4 Printers (4000-IR1/IR2 and -IR3/IR4)
- Chapter 16. Infoprint 4000-ID1/ID2 and -ID3/ID4 Printers (4000-ID1/ID2 and -ID3/ID4)
- Chapter 17. Infoprint 4000-ID5/ID6 Printer (4000-ID5/ID6)
- Chapter 21. Infoprint Color 130 Plus Printer (3170-005)

Printer Characteristics and PSF-Supported Functions

When you prepare an application to be printed on a PSF-supported printer, you should consider certain printer characteristics. Although the printers have many capabilities and functions in common, some differences exist. This publication describes printer characteristics and functions that are important when you are:

- Preparing an application for use on only one type of printer
- Deciding which printer to use for an application
- Preparing an application for use on more than one type of printer

This publication describes the differences among printers that may affect using the printer with PSF. For more information about a specific printer or for information about other printer characteristics, refer to the printer publications.

The printer characteristics as shown in Table 1 through Table 7 are supported similarly by PSF programs on different operating systems. An example of a printer characteristic is the medium on which the printer prints: continuous forms or cut-sheet. The printer hardware determines the medium, and PSF uses what is provided.

In contrast, other PSF-supported functions can differ across operating systems and releases. For example, current releases of the PSF licensed programs support graphics and bar codes, whereas earlier releases do not.

Printer Characteristics

Table 1 through Table 7 on page 9 summarize some of the printer characteristics described in this publication.

Workgroup Laser Printers

IBM Printing Systems' workgroup laser printers are cut-sheet printers designed to support the printing needs of small to medium-sized organizations. Table 1 and Table 2 on page 3 list the characteristics of these printers.

Table 1. Workgroup Laser Printer Characteristics

Printer Characteristics	Network Printer 12 (4312)	Network Printer 17 (4317)	Infoprint Color 8 (4308)	Infoprint 12 (4912)
Maximum printing rate	12 ppm	17 ppm	8 ppm	12 ppm
Print technology	Laser	Laser	Laser	Laser
Datastreams * Pages and ESC/P support is available only in Japan.	IPDS, SCS, DSC, DSE, PostScript, PCL, Pages*, ESC/P*	IPDS, SCS, DSC, DSE, PostScript, PCL, Pages*, ESC/P*	PCL, PostScript	PCL, PostScript

Table 1. Workgroup Laser Printer Characteristics (continued)

Printer Characteristics	Network Printer 12 (4312)	Network Printer 17 (4317)	Infoprint Color 8 (4308)	Infoprint 12 (4912)
Form type	Cut Sheet	Cut Sheet	Cut Sheet	Cut Sheet
Number of input bins	2 standard 1 optional	2 standard 1 optional	2 standard 1 optional	2 standard 2 optional
Number of output bins	1 standard 1 optional	1 standard 2 optional	2 standard	1 standard 1 optional
Manual forms feed	yes	yes	yes	yes
Envelope printing	yes	yes	no	yes
MICR printing *IBM Business Partners may have MICR solutions for these printers.	no*	no*	no*	no*
Duplex printing	yes	yes	yes (manual)	yes (manual)
Color	no	no	yes	no
Printhead resolution	600 dpi	600 dpi	600 dpi	300 dpi 600 dpi 1,200 dpi
Maximum impressions per month (duty cycles)	35,000	65,000	25,000	20,000

Table 2. Workgroup Laser Printer Characteristics (continued)

Printer Characteristics	Infoprint 20 (4320)	Infoprint 21 (4322)	Infoprint 32 (4332-001) (4332-002) (4332-003)	Infoprint 40 (4332-004) (4332-005) (4332-006)
Maximum printing rate	20 ppm	21 ppm	32 ppm	40 ppm
Print technology	Laser	Laser	Laser	Laser
Datastreams * Pages and ESC/P support is available only in Japan.	IPDS, SCS, DSC, DSE, PostScript, PCL, Pages*, ESC/P*	IPDS, SCS, DSC, DSE, PostScript, PCL	IPDS, SCS, DSC, DSE, PostScript, PCL, Pages*, ESC/P*	IPDS, SCS, DSC, DSE, PostScript, PCL, Pages*, ESC/P*
Form type	Cut Sheet	Cut Sheet	Cut Sheet	Cut Sheet
Number of input bins	2 standard 2 optional	2 standard 2 optional	3 standard 3 optional	3 standard 3 optional
Number of output bins	1 standard 1 optional	1 standard 2 optional	1 standard 4 optional	1 standard 4 optional
Manual forms feed	yes	yes	yes	yes
Envelope printing	yes	yes	yes	yes
MICR printing *IBM Business Partners may have MICR solutions for these printers.	no*	no*	no*	no*
Duplex printing	yes	yes	yes	yes
Color	no	no	no	no
Printhead resolution	600 dpi	1200 dpi	600 dpi	600 dpi

Table 2. Workgroup Laser Printer Characteristics (continued) (continued)

Printer Characteristics	Infoprint 20 (4320)	Infoprint 21 (4322)	Infoprint 32 (4332-001) (4332-002) (4332-003)	Infoprint 40 (4332-004) (4332-005) (4332-006)
Maximum impressions per month (duty cycles)	75,000	100,000	150,000	150,000

Cutsheet Production Printers

IBM Printing Systems' cut sheet production printers are heavy-duty, full-function printers with multiple connectivity options. Table 3 lists the characteristics for these printers.

Table 3. Cut Sheet Production Printer Characteristics

Printer Characteristics	Infoprint 60 (3160-002)	Infoprint 70 (2770)	Infoprint 2000 (2710-NP1) (2710-RP1)	Infoprint 2000 (2710-DP1)
Maximum printing rate	60 ppm	70 ppm	110 ppm	110 ppm
Print technology	Laser	Laser	Laser	Laser
Datastreams	IPDS, PCL	IPDS	PostScript 3, PCL6, PDF	IPDS, LCDS/Metacode, PCL6, PostScript 3, PDF
Form type	Cut Sheet	Cut Sheet	Cut-Sheet	Cut-Sheet
Number of input bins	3 standard 1 optional	4 standard 1 optional	3 standard	3 standard
Number of output bins	2 standard 2 optional	2 standard 1 optional	1 standard	1 standard
Manual forms feed	no	no	no	no
Envelope printing	no	no	no	no
MICR printing *IBM Business Partners may have MICR solutions for these printers.	no*	no*	no	no
Duplex printing	yes	yes	yes	yes
Color	no	no	no	no
Printhead resolution	240 dpi 300 dpi 600 dpi	600 dpi	600 dpi	600 dpi
Maximum impressions per month (duty cycles)	750,000	400,000	2,000,000	2,000,000

Continuous Form Production Printers

IBM Printing Systems' continuous form production printers are high-speed, high capacity printers. Table 4 and Table 5 on page 6 lists the characteristics for these printers.

Table 4. Continuous Form Production Printer Characteristics (1 of 2)

Printer Characteristics	Infoprint 3000 (3300-ES1)	Infoprint 3000 (3300-ED1/ED2)	Infoprint 4000 Simplex (4000-IS1)	Infoprint 4000 Simplex (4000-IS2) ¹
Print technology	Laser	Laser	Laser	Laser
Datastreams	IPDS	IPDS	IPDS	IPDS

Table 4. Continuous Form Production Printer Characteristics (1 of 2) (continued)

Printer Characteristics	Infoprint 3000 (3300-ES1)	Infoprint 3000 (3300-ED1/ED2)	Infoprint 4000 Simplex (4000-IS1)	Infoprint 4000 Simplex (4000-IS2) ¹
Form type	Continuous	Continuous	Continuous	Continuous
Number of input bins	1 standard	1 standard	1 standard	1 standard
Number of output bins	1 standard	1 standard	1 standard	1 standard
Manual forms feed	n/a	n/a	n/a	n/a
Envelope printing	n/a	n/a	n/a	n/a
MICR printing *With either RPQ 8B4013 or 8B4018 installed	no	no	yes*	yes*
Duplex printing	no	yes	no	no
Color *With the IBM 4005 Infoprint Hi-Lite Color printer attached ²	no	no	yes*	yes*
Printhead resolution	480 dpi 600 dpi	480 dpi 600 dpi	240 dpi 300 dpi	240 dpi 300 dpi
Maximum printing rates for letter (8.5 x 11)				
inches per second	15.9	15.9	32.5	46
inches per minute	954	954	1,950	2,760
Maximum printing rates for letter in pages per minute ³				
1-up landscape (8.5 inches long) simplex	112	112	229	324
1-up landscape (8.5 inches long) duplex	n/a	224	n/a	n/a
2-up portrait (11 inches long) simplex	172	172	354	501
2-up portrait (11 inches long) duplex	n/a	344	n/a	n/a
Maximum printing rates for A4 (210 x 297 mm)				
mm per second	404	404	825	1168
mm per minute	24,231	24,231	49,530	70,104
Maximum printing rates for A4 in pages per minute ³				
1-up landscape (210 mm long) simplex	115	115	235	333
1-up landscape (210 mm long) duplex	n/a	230	n/a	n/a
2-up portrait (297 mm long) simplex	162	162	333	472
2-up portrait (297 mm long) duplex	n/a	324	n/a	n/a
Maximum usage in pages per month (duty cycles) ⁴				
Letter: 1-up landscape (8.5 inches long)	2,800,000 simplex	5,800,000 duplex	5,600,000 simplex	8,000,000 simplex
Letter: 2-up portrait (11 inches long)	4,400,000 simplex	8,800,000 duplex	8,700,000 simplex	12,300,000 simplex

Table 4. Continuous Form Production Printer Characteristics (1 of 2) (continued)

Printer Characteristics	Infoprint 3000 (3300-ES1)	Infoprint 3000 (3300-ED1/ED2)	Infoprint 4000 Simplex (4000-IS1)	Infoprint 4000 Simplex (4000-IS2) ¹
A4: 1-up landscape (210 mm long)	3,000,000 simplex	6,000,000 duplex	5,700,000 simplex	8,100,000 simplex
A4: 2-up portrait (297 mm long)	4,000,000 simplex	8,000,000 duplex	8,200,000 simplex	11,500,000 simplex
<p>1. The 4000-IS2 printer was originally shipped with a print speed of 44 inches per second. All 4000-IS2 printers shipped after February 17, 1998 (or with upgrades 9324 or 4260 installed) have a print speed of 46 inches per second.</p> <p>2. The IBM Infoprint 4005 Hi-Lite Color post-processor provides a high-speed, high quality, all-points-addressable (APA) color printing system to complement the industry-leading quality and reliability the IBM Infoprint 4000 Wide or Wide Duplex printers (240 dpi models). Visit the IBM Printing Systems Internet page at http://www.ibm.com/printers for more information about the Infoprint 4005.</p> <p>3. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>4. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>				

Table 5. Production/System Printer Characteristics (2 of 2)

Printer Characteristics	Infoprint 4000 (4000 IR1/IR2)	Infoprint 4000 (4000 IR3/IR4)	Infoprint 4000 (4000 ID1/ID2)	Infoprint 4000 (4000 ID3/ID4)	Infoprint 4000 (4000 ID5/ID6)
Print technology	Laser	Laser	Laser	Laser	Laser
Datastreams	IPDS	IPDS	IPDS	IPDS	IPDS
Form type	Continuous	Continuous	Continuous	Continuous	Continuous
Number of input bins	1 standard	1 standard	1 standard	1 standard	1 standard
Number of output bins	1 standard	1 standard	1 standard	1 standard	1 standard
Manual forms feed	n/a	n/a	n/a	n/a	n/a
Envelope printing	n/a	n/a	n/a	n/a	n/a
MICR printing *With either RPQ 8B4013 or 8B4018 installed	no	no	yes*	no	yes*
Duplex printing	yes	yes	yes	yes	yes
Color *With the IBM 4005 Infoprint Hi-Lite Color printer attached ¹	no	no	yes*	yes*	yes*
Printhead resolution	480 dpi 600 dpi	480 dpi 600 dpi	240 dpi 300 dpi	240 dpi 300 dpi	480 dpi 600 dpi
Maximum printing rates for letter (8.5 x 11 inches)					
inches per second	21.3	32.5	32.5	46	46
inches per minute	1,278	1,950	1,950	2,760	2,760
Maximum printing rates for letter in pages per minute ²					
1-up landscape (8.5 inches long) simplex	150	229	229	324	324

Table 5. Production/System Printer Characteristics (2 of 2) (continued)

Printer Characteristics	Infoprint 4000 (4000 IR1/IR2)	Infoprint 4000 (4000 IR3/IR4)	Infoprint 4000 (4000 ID1/ID2)	Infoprint 4000 (4000 ID3/ID4)	Infoprint 4000 (4000 ID5/ID6)
1-up landscape (8.5 inches long) duplex	300	458	458	648	648
2-up portrait (11 inches long) simplex	232	354	354	501	501
2-up portrait (11 inches long) duplex	464	708	708	1,002	1,002
Maximum printing rates for A4 (210 x 297 mm)					
mm per second	541	825	825	1168	1168
mm per minute	32,461	49,530	49,530	70,104	70,104
Maximum printing rates for A4 in pages per minute ²					
1-up landscape (210 mm long) simplex	154	235	235	333	333
1-up landscape (210 mm long) duplex	308	470	470	666	666
2-up portrait (297 mm long) simplex	218	333	333	472	472
2-up portrait (297 mm long) duplex	436	666	666	944	944
Maximum usage in pages per month (duty cycles) ³					
Letter: 1-up landscape (8.5 inches long)	7,300,000 (duplex)	11,200,000 (duplex)	11,200,000 (duplex)	16,000,000 (duplex)	16,000,000 (duplex)
Letter: 2-up portrait (11 inches long)	11,300,000 (duplex)	17,400,000 (duplex)	17,400,000 (duplex)	24,600,000 (duplex)	24,600,000 (duplex)
A4: 1-up landscape (210 mm long)	7,500,000 (duplex)	11,600,000 (duplex)	11,600,000 (duplex)	16,300,000 (duplex)	16,300,000 (duplex)
A4: 2-up portrait (297 mm long)	10,700,000 (duplex)	16,700,000 (duplex)	16,700,000 (duplex)	23,000,000 (duplex)	23,000,000 (duplex)
<ol style="list-style-type: none"> 1. The IBM Infoprint 4005 Hi-Lite Color post-processor provides a high-speed, high quality, all-points-addressable (APA) color printing system to complement the industry-leading quality and reliability the IBM Infoprint 4000 Wide or Wide Duplex printers (240 dpi models). Visit the IBM Printing Systems Internet page at http://www.ibm.com/printers for more information about the Infoprint 4005. 2. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate. 3. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis. 					

Enterprise Color Printers

IBM Printing Systems' enterprise color printers are web-fed, full-color printers. Table 6 on page 8 lists the characteristics for these printers.

Table 6. Enterprise Color Printer Characteristics

Printer Characteristics	InfoColor 70 (3170-002) (3170-02D)	Infoprint Color 100 (3170-03D)	Infoprint Color 130 (3170-004)	Infoprint Color 130 Plus (3170-005)
Print technology	Electro- photographic	Electro- photographic	Electro- photographic	Electro- photographic
Datastreams	PostScript	PostScript	PostScript	IPDS
Form type	Continuous	Continuous	Continuous	Continuous
Number of input bins	1 standard	1 standard	1 standard	1 standard
Number of output bins	1 standard	1 standard	1 standard	1 standard
Manual forms feed	n/a	n/a	n/a	n/a
Envelope printing	n/a	n/a	n/a	n/a
MICR printing	no	no	no	no
Duplex printing	yes	yes	no	no
Color selection	yes	yes	yes	yes
Printhead resolution	600 dpi	600 dpi	600 dpi	600 dpi
Maximum printing rates for letter (8.5 x 11 inches)				
inches per second	3.4	4.8	6.3	6.3
inches per minute	204	289	378	378
Maximum printing rates for letter in pages per minute ¹				
1-up landscape (8.5 inches long) simplex	35	34	44	44
1-up landscape (8.5 inches long) duplex	70	68	138	138
2-up portrait (11 inches long) simplex	n/a	52	68	68
2-up portrait (11 inches long) duplex	n/a	105	136	136
Maximum printing rates for A4 (210 x 297 mm)				
mm per second	86	122.5	160	160
mm per minute	5160	7350	9,600	9,600
Maximum printing rates for A4 in pages per minute ¹				
1-up landscape (210 mm long) simplex	35	34	44	44
1-up landscape (210 mm long) duplex	70	68	138	138
2-up portrait (297 mm long) simplex	n/a	52	n/a	n/a
2-up portrait (297 mm long) duplex	n/a	105	n/a	n/a
Maximum usage in pages per month (duty cycles) ²				
Letter: 1-up landscape (8.5 inches long)	680,000 duplex	680,000 duplex	680,000 duplex	680,000 duplex
Letter: 2-up portrait (11 inches long)	n/a	1,050,000 duplex	1,050,000 duplex	1,050,000 duplex

Table 6. Enterprise Color Printer Characteristics (continued)

Printer Characteristics	InfoColor 70 (3170-002) (3170-02D)	Infoprint Color 100 (3170-03D)	Infoprint Color 130 (3170-004)	Infoprint Color 130 Plus (3170-005)
A4: 1-up landscape (210 mm long)	700,000 duplex	700,000 duplex	700,000 duplex	700,000 duplex
A4: 2-up portrait (297 mm long)	n/a	1,000,000 duplex	1,000,000 duplex	1,000,000 duplex
<p>1. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>2. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>				

Industrial Impact and Non-Impact Printers

IBM Printing Systems' industrial impact and non-impact printers are cost-effective, rugged impact and non-impact printers that print on a wide variety of media. Table 7 and Table 8 on page 10 lists the characteristics for these printers.

Table 7. Industrial / Impact and Non-Impact Printer Characteristics (1 of 2)

Printer Characteristics	4230-xx1 4230-xx2 4230-xx3	4232	4247-A00/001 4247-002
Maximum printing rate: characters per second (cps) Maximum printing rate: lines per minute (lpm) Maximum printing rate: inches per second (ips)	375 cps (-xx1) 480 cps (-xx1) 600 cps (-xx1)	600 cps	700 cps (A00/001) 400 (002)
Print technology	Impact Dot Matrix	Impact Dot Matrix	Impact Dot Matrix
Datastreams	PPDS, Epson, ASCII, SCS, IPDS	PPDS, Epson, ASCII	PPDS, Epson, ASCII, SCS, IPDS
Form type	Continuous Cut-Sheet	Continuous Cut-Sheet	Continuous Cut-Sheet
Number of input bins	1 standard	1 standard	3 standard 3 optional
Number of output bins	1 standard	1 standard	1 standard
Manual forms feed *An Automatic Sheet Feed Device is available.	yes	yes	yes*
Envelope printing	n/a	n/a	n/a
MICR printing	no	no	no
Duplex printing	no	no	no
Color	no	no	no
Operator-adjustable forms	yes	yes	yes
Printhead resolution (pels per inch)	144 X 144	144 X 144	144 X 144
Maximum characters per second (cps) per month (duty cycles)	16,000,000	16,000,000	20,000,000

Table 8. Industrial / Impact and Non-Impact Printer Characteristics (2 of 2)

Printer Characteristics	6400-050/P50 6400-010/P10 6400-015	4400 Thermal Printer 4400-004 4400-006 4400-008	Infoprint 62 (4370-002) (4370-003)
Maximum printing rate: characters per second (cps) Maximum printing rate: lines per minute (lpm) Maximum printing rate: inches per second (ips)	500 lpm (050/P50) 1000 lpm (010/P10) 1500 lpm (015)	Models 004/006 8 ips at 300 dpi 10 ips at 203 dpi Model 008 6 ips at 300 dpi 8 ips at 203 dpi	n/a
Print technology	Line Matrix	Thermal	Light Emitting Diode
Datastreams	PPDS, Epson, ASCII, SCS, IPDS	ASCII, Code V and IGP, IPDS, SCS	IPDS
Form type	Continuous	Continuous	Continuous
Number of input bins	1 standard	1 standard	1 standard
Number of output bins	1 standard	1 standard	1 standard 1 optional
Manual forms feed *An Automatic Sheet Feed Device is available.	n/a	n/a	n/a
Envelope printing	n/a	n/a	n/a
MICR printing	no	no	no
Duplex printing	no	no	no
Color	no	no	no
Operator-adjustable forms	yes	yes	n/a
Printhead resolution (pels per inch)	120 X 144	203 dpi 300 dpi	240 dpi (4370-002) 300 dpi (4370-003)
Maximum characters per second (cps) per month (duty cycles)	n/a	n/a	n/a
Maximum printing rates for letter (8.5 x 11)			
inches per second	n/a		8.8
inches per minute			528
Maximum printing rates for letter in pages per minute ¹			
1-up landscape (8.5 inches long) simplex	n/a		62
1-up landscape (8.5 inches long) duplex			n/a
2-up portrait 11 inches long (simplex)			n/a
2-up portrait 11 inches long (duplex)			n/a
Maximum printing rates for A4 (210 mm x 297 mm)			
mm per second	n/a		1574
mm per minute			13,411
Maximum printing rates for A4 in pages per minute ¹			

Table 8. Industrial / Impact and Non-Impact Printer Characteristics (2 of 2) (continued)

Printer Characteristics	6400-050/P50 6400-010/P10 6400-015	4400 Thermal Printer 4400-004 4400-006 4400-008	Infoprint 62 (4370-002) (4370-003)
1-up landscape (210 mm long) simplex	n/a		64
1-up landscape (210 mm long) duplex			n/a
2-up portrait (297 mm long) simplex			n/a
2-up portrait (297 mm long) duplex			n/a
Maximum usage in pages per month (duty cycles) ²			
Letter: 1-up landscape (8.5 inches long)	n/a		600,000 simplex
Letter: 2-up portrait (11 inches long)			n/a
A4: 1-up landscape (210 mm long)			600,000 simplex
A4: 2-up portrait (297 mm long)			n/a
<p>1. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>2. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>			

AFP Font Collection

The AFP Font Collection provides a comprehensive set of fonts and utility programs that enable you to optimize font usage on Advanced Function Printing devices. The fonts provided by this product, or transformed using its utilities, can be installed on any IBM operating system, providing consistency across platforms and AFP printers. Resident IPDS fonts are supplied for the printers marketed by IBM Printing Systems. The single-byte raster and outline fonts shipped with the AFP Font Collection are already marked correctly for activating resident fonts and for capturing fonts.

A raster font is a sequence of dots that form the character. The number of dots per inch that a printer generates is called the print resolution, or density. A resolution of 240 pels means that a printer prints 240 pels per inch both vertically and horizontally, or 57,600 pels per square inch (240 x 240). The ability to print at a given pel density is determined by the type of printer. Because IBM fonts are provided for specific resolutions, different fonts are available for printers with different resolutions (for example, 240-pel and 300-pel printers).

Outline fonts describe their characters by mathematical formulas rather than by pels. These formulas are used by rasterizing software to create bitmap characters based on two variables: resolution and point size. This means that a single outline font can offer many print resolutions and point sizes.

The Font Collection Version 2 product numbers are: 5648-B33 (MVS, VM, and VSE) and 5648-B45 (AIX, OS/400, and OS/2). For more information, see the Printing Systems web site at:

<http://www.ibm.com/printers>

Font Technologies

Resident fonts are installed in the printer and are always available. Their use can significantly decrease the amount of data that must be sent to the printer across communication lines. A list of which resident fonts are available on the printer can usually be obtained from the printer's menu.

Downloaded fonts are sent from the print server and generally disappear after the job has finished printing. Downloaded fonts can also be “captured” by the printer. Captured fonts automatically become new temporary resident fonts, which improves performance on future jobs that use the same fonts. The printer manages the captured font library, not the print server.

Font Support with PSF and Infoprint Manager: Outline, raster, SBCS and DBCS fonts are supported by Print Services Facility and Infoprint Manager on most operating systems as download, resident, or captured fonts. Table 9 list the font technologies supported by PSF.

Table 9. Font Support with PSF

Operating System	Download	Resident	Captured
PSF for OS/390	yes	yes	yes
PSF/MVS	yes	yes	yes
PSF/VSE	yes	yes	yes
PSF/VM	yes ¹	yes	no
PSF/400	yes	yes	yes
Infoprint Manager for Windows NT and Windows 2000	yes	yes	no
Infoprint Manager for AIX	yes	yes	no

1. PSF/VM does not download outline fonts.

Font Support with IPDS Printers: The following table summarizes the font technologies supported by Printing System IPDS printers.

Table 10. Font Technologies Supported by IPDS Printers

Printer	Single-Byte Raster	Single-Byte Outline	Double-Byte Raster	Double-Byte Outline
Network Printer 12	Downloaded		Downloaded	
Network Printer 17	Downloaded		Downloaded	
Infoprint 20 printer	Downloaded	Downloaded Resident	Downloaded	Downloaded Resident ¹
Infoprint 21 printer	Downloaded	Downloaded Resident	Downloaded	Downloaded Resident ¹
Infoprint 32 printer Infoprint 40 printer	Downloaded	Downloaded Resident	Downloaded	Downloaded Resident ¹
Infoprint 60 printer	Downloaded Resident Capture	Downloaded Resident Capture	Downloaded Resident Capture	Downloaded Resident Capture
Infoprint 62 printer	Downloaded Capture	Downloaded Resident Capture	Downloaded Resident Capture	Downloaded Resident Capture
Infoprint 2000–DP1 printer	Downloaded Capture	Downloaded Resident Capture	Downloaded Resident Capture	Downloaded Resident Capture
Infoprint 3000 printers	Downloaded Capture	Downloaded Resident Capture	Downloaded Resident Capture	Downloaded Resident Capture

Table 10. Font Technologies Supported by IPDS Printers (continued)

Printer	Single-Byte Raster	Single-Byte Outline	Double-Byte Raster	Double-Byte Outline
Infoprint 4000–IR1/IR2 printer Infoprint 4000–IR3/IR4 printer	Downloaded Capture	Downloaded Resident Capture	Downloaded Resident Capture	Downloaded Resident Capture
Infoprint 4000–IS1 printer Infoprint 4000–IS2 printer Infoprint 4000–ID1/ID2 printer Infoprint 4000–ID3/ID4 printer Infoprint 4000–ID5/ID6 printer	Downloaded Capture	Downloaded Resident Capture	Downloaded (240 dpi) Resident Capture	Downloaded Resident Capture
Infoprint Color 130 Plus printer	Downloaded Capture	Downloaded Resident Capture	Downloaded Resident Capture	Downloaded Resident Capture
4230 Printer 4247 Printer 6400 Printer	Resident	Resident	Resident	Resident
1. With the IPDS DBCS font feature.				

Font Support with PCL Printers: The following table summarizes the font technologies supported by Printing System PCL printers.

Table 11. Font Technologies Supported by PCL Printers

Printer	Internal (resident)	Disk (additional)	Downloadable (Soft)
Infoprint Color 8	yes	no	no
Infoprint 12 printer	yes	no	no
Network Printer 12	yes	no	yes
Network Printer 17	yes	yes	yes
Infoprint 20 printer	yes	yes	yes
Infoprint 21 printer	yes	yes	yes
Infoprint 32 printer Infoprint 40 printer	yes	yes	yes
Infoprint 60 printer	yes	yes	yes
Infoprint 2000–NP1/RP1 printers	yes	yes	yes
Infoprint 3000 printers	yes	yes	yes

Font Support with PostScript Printers: The following table summarizes the font technologies supported by Printing System PostScript printers.

Table 12. Font Technologies Supported by PostScript Printers

Printer	Internal	Downloadable (Soft)
Infoprint Color 8	yes	no
Network Printer 12	yes	no

Table 12. Font Technologies Supported by PostScript Printers (continued)

Printer	Internal	Downloadable (Soft)
Network Printer 17	yes	yes
Infoprint 20 printer	yes	yes
Infoprint 21 printer	yes	yes
Infoprint 32 printer	yes	yes
Infoprint 40 printer	yes	yes
Infoprint 2000–NP1/RP1 printers	yes	yes
Infoprint 3000 printers	yes	yes

Network Printer Resource Utility

The Network Printer Resource Utility (NPRU) is an application for Workgroup printers that provides a repository (resource inventory) for fonts and overlays (macros) on a workstation with access to an IBM printer. Once a font or overlay has been added to the NPRU inventory, it can be downloaded to temporary or permanent RAM on the printer or to a Flash or Hard Drive option if available.

The font formats supported are PCL Intellifonts, TrueType, and PostScript Type1. Fonts and overlays that are downloaded are available to workstation applications when the network printer drivers are selected. NPRU is a separate program that uses the printer drivers to download.

See the Setup CD-ROM for individual Workgroup printers for information about the systems that NPRU supports.

IPDS Functions

Table 13 and Table 14 summarizes the IPDS functions supported by each printer.

Table 13. Supported IPDS Functions (1 of 2)

	Network Printer 12 Network Printer 17	Infoprint 20 Infoprint 21 Infoprint 32 Infoprint 40	Infoprint 60	Infoprint 70
N_UP	no	no	yes	no
N_UP Enhanced	no	no	yes	no
Cut-Sheet Emulation	no	no	no	no
Print Quality Selection	no	yes	no	yes
Set Media Size	no	no	no	no
Select Media Modification	no	no	no	no
Media Source by Copy	yes	yes	yes	yes
Media ID by Name	no	no	yes	no
Media ID by OID	no	Infoprint 21 only	no	yes
Maximum Mapped Page Overlay	254	254	32,511	254
Page Overlay Rotation	no	no	yes	no
Maximum Mapped Page Segment	127	127	32,511	127
Changeable Media Origin	yes	yes	yes	yes
Logical Page and Object Coloring	no	no	Prints black, color of medium, or percentage of coverage	no

Table 13. Supported IPDS Functions (1 of 2) (continued)

	Network Printer 12 Network Printer 17	Infoprint 20 Infoprint 21 Infoprint 32 Infoprint 40	Infoprint 60	Infoprint 70
PTOCA PT2 Set Text Color Set Extended Text Color	yes accept no	yes accept accept	yes accept accept	yes accept accept
IM1 Image OCA Color	yes accept	yes accept	yes accept	yes accept
IOCA FS10 Image G4 MMR Comp. G3 MR Comp. G3 MH Comp. IBM MMR Comp. ABIC Bi-Level Comp. RL4 OCA Color Unpadded RIDIC Replicate and Trim Scale to Fill	yes yes yes no yes no yes accept no yes no	yes yes yes no yes no yes accept no yes no	yes yes yes yes yes yes no accept yes yes yes	yes yes yes no yes no yes accept no yes no
IOCA FS42 and FS45	no	no	no	no
GOCA DR2/V0 OCA Colors Process Colors Simulate OCA color with pattern Simulate highlight color with shading Partial Arc Box command	yes accept no no no no no	yes accept accept yes no yes yes	yes accept accept yes yes yes yes	yes accept accept yes no yes yes
EPS Object	no	no	no	no
BCOCA	See Table 15 on page 17 for more information about BCOCA data and these printers.			
FOCA	See Table 10 on page 12 for more information about FOCA data and these printers.			

Table 14. Supported IPDS Functions (2 of 2)

	Infoprint 2000 Model DP1	Infoprint 3000 Infoprint 4000	Infoprint Color 130 Plus	4230 Printer 4247 Printer 4400 Thermal Printer 6400 Printer	Infoprint 62
N_UP	yes	yes	yes	no	yes
N_UP Enhanced	yes	yes	yes	no	yes
Cut-Sheet Emulation	no	yes	yes	no	yes
Print Quality Selection	no	no	no	yes	no
Set Media Size	no	no	no	yes	no
Select Media Modification	no	yes	yes	no	yes
Media Source by Copy	yes	n/a	n/a	n/a	n/a
Media ID by Name	yes	yes	yes	no	yes
Media ID by OID	no	no	no	no	no

Table 14. Supported IPDS Functions (2 of 2) (continued)

	Infoprint 2000 Model DP1	Infoprint 3000 Infoprint 4000	Infoprint Color 130 Plus	4230 Printer 4247 Printer 4400 Thermal Printer 6400 Printer	Infoprint 62
Maximum Mapped Page Overlay	32,511	32,511	32,511	254	32,511
Page Overlay Rotation	yes	yes	yes	no	yes
Maximum Mapped Page Segment	32,511	32,511	32,511	127	32,511
Changeable Media Origin	yes	yes	yes	no	yes
Logical Page and Object Coloring	Prints black, color of medium or percentage coverage		yes	no	Prints black, color of medium or percentage coverage
PTOCA PT2 Set Text Color Set Extended Text Color	yes accept accept	yes accept accept	yes accept accept	yes accept no	yes accept accept
IM1 Image OCA Color	yes accept	yes accept	yes yes	yes accept	yes accept
IOCA FS10 Image G4 MMR Comp. G3 MR Comp. G3 MH Comp. IBM MMR Comp. ABIC Bi-Level Comp. RL4 OCA Color Unpadded RIDIC Replicate and Trim Scale to Fill	yes yes yes yes yes yes no accept yes yes yes yes	yes yes yes yes yes yes no accept yes yes yes yes	yes yes yes yes yes yes no yes no yes yes no	no n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a n/a	yes yes yes yes yes yes no accept no yes yes yes
IOCA FS42 Image IOCA FS45 Image	no	no	yes yes	no	no
GOCA DR2/V0 OCA Colors Process Colors Simulate OCA color with pattern Simulate highlight color with shading Partial Arc Box command	yes accept accept yes yes yes yes	yes accept accept yes yes yes yes	yes yes yes n/a n/a yes yes	yes accept no no no no no	yes accept accept yes yes yes no
EPS Object	no	no	no	no	no
BCOCA	See Table 15 on page 17 for more information about BCOCA data and these printers.				
FOCA	See Table 10 on page 12 for more information about FOCA data and these printers.				

Table 15. Bar Codes supported by IPDS Printers

Bar Code Type	Modifier	4230 Printer 4247 Printer 4400 Printer 6400 Printer	Network Printer 12 Network Printer 17 Infoprint 12 Infoprint 20 Infoprint 21 Infoprint 32 Infoprint 40	Infoprint 4000 Infoprint 3000 Infoprint 60 Infoprint 62 Infoprint 70 Infoprint Color 130 Plus
X'01' — Code 39 (3-of-9) AIM USS-39	X'01' and X'02'	yes	yes	yes
X'02' — MSI (modified Plessey code)	X'01' through X'09'	yes	yes	yes
X'03' — UPC/CGPC Version A	X'00'	yes	yes	yes
X'05' — UPC/CGPC Version E	X'00'	yes	yes	yes
X'06' — UPC — Two Digit Supplemental	X'00'	yes	yes	yes
X'06' — UPC — Two Digit Supplemental	X'01' and X'02'	no	no	yes
X'07' — UPC — Five Digit Supplemental	X'00'	yes	yes	yes
X'07' — UPC — Five Digit Supplemental	X'01' and X'02'	no	no	yes
X'08' — EAN 8 (includes JAN-short)	X'00'	yes	yes	yes
X'09' — EAN 13 (includes JAN-standard)	X'00'	yes	yes	yes
X'0A' — Industrial 2-of-5	X'01' and X'02'	yes	yes	yes
X'0B' — Matrix 2-of-5	X'01' and X'02'	yes	yes	yes
X'0C' — Interleaved 2-of-5, AIM USS-1 2/5	X'01' and X'02'	yes	yes	yes
X'0D' — Codabar, 2-of-7, AIM USS-Codabar	X'01' and X'02'	yes	yes	yes
X'11' — Code 128, AIM USS-128 (includes UCC/EAN-128)	X'02'	yes	yes	yes
X'16' — EAN Two-digit Supplemental	X'00'	yes	yes	yes
X'16' — EAN Two-digit Supplemental	X'01'	no	no	yes
X'17' — EAN Five-digit Supplemental	X'00'	yes	yes	yes
X'17' — EAN Five-digit Supplemental	X'01'	no	no	yes
X'18' — POSTNET	X'00' through X'03'	yes	yes	yes
X'1A' — RM4SCC (Royal Mail, UK)	X'00'	no	yes	yes
X'1A' — RM4SCC (Royal Mail, Dutch Kix)	X'01'	no	Infoprint 21	no
X'1B' — Japan Postal Bar Code	X'00' through X'01'	no	Infoprint 20 Infoprint 21 Infoprint 32 Infoprint 40	yes

Table 15. Bar Codes supported by IPDS Printers (continued)

Bar Code Type	Modifier	4230 Printer 4247 Printer 4400 Printer 6400 Printer	Network Printer 12 Network Printer 17 Infoprint 12 Infoprint 20 Infoprint 21 Infoprint 32 Infoprint 40	Infoprint 4000 Infoprint 3000 Infoprint 60 Infoprint 62 Infoprint 70 Infoprint Color 130 Plus
X'1F' — Australia Postal Bar Code	X'01' through X'08'	no	Infoprint 20	Infoprint 70

Data Streams

The following table shows which platforms have the ability to convert data streams from one format to another. This allows output which otherwise would not be printable on a particular device to be converted into a data stream that the printer understands.

Keep in mind when using data stream transforms that some loss of fidelity may occur. Also, performance and storage considerations should be taken into account because often the transformed data stream will consist entirely of image, which is larger than the originating file.

Note: Transforms that are functionally the same may not be identical from platform.

Table 16. Data Stream Transforms

Transform	Infoprint Manager for AIX (V3R2)	Infoprint Manager for NT (V1R1)	AS/400 Host Print Transform (V4R4)	Infoprint Server Transforms (OS/390 V2R8) ¹
AFP to PCL	yes	yes	yes	yes
AFP to PostScript	yes	yes	no	yes
AFP to PDF	yes	yes	no	yes
PCL to AFP	yes	no	no	yes
PostScript to AFP	yes	yes	no	yes
PDF to AFP	yes	yes	no	yes
SAP to AFP	yes	no	yes	yes
TIFF to AFP	yes	yes	yes	no
AFP to TIFF	no	no	yes	no
SCS to PCL	no	no	yes	no
Line data to AFP	yes	yes	no	yes

1. Requires Infoprint Server for OS/390

Attachment Modes for Supported Printers

The following tables represent the datastream capabilities by attachment type currently available for the Printing Systems product line. These capabilities are enhanced on a regular basis, so it is recommended that you refer to current documentation when considering new printers and attachments. Additional servers, software products, and datastream transforms will also supplement these tables with other connectivity options. Many printers also support drivers available under other platforms (not listed in these tables) such as OS/2, MacOS, Solaris, SCO-UNIX, HP-UX, Novell NetWare, Netware, and Linux. Some of the attachment modes on various platforms will require additional software. For example, driving IPDS printers from any platform requires PSF or Infoprint Manager, and driving PCL or PostScript from OS/390 requires Infoprint Server. Please reference the IBM website at <http://www.ibm.com/printers> for specific software product requirements and up-to-date attachment information.

Attachment Modes for Workgroup Laser Printers

Table 17. Attachment Modes for the Infoprint Color 8

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	PostScript, PCL			PostScript, PCL	PostScript, PCL	PostScript, PCL
PC Parallel				PostScript, PCL	PostScript, PCL	PostScript, PCL

Table 18. Attachment Modes for the Infoprint 12 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	PostScript, PCL			PostScript, PCL		PostScript, PCL
PC Serial						PostScript, PCL
PC Parallel				PostScript, PCL		PostScript, PCL

Table 19. Attachment Modes for the Network Printer 12, Network Printer 17, Infoprint 20, Infoprint 32, and Infoprint 40 Printers

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS, PostScript, PCL	IPDS	IPDS	IPDS, PostScript, PCL, Pages*	PostScript, IPDS, PCL	PostScript, IPDS, PCL
PC Parallel				PostScript, PCL	PCL, Pages*, PostScript, ESC/P*	PCL, Pages*, PostScript, ESC/P*
Coaxial	IPDS, SCS, DSC, DSE	IPDS, SCS, DSC, DSE	IPDS, SCS, DSC, DSE			
Twin-axial				IPDS, SCS		

* Pages and ESC/P support is available only in Japan.

Table 20. Attachment Modes for the Infoprint 21 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS, PostScript, PCL	IPDS	IPDS	IPDS, PostScript, PCL	IPDS, PCL, PostScript	IPDS, PCL, PostScript
PC Parallel				PostScript, PCL	PCL, PostScript	PCL, PostScript
Coaxial	IPDS, SCS, DSC, DSE	IPDS, SCS, DSC, DSE	IPDS, SCS, DSC, DSE			
Twin-axial				IPDS, SCS		

* Pages and ESC/P support is available only in Japan.

Attachment Modes for Cut Sheet Production Printers

Table 21. Attachment Modes for the Infoprint 60 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS, PCL	IPDS	IPDS	IPDS, PCL	IPDS, PCL	IPDS, PCL
Parallel Channel	IPDS	IPDS	IPDS			

Table 22. Attachment Modes for the Infoprint 70 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS			IPDS	IPDS	IPDS
Parallel Channel	IPDS					

Table 23. Attachment Modes for the Infoprint 2000–NP1 and Infoprint 2000–RP1 Printers

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	PostScript, PCL, PDF			PostScript, PCL	PostScript, PCL, PDF, KDKIMAGE	PostScript, PCL, PDF

Table 24. Attachment Modes for the Infoprint 2000–DP1 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	PostScript, PCL, Xerox, DJDE, Metacode, PDF			PostScript, PCL	PostScript, PCL Xerox, DJDE, Metacode, PDF, KDKimage	PostScript, PCL Xerox, DJDE, Metacode, PDF
Parallel Channel	PostScript, PCL, Xerox, DJDE, Metacode, PDF					

Table 25. Attachment Modes for the Infoprint 2000–DP1 Printer with AFCCU Feature

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS			IPDS	IPDS	IPDS
Parallel Channel	IPDS					
ESCON	IPDS					
FDDI					IPDS	

Attachment Modes for Continuous Form Production Printers

Table 26. Attachment Modes for the Infoprint 3000 Printers

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS		IPDS	IPDS	IPDS	IPDS

Table 26. Attachment Modes for the Infoprint 3000 Printers (continued)

	OS/390	VM	VSE	AS/400	AIX	Windows
Parallel Channel	IPDS	IPDS	IPDS			
ESCON	IPDS	IPDS	IPDS			
FDDI					IPDS	

Table 27. Attachment Modes for the Infoprint 4000 Printers

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS		IPDS	IPDS	IPDS	IPDS
Parallel Channel	IPDS	IPDS	IPDS			
ESCON	IPDS	IPDS	IPDS			
FDDI					IPDS	

Attachment Modes for Enterprise Color Printers

Table 28. Attachment Modes for the InfoColor 70, Infoprint Color 100, and Infoprint Color 130 Printers

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring				PostScript	PostScript	PostScript

Table 29. Attachment Modes Infoprint Color 130 Plus Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS				IPDS	
FICON	IPDS					

Attachment Mode for Industrial/Impact and Non-Impact Printers

Table 30. Attachment Modes for the 4230 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	PPDS, Epson, ASCII, SCS, IPDS	PPDS, Epson, ASCII, SCS, IPDS	PPDS, Epson, ASCII, SCS, IPDS	PPDS, Epson, ASCII, SCS, IPDS	PPDS, Epson, ASCII, SCS	PPDS, Epson, ASCII, SCS
PC Serial				PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII
PC Parallel				PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII
Coaxial	SCS, IPDS, DSC, DSE	SCS, IPDS, DSC, DSE	SCS, IPDS, DSC, DSE			
Twin-axial				SCS, IPDS		

Table 31. Attachment Modes for the 4232 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII
PC Serial				PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII
PC Parallel				PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII

Table 32. Attachment Modes for the 4247 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	PPDS, Epson, ASCII, IPDS	PPDS, Epson, ASCII, IPDS	PPDS, Epson, ASCII, IPDS	PPDS, Epson, ASCII, IPDS	PPDS, Epson, ASCII	PPDS, Epson, ASCII
PC Serial				PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII
PC Parallel				PPDS, Epson, ASCII	PPDS, Epson, ASCII	PPDS, Epson, ASCII
Coaxial	PPDS, Epson, ASCII, SCS, IPDS, DSC, DSE	PPDS, Epson, ASCII, SCS, IPDS, DSC, DSE	PPDS, Epson, ASCII, SCS, IPDS, DSC, DSE			
Twin-axial				PPDS, Epson, ASCII, SCS, IPDS		

Table 33. Attachment Modes for the 4400 Thermal Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	ASCII, IPDS, CodeV, IGP		ASCII, IPDS, CodeV, IGP	ASCII, IPDS, CodeV, IGP	ASCII, IPDS, CodeV, IGP	ASCII, IPDS, CodeV, IGP
PC Parallel				ASCII, CodeV, IGP	ASCII, CodeV, IGP	ASCII, CodeV, IGP
Coaxial	ASCII, IPDS, CodeV, IGP	ASCII, CodeV, IGP	ASCII, CodeV, IGP			
Twin-axial				ASCII, IPDS, CodeV, IGP		

Table 34. Attachment Modes for the 6400 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	PPDS, Epson, ASCII, IPDS, CodeV, IGP	PPDS, Epson, ASCII, IPDS, CodeV, IGP	PPDS, Epson, ASCII, IPDS, CodeV, IGP	PPDS, Epson, ASCII, IPDS, CodeV, IGP	PPDS, Epson, ASCII, IPDS, CodeV, IGP	PPDS, Epson, ASCII, IPDS, CodeV, IGP
PC Parallel				PPDS, Epson, ASCII, CodeV, IGP	PPDS, Epson, ASCII, CodeV, IGP	PPDS, Epson, ASCII, CodeV, IGP
Coaxial	PPDS, Epson, ASCII, SCS, IPDS, CodeV, IGP	PPDS, Epson, ASCII, SCS, IPDS, CodeV, IGP	PPDS, Epson, ASCII, SCS, IPDS, CodeV, IGP			

Table 34. Attachment Modes for the 6400 Printer (continued)

	OS/390	VM	VSE	AS/400	AIX	Windows
Twin-axial				PPDS, Epson, ASCII, SCS, IPDS, CodeV, IGP		

Table 35. Attachment Modes for the Infoprint 62 Printer

	OS/390	VM	VSE	AS/400	AIX	Windows
Ethernet or Token Ring	IPDS	IPDS	IPDS	IPDS	IPDS	IPDS
Parallel Channel	IPDS	IPDS	IPDS			
ESCON	IPDS	IPDS	IPDS			

Chapter 2. Network Printer 12 (4312)

The Network Printer 12 is a desktop, cut-sheet printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 1. Network Printer 12 Printer

Table 36 summarizes the printer characteristics for the Network Printer 12.

Table 36. Network Printer 12 Characteristics

Printer Characteristic	Characteristic Value
Maximum printing rate	12 pages per minute
Print technology	Laser
Datastreams *Pages and ESC/P support is available only in Japan.	IPDS, SCS, DSC, Adobe PostScript Level 2, PCL-5e, Pages*, and ESC/P*
Form type	Cut Sheet
Input bins	Standard: Primary tray up to 250 sheets; auxiliary tray up to 80 sheets or 10 envelopes Optional: Secondary tray up to 500 sheets; optional envelope tray up to 50 envelopes
Output bins	Standard: Top output 250 sheets (face down, collated) Optional: Rear output tray 80 sheets (face up, uncollated)
Finisher attachments	n/a
Manual forms feed	yes

Table 36. Network Printer 12 Characteristics (continued)

Printer Characteristic	Characteristic Value
Envelope printing	yes
MICR printing *IBM Business Partners may have MICR solutions for this printer.	no*
Duplex printing	yes (automatic duplex printing is optional)
Color	no
Adjust print-quality levels	no
Printhead resolution	600 dots-per-inch
Maximum impressions per month (duty cycle)	35,000

Printable Area

The Network Printer 12 can print from edge-to-edge; however, print quality is only guaranteed to within 4 mm of all paper edges. For card stock and envelopes, the print quality is guaranteed only within 6 mm of the leading edge. For best possible print quality, edge-to-edge printing is not recommended. Figure 2 shows an example of the printable area.

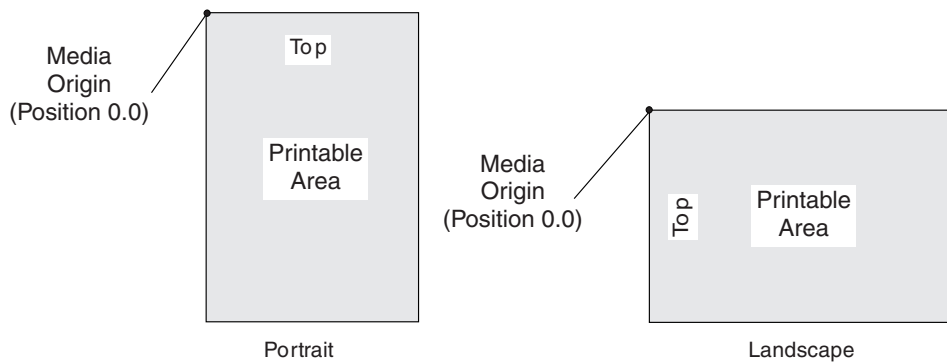


Figure 2. Printable Area on the Network Printer 12

Media Specifications

The Network Printer 12 accepts the following media:

Media types:

Paper, card stock, labels, transparencies, recycled paper and envelopes

Sheet sizes:

A6 (4.1 inches x 5.8 inches) to legal (8.5 inches x 14 inches)

Envelope sizes:

Com-10, C5, DL and Monarch

Media weights:

16 to 117 lbs. (60 to 190 g/m²)

Attachments

PC Parallel and RS-232 Serial Interface:

Table 37. PC Parallel and RS-232 Serial Interface

Protocol	Data Stream	Operating System
PC Parallel	PCL5e, PostScript 2	Windows 3.1, 3.11, 95 NT 3.51/4.0 Windows for Workgroups 3.11 AIX 3.2.5, 4.1
PC Serial	AFPDS, SCS to PCL5e	OS/400(R) 3.2 HPT Facility

Optional Token-Ring and Ethernet:

Table 38. Optional Token-Ring and Ethernet

Protocol	Data Stream	Operating System
IPX/SPX	PCL5e, PostScript 2	Novell NetWare 2.15, 2.2, 3.0, 3.1, 3.11, 3.12, 4.0, 4.01, 4.1 (NEST 1.0)
TCP/IP	PCL5e, PostScript 2	Novell NetWare 3.11, 3.12, 4.0, 4.01, 4.1 IBM LAN Server 2.0 and above Windows NT 3.51/4.0 AIX 3.2.5, 4.1
TCP/IP	IPDS	Infoprint Manager PSF/MVS 2.2 PSF for OS/390 PSF/400 3.1, 3.6, 3.2
TCP/IP	PCL5e	OS/400 3.1 and later
NETBIOS/NETBEUI	PCL5e, PostScript 2	IBM LAN Server 1.3 and above Microsoft LAN Manager 2.0 and above
TokenTalk	PostScript 2	Apple System 7
EtherTalk	PostScript 2	Apple System 7

Optional Coax Interface:

Table 39. Optional Coax Interface

Protocol	Data Stream	Operating System
NDS	IPDS	PSF/MVS 2.2, PSF for OS/390
NDS	IPDS	PSF/VSE 2.2.1
NDS	IPDS	PSF/VM 2.1.1, 2.1.0 + maintenance
NDS	SCS, DSC, DSE	Infoprint Server
NDS	IPDS	GDDM 2.3
NDS	SCS, DSC, DSE	GDDM 2.3
NDS	IPDS	VM RSCS 2.2
NDS	SCS, DSC, DSE	VM RSCS 2.2
NDS	SCS, DSC, DSE	JES328X 2.0
NDS	SCS, DSC, DSE	VTAM

Table 39. Optional Coax Interface (continued)

Protocol	Data Stream	Operating System
NDS	SCS	CICS/MVS
NDS	SCS	CICS/VSE

Optional Twinax Interface:

Table 40. Optional Twinax Interface

Protocol	Data Stream	Operating System
Arctic	IPDS	PSF/400 3.1, 3.6, 3.2
Arctic	IPDS	OS/400 3.6, 3.1, 3.0.5, 2.3, 2.2
Arctic	IPDS	OS/400 3.2
Arctic	SCS	OS/400 3.6, 3.1, 3.0.5, 2.3, 2.2
Arctic	SCS	OS/400 3.2
Arctic	SCS, IPDS	SSP Rel. 7.1
Arctic	SCS, IPDS	OS/400 3.6 with SSP Rel. 7.5

Chapter 3. Network Printer 17 (4317)

This section describes the Network Printer 17 printer characteristics and PSF-supported functions. The Network Printer 17 is a desktop, cut-sheet printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 3. Network Printer 17 Printer

Table 41 summarizes the printer characteristics and PSF-supported functions for the Network Printer 17 printers.

Table 41. Network Printer 17 Characteristics

Printer Characteristic	Characteristic Value
Maximum printing rate	17 pages per minute
Print technology	Laser
Datastreams * Pages and ESC/P support is available only in Japan.	IPDS, SCS, DSC, Adobe PostScript Level 2, PCL-5e, Pages*, and ESC/P*
Form type	Cut Sheet

Table 41. Network Printer 17 Characteristics (continued)

Printer Characteristic	Characteristic Value
Number of input bins	Standard: Primary tray up to 250 sheets; auxiliary tray up to 100 sheets or 10 envelopes Optional: 2 secondary trays up to 500 sheets each (total 1000); envelope tray up to 75 envelopes
Number of output bins	Standard: Top output 250 sheets (face down, collated) Optional: Offset jogger up to 500 sheets; 10 bin secure mailbox up to 450 sheets
Finisher attachments	n/a
Manual forms feed	yes
Envelope printing	yes
MICR printing *IBM Business Partners may have MICR solutions for this printer.	no*
Duplex printing	yes (automatic duplex printing is optional)
Color	no
Adjust print-quality levels	no
Printhead resolution	600 dots-per-inch
Maximum impressions per month (duty cycle)	65,000

Printable Area

can print from edge-to-edge; however, print quality is only guaranteed to within 4 mm of all paper edges. For card stock and envelopes, the print quality is guaranteed only within 6 mm of the leading edge. For best possible print quality, edge-to-edge printing is not recommended. Figure 4 shows an example of the printable area of a form.

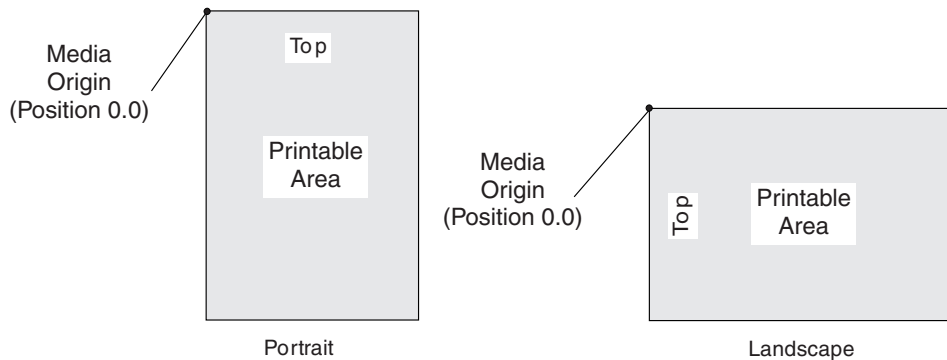


Figure 4. Printable Area on the Network Printer 17

Media Specifications

The Network Printer 17 accepts the following media:

Media types:

Paper, card stock, labels, transparencies, recycled paper and envelopes

Sheet sizes:

A6 (4.1 inches x 5.8 inches) to legal (8.5 inches x 14 inches)

Envelope sizes:

Com-10, C5, DL and Monarch

Media weights:16 to 117 lbs. (60 to 190 g/m²)

Attachments

PC Parallel and RS-232 Serial Interface:

Table 42. PC Parallel and RS-232 Serial Interface

Protocol	Data Stream	Operating System
PC Parallel	PCL5e, PostScript 2	Windows 3.1, 3.11, 95 NT 3.51/4.0 Windows for Workgroups 3.11 AIX 3.2.5, 4.1
PC Serial	AFPDS, SCS to PCL5e	OS/400(R) 3.2 HPT Facility

Optional Token-Ring and Ethernet:

Table 43. Optional Token-Ring and Ethernet

Protocol	Data Stream	Operating System
IPX/SPX	PCL5e, PostScript 2	Novell NetWare 2.15, 2.2, 3.0, 3.1, 3.11, 3.12, 4.0, 4.01, 4.1 (NEST 1.0)
TCP/IP	PCL5e, PostScript 2	Novell NetWare 3.11, 3.12, 4.0, 4.01, 4.1 IBM LAN Server 2.0 and above Windows NT 3.51/4.0 AIX 3.2.5, 4.1
TCP/IP	IPDS	PSF/MVS 2.2 PSF for OS/390 Infoprint Manager PSF/400 3.1, 3.6, 3.2
TCP/IP	PCL5e	OS/400 3.1 and later
NETBIOS/NETBEUI	PCL5e, PostScript 2	Microsoft LAN Manager 2.0 and above IBM LAN Server 1.3 and above
TokenTalk	PostScript 2	Apple System 7
EtherTalk	PostScript 2	Apple System 7

Optional Coax Interface:

Table 44. Optional Coax Interface

Protocol	Data Stream	Operating System
NDS	IPDS	PSF/MVS 2.2, PSF for OS/390
NDS	IPDS	PSF/VSE 2.2.1
NDS	IPDS	PSF/VM 2.1.1, 2.1.0 + maintenance
NDS	SCS, DSC, DSE	Infoprint Server
NDS	IPDS	GDDM 2.3
NDS	SCS, DSC, DSE	GDDM 2.3

Table 44. Optional Coax Interface (continued)

Protocol	Data Stream	Operating System
NDS	IPDS	VM RSCS 2.2
NDS	SCS, DSC, DSE	VM RSCS 2.2
NDS	SCS, DSC, DSE	JES328X 2.0
NDS	SCS, DSC, DSE	VTAM
NDS	SCS	CICS/MVS
NDS	SCS	CICS/VSE

Optional Twinax Interface:

Table 45. Optional Twinax Interface

Protocol	Data Stream	Operating System
Arctic	IPDS	PSF/400 3.1, 3.6, 3.2
Arctic	IPDS	OS/400 3.6, 3.1, 3.0.5, 2.3, 2.2
Arctic	IPDS	OS/400 3.2
Arctic	SCS	OS/400 3.6, 3.1, 3.0.5, 2.3, 2.2
Arctic	SCS	OS/400 3.2
Arctic	SCS, IPDS	SSP Rel. 7.1
Arctic	SCS, IPDS	OS/400 3.6 with SSP Rel. 7.5

Chapter 4. Infoprint Color 8 Printer (4308)

The Infoprint Color 8 printer is a high-quality desktop, cut-sheet color printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes in 600 dpi color and monochrome.



Figure 5. Infoprint Color 8 Printer

Table 46 summarizes the printer characteristics for the Infoprint Color 8 printer.

Table 46. Infoprint Color 8 Printer Characteristics

Printer Characteristic	Characteristic Value
Maximum printing rate	8 pages per minute
Print technology	Laser
Datastreams	PCL and PostScript
Form type	Cut Sheet
Number of input bins	Standard: Primary tray up to 500 sheets; Manual Feed Input up to 100 sheets
	Optional: Secondary tray up to 500 sheets

Table 46. Infoprint Color 8 Printer Characteristics (continued)

Printer Characteristic	Characteristic Value
Number of output bins	Standard: Document stacker up to 250 sheets, face-down stacking; Special Media Stacker up to 100 sheets for special printing, face-up stacking
Finisher attachments	n/a
Manual forms feed	yes
Envelope printing	no
MICR printing *IBM Business Partners may have MICR solutions for this printer.	no*
Duplex printing	yes (manual)
Color	yes
Adjust print-quality levels	no
Printhead resolution	600 dots-per-inch
Maximum impressions per month (duty cycle)	25,000

Printable Area

The Infoprint Color 8 can print from edge-to-edge; however, print quality is only guaranteed to within 4 mm of all paper edges. For card stock and envelopes, the print quality is guaranteed only within 6 mm of the leading edge. For best possible print quality, edge-to-edge printing is not recommended. Figure 6 shows an example of the printable area of a page.

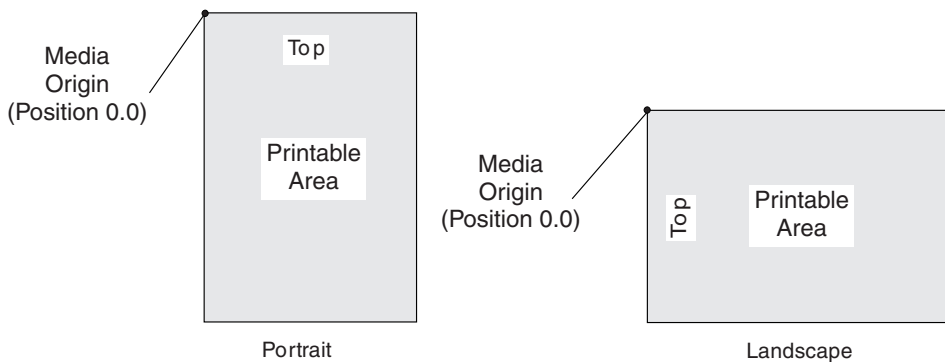


Figure 6. Printable Area on the Infoprint Color 8 printer

Selecting the Printing Medium

The Infoprint Color 8 printer are cut-sheet printers with several media sources, depending on the model and options selected.

To select the printing medium, use the **Device Settings** tab of the **Properties** menu of your printer driver.

Media Size and Configuration

The media loaded for your printer must match the media size in the printer configuration. If these sizes do not match, a printer error code indicates that this mismatch must be corrected by either changing the media at the printer or by changing the configuration to match the media.

Media Specifications

The Infoprint Color 8 accepts the following media:

Media types:

High-quality electrophotographic copier/printer paper; labels, transparencies, and card stock designed for laser printers

Sheet sizes:

- A6 (105 x 148 mm) to A4 (210 x 297 mm)
- Letter (8.5 inches x 11 inches) to Legal 14 (8.5 inches x 14. inches)
- Custom sizes: 3.5" - 8.5 inches x 5.5 inches - 14 inches (86.4 mm - 216 mm x 140 mm - 355.6 mm) from Manual Feed Input only

Media weights:

- 17 to 28 lbs. (64 to 105 g/m²) standard and optional trays
- 20 to 44 lbs. (75 to 165 g/m²) manual feed input

Attachments

Infoprint Color 8 printer supports the following:

Drivers:

Table 47. Supported Drivers on the Infoprint Color 8 Printer

Driver Name	Operating System Supported
Windows for PCL 5c	Windows 3.x/95/98 (models 001, 002) Windows 95/98 (model 003)
Windows NT for PCL 5c	Windows NT 4.0 ¹
Windows for PostScript 2/3	Windows 3.x/95/98 with Heidelberg color management (models 001, 002) Windows 95/98 (model 003)
Windows NT for PostScript 2/3	Windows NT 4.0 ¹ with Heidelberg color management (models 001, 002) Windows NT 4.0 ¹ (model 003)
OS/2 PostScript 2	OS/2 2.11, Warp (models 001, 002)
AIX PCL 5c and PostScript 2/3	AIX 4.1 and higher
Macintosh PostScript 2/3	MacOS 7.5 and higher
Sun Solaris PCL 5c and PostScript 2/3	Solaris 2.5 and higher
SCO-UNIX PCL 5c and PostScript 2/3	SCO-UNIX OPENDESKTOP 3, SCO-UNIX OPENSERVER 5, SCO UNIX 3.2V4.2
HP-UX PCL 5c and PostScript 2	HP-UX 10.x and higher
1. Follow-ons to Windows NT 4.0 will be supported.	

Network Operating Systems

Table 48. Supported Network Operating Systems on the Infoprint Color 8 Printer. Description

Protocol	Datastream	Operating System
IPX/SPX	PostScript, PCL 5c	Novell NetWare 3.11, 3.12, 4.0, 4.01, 4.1, 5 ¹
TCP/IP	PostScript, PCL 5c	NetWare 3.12 and 4.11 OS/2 2.11, Warp
IPX/SPX	PostScript, PCL 5c	NetWare 3.12 and 4.11

Table 48. Supported Network Operating Systems on the Infoprint Color 8 Printer (continued). Description

Protocol	Datastream	Operating System
DLC	PostScript, PCL 5c	Windows 95/98, Windows NT 4.0 (models 001/002)
NETBEUI	PostScript, PCL 5c	Windows 95/98, Windows NT 4.0 (model 003)
TCP/IP	PostScript, PCL 5c	Windows NT 4.0
LPR/LPD	PostScript, PCL 5c	AIX 4.1 and higher Solaris 2.5 and higher SCO UNIX 2.5 and higher HP-UX 10.x and higher
1. Novell genuine NDPS gateway supported.		

AS/400

Infoprint Color 8 is supported as a Workstation Customization Object under the Host Print Transform (HPT) facility of OS/400 V3.2. HPT transforms the AFPDS or SCS data stream to ASCII for printing to AS/400 ASCII emulator products with a parallel attached printer including:

- PC or PS/2 running the IBM enhanced 5250 emulation program
- PC or PS/2 running PC Support/400 or Client Access/400
- Infowindow II displays (3477/3487)

The ASCII data stream can also be sent to this printer when attached directly to a Token-Ring or Ethernet LAN via the OS/400 TCP/IP Line Printer Requester (LPR) and Line Printer Daemon (LPD).

IBM Infoprint Manager

The Infoprint Color 8 printer is supported under IBM's Infoprint Manager through PCL 5c print transform.

Chapter 5. Infoprint 12 Printer (4912)

The Infoprint 12 is a desktop, cut-sheet printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 7. Infoprint 12 Printer

Table 49 summarizes the printer characteristics for the Infoprint 12.

Table 49. Infoprint 12 Characteristics

Printer Characteristic	Characteristic Value
Maximum printing rate	12 pages per minute
Print technology	Laser
Datastreams	PostScript 3 and PCL 6
Form type	Cut Sheet
Number of input bins	Standard: Primary tray up to 250 sheets; auxiliary tray up to 100 sheets Optional tray up to 550 sheets or 40 envelopes
Number of output bins	Standard: Main bin up to 250 sheets; rear exit tray up to 100 sheets
Finisher attachments	n/a

Table 49. Infoprint 12 Characteristics (continued)

Printer Characteristic	Characteristic Value
Manual forms feed	yes
Envelope printing	yes
MICR printing *IBM Business Partners may have MICR solutions for this printer.	no*
Duplex printing	yes (manual duplex printing is standard)
Color	no
Adjust print-quality levels	no
Printhead resolution	300 dots-per-inch 600 dots-per-inch 1,200 dots-per-inch
Maximum impressions per month (duty cycle)	20,000

Printable Area

The printable area is up to 0.157 inch (4 mm) from the edge (top, bottom, left, and right) for a sheet of paper and 0.394 inch (10 mm) from the edge (top, bottom, left, and right) for envelopes.

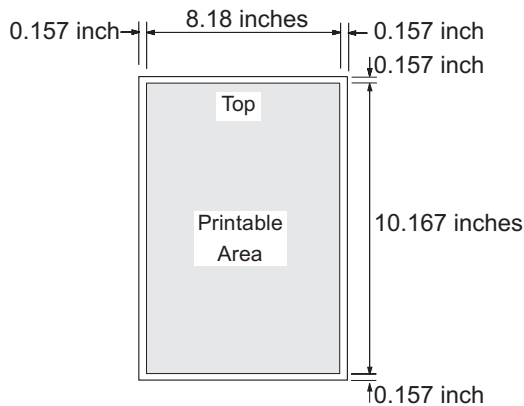


Figure 8. Printable Area on the Infoprint 12

Media Size and Configuration

The media loaded for your printer must match the media size in the printer configuration. If these sizes do not match, a printer error code indicates that this mismatch must be corrected by either changing the media at the printer or by changing the configuration to match the media.

Media Specifications

The Infoprint 12 accepts the following media:

Media types:

Paper, card stock, labels, transparencies, recycled paper and envelopes

Sheet sizes:

A6 (4.1 inches x 5.8 inches) to legal (8.5 inches x 14 inches), Custom forms sizes from 3 inches x 5.8 inches (76.2 mm x 127 mm) to 8.5 inches x 14 inches (215.9 mm x 355.6 mm) to 105 gsm

Envelope sizes:

Com-10, C5, DL and Monarch

Media weights:

- Copier/xerographic papers: 16 to 28 lbs. (60 to 105 gsm)
- Cardstock: 16 to 43 lbs. (60 to 163 gsm)
- Envelopes: 16 to 28 lbs. (60 to 105 gsm)

Attachments

Printer Attachment Interfaces

Infoprint 12 has the following attachment interfaces as standard:

- IEEE 1284 Parallel Interface (level I electronics with a Type B connector).
- USB (Version 1.0/1.1)

Infoprint 12 supports port switching between the parallel, USB, and optional Fast Ethernet ports.

Attachments/Operating System Support

Table 50. Attachment and Operating System Support for the Infoprint 12 Printer

Physical	Protocol	Operating Systems
Parallel (IEEE 1284)		Windows 95/98/Millennium, NT 4.0, Windows 2000 Macintosh OS 8.5 and higher
USB		Windows 98/Millennium, NT 4.0, Windows 2000 Macintosh OS 8.5 and higher
LAN (IEEE 802.3)	IPX/SPX TCP/IP	Novell NetWare 3.x, 4.x, 5.x Windows 95/98/Millennium, NT 4.0, Windows 2000 Novell NetWare 5.x Linux (Red Hat)
	NETBIOS/NETBEUI	Windows 95/98
IEEE 802.3	AppleTalk	Macintosh OS 8.5 and higher

Chapter 6. Infoprint 20 Printer (4320)

This section describes the Infoprint 20 printer characteristics and PSF-supported functions. The Infoprint 20 printer is a desktop, cut-sheet printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 9. Infoprint 20 Printer

Table 51 summarizes the printer characteristics for the Infoprint 20 printer.

Table 51. Infoprint 20 Printer Characteristics

Printer Characteristic	Characteristic Value
Maximum printing rate	20 pages per minute
Print technology	Laser
Datastreams * Pages and ESC/P support is available only in Japan.	IPDS, SCS, DSC, PostScript, PCL, Pages*, and ESC/P
Form type	Cut Sheet
Number of input bins	Standard: Primary tray up to 500 sheets; secondary tray up to 150 sheets or 10 envelopes Optional: drawer up to 500 sheets; high-capacity drawer up to 2,000 sheets; envelope feeder up to 75 envelopes

Table 51. Infoprint 20 Printer Characteristics (continued)

Printer Characteristic	Characteristic Value
Number of output bins	Standard: Top output 500 sheets (face down, collated); Optional duplex provides two-sided printing, offset-jagged output and additional 250 sheets output capacity (750 total)
Finisher attachments	n/a
Manual forms feed	yes
Envelope printing	yes
MICR printing *IBM Business Partners may have MICR solutions for this printer.	no*
Duplex printing	yes
Color	no
Adjust print-quality levels	no
Printhead resolution	600 dots-per-inch
Maximum impressions per month (duty cycle)	75,000

Printable Area

The Infoprint 20 printer can print from edge-to-edge. For paper ledger size (11 x 17 in.) and smaller, print quality is guaranteed to only within 4 mm of the border. For paper larger than ledger size, print quality is guaranteed only within 4 mm of the short (leading or trailing edge) borders and within 5 mm on each side. For best print quality, edge-to-edge printing is not recommended. Figure 10 shows an example of the printable area of a form.

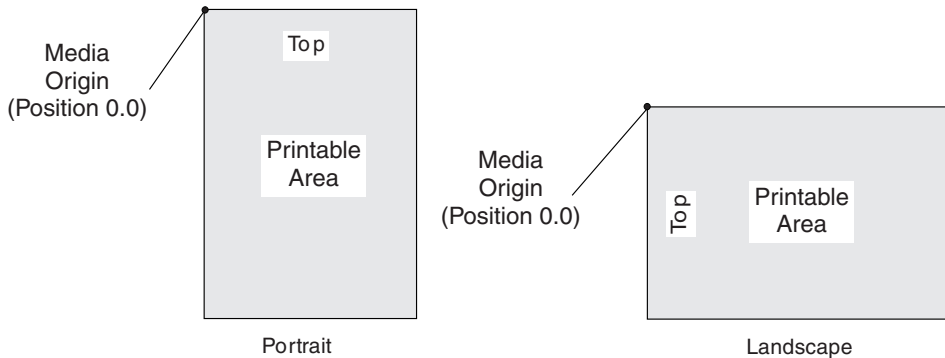


Figure 10. Printable Area on the Infoprint 20 Printer

Media Specifications

The Infoprint 20 printer accepts the following media:

Media types:

Copier/xerographic paper, recycled paper, card stock, transparencies, some labels

Sheet sizes:

B5 (182 x 257 mm) to A3/ledger (11" x 17"), universal paper sizes (up to 13" x 20", 330 x 508 mm)

Envelope sizes:

Com-10, C5, DL and Monarch

Paper weights:16 to 28 lbs. (64 to 135 g/m²)

Attachments

PC Parallel Interface:

Table 52. PC Parallel Interface

Protocol	Data Stream	Operating System
PC Parallel	PCL5e	Windows 3.1/3.11/95, NT 4.0, OS/2, AIX 3.2.5, AIX 4.1 and higher, Sun Solaris 2.3 and higher, HP-UX 9, HP-UX 10, SCO UNIX 3, SCO UNIX 5
PC Parallel	PostScript 2/3	Windows 3.1/3.11/95, NT 4.0 (2), AIX 3.2.5, AIX 4.1 and higher, Sun Solaris 2.3 and higher, HP-UX 9, HP-UX 10, SCO UNIX 3, and SCO UNIX 5
PC Parallel	PostScript 2/3	Windows 95 J, Windows NT J4.0
PC Parallel	PCL5e	P-Windows 3.2, T-Windows 3.1, Windows 95 (S-C), Windows 95 (T-C), Windows NT 4.0 (S-C), Windows NT 4.0 (T-C)
PC Parallel	AFPDS, SCS to PCL5e	OS/400(R) 3.2 HPT Facility
PC Parallel	PAGES and ESC/P	Windows 3.1/95J, NT 3.51/4.0, AIX 3.2.5, AIX 4.1 and higher, and PC-DOS J6.3/V and above

Optional Token-Ring and Ethernet:

Table 53. Optional Token-Ring and Ethernet

Protocol	Data Stream	Operating System
IPX/SPX	PCL5e, PostScript	Novell NetWare 2.15, 2.2, 3.0, 3.1, 3.11, 3.12, 4.0, 4.01, 4.1 (NEST 1.0)
TCP/IP	PCL5e, PostScript 2	Novell NetWare 3.11, 3.12, 4.0, 4.01, 4.1
TCP/IP	PostScript	NetWare J 3.12J and 4.11J
IPX/SPX	PostScript	NetWare J 3.12J and 4.11J
NETBIOS/NETBEUI	PCL5e, PostScript 2	IBM LAN Server 1.3 and above
TCP/IP	PCL5e, PostScript 2	IBM LAN Server 2.0 and above
NETBIOS/NETBEUI	PCL5e, PostScript 2	Microsoft LAN Manager 2.0 and above
TCP/IP	IPDS	PSF for AIX 2.1, Infoprint Manager
TCP/IP	IPDS	PSF/MVS 2.2, PSF for OS/390
TCP/IP	IPDS	PSF/400 3.1, 3.2, 3.6, 3.7, 4.1
IEEE 802.3	IPDS	PSF for AIX 2.1, Infoprint Manager
IEEE 802.3	IPDS	PSF/MVS 2.2, PSF for OS/390

Table 53. Optional Token-Ring and Ethernet (continued)

Protocol	Data Stream	Operating System
IEEE 802.3	IPDS	PSF/400 3.1, 3.2, 3.6, 3.7, 4.1
TokenTalk	PostScript 2	Apple System 7
EtherTalk	PostScript 2	Apple System 7
TokenTalk	PostScript 2	KajiTalk 7.5/7.6, MAC OS 8.0
EtherTalk	PostScript 2	KajiTalk 7.5/7.6, MAC OS 8.0
TCP/IP	PCL5e, PostScript 2	Windows NT 3.51/4.0
TCP/IP	PCL5e, PostScript 2	AIX 3.2.5, 4.1, 4.2 and later
TCP/IP	PCL5e, PostScript 2	OS/400 3.1 and later
TCP/IP	PCL5e, PostScript 2	Sun Solaris 2.3 and higher
TCP/IP	PCL5e, PostScript 2	SCO-UNIX 3, SCO-UNIX 5
TCP/IP	PCL5e, PostScript 2	HP-UX 9, HP-UX 10

Optional Coax Interface:

Table 54. Optional Coax Interface

Protocol	Data Stream	Operating System
NDS	IPDS	PSF/MVS 2.2, PSF for OS/390
NDS	IPDS	PSF/VSE 2.2.1
NDS	IPDS	PSF/VM 2.1.1, 2.1.0 + maintenance
NDS	SCS, DSC, DSE	Infoprint Server
NDS	IPDS	GDDM 2.3
NDS	SCS, DSC, DSE	GDDM 2.3
NDS	IPDS	VM RSCS 2.2
NDS	SCS, DSC, DSE	VM RSCS 2.2
NDS	SCS, DSC, DSE	JES328X 2.0
NDS	SCS, DSC, DSE	VTAM
NDS	SCS	CICS/MVS
NDS	SCS	CICS/VSE

Optional Twinax Interface:

Table 55. Optional Twinax Interface

Protocol	Data Stream	Operating System
Arctic	IPDS	PSF/400 3.1, 3.6, 3.2, 3.7, 4.1
Arctic	IPDS	OS/400 3.6, 3.1, 3.0.5
Arctic	IPDS	OS/400 3.2
Arctic	SCS	OS/400 3.6, 3.1, 3.0.5
Arctic	SCS	OS/400 3.2
Arctic	SCS, IPDS	SSP Rel. 7.1
Arctic	SCS, IPDS	OS/400 3.6 with SSP Rel. 7.5

Chapter 7. Infoprint 21 Printer (4322)

This section describes the Infoprint 21 printer characteristics and PSF-supported functions. The Infoprint 21 printer is a desktop, cut-sheet printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 11. Infoprint 21 Printer

Table 56 summarizes the printer characteristics for the Infoprint 21 printer.

Table 56. Infoprint 21 Printer Characteristics

Printer Characteristic	Characteristic Value
Maximum printing rate	21 pages per minute
Print technology	Laser
Datastreams	IPDS, SCS, DSC, PostScript, and PCL
Form type	Cut Sheet
Number of input bins	Standard: Primary tray up to 550 sheets or 85 envelopes; auxiliary tray up to 100 sheets or 10 envelopes
	Optional: Up to two additional 550-sheet trays (maximum 5 input sources ¹ and 1,750 sheets)
Number of output bins	Standard: 500-sheet top exit bin with bin full sensing
	Optional: 500-sheet offset jogging stacker; 100-sheet face-up rear paper exit tray

Table 56. Infoprint 21 Printer Characteristics (continued)

Printer Characteristic	Characteristic Value
Finisher attachments	n/a
Manual forms feed	yes
Envelope printing	yes
MICR printing *IBM Business Partners may have MICR solutions for this printer.	no*
Duplex printing	yes
Color	no
Adjust print-quality levels	no
Printhead resolution	1200 dots-per-inch
Maximum impressions per month (duty cycle)	100,000
1. The 5th input source includes the 75-envelope feeder.	

Printable Area

The Infoprint 21 printer can print from edge-to-edge; however, print quality is only guaranteed to within 4 mm of all paper edges. For card stock and envelopes, the print quality is guaranteed only within 6 mm of the leading edge. For best possible print quality, edge-to-edge printing is not recommended. Figure 12 shows an example of the printable area of a form.

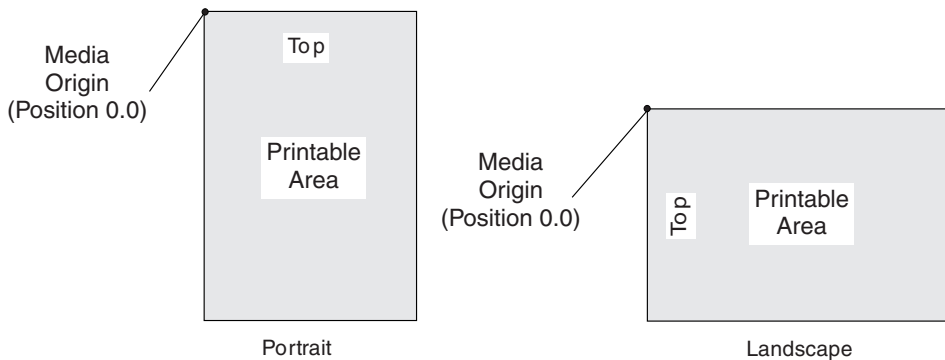


Figure 12. Printable Area on the Infoprint 21 Printer

Media Specifications

The Infoprint 21 printer accepts the following media:

Media types:

Paper, card stock, labels, transparencies, recycled paper and envelopes

Sheet sizes:

Letter (8.5 inches x 11 inches), Legal (8.5 inches x 14 inches), Folio (8.5 inches x 13 inches), Executive (7.25 inches x 10.5 inches), Statement (5.5 inches x 8.5 inches), Index card (3 inches x 5 inches), A4 (210 mm x 297 mm), A5 (148 mm x 210 mm), B5-ISO (176 mm x 250 mm), B5-JIS (182 mm x 257 mm), Japanese postcard Hagaki (100 mm x 148 mm), custom forms sizes from 3 inches x 5 inches (76.2 mm x 127 mm) to 8.5 inches x 14 inches (215.9 mm x 355.6 mm)

Envelope sizes:

Com-10, C5, DL and Monarch

Media weights:

- Copier/xerographic papers: 16 to 28 lbs. (60 to 105 gsm)
- Cardstock: 16 to 133 lbs. (60 to 216 gsm)
- Labels: 60 to 216 gsm
- Envelopes: 16 to 28 lbs. (60 to 105 gsm)
- Transparencies: 0.0039 inches to 0.0045 inches clear film for laser printers and copiers

Attachments

Infoprint 21 supports up to two simultaneously active interfaces:

- IEEE 1284 Parallel Interface (Level II electronics, with a Type C connector) is standard on the printer
 - Supports compatibility mode, reverse transform, nibble mode, and ECP mode.
 - Microsoft Plug and Play Compatibility
 - An IEEE 1284 Printer Cable is available (feature number 4180, P/N 38L1409).
- One optional interface slot with the following options:
 - Ethernet interface using the IBM Ethernet 10/100 Adapter (feature number 4162, P/N 38L1401).
 - Token-Ring interface using the IBM Token-Ring 4/16 Adapter (feature number 4120, P/N 38L1400).
 - Twinax interface using the IBM Twinax SCS Interface (feature number 4141, P/N 38L1402).
 - Coaxial interface using the IBM Coax SCS Interface (feature number 4171, P/N 38L1403).

These four features are mutually exclusive and there are no prerequisites for these features. Only one of these features may be installed per printer.

Attachment/Operating System Support

Table 57. Attachment/Operating System Support for the Infoprint 21 Printer

Physical	Protocol	Operating System
Parallel (IEEE 1284)	Row1, Col2	Windows 95/98, NT 4.0 Windows 2000 AIX 4.1 and higher OS/2 v3.0, v4.0 Sun Solaris 2.5 and higher HP-UX 10, HP-UX 11 SCO UNIX 3, SCO UNIX 5 OS/400 (R) 3.2 HPT Facility
LAN (IEEE 802.3/5)	IPX/SPX	Novell NetWare 3.1, 3.11, 3.12, 4.0, 4.01, 4.1, 4.11, 5.0, 3.12J, 4.11J
	TCP/IP	Novell NetWare 5.0 Windows 95/98, Windows NT 4.0, Windows 2000 OS/2 v3.0, v4.0 AIX 4.03 and higher OS/400 3.2, 4.1, 4.2, 4.3, 4.4 Sun Solaris 2.5 and higher HP-UX 10, HP-UX 11 SCO-UNIX 3, SCO-UNIX 5 PSF for AIX 2.1 Infoprint Manager for AIX 3.1 Infoprint Manager for Windows NT & Windows 2000 1.1 PSF for OS/390 V3.1.0 PSF/400 3.2, 4.1, 4.2, 4.3, 4.4 Linux
	NETBIOS/NETBEUI	Windows 95/98, NT 4.0, OS/2 v3.0, v4.0

Table 57. Attachment/Operating System Support for the Infoprint 21 Printer (continued)

Physical	Protocol	Operating System
IEEE 802.3	EtherTalk	Apple System 8.0 and higher KanjiTalk 8.0 and higher
IEEE 802.5	TokenTalk	Apple System 8.0 and higher KanjiTalk 8.0 and higher

Optional Coax Interface

Table 58. Optional Coax Interface for the Infoprint 21 Printer

Data Stream	Operating System
AFP/IPDS	PSF/MVS 3.1 PSF/MVS 2.2 PSF for OS/390 PSF/VSE 2.2.1 PSF/VM 2.1.1, 2.1.0 + maintenance GDDM 2.3
SCS, DSC, DSE	GDDM 2.3 VM RSCS 2.2 JES328X 2.0 VTAM
AFP/IPDS	VM RSCS 2.2
SCS	CICS/MVS CICS/VSE

Optional Twinax Interface

Table 59. Optional Twinax Interface for the Infoprint 21 Printer

Data Stream	Operating System
AFP/IPDS	PSF/400 3.2
SCS	OS/400 3.2
SCS, AFP/IPDS	SSP Rel. 7.1

IBM OS/400 ASCII Printer Support

Infoprint 21 is supported as an ASCII (PCL) printer via a Workstation Customization Object under the Host Print Transform (HPT) facility of OS/400 V3.2 and higher.

HPT transforms the AFPDS or SCS data stream to ASCII for printing to AS/400 ASCII printers. ASCII printers can be attached using emulator products with a parallel attached printer including:

- PC or PS/2 running the IBM enhanced 5250 emulation program
- PC or PS/2 running PC Support/400 or Client Access/400
- Infowindow II displays (3477/3487)

The ASCII data stream can also be sent to this printer when attached directly to a Token-Ring or Ethernet LAN via TCP/IP. That connection can use either of the following two TCP/IP drivers:

- OS/400 SNMP printer driver.

Information APAR II03291 describes the PTFs required in V4R3 and V4R4 to use this driver. Availability of the PTFs are 06/30/2000 for V4R3 and 07/31/2000 for V4R4.

- OS/400 TCP/IP Line Printer Requester (LPR) and Line Printer Daemon (LPD), also known as remote output queue.

HPT support (AFP to ASCII) includes the following limitations:

- AFP graphics (GOCA) commands not supported
- Multiple-up not supported
- BGR and GDF graphics files not supported
- GDDM scalable fonts not supported
- CHRSIZE font keyword not supported
- Edge to edge not supported
- FIDELITY keyword not supported
- AFP to ASCII may need to be run in raster mode in order to produce accurate results.

Printer Drivers

The following drivers are available:

Table 60. Printer Drivers for the Infoprint 21 Printer

Platform	Data Stream
Windows 95/98	PS 3
Windows NT 4.0	PS 3
Windows 2000	PS 3
Windows 95/98	PCL 6/5e
Windows NT 4.0	PCL 6/5e
Windows 2000	PCL 6/5e
Mac OS 8.0+	PS 3
OS/2 v3.0, v4.0	PS 2
AIX 4.1+	PS 3/PCL 5e
Sun Solaris 2.5+	PS 3/PCL 5e
SCO UNIX 3.0/5.0	PS 3/PCL 5e
HP-UX 10.0x/11.0x	PS 3/PCL 5e
Linux	PS 2

Chapter 8. Infoprint 32 and Infoprint 40 Printers (4332)

This section describes printer characteristics for the Infoprint 32 and Infoprint 40 printers. The Infoprint 32 and Infoprint 40 printers are desktop, cut-sheet printers that uses laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 13. Infoprint 32 Printer



Figure 14. Infoprint 40 Printer with Optional Finisher

Table 61 summarizes the printer characteristics for the Infoprint 32 and Infoprint 40 printers.

Table 61. Infoprint 32 and Infoprint 40 Printer Characteristics

Printer Characteristic	Characteristic Value Infoprint 32 Printer	Characteristic Value Infoprint 40 Printer
Maximum printing rate	32 pages per minute	40 pages per minute
Print technology	Laser	
Datastreams * Pages and ESC/P support is available only in Japan.	IPDS, SCS, DSC, PostScript, PCL, Pages*, and ESC/P	
Form type	Cut Sheet	
Number of input bins	Standard: 2 Primary trays up to 500 sheets each (1,000 total); auxiliary tray up to 50 sheets or 4 envelopes Optional: 2,500 sheet, high-capacity input with 3 drawers (one 1500 up to sheets and 2 up to 1000 sheets); envelope feeder up to 100 envelopes	
Number of output bins	Standard: Top output up to 500 sheets (collated, with bin-full sensing and offset jogging) Optional: 2,000-sheet finisher with 3 additional output bins, offset jogging and stapling (up to 50 sheets per set) and 200-sheet, face-up output tray	
Finisher Attachments		

Table 61. Infoprint 32 and Infoprint 40 Printer Characteristics (continued)

Printer Characteristic	Characteristic Value Infoprint 32 Printer	Characteristic Value Infoprint 40 Printer
Corner staple		yes
Edge staple		yes
Side Staple		no
Saddle		no
Z-Fold		no
Inserter		no
Manual forms feed		yes
Envelope printing		yes
MICR printing *IBM Business Partners may have MICR solutions for this printer.		no*
Duplex printing		yes
Color		no
Adjust print-quality levels		no
Printhead resolution		600 dots-per-inch
Maximum impressions per month (duty cycle)		75,000

Printable Area

The Infoprint 32 and Infoprint 40 printers can print from edge-to-edge for all data streams except PAGES; however, print quality is only guaranteed to within 4 mm of all paper edges. For card stock and envelopes, the print quality is guaranteed only within 6 mm of the leading edge. For best possible print quality, edge-to-edge printing is not recommended. Figure 15 shows an example of the printable area of a form.

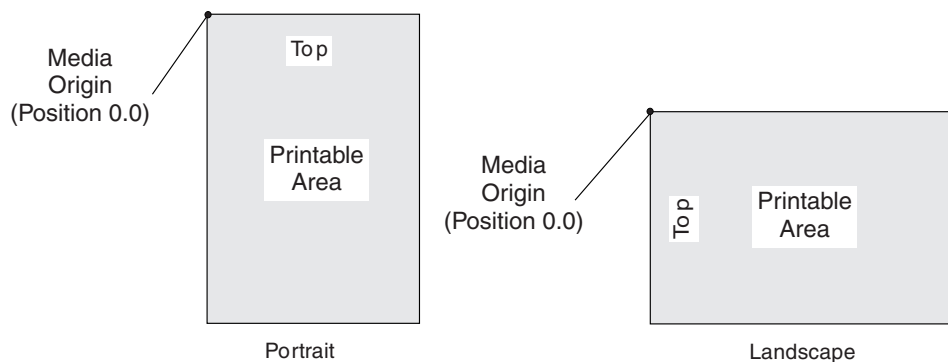


Figure 15. Printable Area on the Infoprint 32 and Infoprint 40 Printers

Media Specifications

The Infoprint 32 and Infoprint 40 printers accept the following media:

Media types:

Copier/xerographic paper, recycled paper, card stock, transparencies, paper labels, prepunched paper, and envelopes

Sheet sizes:

A wide range from A5/statement (210 mm x 149 mm, 8.5 inches x 5.5 inches), including Japanese Hagaki (100 mm x 148 mm), to A3/ledger (420 mm x 297 mm, 11 inches x 17 inches)

Envelope sizes:

Com-10, C5, DL and Monarch

Media weights:

17 to 24 lbs (64 to 90 gsm) from primary trays and up to 110 lbs. (165 gsm) from auxiliary tray

Attachments

PC Parallel Interface:

Table 62. PC Parallel Interface

Protocol	Data Stream	Operating System
PC Parallel	PCL5e	Windows 3.1/3.11/95/98, NT 4.0, AIX 3.2.5, AIX 4.1 and higher, Sun Solaris 2.3 and higher, HP-UX 9.0x, HP-UX 10.0x, SCO UNIX OPENSERVER 5.0, SCO UNIX OPENDESKTOP 3.0, SCO UNIX 3.2V4.2
PC Parallel	PostScript 2/3	Windows 3.1/3.11/95/98, AIX 3.2.5, AIX 4.1 and higher, Sun Solaris 2.3 and higher, HP-UX 9.0x, HP-UX 10.0x, SCO UNIX OPENSERVER 5.0, SCO UNIX OPENDESKTOP 3.0, SCO UNIX 3.2V4.2
PC Parallel	PostScript 2/3	NT 4.0, Windows NT J4.0
PC Parallel	PCL5e	P-Windows 3.2, T-Windows 3.1, Windows 95 (S-C), Windows 95 (T-C), Windows NT 4.0 (S-C), Windows NT 4.0 (T-C)
PC Parallel	AFPDS, SCS to PCL5e	OS/400(R) 3.2 HPT Facility
PC Parallel	PostScript 2/3	Apple System 7.5 and Up
PC Parallel	PostScript 2/3	Apple KanjiTalk 7.5 and Up
PC Parallel	PAGES and ESC/P	Windows 3.1/95J, NT 3.51/4.0, AIX 3.2.5, AIX 4.1 and higher, and PC-DOS J6.3/V and above

Optional Token-Ring and Ethernet:

Table 63. Optional Token-Ring and Ethernet

Protocol	Data Stream	Operating System
IPX/SPX	PCL5e, PostScript	Novell NetWare 2.15, 2.2, 3.0, 3.1, 3.11, 3.12, 4.0, 4.01, 4.1 (NEST 1.0)

Table 63. Optional Token-Ring and Ethernet (continued)

Protocol	Data Stream	Operating System
TCP/IP	PCL5e, PostScript 2	Novell NetWare 3.11, 3.12, 4.0, 4.01, 4.1 IBM LAN Server 2.0 and above Windows NT 3.51/4.0AIX 3.2.5, 4.1, 4.2 and later OS/400 3.1 and later Sun Solaris 2.3 and higher SCO-UNIX 3, SCO-UNIX 5 HP-UX 9, HP-UX 10
TCP/IP	PostScript	NetWare J 3.12J and 4.11J
TCP/IP	IPDS	Infoprint Manager for AIX 2.1 PSF/MVS 2.2 PSF for OS/390 PSF/400 3.1, 3.2, 3.6, 3.7, 4.1
TCP/IP	PAGES	NetWare 3.12J & 4.11J IBM LAN Server 2.0 and above IBM AIX 3.2.5 and above OS/400 V3.2 and above with HPT
IPX/SPX	PostScript	NetWare J 3.12J and 4.11J
NETBIOS/NETBEUI	PCL5e, PostScript 2	IBM LAN Server 1.3 and above Microsoft LAN Manager 2.0 and above
IEEE 802.3	IPDS	Inoprint Manager for AIX 2.1 PSF/MVS 2.2 PSF for OS/390 PSF/400 3.1, 3.2, 3.6, 3.7, 4.1
TokenTalk	PostScript 2	Apple System 7 KajiTalk 7.5/7.6, MAC OS 8.0
EtherTalk	PostScript 2	Apple System 7 KajiTalk 7.5/7.6, MAC OS 8.0
IPX/SPX	PAGES	NetWare 3.12J & 4.11J
NETBIOS/NETBEUI	PAGES	IBM LAN Server 2.0 and above

Optional Coax Interface:

Table 64. Optional Coax Interface

Protocol	Data Stream	Operating System
NDS	IPDS	PSF/MVS 2.2, PSF for OS/390
NDS	IPDS	PSF/VSE 2.2.1
NDS	IPDS	PSF/VM 2.1.1, 2.1.0 + maintenance
NDS	SCS, DSC, DSE	Infoprint Server
NDS	IPDS	GDDM 2.3
NDS	SCS, DSC, DSE	GDDM 2.3
NDS	IPDS	VM RSCS 2.2
NDS	SCS, DSC, DSE	VM RSCS 2.2
NDS	SCS, DSC, DSE	JES328X 2.0
NDS	SCS, DSC, DSE	VTAM

Table 64. Optional Coax Interface (continued)

Protocol	Data Stream	Operating System
NDS	SCS	CICS/MVS
NDS	SCS	CICS/VSE

Optional Twinax Interface:

Table 65. Optional Twinax Interface

Protocol	Data Stream	Operating System
Arctic	IPDS	PSF/400 3.1, 3.2, 3.6, 3.7, 4.1, 4.2
Arctic	IPDS	OS/400 3.1, 3.2, 3.6, 3.7, 4.1, 4.2
Arctic	SCS	OS/400 3.6, 3.1, 3.0.5
Arctic	SCS, IPDS	SSP Rel. 7.1
Arctic	SCS, IPDS	OS/400 3.6 with SSP Rel. 7.5

Chapter 9. Infoprint 60 Printer (3160-002)

This section describes Infoprint 60 printer characteristics. The Infoprint 60 printer is a cut-sheet printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes at up to 60 impressions per minute.



Figure 16. Infoprint 60 Printer

Table 66 summarizes the printer characteristics for the Infoprint 60 printer.

Table 66. Infoprint 60 Printer Characteristics

Printer Characteristic	Characteristic Value
Maximum printing rate	60 pages per minute
Print technology	Laser
Datastreams	IPDS and PCL
Form type	Cut Sheet
Number of input bins	Standard: 3 bins, one with up to 2000 sheets and 2 bins with up to 500 sheets each
	Optional: 1 bin with up to 2000 sheets
Number of output bins	Standard: Output tray up to 1500 sheets; top output tray up to 500 sheets
	Optional: 3000-sheet stacker with convenience stapler
Finisher Attachments	
Corner staple	yes
Edge staple	yes
Side Staple	yes
Saddle	yes
Z-Fold	yes
Inserters	yes
Manual forms feed	no
Envelope printing	no
MICR printing *IBM Business Partners may have MICR solutions for this printer.	no*
Duplex printing	yes
Color	no
Adjust print-quality levels	no
Printhead resolution	240 dots-per-inch 300 dots-per-inch 600 dots-per-inch
Maximum impressions per month (duty cycle)	750,000

Printable Area

Although the Infoprint 60 printer can print to the edge of the paper, for best results, limit printing to within .24 inch (6 mm) of all edges of the sheet. Printing any closer to the edges of the sheet may result in degraded print quality and loss of characters. Figure 17 on page 59 shows an example of the printable area of a sheet for a Infoprint 60 printer. The printable area shown is 8.02 by 10.52 inches.

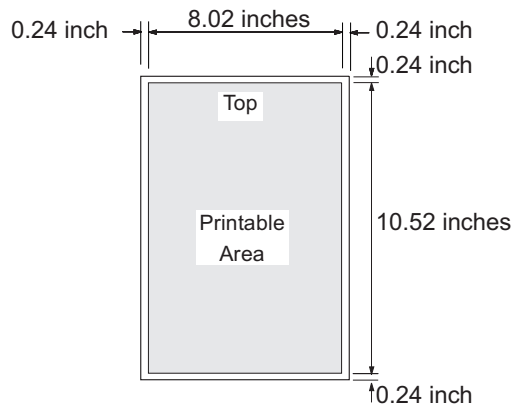


Figure 17. Recommended Printable Area for an 8.5 x 11 Inch Sheet on the Infoprint 60 Printer

Media Specifications

The Infoprint 60 printer accepts the following media:

Media types:

Plain or letterhead cutsheet paper, paper or polymer-based adhesive labels suitable for electrophotographic printing, pre-printed forms and letterheads, perforated and pre-punched (2, 3 and 4 holes) xerographic papers

Sheet sizes:

Letter (8.5 inches x 11 inches), A4 (210 mm x 297 mm), Legal (8.5 inches x 14 inches), A3 (297 mm x 420 mm), Ledger (11 inches x 17 inches), B4 (257 mm x 364 mm), B5 (182 mm x 257 mm), non-standard paper sizes from 7.48 inches x 7 inches (190 mm x 178 mm) through 11.69 inches x 17 inches (297 mm x 432 mm)

Media weights:

17 lb. to 42 lb. (64 gsm to 160 gsm); 110 lb. index (200 gsm) - letter and A4, simplex only; notebook divider tabs, 90 lb. to 110 lb. weights

Attachments

Host software support for InfoPrint 60 printer attachments are listed below.

Table 67. Attachments for the Infoprint 60 Printer

Platform	370 Channel Feature 4020	Token-Ring SNA Feature 4120	Token-Ring TCP/IP Feature 4120	Ethernet TCP/IP Feature 4162
PSF/MVS	Yes	Yes	Yes	Yes
PSF for OS/390	Yes	Yes	No	No
PSF/VSE	Yes	Yes	No	No
PSF/VM	No	Yes	Yes	Yes
PSF/400	No	No	Yes	Yes
PSF/AIX	No	No	Yes	Yes
PSF/2	No	No	Yes	Yes
InfoPrint Manager	No	No	Yes	Yes

Chapter 10. Infoprint 70 Printer (2770)

This section describes the Infoprint 70 printer characteristics. The Infoprint 70 printer is a cut-sheet printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes at up to 70 impressions per minute. The Infoprint 70 printer uses a high performance controller which provides IPDS processing.



Figure 18. Infoprint 70 Printer

Table 68 summarizes the printer characteristics for the Infoprint 70 printer.

Table 68. Infoprint 70 Printer Characteristics

Printer Characteristic	Characteristic Value
Maximum printing rate	70 pages per minute
Print technology	Laser
Datastreams	IPDS
Form type	Cut Sheet
Number of input bins	Standard: Two 500-sheet trays; one 2000-sheet tray; one 150-sheet auxiliary tray
	Optional: 3000-sheet high-capacity feeder (A4 or letter size only)
Number of output bins	Standard: One 200-sheet stacker; one 2000-sheet stacker with stapling capability (up to 50 sheets)

Table 68. Infoprint 70 Printer Characteristics (continued)

Printer Characteristic	Characteristic Value
Finisher Attachments	
Corner staple	yes
Edge staple	yes
Side Staple	no
Saddle	no
Z-Fold	no
Inserter	no
Manual forms feed	no
Envelope printing	no
MICR printing *IBM Business Partners may have MICR solutions for this printer.	no*
Duplex printing	yes
Color	no
Adjust print-quality levels	no
Printhead resolution	600 dots-per-inch
Maximum impressions per month (duty cycle)	400,000

Printable Area

Although the Infoprint 70 printer can print to the edge of the paper, for best results, limit printing to within .24 inch (6 mm) of all edges of the sheet. Printing any closer to the edges of the sheet may result in degraded print quality and loss of characters. Figure 19 shows an example of the printable area of a sheet for an Infoprint 70 printer. The printable area shown is 8.02 by 10.52 inches.

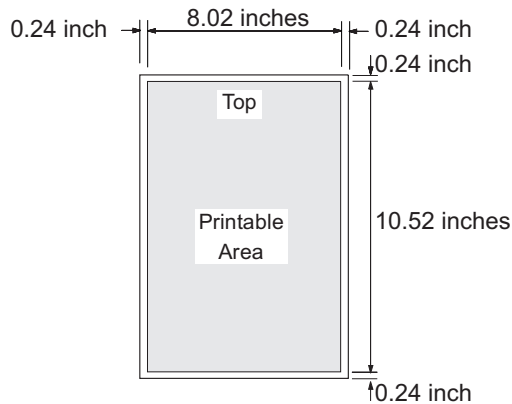


Figure 19. Recommended Printable Area for an 8.5 x 11-Inch Sheet on the Infoprint 70 Printer

Media Specifications

The Infoprint 70 printer accepts the following media:

Media types:

Plain or letterhead cutsheet paper, paper or polymer-based adhesive labels suitable for electrophotographic printing, pre-printed forms and letterheads, perforated and pre-punched (2, 3 and 4 holes) xerographic papers

Sheet sizes:

A5 (148 mm x 210 mm) through 12 inches x 18 inches (304.8 mm x 457.2 mm)

Note: Letter/A4 (long edge feed) or smaller paper sizes.

Media weights:

Copier/xerographic papers and labels: 16 to 53 lbs. (60 to 199 gsm)

Attachments

The Infoprint 70 has one interface slot with the following two options:

- Ethernet interface using the IBM Ethernet 10/100 BaseTX Adapter (feature number 4162).
- Token-Ring interface using the IBM Token-Ring 4/16 Adapter (feature number 4120).

These are mandatory features. One of them must be specified. They are mutually exclusive and there are no pre-requisites for this feature.

Host Systems Supported

Infoprint 70 supports the following host systems:

- AS/400 Systems
 - AS/400e Servers
 - AS/400e Systems
 - AS/400 Advanced Series
- RS/6000 systems
- Enterprise Servers
 - Netfinity Servers
 - S/390
 - G5, G6 Parallel Enterprise Servers
 - Multiprise Servers
 - Integrated Servers
 - ES/9000

Software

Table 69. Software Supported on the Infoprint 70 Printer

Physical	Protocol	Operating System
LAN (IEEE 802.3/.5)	TCP/IP	PSF/400 4.3, 4.4, 4.5 PSF/MVS 2.2 PSF for OS/390 Infoprint Manager for AIX 3.2 Infoprint Manager for NT 1.1

Chapter 11. Infoprint 2000 NP1 and RP1 Printers (2710–NP1, 2710–RP1)

This section describes the Infoprint 2000–NP1 and –RP1 printer characteristics. The Infoprint 2000–NP1 and –RP1 are cut-sheet printers that use laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 20. Infoprint 2000–NP1 and –RP1 Printer

Table 70 summarizes the printer characteristics for the Infoprint 2000 NP1 and RP1 printers.

Table 70. Infoprint 2000 NP1 and RP1 Printers' Characteristics

Characteristics	Characteristic Value Infoprint 2000–NP1 Infoprint 2000–RP1
Maximum printing rate	110 pages per minute
Print technology	Electrophotographic/LED
Datastreams	PostScript 3 and PCL6
Form type	Cut Sheet
Number of input bins	Standard: 2 trays up to 1000 sheets each, 1 tray up to 2000 sheets
	Optional: 2 trays up to 1000 sheets each, 1 tray up to 2000 sheets
Number of output bins	Standard: Finisher top bin up to 500 sheets; finisher main bin up to 3000 sheets
	Optional: High capacity stacker up to 5000 sheets
Finisher Attachments	
Corner staple	yes
Edge staple	yes
Side staple	yes
Saddle	no
Z-Fold	no
Inserter	yes
Envelope printing	no

Table 70. Infoprint 2000 NP1 and RP1 Printers' Characteristics (continued)

Characteristics	Characteristic Value Infoprint 2000–NP1 Infoprint 2000–RP1
MICR printing	no
Duplex printing	yes
Color	no
Adjust print-quality levels	no
Printhead resolution	600 dots-per-inch
Maximum impressions per month (duty cycle)	2,000,000

Printable Area

The Infoprint 2000–NP1 and –RP1 printers do not support edge-to-edge printing. The leading .05 inch (1 mm) is in a non-printable area. Any information in the non-printable area will be truncated. Figure 21 shows an example of the printable area of a form.

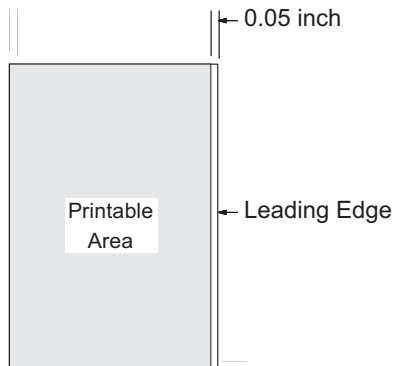


Figure 21. Printable Area in IPDS Mode on the Infoprint 2000 NP1 and RP1 Printers

Media Size and Configuration

The media loaded for your printer must match the media size in the printer configuration. If these sizes do not match, a printer error code indicates that this mismatch must be corrected by either changing the media at the printer or by changing the configuration to match the media.

Media Specifications

The Infoprint 2000 accepts the following media:

Media types:

- Xerographic, bond, book, duplicator, mimeographic, uncoated offset, ledger (tabloid), cover, index, bristol, and other long-grain plain papers (such as dual-purpose).
- Prepunched paper of these types:
 - International and Japan Standard 2–hole
 - U.S. and Japan 3–hole
 - German Standard 2– and 4–hole
 - Swedish Standard
 - U.S. 5–Hole
 - Bell/AT&T Systems 7–hole
- Recycled paper

Paper, card stock, labels, transparencies, recycled paper and envelopes

Sheet sizes:

8 inch x 10.5 inch, letter (8.5 inch x 11 inch), legal (8.5 inch x 14 inch), letter-tab (9 inch x 11 inch) manual (9 inch x 12 inch), ledger (tabloid) (11 inch x 17 inch), A4 (210 mm x 297 mm) A4 tab (225 mm x 297 mm), A3 (420 mm x 297 mm), legal-tab (9 inch x 14 inch)

Media weights:

16 to 110 lbs. (60 to 200 g/m²)

Attachments

Network Connectivity

The network connectivity option uses a 10/100BaseT Ethernet Network Interface Card (NIC) with a RJ-45 jack. Network protocol support includes TCP/IP, Appletalk, Ethernet, IPX/SPX.

Channel Connectivity

The channel connectivity option includes a channel controller standalone unit providing support for Xerox datastreams. It has connectors for channel Tag and Bus cables. Tag and Bus cables must be ordered separately for a connection to an IBM S/390 parallel channel.

Chapter 12. Infoprint 2000–DP1 Printer (2710–DP1)

This section describes the Infoprint 2000–DP1 printer characteristics. The Infoprint 2000–DP1 printer is a cut-sheet printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 22. Infoprint 2000–DP1 Printer

Table 71 summarizes the printer characteristics for the Infoprint 2000–DP1 printer.

Table 71. Infoprint 2000–DP1 Printer Characteristics

Characteristics	Characteristic Value
Maximum printing rate	110 pages per minute
Print technology	Electrophotographic/LED
Datastreams ¹	IPDS and PDF or LCDS/Metacode, PostScript 3, and PCL6
Form type	Cut Sheet
Number of input bins	Standard: 2 trays up to 1000 sheets each, 1 tray up to 2000 sheets
	Optional: 2 trays up to 1000 sheets each, 1 tray up to 2000 sheets
Number of output bins	Standard: Finisher top bin up to 500 sheets; finisher main bin up to 3000 sheets
	Optional: High capacity stacker up to 5000 sheets
Finisher Attachments	
Corner staple	yes
Edge staple	yes
Side Staple	yes
Saddle	no
Z-Fold	no
Inserter	no
Envelope printing	no
MICR printing	no

Table 71. Infoprint 2000–DP1 Printer Characteristics (continued)

Characteristics	Characteristic Value
Duplex printing	yes
Color	no
Adjust print-quality levels	no
Printhead resolution	600 dots-per-inch
Maximum impressions per month (duty cycle)	2,000,000
1. With the IPDS feature installed the Infoprint 2000-DP1 cannot accept the LCDS/Metacode, PostScript 3, and PCL6 datastreams.	

Printable Area

The Infoprint 2000–DP1 printer does not support edge-to-edge printing. The leading .05 inch (1 mm) is in a non-printable area. Any information in the non-printable area will be truncated. Figure 23 shows an example of the printable area of a form.

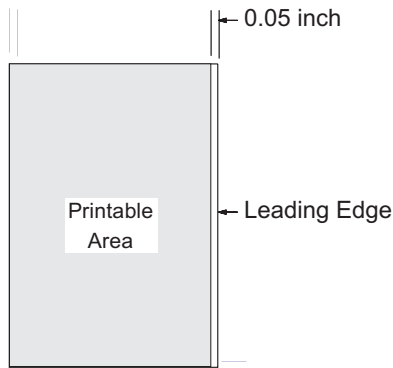


Figure 23. Printable Area in IPDS Mode on the Infoprint 2000–DP1 Printer

Media Specifications

The Infoprint 2000–DP1 printer accepts the following media:

Media types:

- Xerographic, bond, book, duplicator, mimeographic, uncoated offset, ledger (tabloid), cover, index, bristol, and other long-grain plain papers (such as dual-purpose).
- Prepunched paper of these types:
 - International and Japan Standard 2–hole
 - U.S. and Japan 3–hole
 - German Standard 2– and 4–hole
 - Swedish Standard
 - U.S. 5–Hole
 - Bell/AT&T Systems 7–hole
- Recycled paper

Paper, card stock, labels, transparencies, recycled paper and envelopes

Sheet sizes:

8 inch x 10.5 inch, letter (8.5 inch x 11 inch), legal (8.5 inch x 14 inch), letter-tab (9 inch x 11 inch) manual (9 inch x 12 inch), ledger (tabloid) (11 inch x 17 inch), A4 (210 mm x 297 mm) A4 tab (225 mm x 297 mm), A3 (420 mm x 297 mm), legal-tab (9 inch x 14 inch)

Media weights:

16 to 110 lbs. (60 to 200 g/m²)

Attachments

Non-IPDS Attachment Features

Network Connectivity: The network connectivity option uses a 10/100BaseT Ethernet Network Interface Card (NIC) with a RJ-45 jack. Network protocol support includes TCP/IP, Appletalk, Ethernet, IPX/SPX.

Channel Connectivity: The channel connectivity option includes a channel controller standalone unit providing support for Xerox datastreams. It has connectors for channel Tag and Bus cables. Tag and Bus cables must be ordered separately for a connection to an IBM S/390 parallel channel.

IPDS Attachment Features

S/370 Parallel Channel Attachment for IPDS: This feature provides a System/370 Parallel Channel Attachment when using IPDS.

ESCON Channel Attachment for IPDS: This feature provides the ESCON Channel Attachment when using IPDS. The customer has the option of choosing one or two attachments when ordering the Infoprint 2000.

Token-Ring Attachment for IPDS: The token-ring feature provides the native attachment of an Infoprint 2000 printing system to a LAN via Token-Ring when using IPDS.

10/100BaseT Ethernet (TCP/IP) Attachment for IPDS: This feature provides the attachment of the Infoprint 2000 Printing System to a LAN via 10/100BaseT Ethernet (TCP/IP) when using IPDS.

FDDI (TCP/IP) Attachment for IPDS: This feature provides a native attachment of the Infoprint 2000 printing system to a LAN via FDDI (TCP/IP) when using IPDS.

Chapter 13. Infoprint 3000–ES1 and –ED1/ED2 Printers (3300)

This section describes the Infoprint 3000–ES1 and Infoprint 3000–ED1/ED2 printer characteristics. The Infoprint 3000 printers are continuous forms printers that use laser and electrophotographic technology to print text, images, graphics, and bar codes.



Figure 24. Infoprint 3000–ED1/ED2 Printer

Table 72 summarizes the printer characteristics for the Infoprint 3000–ES1 and –ED1/ED2 printers.

Table 72. Infoprint 3000–ES1 and –ED1/ED2 Printer Characteristics

Printer characteristic	Characteristic Value Infoprint 3000–ES1	Characteristic Value Infoprint 3000–ED1/ED2
Print technology	Laser	
Datastreams	IPDS	
Form type	Continuous	
Number of input bins	Up to 15.5 inch (394 mm) stack of paper	
Number of output bins	Up to 12 inch (305 mm) stack of paper	
Finisher attachments	n/a	
Manual forms feed	n/a	
Envelope printing	n/a	
MICR printing	no	
Duplex printing	no	
Color	no	
Adjust print-quality levels	yes	
Printhead resolution	480 dots-per-inch 600 dots-per-inch	
Maximum printing rates for letter (8.5 x 11 inches)		
inches per second	15.9	
inches per minute	954	

Table 72. Infoprint 3000–ES1 and –ED1/ED2 Printer Characteristics (continued)

Maximum printing rates for letter in pages per minute ¹		
1–up landscape (8.5 inches long) simplex	114	
1–up landscape (8.5 inches long) duplex	n/a	228
2–up portrait (11 inches long) simplex	172	
2–up portrait (11 inches long) duplex	n/a	344
Maximum printing rates for A4 (210 x 297 mm)		
mm per second	404	
mm per minute	24,231	
Maximum printing rates for A4 in pages per minute ¹		
1–up landscape (210 mm long) simplex	114	
1–up landscape (210 mm long) duplex	n/a	228
2–up portrait (297 mm long) simplex	162	
2–up portrait (297 mm long) duplex	n/a	324
Maximum usage in pages per month (duty cycles) ²		
Letter: 1–up landscape (8.5 inches long)	2,800,000 simplex	5,600,000 duplex
Letter: 2–up portrait (11 inches long)	4,400,000 simplex	8,800,000 duplex
A4: 1–up landscape (210 mm long)	3,000,000 simplex	6,000,000 duplex
A4: 2–up portrait (297 mm long)	4,000,000 simplex	8,000,000 duplex
<p>1. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>2. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>		

Printable Area

The printable area depends on the size of the form being used. The Infoprint 3000–ES1 and –ED1/ED2 printers can print from perforation to perforation when using roll forms. However, when printing on folded forms, the printing may be degraded in areas near a folded perforation, an internal perforation, or any cut in the form because of the “tenting” (*fold memory*) of the form.

Figure 25 on page 75 shows an example of the printable area of a standard, letter-size roll form for the Infoprint 3000. Notice that the media origin is located in different corners for wide and narrow forms. Although the maximum printable area for narrow forms is 8.5 by 17 inches, and the maximum printable area for wide forms is 17 by 17 inches, the examples show the printable area for letter-size forms.

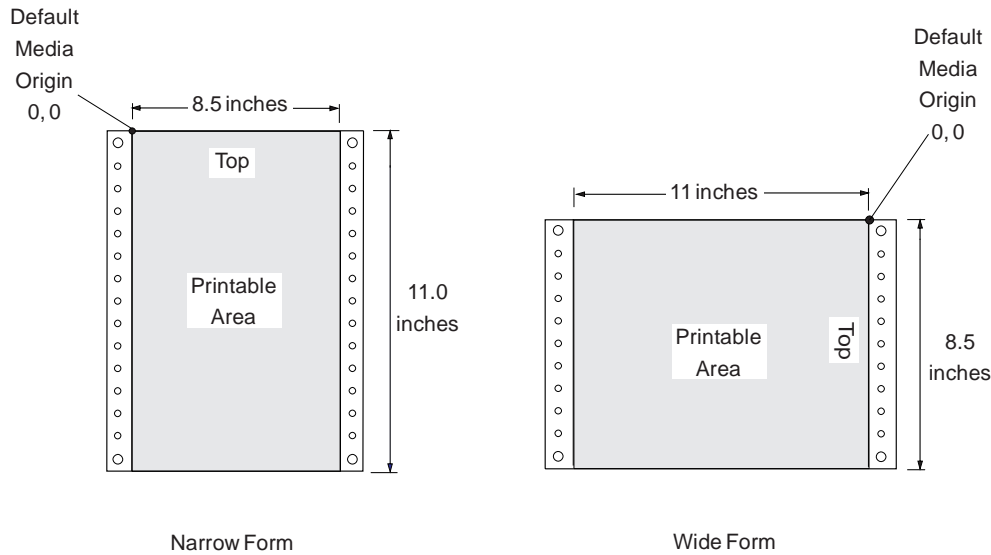


Figure 25. Printable Area on the Infoprint 3000-ES1 and -ED1/ED2 Printers

Media Specifications

The Infoprint 3000-ES1 and -ED1/ED2 printers accept the following media:

Media types:

Preprinted or blank fanfold forms, roll-feed paper

Media widths:

Model ES1

8 inches to 18 inches (203 mm to 457 mm)

Models ED1/ED2

9 inches to 18 inches (229 mm to 457 mm)

Media lengths:

7 inches to 14 inches (178 mm to 356 mm) standard; 7 inches to 28 inches (178 mm to 712 mm) with pre- and post-processing options

Media weights:

Model ES1

16 lb. to 42 lb. (60 gsm to 157 gsm)

Models ED1/ED2

16 lb. to 28 lb. (60 gsm to 105 gsm)

Attachments

The InfoPrint 3000-ES1 and 3000-ED1/ED2 support a maximum of two attachments. These attachments can be:

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

The two attachments may be the same (for example, two ESCON channels), or mixed (for example, one ESCON and one Token-Ring). The exception is that the printer can have only one TCP/IP attachment of any flavor. You cannot have two Token-Ring attachments, for example. For a single printer (a simplex printer, a duplex printing system, or a dual simplex printer), only one attachment can be active at a time. If

both attachments are to the same system, or to a tightly-coupled system, and the attachments are of the same type channel (example, both are ESCON or both are parallel channel), then switching between the two attachments can be performed dynamically by the host system. If the attachments or host differ, or the hosts are not tightly-coupled, then the switch must be performed manually by the operator. The printer must be disabled from the current system and attachment before it can be enabled to the other attachment.

System/370 Parallel Channel

System/370 parallel channel attachment is supported on OS/390, PSF/MVS, PSF/VM, and PSF/VSE printing environments.

- For S/370 parallel channel attachment, a control unit position on a S/370 parallel block multiplexer channel is required on an IBM 3090™ or ES/9000™ processor.
- The following processors are also supported for S/370 parallel channel attachments: S/390 Parallel Enterprise Server, and the S/390 Multiprise 2000 servers.
- Attachment is also supported via the 9034 ESCON Converter Model 1.

ESCON Channel

ESCON channel is supported on OS/390, PSF/MVS, PSF/VM, and PSF/VSE printing environments.

- The IBM Infoprint 3000-ES1 and 3000-ED1/ED2 may be attached natively to IBM ESCON channel (3090-J, 9021, 9121, 9221, 9672, 2003).
- Attachment is also supported via the 9032/9033 ESCON Directors and 9036 ESCON Remote Channel Model 1 and Model 2.

The ESCON attachment may be shared between different ESCON systems or different ESCON multiple image facility (EMIF) images, if ALL host systems connected to the printer are using the OS/390 (V1R3.0 or higher) operating system and ALL of the PSF/MVS applications in those systems have the APAR OW29992 installed. Such OS/390 systems can be guests of VM/ESA.

When these conditions are met for ESCON then the multihost flag can be set to "TRUE" in the printer. This will automatically invoke the protocol allowing the printer to print only one host (or OS/390 guest of VM) at a time. When the first host is printing the second host will receive an "assigned elsewhere" message until the first host is finished printing and releases the printer.

Token-Ring (TCP/IP) Attachment

Token-Ring (TCP/IP) attachment is supported on PS/400, PSF for AIX, and Infoprint Manager for AIX printing environments along with selected RS/6000 and AS/400 models. The 3000-ES1 and 3000-ED1/ED2 are connected to the host Token-Ring through the IBM Token-Ring cabling via the Token Ring High-performance adapter, which is contained in the AFCCU. The control unit can be attached to either a 16 Mbit/sec or a 4 Mbit/sec Token-Ring LAN. The TCP/IP Token-Ring Attachment will attach to the following devices:

- 8228 Token Ring Multistation Access Unit attached to an AS/400 or RS/6000 processor
- 8230 Token Ring Network Controller Access attached to an AS/400 or RS/6000 processor
- 8228 Token Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, or 308X processor
- 8230 Token Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, or 308X processor

The printer may be located at a maximum distance of 100 meters (328 ft) from the 8228 Multistation Access Unit or 8230 Controlled Access Unit.

The distance between the 8228 Multistation Access Units can be increased with either the 8220 or 8219 Optical Fiber Repeater.

- Installation Instructions are provided with the feature.

Ethernet 10/100 BaseT (TCP/IP)

Ethernet 10/100 BaseT (TCP/IP) attachment is supported on PSF/400, PSF for AIX, and Infoprint Manager for AIX printing environments. An Ethernet Adapter Card is supplied with Specify Feature number 9993 and Special Feature number 4165. The adapter card is installed in the IBM Infoprint 3000-ES1 and ED2 AFCCU processors. The IBM Infoprint 3000-ES1 and ED1/ED2 may then be attached to an Ethernet LAN.

- 10/100 BaseT LAN using Twisted Pair Cabling
 - IBM supplies a Twisted Pair wrap plug (PN 00G2380)
- Installation Instructions are provided with the features.

FDDI (TCP/IP)

FDDI (TCP/IP) attachment is supported on PSF for AIX and Infoprint Manager printing environments and for selected RS/6000 models. The Infoprint 3000-ES1 and 3000-ED1/ED2 are connected to the host FDDI through FDDI 62.5/125 multimode fiber cabling using SC connectors via the FDDI Single Station adapter, which is contained in the AFCCU. The FDDI (TCP/IP) attachment will attach to the following devices:

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

The printer may be located at a maximum distance of 2 Kilometers from the 826 Multiprotocol Intelligent Switching Hub or RS/6000 processor.

Chapter 14. Infoprint 4000 IS1– and –IS2 Printers (4000–IS1 and –IS2)

This section describes the Infoprint 4000–IS1 and Infoprint 4000–IS2 printer characteristics. The Infoprint 4000–IS1 and Infoprint 4000–IS2 are continuous-forms printers that use laser and electrophotographic technology to print text, images, graphics, and bar codes at up to 229 impressions per minute (ipm) for the Infoprint 4000–IS1 printer and 324 impressions per minute (ipm) for the Infoprint 4000–IS2 printer.



Figure 26. Infoprint 4000–IS1 and –IS2 Printers

Table 73 summarizes the printer characteristics for the Infoprint 4000–IS1 and –IS2 printers.

Table 73. Infoprint 4000–IS1 and –IS2 Printer Characteristics

Printer Characteristics	Characteristic Value Infoprint 4000–IS1	Characteristic Value Infoprint 4000–IS2 ¹
Print technology	Laser	
Datastreams	IPDS	
Form type	Continuous	
Number of input bins	Up to 16 inch (406 mm) stack of paper (box)	
Number of output bins	Up to 14 inch (355 mm) stack of paper; supports 7 inch to 14 inch folds	
Finisher attachments	n/a	
Manual forms feed	n/a	
Envelope printing	n/a	

Table 73. Infoprint 4000–IS1 and –IS2 Printer Characteristics (continued)

MICR printing *With either RPQ 8B4013 or 8B4018 installed	yes*	
Duplex printing	no	
Color *With the IBM 4005 Infoprint Hi-Lite Color printer attached ²	yes*	
Adjust print-quality levels	yes	
Printhead resolution	240 dpi 300 dpi	
Maximum printing rates for letter (8.5 x 11 inches)		
inches per second	32.5	46
inches per minute	1,950	2,760
Maximum printing rates for letter in pages per minute ³		
1–up landscape (8.5 inches long) simplex	229	324
1–up landscape (8.5 inches long) duplex	n/a	
2–up portrait (11 inches long) simplex	354	501
2–up portrait (11 inches long) duplex	n/a	
Maximum printing rates for A4 (210 x 297 mm)		
mm per second	825	1168
mm per minute	49,530	70,104
Maximum printing rates for A4 in pages per minute ³		
1–up landscape (210 mm long) simplex	235	330
1–up landscape (210 mm long) duplex	n/a	
2–up portrait (297 mm long) simplex	333	472
2–up portrait (297 mm long) duplex	n/a	
Maximum usage in pages per month (duty cycles) ⁴		
Letter: 1–up landscape (8.5 inches long)	5,600,000 simplex	8,000,000 simplex
Letter: 2–up landscape 11 inches long)	8,700,000 simplex	12,300,000 simplex
A4: 1–up landscape (210 mm long)	5,700,000 simplex	8,100,000 simplex
A4: 2–up landscape (297 mm long)	8,200,000 simplex	11,500,000 simplex
<p>1. The 4000–IS2 printer was originally shipped with a print speed of 44 inches per second. All 4000–IS2 printers shipped after February 17, 1998 (or with upgrades 9324 or 4260 installed) have a print speed of 46 inches per second.</p> <p>2. The Infoprint 4005 Hi-Lite Color post-processor provides a high-speed, high-quality, all-points-addressable (APA) color printing system to complement the industry-leading quality and reliability the IBM Infoprint 4000 Wide or Wide Duplex printers (240 dpi models). Visit the IBM Printing Systems Inter page at http://www.ibm.com/printers for more information about the Infoprint 4005.</p> <p>3. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>4. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>		

Printable Area

The printable area depends on the size of the form being used. The Infoprint 4000–IS1 and –IS2 printers can print from perforation to perforation when using roll forms. However, when printing on folded forms, the printing may be degraded in areas near a folded perforation, an internal perforation, or any cut in the form because of the “tenting” (*fold memory*) of the form.

Figure 27 shows examples of the printable areas of a roll form for a Infoprint 4000 IS1 and IS2 printers. Notice that the media origin is located in different corners for wide and narrow forms. The printable area for the narrow form is 8.5 by 11 inches. The printable area for the wide form is 11 by 8.5 inches.

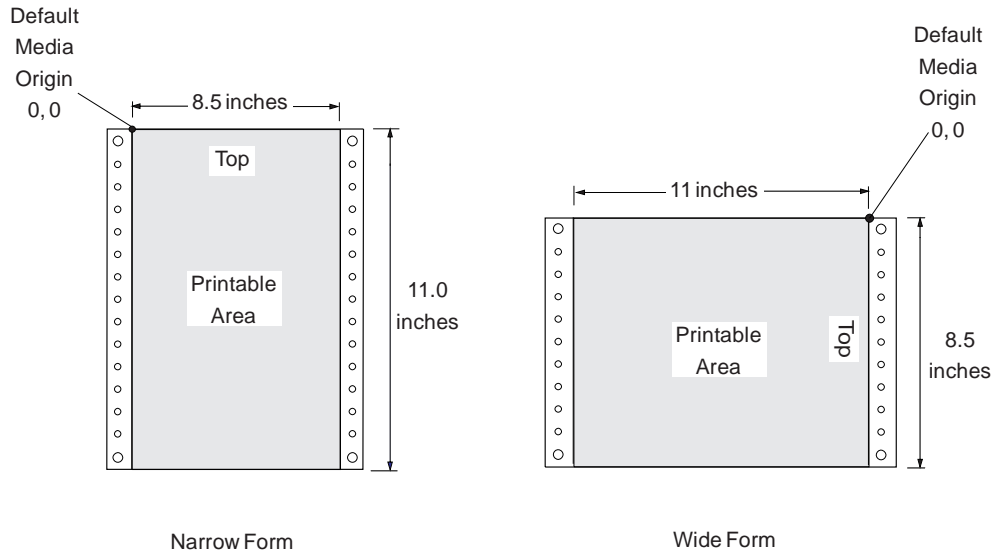


Figure 27. Printable Area for 9.5 by 11-Inch (Narrow) and a 12 by 8.5-Inch (Wide) Roll Forms on Infoprint 4000–IS1 and –IS2 printers

Figure 28 on page 82 shows examples of the printable areas of folded forms for a Infoprint 4000–IS1 and –IS2 printers. Notice that the media origin is located in different corners for wide and narrow forms. The printable area for the narrow form is 8.5 by 10.66 inches. The printable area for the wide form is 11 by 8.16 inches.

FOR TEXT, OCR, AND BAR CODES

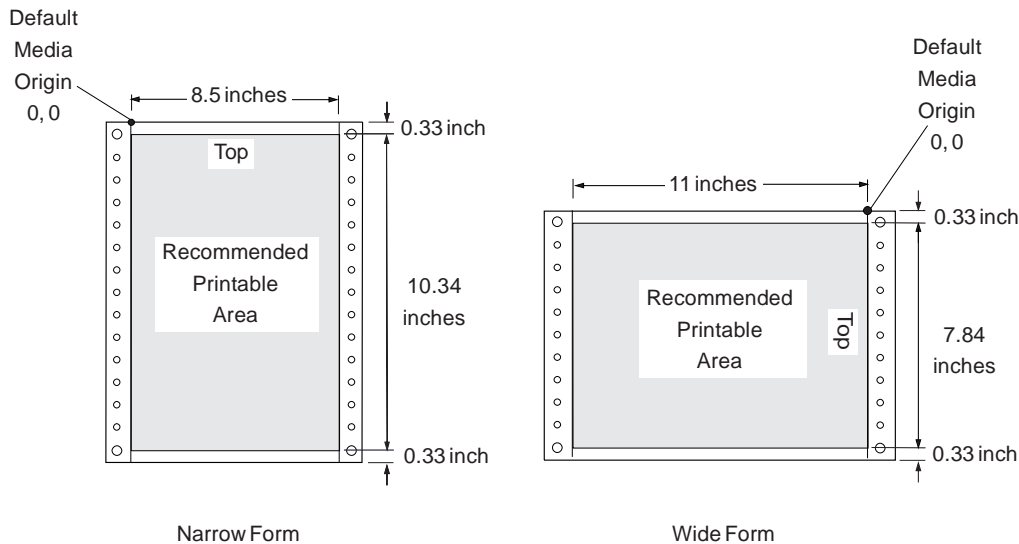


Figure 28. Printable Area for 9.5 by 11-Inch (Narrow) and a 12 by 8.5-Inch (Wide) Folded Forms on Infoprint 4000-IS1 and -IS2 printers

Media Specifications

The Infoprint 4000-IS1 and -IS2 printers accept the following media:

Media types:

Preprinted or blank fanfold forms, roll feed paper, some labels

Media widths:

8 inches to 18 inches (203 to 457 mm)

Media lengths:

3 inches to 14 inches (76 to 356 mm) standard; up to 28 inches (711 mm) with RPQ (additional memory required)

Media weights:

Model IS1

16 to 42 lbs. (60 to 160 gsm)

Model IS2

16 to 28 lbs. (60 to 105 gsm)

Attachments

System/370 Parallel Channel

For S/370 parallel channel attachment, a control unit position on a S/370 parallel block multiplexer channel is required on an IBM 4361, 4381, 3090, ES/9370, or ES/9000 processor. The following processors are also supported for S/370 parallel channel attachment, Parallel Enterprise Server Models R1, R2, and R3 S/390 G3 Enterprise Server, and the S/390 Multiprise™ 2000. Attachment is also supported via the 9034 ESCON converter model 1. The S/370 Channel is supported in MVS, VM, and VSE operating system environments.

ESCON Channel

The IBM InfoPrint 4000 IS1/IS2 may be attached natively to ESCON channels. Note that when attached via ESCON, the IBM InfoPrint 4000 IS1/IS2 is supported on the MVS, VM, and VSE operating systems only. The IBM InfoPrint 4000 IS1/IS2 may also be attached to selected PS/2, RS/6000, AS/400 models

using Token-Ring (TCP/IP), or Ethernet (TCP/IP). Attachment is also supported via the 9032/9033 ESCON Directors, and 9036 ESCON Remote Channel Extender.

Token-Ring (TCP/IP) Attachment

The IBM InfoPrint 4000 IS1/IS2 is connected to the host Token-Ring through the IBM Token-Ring cabling via the Token-Ring High-Performance adapter, which is contained in the AFCCU. The attachment card and token-ring adapter cable P/N 53F3930 (approximately 4.6 m (15 ft)) in length are included with the IBM InfoPrint 4000 IS1/IS2. The control unit can be attached to either a 16Mbit/sec or a 4Mbit/sec Token-Ring LAN. The TCP/IP Token Ring Attachment will attach to the following devices:

- 8228 Token Ring Multistation Access Unit attached to an AS/400, PS/2, or RS/6000 processor.
- 8230 Token Ring Network Controller Access Unit attached to an AS/400, PS/2, or RS/6000 processor.
- 8228 Token Ring Multistation Access Unit attached to a 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 printer may be located at a maximum distance of 100 meters (333ft.) from the 8228 Multistation Access Unit or 8230 Controlled Access Unit. The distance between the 8228 Multistation Access Units can be increased with either the 8220 or 8219 Optical Fiber Repeater.

Ethernet (TCP/IP) Attachment

An Ethernet Adapter Card (P/N 00G3369) is supplied with Specify Feature 9990 and Special Feature 4161. This is installed in the processor of the AFCCU of the IBM InfoPrint 4000 IS1/IS2. The IBM InfoPrint 4000 IS1/IS2 may then be attached to an Ethernet LAN via one of the following means:

- Ethernet Thin Coax
 - IBM Supplies a Thin Coax wrap connector (P/N 02G7433)
- Ethernet Thick Coax
 - IBM Supplies the Thick Coax wrap connector (D-shell connector; P/N 71F1167)
- Ethernet Twisted Pair
 - IBM Supplies a Twisted Pair Transceiver (P/N 00G2906)
 - IBM Supplies a Twisted Pair Wrap plug (P/N 00G2380)

Chapter 15. Infoprint 4000–IR1/IR2 and –IR3/IR4 Printers (4000–IR1/IR2 and –IR3/IR4)

This section describes the Infoprint 4000–IR1/IR2 and Infoprint–IR3/IR4 printer characteristics. The Infoprint 4000–IR1/IR2 and –IR3/IR4 are continuous-forms printers that use laser and electrophotographic technology to print text, images, graphics, and bar codes at up to 464 impressions per minute (ipm) for the Infoprint 4000–IR1/IR2 printer and 708 impressions per minute (ipm) for the Infoprint 4000–IR3/IR4 printer in duplex mode. The Infoprint 4000–IR1/IR2 and –IR3/IR4 printers have 18-inch wide paper paths with a 17-inch wide print width, which permits printing of two 8.5-by-11 inch or two ISO A4 pages on a single side of a sheet. The Infoprint 4000–IR1/IR2 and –IR3/IR4 printers use the Advanced Function Common Control Unit (AFCCU) based on RISC technology.

The Infoprint 4000 –IR1/IR2 and –IR3/IR4 also has 480/600 pels-per-inch resolution and the Print Quality Enhancement (PQE) function, which smoothes edges on diagonal lines, protects fine details, improves the fidelity of images, and allows for adjustment of the boldness of text and the darkness of images.



Figure 29. Infoprint 4000–IR1/IR2 and –IR3/IR4 Printers

Table 74 summarizes the printer characteristics for the Infoprint 4000–IR1/IR2 and –IR3/IR4 printers

Table 74. Infoprint 4000–IR1/IR2 and –IR3/IR4 Printer Characteristics

Printer Characteristics	Characteristic Value Infoprint 4000–IR1/IR2	Characteristic Value Infoprint 4000–IR3/IR4
Print technology	Laser	
Datastreams	IPDS	
Form type	Continuous	
Number of input bins	Up to 16 inch (406 mm) stack of paper (box)	
Number of output bins	Up to 14 inch (356 mm) stack of paper (internal stacker); supports 7 inch to 14 inch folds	
Finisher attachments	n/a	
Manual forms feed	n/a	
Envelope printing	n/a	
MICR printing	no	
Duplex printing	yes	
Color	no	

Table 74. Infoprint 4000–IR1/IR2 and –IR3/IR4 Printer Characteristics (continued)

Adjust print-quality levels	yes	
Printhead resolution	480 dpi 600 dpi	
Maximum printing rates for letter (8.5 x 11 inches)		
inches per second	21.3	32.5
inches per minute	1,278	1,950
Maximum printing rates for letter in pages per minute ¹		
1–up landscape (8.5 inches long) simplex	153	229
1–up landscape (8.5 inches long) duplex	306	458
2–up portrait (11 inches long) simplex	232	354
2–up portrait (11 inches long) duplex	464	708
Maximum printing rates for A4 (210 x 297 mm)		
mm per second	541	825
mm per minute	32,461	49,530
Maximum printing rates for A4 in pages per minute ¹		
1–up landscape (210 mm long) simplex	153	235
1–up landscape (210 mm long) duplex	306	470
2–up portrait (297 mm long) simplex	218	333
2–up portrait (297 mm long) duplex	436	666
Maximum usage in pages per month (duty cycles) ²		
Letter: 1–up landscape (8.5 inches long)	7,300,000 duplex	8,700,000 duplex
Letter: 2–up portrait (11 inches long)	11,300,000 duplex	17,400,000 duplex
A4: 1–up landscape (210 mm long)	7,500,000 duplex	8,200,000 duplex
A4: 2–up portrait (297 mm long)	10,700,000 duplex	16,700,000 duplex
<p>1. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>2. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>		

Printable Area

The printable area depends on the size of the form being used. The Infoprint 4000–IR1/IR2 and –IR3/IR4 printers can print from perforation to perforation when using roll forms. However, when printing on folded forms, the printing may be degraded in areas near a folded perforation, an internal perforation, or any cut in the form because of the “tenting” (*fold memory*) of the form.

Figure 30 on page 87 shows an example of the printable area of a standard, letter-size roll form for the Infoprint 4000–IR1/IR2 and –IR3/IR4 printers. Notice that the media origin is located in different corners for wide and narrow forms. Although the maximum printable area for narrow forms is 8.5 by 17 inches, and the maximum printable area for wide forms is 17 by 17 inches, the examples show the printable area for letter-size forms.

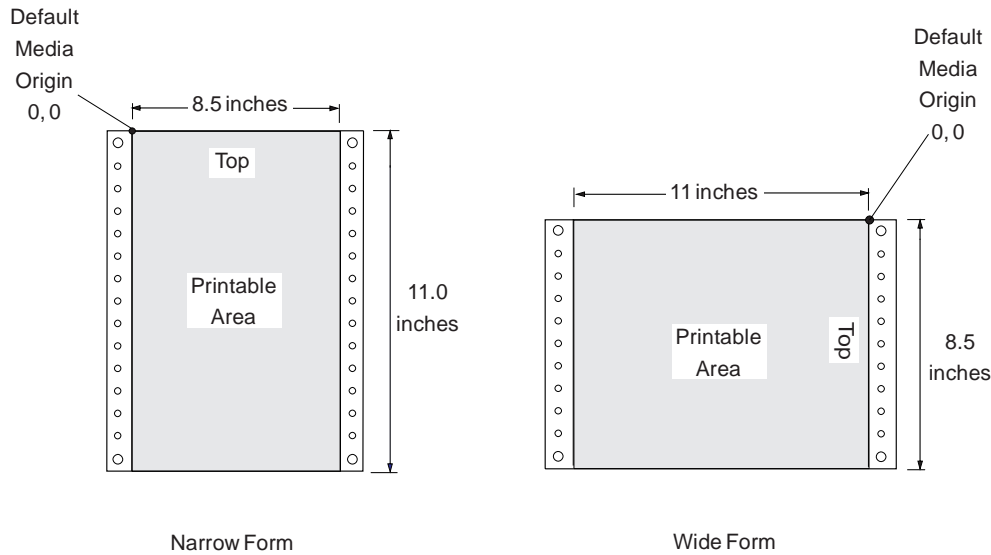


Figure 30. Printable Area in IPDS Mode on the Infoprint 4000-IR1/IR2 and -IR3/IR4 Printers

Media Specifications

The Infoprint 4000-IR1/IR2 and -IR3/IR4 printers accept the following media:

Media types:

Preprinted or blank fanfold forms, roll-feed paper, some labels

Media widths:

9 inches to 18 inches (225 mm to 457 mm); 17 inches maximum (432 mm) when operating with pinless RPQ

Media lengths:

3 inches to 14 inches (76 mm to 356 mm) with on-board stacker; 3 inches to 25 inches (76 mm to 635 mm) with Post-Processing

Media weights:

16 lb. to 28 lb. (60 gsm to 105 gsm)

Attachments

The InfoPrint 4000-IR1/IR2 and -IR3/IR4 supports a maximum of two attachments. These attachments can be:

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

The two attachments may be the same (e.g., 2 ESCON channels), or mixed (eg., 1 ESCON and 1 Token-Ring). The exception is that the printer can have only 1 TCP/IP attachment of any flavor. You cannot have 2 Token-Ring or 2 FDDI attachments, or a combination of 1 Token-Ring or 1 FDDI attachments.

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

System/370 Parallel Channel

System/370 parallel channel attachment is supported on PSF/MVS, PSF/VM, and PSF/VSE printing environments. For S/370 parallel channel attachment, a control unit position on a S/370 parallel block multiplexer channel is required on an IBM 3090™ or ES/9000™ processor. The following processors are also supported for S370 parallel channel attachments, S/390 Parallel Enterprise Server, and the S/390 Multiprise 2000 servers. Attachment is also supported via the 9034 ESCON Converter Model 1.

ESCON Channel

ESCON channel is supported on PSF/MVS, PSF/VM, and PSF/VSE printing environments. The IBM InfoPrint 4000 may be attached natively to IBM ESCON channels (3090-J, 9021, 9121, 9221, 9672, 2003). Attachment is also supported via the 9032/9033 ESCON Directors and 9036 ESCON Remote Channel Extender model 1 and model 2.

Token-Ring (TCP/IP) Attachment

Token-Ring (TCP/IP) attachment is supported on PSF for OS/2 and PSF for AIX printing environments along with selected RS/6000 and AS/400 models. The 4000 is connected to the host Token-Ring through the IBM Token-Ring cabling via the Token Ring High-performance adapter, which is contained in the AFCCU. The control unit can be attached to either a 16Mbit/sec or a 4Mbit/sec Token-Ring LAN. The TCP/IP Token-Ring Attachment will attach to the following devices:

- 8228 Token Ring Multistation Access Unit attached to an AS/400 or RS/6000 processor
- 8230 Token Ring Network Controller Access attached to an AS/400 or RS/6000 processor
- 8228 Token Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, or 308X processor
- 8230 Token Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, or 308X processor

The printer may be located at a maximum distance of 100 meters (333 ft) from the 8228 Multistation Access Unit or 8230 Controlled Access Unit.

The distance between the 8228 Multistation Access Units can be increased with either the 8220 or 8219 Optical Fiber Repeater.

- Installation Instructions are provided with the feature.

FDDI (TCP/IP)

FDDI (TCP/IP) attachment is supported on PFS for AIX printing environments for selected RS/6000 models. The 4000 is connected to the host FDDI through FDDI 62.5/125 multi-mode fiber cabling using SC connectors via the FDDI Single Station adapter, which is contained in the AFCCU. The FDDI (TCP/IP) attachment will attach to the following devices:

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

The printer may be located at a maximum distance of 2 Kilometers from the 8260 Multiprotocol Intelligent Switching Hub or RS/6000 processor.

Chapter 16. Infoprint 4000–ID1/ID2 and –ID3/ID4 Printers (4000–ID1/ID2 and –ID3/ID4)

This chapter describes Infoprint 4000–ID1/ID2 and –ID3/ID4 printer characteristics. The Infoprint 4000–ID1/ID2 and –ID3/ID4 printers are a channel-attached or LAN-attached, continuous-forms printer that use a laser and electrophotographic technology to print text, images, graphics, and bar codes at up to 229 ipm (impressions per minute) for the Infoprint 4000–ID1/ID2 and 324 ipm for the –ID3/ID4. The Infoprint 4000–ID1/ID2 and –ID3/ID4 printers use the Advanced Function Common Control Unit (AFCCU) based on RISC technology, which provides as standard the Advanced Function Image and Graphics (AFIG) feature and the Decompression Performance Enhancement (DPE) feature.

The Infoprint 4000–ID1/ID2 and –ID3/ID4 printers also have 300 pels-per-inch resolution and the Print Quality Enhancement (PQE) function, which smooths edges on diagonal lines, protects fine details, improves the fidelity of images, and allows for adjustment of the boldness of text and the darkness of images.



Figure 31. Infoprint 4000–ID1/ID2 and –ID3/ID4 Printers

Table 75 summarizes the printer characteristics for the Infoprint 4000–ID1/ID2 and –ID3/ID4 printers.

Table 75. Infoprint 4000–ID1/ID2 and –ID3/ID4 Printer Characteristics

Printer Characteristics	Characteristic Value Infoprint 4000–ID1/ID2	Characteristic Value Infoprint 4000–ID3/ID4
Print technology	Laser	
Datastreams	IPDS	
Form type	Continuous	
Number of input bins	Up to 16 inch (406 mm) stack of paper (box)	
Number of output bins	Up to 14 inch (355 mm) stack of paper	
Finisher attachments	n/a	
Manual forms feed	n/a	
Envelope printing	n/a	
MICR printing *With either RPQ 8B4013 or 8B4018 installed	yes*	
Duplex printing	yes	

Table 75. Infoprint 4000–ID1/ID2 and –ID3/ID4 Printer Characteristics (continued)

Color *With the IBM 4005 Infoprint Hi-Lite Color printer attached ²	yes*	
Adjust print-quality levels	yes	
Printhead resolution	240 dpi 300 dpi	
Maximum printing rates for letter (8.5 x 11 inches)		
inches per second	32.5	46
inches per minute	1,950	2,760
Maximum printing rates for letter in pages per minute ²		
1–up landscape (8.5 inches long) simplex	229	324
1–up landscape (8.5 inches long) duplex	458	648
2–up portrait (11 inches long) simplex	354	501
2–up portrait (11 inches long) duplex	708	1,002
Maximum printing rates for A4 (210 x 297 mm)		
mm per second	825	1168
mm per minute	49,530	70,104
Maximum printing rates for A4 in pages per minute ²		
1–up landscape (210 mm long) simplex	235	330
1–up landscape (210 mm long) duplex	470	660
2–up portrait (297 mm long) simplex	333	472
2–up portrait (297 mm long) duplex	666	944
Maximum usage in pages per month (duty cycles) ³		
Letter: 1–up landscape (8.5 inches long)	11,200,000 duplex	16,200,000 duplex
Letter: 2–up portrait (11 inches long)	17,400,000 duplex	24,600,000 duplex
A4: 1–up landscape (210 mm long)	11,600,000 duplex	16,300,000 duplex
A4: 2–up portrait (297 mm long)	16,700,000 duplex	23,000,000 duplex
<p>1. The Infoprint 4005 Hi-Lite Color post-processor provides a high-speed, high-quality, all-points-addressable (APA) color printing system to complement the industry-leading quality and reliability the IBM Infoprint 4000 ID1/ID2 Wide or Wide Duplex printers (240 dpi models). Visit the IBM Printing Systems Inter page at http://www.ibm.com/printers for more information about the Infoprint 4005.</p> <p>2. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>3. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>		

Printable Area

The printable area depends on the size of the form being used. The Infoprint 4000–ID1/ID2 and –ID3/ID4 printers can print from perforation to perforation when using roll forms. However, when printing on folded forms, the printing may be degraded in areas near a folded perforation, an internal perforation, or any cut in the form because of the “tenting” (*fold memory*) of the form.

Figure 32 shows examples of the printable areas of a standard, letter-size roll form for a Infoprint 4000–ID1/ID2 and –ID3/ID4 printers. Notice that the media origin is located in different corners for wide and narrow forms. Although the maximum printable area for narrow forms is 8.5 by 17 inches, and the maximum printable area for wide forms is 17 by 17 inches, the examples show the printable area for letter-size forms.

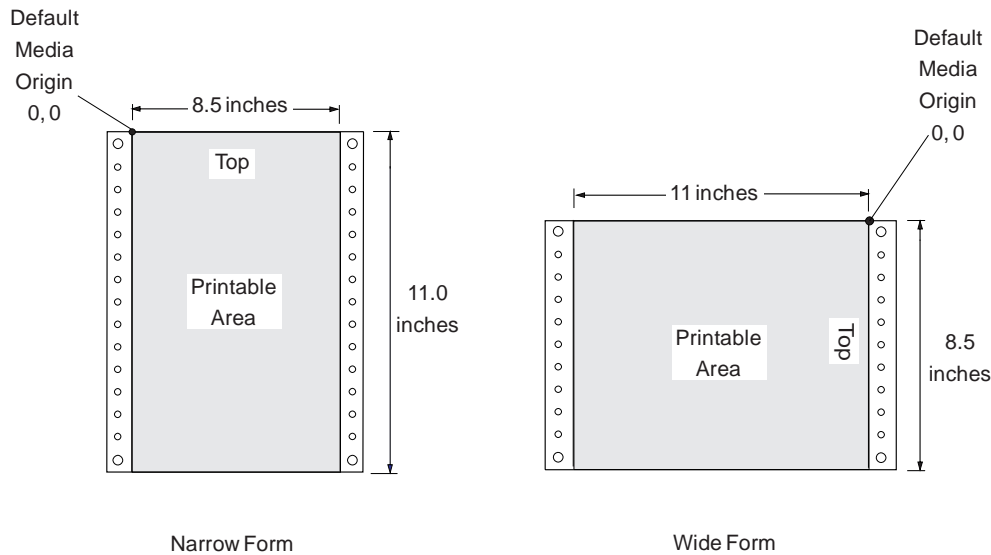


Figure 32. Recommended printable areas. These are the recommended printable areas on 9.5 by 11-inch (narrow) and 18 by 8.5-inch (wide) roll forms.

Figure 33 on page 92 and Figure 34 on page 92 show examples of the recommended printable areas for folded forms for a Infoprint 4000–ID1/ID2 and –ID3/ID4 printers. Notice that the media origin is located in different corners for wide and narrow forms. The recommended printable area for the narrow form is 8.5 by 10.34 inches for text, OCR, or bar code data and 8.5 by 10.0 inches for images or solid-fill data. The recommended printable area for the wide form is 11 by 7.84 inches for text, OCR, or bar code data and 11 by 7.5 for images or solid-fill data. The printer can print to the perforation on the leading and trailing edges of the form; however, the print quality within 0.33 inch of the perforation may be degraded.

FOR TEXT, OCR, AND BAR CODES

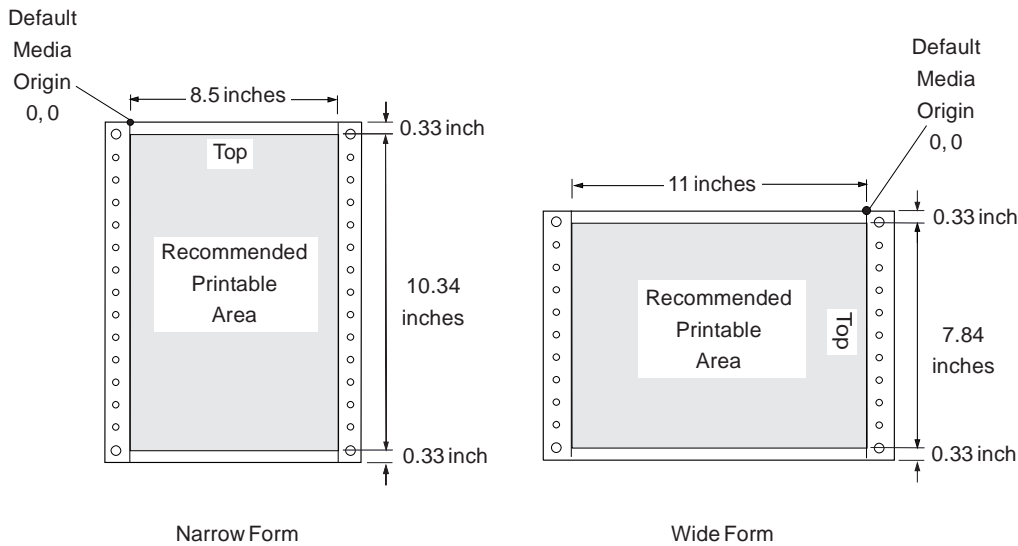


Figure 33. *Folded Forms on the Infoprint 4000–ID1/ID2 and –ID3/ID4 Printers. These are the recommended printable areas on 9.5 by 11-inch (narrow) and 12 by 8.5-inch (wide) folded forms for printing text, OCR, and bar code data.*

FOR SOLIDFILL AND IMAGES

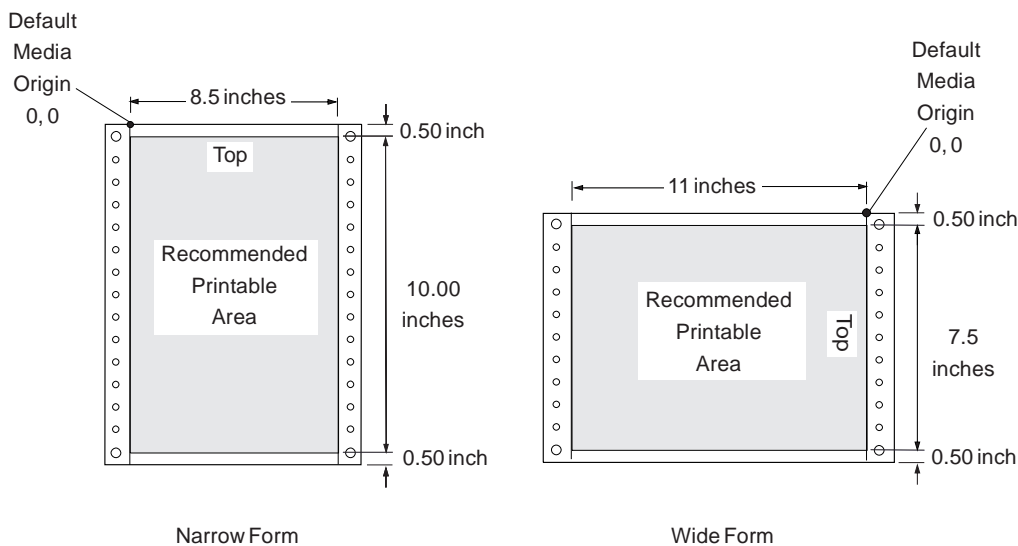


Figure 34. *Folded Forms on the Infoprint–4000 ID1/ID2 and –ID3/ID4 Printers. These are the recommended printable areas on 9.5 by 11-inch (narrow) and 12 by 8.5-inch (wide) folded forms for printing solid-fill data and images.*

Media Specifications

The Infoprint 4000–ID1/ID2 and –ID3/ID4 printers accept the following media:

Media types:

Preprinted or blank fanfold forms, roll-feed paper, some labels

Media widths:

Simplex

8 inches to 18 inches (203 mm to 457 mm)

Duplex

9 inches to 18 inches (229 mm to 457 mm)

Media lengths:

7 inches to 14 inches (178 mm to 356 mm) standard (Infoprint 4000–ID1/ID2 printer); 7 inches to 28 inches (178 mm to 712 mm) standard (Infoprint 4000–ID3/ID4 printer); 17 inches (432 mm) with post-processing; up to 22 inches (558 mm) with RPQ (additional memory required)

Media weights:

16 lb. to 42 lb. (60 gsm to 160 gsm) simplex; 18 lb. to 28 lb. (68 gsm to 107 gsm) duplex

Attachments

The InfoPrint 4000–ID1/ID2 and –ID3/ID4 supports a maximum of two attachments. These attachments can be:

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

The two attachments may be the same (e.g., 2 ESCON channels), or mixed (eg., 1 ESCON and 1 Token-Ring). The exception is that the printer can have only 1 TCP/IP attachment of any flavor. You cannot have 2 Token-Ring or 2 FDDI attachments, or a combination of 1 Token-Ring or 1 FDDI attachments.

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

System/370 Parallel Channel

System/370 parallel channel attachment is supported on PSF/MVS, PSF/VM, and PSF/VSE printing environments. For S/370 parallel channel attachment, a control unit position on a S/370 parallel block multiplexer channel is required on an IBM 3090™ or ES/9000™ processor. The following processors are also supported for S370 parallel channel attachments, S/390 Parallel Enterprise Server, and the S/390 Multiprise 2000 servers. Attachment is also supported via the 9034 ESCON Converter Model 1.

ESCON Channel

ESCON channel is supported on PSF/MVS, PSF/VM, and PSF/VSE printing environments. The IBM InfoPrint 4000 may be attached natively to IBM ESCON channels (3090-J, 9021, 9121, 9221, 9672, 2003). Attachment is also supported via the 9032/9033 ESCON Directors and 9036 ESCON Remote Channel Extender model 1 and model 2.

Token-Ring (TCP/IP) Attachment

Token-Ring (TCP/IP) attachment is supported on PSF for OS/2 and PSF for AIX printing environments along with selected RS/6000 and AS/400 models. The Infoprint 4000 is connected to the host Token-Ring through the IBM Token-Ring cabling via the Token Ring High-performance adapter, which is contained in the AFCCU. The control unit can be attached to either a 16Mbit/sec or a 4Mbit/sec Token-Ring LAN. The TCP/IP Token-Ring Attachment will attach to the following devices:

- 8228 Token Ring Multistation Access Unit attached to an AS/400 or RS/6000 processor
- 8230 Token Ring Network Controller Access attached to an AS/400 or RS/6000 processor
- 8228 Token Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, or 308X processor
- 8230 Token Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, or 308X processor

The printer may be located at a maximum distance of 100 meters (333 ft) from the 8228 Multistation Access Unit or 8230 Controlled Access Unit.

The distance between the 8228 Multistation Access Units can be increased with either the 8220 or 8219 Optical Fiber Repeater.

- Installation Instructions are provided with the feature.

FDDI (TCP/IP)

FDDI (TCP/IP) attachment is supported on PFS for AIX printing environments for selected RS/6000 models. The 4000 is connected to the host FDDI through FDDI 62.5/125 multi-mode fiber cabling using SC connectors via the FDDI Single Station adapter, which is contained in the AFCCU. The FDDI (TCP/IP) attachment will attach to the following devices:

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

The printer may be located at a maximum distance of 2 Kilometers from the 8260 Multiprotocol Intelligent Switching Hub or RS/6000 processor.

Chapter 17. Infoprint 4000–ID5/ID6 Printer (4000–ID5/ID6)

This chapter describes Infoprint 4000–ID5/ID6 printer characteristics. The Infoprint 4000–ID5/ID6 printer is a channel-attached or LAN-attached, continuous-forms printer that uses a laser and electrophotographic technology to print text, images, graphics, and bar codes at up to 1,002 ipm (impressions per minute). The Infoprint 4000–ID5/ID6 printer use the Advanced Function Common Control Unit (AFCCU) based on RISC technology, which provides as standard the Advanced Function Image and Graphics (AFIG) feature and the Decompression Performance Enhancement (DPE) feature.

The Infoprint 4000–ID5/ID6 printer also have 600 pels-per-inch resolution and the Print Quality Enhancement (PQE) function, which smooths edges on diagonal lines, protects fine details, improves the fidelity of images, and allows for adjustment of the boldness of text and the darkness of images.



Figure 35. Infoprint 4000–ID5/ID6 Printer

Table 76 summarizes the printer characteristics for the Infoprint 4000–ID5/ID6 printer.

Table 76. Infoprint 4000–ID5/ID6 Printer Characteristics

Printer Characteristics	Characteristic Value
Print technology	Laser
Datastreams	IPDS
Form type	Continuous
Number of input bins	Up to 16 inch (406 mm) stack of paper (box)
Number of output bins	Up to 14 inch (356 mm) stack of paper
Finisher attachment	n/a
Manual forms feed	n/a
Envelope printing	n/a
MICR printing *With either RPQ 8B4013 or 8B4018 installed	yes*
Duplex printing	yes
Color *With the IBM 4005 Infoprint Hi-Lite Color printer attached ²	yes*
Adjust print-quality levels	yes
Printhead resolution	480 dpi 600 dpi

Table 76. Infoprint 4000–ID5/ID6 Printer Characteristics (continued)

Maximum printing rates for letter (8.5 x 11 inches)	
inches per second	46
inches per minute	2,760
Maximum printing rates for letter in pages per minute ²	
1–up landscape (8.5 inches long) simplex	324
1–up landscape (8.5 inches long) duplex	648
2–up portrait (11 inches long) simplex	501
2–up portrait (11 inches long) duplex	1,002
Maximum printing rates for A4 (210 x 297 mm)	
mm per second	1168
mm per minute	70,104
Maximum printing rates for A4 in pages per minute ²	
1–up landscape (210 mm long) simplex	333
1–up landscape (210 mm long) duplex	666
2–up portrait (297 mm long) simplex	472
2–up portrait (297 mm long) duplex	944
Maximum usage in pages per month (duty cycles) ³	
Letter: 1–up landscape (8.5 inches long)	16,000,000 duplex
Letter: 2–up portrait (11 inches long)	24,600,000 duplex
A4: 1–up landscape (210 mm long)	16,200,000 duplex
A4: 2–up portrait (297 mm long)	23,000,000 duplex
<p>1. The Infoprint 4005 Hi-Lite Color post-processor provides a high-speed, high-quality, all-points-addressable (APA) color printing system to complement the industry-leading quality and reliability the IBM Infoprint 4000 ID1/ID2 Wide or Wide Duplex printers (240 dpi models). Visit the IBM Printing Systems Inter page at http://www.ibm.com/printers for more information about the Infoprint 4005.</p> <p>2. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>3. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>	

Printable Area

The printable area depends on the size of the form being used. The Infoprint 4000–ID5/ID6 printer can print from perforation to perforation when using roll forms. However, when printing on folded forms, the printing may be degraded in areas near a folded perforation, an internal perforation, or any cut in the form because of the “tenting” (*fold memory*) of the form.

Figure 36 on page 97 shows examples of the printable areas of a standard, letter-size roll form for a Infoprint 4000–ID5/ID6 printer. Notice that the media origin is located in different corners for wide and narrow forms. Although the maximum printable area for narrow forms is 8.5 by 17 inches, and the maximum printable area for wide forms is 17 by 17 inches, the examples show the printable area for letter-size forms.

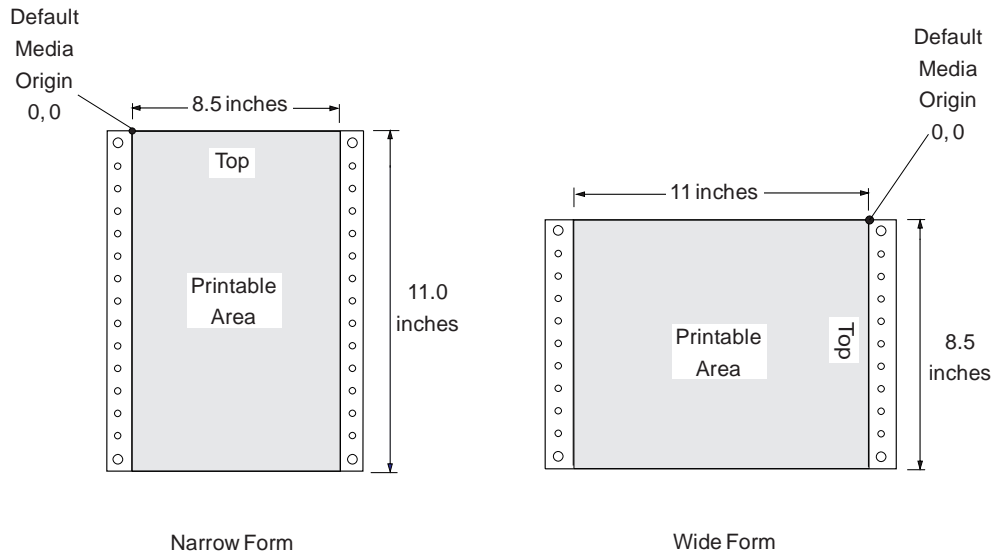


Figure 36. Recommended Printable Areas on the Infoprint 4000-ID5/ID6 Printer. These are the recommended printable areas on 9.5 by 11-inch (narrow) and 18 by 8.5-inch (wide) roll forms.

Figure 37 and Figure 38 on page 98 show examples of the recommended printable areas for folded forms for a Infoprint 4000-ID5/ID6 printer. Notice that the media origin is located in different corners for wide and narrow forms. The recommended printable area for the narrow form is 8.5 by 10.34 inches for text, OCR, or bar code data and 8.5 by 10.0 inches for images or solid-fill data. The recommended printable area for the wide form is 11 by 7.84 inches for text, OCR, or bar code data and 11 by 7.5 for images or solid-fill data. The printer can print to the perforation on the leading and trailing edges of the form; however, the print quality within 0.33 inch of the perforation may be degraded.

FOR TEXT, OCR, AND BAR CODES

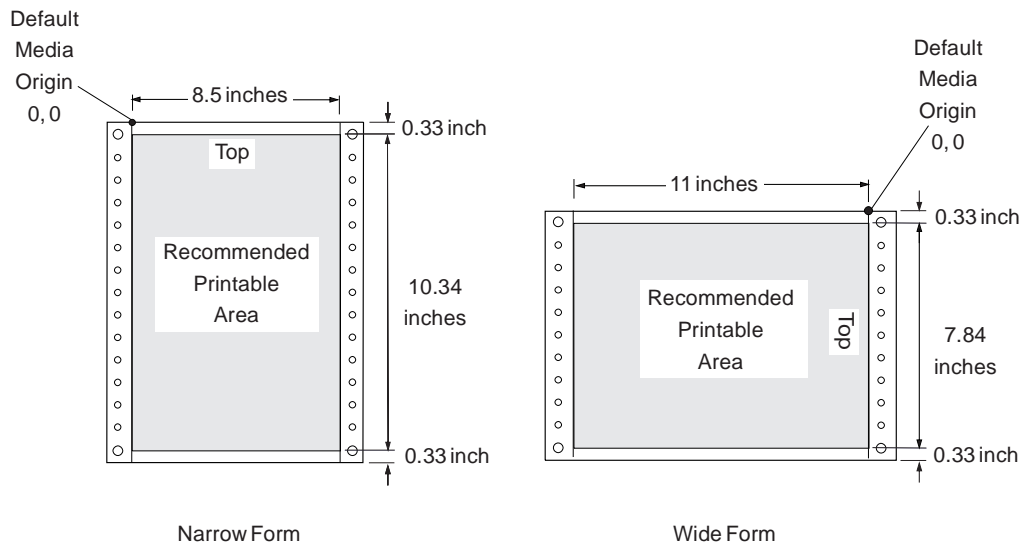


Figure 37. Folded Forms on the Infoprint 4000-ID5/ID6 Printer. These are the recommended printable areas on 9.5 by 11-inch (narrow) and 12 by 8.5-inch (wide) folded forms for printing text, OCR, and bar code data.

FOR SOLIDFILL AND IMAGES

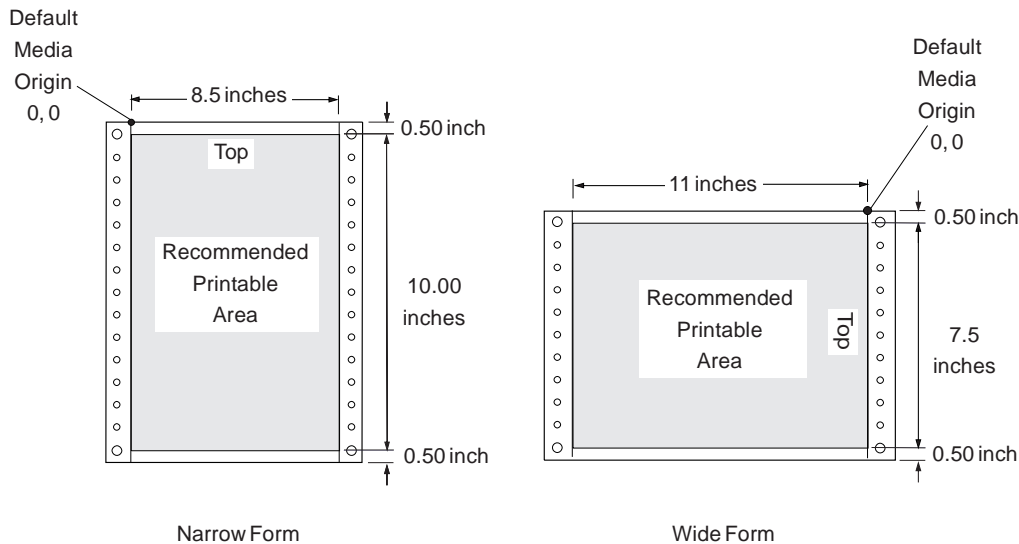


Figure 38. Folded Forms on the Infoprint 4000-ID5/ID6 Printer. These are the recommended printable areas on 9.5 by 11-inch (narrow) and 12 by 8.5-inch (wide) folded forms for printing solid-fill data and images.

Media Specifications

The Infoprint 4000-ID5/ID6 printer accepts the following media:

Media types:

Preprinted or blank fanfold forms, roll-feed paper, some labels

Media widths:

Simplex

8 inches to 18 inches (203 mm to 457 mm)

Duplex

9 inches to 18 inches (229 mm to 457 mm)

Media lengths:

3 inches to 14 inches (76 mm to 356 mm) standard stacker; up to 28 inches (711 mm) with post-processing and Infoprint

Media weights:

16 lb. to 28 lb. (60 gsm to 105 gsm) dual simplex; 18 lb. to 28 lb. (68 gsm to 105 gsm) duplex

Attachments

The InfoPrint 4000-ID5/ID6 supports a maximum of two attachments. These attachments can be:

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

The two attachments may be the same (e.g., 2 ESCON channels), or mixed (eg., 1 ESCON and 1 Token-Ring). The exception is that the printer can have only 1 TCP/IP attachment of any flavor. You cannot have 2 Token-Ring or 2 FDDI attachments, or a combination of 1 Token-Ring or 1 FDDI attachments.

When printing in duplex configuration, only one attachment can be active at a time. If both attachments are to the same system, or to a tightly-coupled system, and the attachments are of the same type (example, both are ESCON or both are parallel channel), then switching between the two attachments can be performed dynamically by the host system. If the attachments or host differ, or the hosts are not

tightly-coupled, then the switch must be performed manually by the operator. The printer must be disabled from the current system and attachment before it can be enabled to the other attachment.

System/370 Parallel Channel

System/370 parallel channel attachment is supported on PSF/MVS, PSF/VM, and PSF/VSE printing environments. For S/370 parallel channel attachment, a control unit position on a S/370 parallel block multiplexer channel is required on an IBM 3090™ or ES/9000™ processor. The following processors are also supported for S370 parallel channel attachments, S/390 Parallel Enterprise Server, and the S/390 Multiprise 2000 servers. Attachment is also supported via the 9034 ESCON Converter Model 1.

ESCON Channel

ESCON channel is supported on PSF/MVS, PSF/VM, and PSF/VSE printing environments. The IBM InfoPrint 4000 may be attached natively to IBM ESCON channels (3090-J, 9021, 9121, 9221, 9672, 2003). Attachment is also supported via the 9032/9033 ESCON Directors and 9036 ESCON Remote Channel Extender model 1 and model 2.

Token-Ring (TCP/IP) Attachment

Token-Ring (TCP/IP) attachment is supported on PSF for OS/2 and PSF for AIX printing environments along with selected RS/6000 and AS/400 models. The Infoprint 4000 is connected to the host Token-Ring through the IBM Token-Ring cabling via the Token Ring High-performance adapter, which is contained in the AFCCU. The control unit can be attached to either a 16Mbit/sec or a 4Mbit/sec Token-Ring LAN. The TCP/IP Token-Ring Attachment will attach to the following devices:

- 8228 Token Ring Multistation Access Unit attached to an AS/400 or RS/6000 processor
- 8230 Token Ring Network Controller Access attached to an AS/400 or RS/6000 processor
- 8228 Token Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, or 308X processor
- 8230 Token Ring Multistation Access Unit attached to a 3172, 3174, 3745, 3725, or 3720 attached to a 3090, ES/9000, or 308X processor

The printer may be located at a maximum distance of 100 meters (333 ft) from the 8228 Multistation Access Unit or 8230 Controlled Access Unit.

The distance between the 8228 Multistation Access Units can be increased with either the 8220 or 8219 Optical Fiber Repeater.

- Installation Instructions are provided with the feature.

FDDI (TCP/IP)

FDDI (TCP/IP) attachment is supported on PFS for AIX printing environments for selected RS/6000 models. The 4000 is connected to the host FDDI through FDDI 62.5/125 multi-mode fiber cabling using SC connectors via the FDDI Single Station adapter, which is contained in the AFCCU. The FDDI (TCP/IP) attachment will attach to the following devices:

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

The printer may be located at a maximum distance of 2 Kilometers from the 8260 Multiprotocol Intelligent Switching Hub or RS/6000 processor.

Chapter 18. InfoColor 70 Printer (3170–002)

This section describes the InfoColor 70 printer characteristics. The InfoColor 70 printer is a 600 dpi, token-ring or Ethernet, continuous-forms printer that uses electrophotographic technology to print text, images, graphics, and bar codes at up to 70 impressions per minute (ipm) in duplex mode. The InfoColor 70 printer has a 12.5 inch wide paper path with a 12 inch wide print width, which permits printing of two 8.5 x 11 inch or two ISO A4 pages on a single side of a sheet.



Figure 39. InfoColor 70 Printer

Table 77 summarizes the printer characteristics for the InfoColor 70 printers.

Table 77. InfoColor 70 Printer Characteristics

Printer Characteristics	Characteristic Value
Print technology	Electrophotographic
Datastreams	PostScript Level 2
Form type	Continuous
Number of input bins	1 standard
Number of output bins	1 standard
Manual forms feed	n/a
Envelope printing	n/a
MICR printing	no
Duplex printing	yes

Table 77. InfoColor 70 Printer Characteristics (continued)

Printer Characteristics	Characteristic Value
Color	yes
Adjust print-quality levels	no
Printhead resolution	600 dpi
Maximum printing rates for letter (8.5 x 11 inches)	
inches per second	4.8
inches per minute	289
Maximum printing rates for letter in pages per minute ¹	
1-up landscape (8.5 inches long) simplex	35
1-up landscape (8.5 inches long) duplex	70
2-up portrait (11 inches long) simplex	n/a
2-up portrait (11 inches long) duplex	n/a
Maximum printing rates for A4 (210 x 297 mm)	
mm per second	122.5
mm per minute	7,350
Maximum printing rates for A4 in pages per minute ¹	
1-up landscape (210 mm long) simplex	35
1-up landscape (210 mm long) duplex	70
2-up portrait (297 mm long) simplex	n/a
2-up portrait (297 mm long) duplex	n/a
Maximum usage in pages per month (duty cycles) ²	
Letter: 1-up landscape (8.5 inches long)	680,000 duplex
Letter: 2-up landscape (11 inches long)	n/a
A4: 1-up landscape (210 mm long)	700,000 duplex
A4: 2-up landscape (297 mm long)	n/a
<p>1. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>2. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>	

Printable Area

The InfoColor 70 cannot print in certain unprintable areas near the edges of the form.

Figure 40 on page 103 shows an example of the printable area of a form. The printable area shown is 8.17 by 10.66 inches.

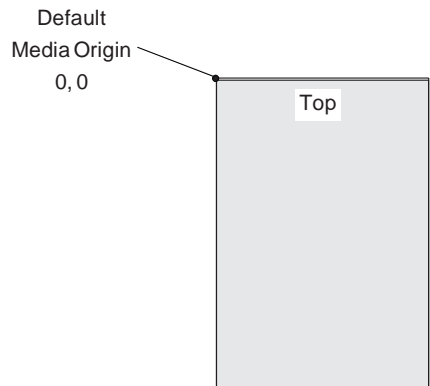


Figure 40. Printable Area in IPDS Mode on the InfoColor 70

Media Specifications

The InfoColor 70 accepts the following media:

Media types:

Web-fed roll, coated or uncoated

Media widths:

8.27 inches to 12.6 inches (210 mm to 320 mm)

Media lengths:

Up to 17 inches (430 mm) stacked output

Media weights:

60 gsm to 200 gsm, 22 lb. to 74 lb. cover, 16 lb. to 52 lb. bond, 41 lb. to 135 lb. text

Attachments

The controller attaches to a LAN through either an Ethernet or Token Ring Adapter:

- Token-Ring attachment (TCP/IP) option
- Ethernet attachment (TCP/IP, IPX, EtherTalk)

Print Drivers

Two Utilities Diskettes are included with the IBM InfoColor 70. These diskettes are for Macintosh and the IBM Personal Computer, and contain PostScript Printer Description (PPD) files and a Printer Description File (PDF) for QuarkXpress. Also included is the set registration length QuarkXpress extension that is used to adjust crop marks.

Chapter 19. Infoprint Color 100 Printer (3170–003)

This section describes the Infoprint Color 100 printer characteristics. The Infoprint Color 100 is a 600 dpi token-ring and Ethernet, continuous-forms printer that uses laser and electrophotographic technology to print text, images, graphics, and bar codes at up to 100 impressions per minute (ipm) in duplex mode. The Infoprint Color 100 has an 19 inch wide paper path with a 18.875 inch wide print width, which permits printing of two 8.5 x 11 inch or two ISO A4 pages on a single side of a sheet.



Figure 41. Infoprint Color 100 Printer

Table 78 summarizes the printer characteristics for the Infoprint Color 100 printers.

Table 78. InfoColor 100 Printer Characteristics

Printer Characteristics	Characteristic Value
Print technology	Electrophotographic
Datastreams	PostScript Level 2
Form type	Continuous
Number of input bins	1 standard
Number of output bins	1 standard
Manual forms feed	n/a
Envelope printing	n/a
MICR printing	no
Duplex printing	yes

Table 78. InfoColor 100 Printer Characteristics (continued)

Printer Characteristics	Characteristic Value
Color	yes
Adjust print-quality levels	no
Printhead resolution	600 dpi
Maximum printing rates for letter (8.5 x 11 inches)	
inches per second	4.8
inches per minute	289
Maximum printing rates for letter in pages per minute ¹	
1-up landscape (8.5 inches long) simplex	34
1-up landscape (8.5 inches long) duplex	68
2-up portrait (11 inches long) simplex	52
2-up portrait (11 inches long) duplex	105
Maximum printing rates for A4 (210 x 297 mm)	
mm per second	122.5
mm per minute	7,350
Maximum printing rates for A4 in pages per minute ¹	
1-up landscape (210 mm long) simplex	34
1-up landscape (210 mm long) duplex	68
2-up portrait (297 mm long) simplex	52
2-up portrait (297 mm long) duplex	105
Maximum usage in pages per month (duty cycles) ²	
Letter: 1-up landscape (8.5 inches long)	680,000 duplex
Letter: 2-up landscape (11 inches long)	1,050,000 duplex
A4: 1-up landscape (210 mm long)	700,000 duplex
A4: 2-up landscape (297 mm long)	1,000,000 duplex
<p>1. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>2. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>	

Printable Area

The Infoprint Color 100 accepts paper from 8.17 to 12 inches in width. For 12 inch wide paper the printer the unprintable area of the form is .05 inches on either side of the paper and .083 inch from either end of the page. Figure 42 on page 107 shows an example of the printable area of a form 12 inches wide by 17 inches long.

Note: Do not print edge-to-edge on paper that is less than 12 inches in width.

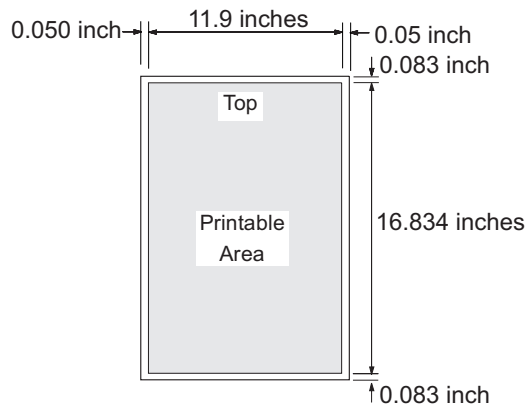


Figure 42. Printable Area on the Infoprint Color 100 Printer

Media Specifications

The Infoprint Color 100 accepts the following media:

Media types:

Web-fed roll, coated or uncoated

Media widths:

19.7 inches to 20 inches (500 to 508 mm)

Media lengths:

11 inches to 39.37 inches (279 mm to 1,000 mm)

Media weights:

60 gsm to 250 gsm, 22 lb. to 92 lb. cover, 16 lb. to 66 lb. bond, 41 lb. to 169 lb. text

Attachments

The controller attaches to a LAN through the standard 10/100 BaseT Ethernet port, or through the optional Token Ring or Ethernet Adapters.

The 10/100 BaseT Ethernet port is standard on all InfoPrint Color 100 printers. This connection provides 10Mb/sec or 100Mb/sec connectivity to 10BaseT or 100BaseT Ethernet LANs, including the ability to automatically sense the speed at the hub port.

Print Drivers

Two utilities diskettes are included with the IBM InfoPrint Color 100. These diskettes are for Macintosh, Windows 95, and Windows 3.1X, and contain PostScript Printer Description (PPD) files, a Printer Description File (PDF) for QuarkXpress, and ICC color profiles. Also included is the set registration length QuarkXpress extension that is used to adjust crop marks.

Chapter 20. Infoprint Color 130 Printer (3170–004)

This section describes the Infoprint Color 130 printer characteristics. The Infoprint Color 130 printer is a 600 dpi token-ring and Ethernet, continuous-forms printer that uses electrophotographic technology to print text, images, graphics, and bar codes at up to 130 impressions per minute (ipm) in duplex mode. The Infoprint Color 130 printer has an 19 inch wide paper path with a 18.875 inch wide print width, which permits printing of two 8.5 x 11 inch or two ISO A4 pages on a single side of a sheet.



Figure 43. Infoprint Color 130 printer

Table 79 summarizes the printer characteristics for the Infoprint Color 130 printers.

Table 79. InfoColor 130 Printer Characteristics

Printer Characteristics	Characteristic Value
Print technology	Laser
Datastreams	PostScript Level 2, Level 3 compatible, and PDF
Form type	Continuous
Number of input bins	1 standard
Number of output bins	1 standard
Manual forms feed	n/a
Envelope printing	n/a
MICR printing	no
Duplex printing	yes
Color	yes
Adjust print-quality levels	no

Table 79. InfoColor 130 Printer Characteristics (continued)

Printer Characteristics	Characteristic Value
Printhead resolution	600 dpi
Maximum printing rates for letter (8.5 x 11 inches)	
inches per second	6.3
inches per minute	378
Maximum printing rates for letter in pages per minute ¹	
1-up landscape (8.5 inches long) simplex	44
1-up landscape (8.5 inches long) duplex	88
2-up portrait (11 inches long) simplex	68
2-up portrait (11 inches long) duplex	136
Maximum printing rates for A4 (210 x 297 mm)	
mm per second	160
mm per minute	9,600
Maximum printing rates for A4 in pages per minute ¹	
1-up landscape (210 mm long) simplex	44
1-up landscape (210 mm long) duplex	138
2-up portrait (297 mm long) simplex	n/a
2-up portrait (297 mm long) duplex	n/a
Maximum usage in pages per month (duty cycles) ²	
Letter: 1-up landscape (8.5 inches long)	680,000 duplex
Letter: 2-up landscape (11 inches long)	1,050,000 duplex
A4: 1-up landscape (210 mm long)	700,000 duplex
A4: 2-up landscape (297 mm long)	1,000,000 duplex
<p>1. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>2. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>	

Printable Area

The Infoprint Color 130 Printer accepts paper from 8.17 to 12 inches in width. For 12 inch wide paper the printer the unprintable area of the form is .05 inches on either side of the paper and .083 inch from either end of the page. Figure 44 on page 111 shows an example of the printable area of a form 12 inches wide by 17 inches long.

Note: Do not print edge-to-edge on paper that is less than 12 inches in width.

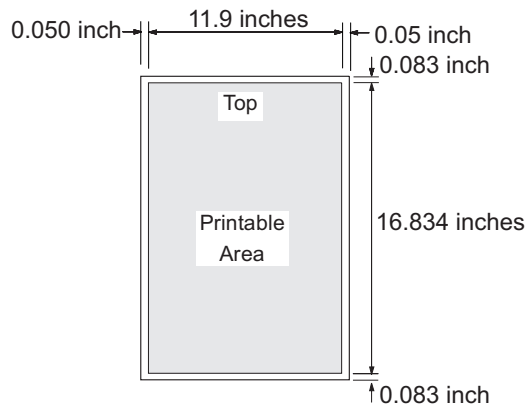


Figure 44. Printable Area on the Infoprint Color 130 Printer

Media Specifications

The Infoprint Color 130 accepts the following media:

Media types:

Web-fed roll, coated or uncoated

Media widths:

19.7 inches to 20 inches (500 to 508 mm)

Media lengths:

11 inches to 39.37 inches (279 mm to 1,000 mm)

Media weights:

60 gsm to 240 gsm, 22 lb. to 92 lb. cover, 16 lb. to 64 lb. bond, 41 lb. to 169 lb. text

Attachments

The IBM Infoprint Color 130 must be attached to either a Token Ring or Ethernet LAN.

The controller can attach the printer to the LAN through the 10/100 BaseT adapter that is standard, or through one of the optional adapters.

The standard 10/100 BaseT Ethernet port provides 10Mb/sec or 100 Mb/sec connectivity to 10BaseT or 100BaseT Ethernet LANs, including the ability to automatically sense the speed of the hub port.

A maximum of one of the following optional adapters are available on the Model 004.

- Token-Ring Adapter
- Ethernet 10/100 BaseT Adapter
- Gigabit Ethernet

Print Drivers

Two utilities diskettes are included with the IBM Infoprint Color 130. These diskettes are for Macintosh, and Windows 95. The diskettes contain PostScript Printer Description (PPD) files, and ICC color profiles.

Chapter 21. Infoprint Color 130 Plus Printer (3170–005)

This section describes the Infoprint Color 130 Plus Printer characteristics. The Infoprint Color 130 Plus Printer is a 600 dpi token-ring, continuous-forms printer that uses electrophotographic technology to print text, images, graphics, and bar codes at up to 130 impressions per minute (ipm) in duplex mode. The Infoprint Color 130 Plus Printer has an 19 inch wide paper path with a 18.875 inch wide print width, which permits printing of two 8.5 x 11 inch or two ISO A4 pages on a single side of a sheet. The Infoprint Color 130 Plus Printer uses the Advanced Function Common Control Unit (AFCCU).



Figure 45. Infoprint Color 130 Plus Printer

Table 80 summarizes the printer characteristics for the Infoprint Color 130 Plus Printers.

Table 80. InfoColor 130 Plus Printer Characteristics

Printer Characteristics	Characteristic Value
Print technology	Laser
Datastreams	IPDS
Form type	Continuous
Number of input bins	1 standard
Number of output bins	1 standard
Finisher attachments	n/a
Manual forms feed	n/a
Envelope printing	n/a
MICR printing	no
Duplex printing	yes
Color	yes

Table 80. InfoColor 130 Plus Printer Characteristics (continued)

Printer Characteristics	Characteristic Value
Adjust print-quality levels	no
Printhead resolution	600 dpi
Maximum printing rates for letter (8.5 x 11 inches)	
inches per second	6.3
inches per minute	378
Maximum printing rates for letter in pages per minute ²	
1-up landscape (8.5 inches long) simplex	44
1-up landscape (8.5 inches long) duplex	138
2-up portrait (11 inches long) simplex	68
2-up portrait (11 inches long) duplex	136
Maximum printing rates for A4 (210 x 297 mm)	
mm per second	160
mm per minute	9,600
Maximum printing rates for A4 in pages per minute ³	
1-up landscape (210 mm long) simplex	44
1-up landscape (210 mm long) duplex	138
2-up portrait (297 mm long) simplex	n/a
2-up portrait (297 mm long) duplex	n/a
Maximum usage in pages per month (duty cycles) ²	
Letter: 1-up landscape (8.5 inches long)	680,000 duplex
Letter: 2-up landscape (11 inches long)	1,050,000 duplex
A4: 1-up landscape (210 mm long)	700,000 duplex
A4: 2-up landscape (297 mm long)	1,000,000 duplex
<ol style="list-style-type: none"> 1. The Infoprint Color 130 Plus can print PostScript and PDF when used with Infoprint Manager. 2. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate. 3. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis. 	

Printable Area

The Infoprint Color 130 Plus Printer accepts paper from 8.17 to 12 inches in width. For 12 inch wide paper the printer the unprintable area of the form is .05 inches on either side of the paper and .083 inch from either end of the page. Figure 46 on page 115 shows an example of the printable area of a form 12 inches wide by 17 inches long.

Note: Do not print edge-to-edge on paper that is less than 12 inches in width.

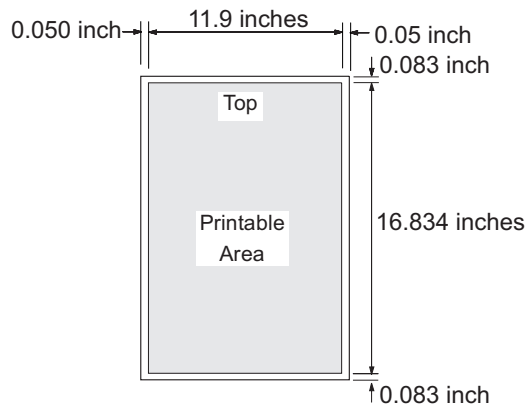


Figure 46. Printable Area on the Infoprint Color 130 Plus Printer

Media Specifications

The Infoprint Color 130 Plus accepts the following media:

Media types:

Web-fed roll, coated or uncoated

Media widths:

19.7 inches to 20 inches (500 to 508 mm)

Media lengths:

6 inches to 39.37 inches (150 mm to 1,000 mm)

Media weights:

60 gsm to 250 gsm, 22 lb. to 92 lb. cover, 16 lb. to 64 lb. bond, 41 lb. to 169 lb. text

Attachments

S/390 Host Attachment

At least one of the following adapters must be used to attach the Infoprint Color 130 Plus Model 005 to a host System/390 for PSF for OS/390.

- ESCON Channel
- FICON Channel

Gigabit Ethernet Infoprint Manager Attachment

Gigabit Ethernet must be used to attach the Infoprint Color 130 Plus to an RS/6000 Infoprint Manager System.

Host Software

A host attachment to either Infoprint Manager for AIX running on an RS/6000 and/or a S/390 running PSF for OS/390 (5655-B17), is required. To transform PostScript or PDF for printing on an Infoprint Color 130 Plus, Infoprint Manager for AIX is always required.

Printer Attachment Rules

The controller can attach the printer to the RS/6000 running Infoprint Manager through an Ethernet Gigabit adapter and to a S/390 running PSF for OS/390 through either an ESCON or FICON channel.

A maximum of two of these adapters (Gigabit, FICON, or ESCON) can be installed on the 3170-005. Only one of the Gigabit or FICON adapters may be installed. Two ESCON adapters are allowed. Possible combinations include:

- 1 Ethernet Gigabit Adapter
- 1 FICON Adapter
- 2 ESCON
- 1 ESCON and One FICON
- 1 Ethernet Gigabit and 1 ESCON
- 1 Ethernet Gigabit and 1 FICON

Infoprint Color 130 Plus Datastream Support

The following datastreams are supported on an Infoprint Color 130 Plus attached to a host S/390 with PSF for OS/390.

- AFP with Infoprint Color Image (FS45)
- AFP line data
- EPS embedded or referenced in the AFP datastream
- Single-page PDF embedded or referenced in the AFP datastream

The following datastreams are supported on an Infoprint Color 130 Plus attached to an Infoprint Manager for AIX System.

- All of the datastreams shown above for a S/390 with PSF for OS/390
- GIF, TIFF, and JPEG (JFIF) images which have been transformed to an Infoprint Color Image in the Infoprint Manager System
- PostScript 3 which has been transformed to an Infoprint Color Image in the Infoprint Manager System
- PDF 1.3 which has been transformed to an Infoprint Color Image in the Infoprint Manager System

A stand-alone version of the image conversion program is provided for the AIX and Windows NT platforms. This program can be used to convert TIFF, GIF, and JPEG (JFIF) images to Infoprint Color Images (FS45) in batch mode. The resulting Infoprint Color Image can then be stored in an Infoprint Manager or OS/390 resource library, embedded or referenced in an AFP (MO:DCA-P) datastream, and printed using PSF for OS/390 or Infoprint Manager for AIX.

Software Requirements

Either PSF for OS/390 (5655-B17) V3R2 or Infoprint Manager for AIX V3R2 (5765-E42) must be installed on a host server to support Infoprint Color 130 Plus.

Infoprint Manager for AIX requires APAR IY8860 and the Infoprint Color 130 Plus PRPQ #8A8091.

Both PSF for OS/390 and Infoprint Manager for AIX support printing AFP (MO:DCA-P) datastreams with the new Infoprint Color Image (FS45) objects. Both also support printing AFP data streams with Encapsulated PostScript (EPS) objects or single-page PDF objects. These objects must reside in a S/390 container library, in an AIX resource library, or in the resource group at the beginning of the AFP print file.

Only Infoprint Manager for AIX supports printing PostScript or PDF files directly using a server-based AFP transform. The AFP Upload facility can be used to upload the AFP file generated by this transform to a S/390 for printing by PSF for OS/390.

In addition to workstation-based application generators, the following products can be used to create color AFP data.

- IBM Page Printer Formatting Aid/370 R1 (5688-190) with APAR PQ 37413.
- The Page Printer Formatting Aid feature of Infoprint Manager for AIX V3 with APAR PQ37413
- IBM Overlay Generation Language/370 V1R1 (5688-191)
- The AFP Windows Driver

An AFP Viewer that includes support for Infoprint Color Image (FS45), Encapsulated PostScript, and PDF objects is distributed with the printer. This viewer allows application developers to view Infoprint Color 130 Plus datastreams from a workstation. This AFP Viewer can be installed on up to 10 developer workstations.

A utility program to convert JPEG, GIF, and TIFF images to Infoprint Color Images (FS45) is also distributed with the Infoprint Color 130 Plus printer.

APARS for Infoprint Color 130 Plus support are required for most of the above programs. Contact the IBM Supportline for information.

Chapter 22. 4230 Printer (4230)

This section describes 4230 Printer's characteristics. The 4230 Printer is a tabletop, serial, dot-matrix, impact printer that prints text, images, graphics, and bar codes at up to 600 characters per second, depending on the model and print quality selected.



Figure 47. 4230 Printer

Table 81 summarizes the printer characteristics for the 4230 Printer.

Table 81. 4230 Impact Printers

Printer Characteristics	Characteristic Value
Maximum printing rate: characters per second (cps)	375 cps (-xx1) 480 cps (-xx2) 600 cps (-xx3)
Print technology	Impact Dot Matrix
Datastreams	PPDS, Epson, ASCII, SCS, IPDS
Form type	Continuous Cut-Sheet
Continuous forms input paths	1 standard
Continuous forms output paths	1 standard
Finisher attachments	n/a
Manual forms feed	yes
Envelope printing	n/a
MICR printing	no
Duplex printing	no
Color	no

Table 81. 4230 Impact Printers (continued)

Operator-adjustable forms	yes
Printhead resolution (pels-per-inch)	144 x 144
Maximum characters per second (cps) per month (duty cycles)	16,000,000

Printable Area

The size of the printable area must be set using a printer configuration option. If the defined printable area is not large enough to contain the page of data, a data-check exception (position check) occurs.

Media Specifications

The 4230 Printer accepts the following media:

Media types:

Operator-changeable forms modules, continuous forms up to 6 parts, cutsheet, document-on-demand/zero tear-off

Media widths:

3 inches to 15 inches (76 mm to 381 mm)

Media lengths:

3 inches to 14 inches (76 mm to 356 mm) continuous forms, 5 inches to 14 inches (127 mm to 356 mm) cutsheet

Attachments

IBM 4230 Models 101, 102, 111, and 1S2 Impact Matrix Printers

The IBM 4230 Models 101, 102, 111, and 1S2 Impact Matrix Printer may attach to systems as follows:

- The System/36 - Workstation Control Unit, AS/400 system on a Twinaxial Workstation port, the 5294 Control Unit - Workstation port (feature #3601 required) and 5X94 Control Units.

IBM 4230 Model 201 Impact Matrix Printer

The IBM 4230 Model 201 Impact Matrix Printer may attach to systems as follows:

- The 3174 Control Unit - Terminal port (using Release A5.4, Release B4.0), or the 3274 Control Unit on a Category A terminal port (using Rel. C49.0 and Rel. D65.1), the 3276 Control Unit - Terminal port, or the 43X1 Processor Display/Printer Adapter or Workstation Adapter, the ES/9370 Processor Workstation Controller (feature #6020; using Release 5.1) a 9371 Micro Channel 370 3270 Adapter (feature #6120 -VM/VSE only) or ES9000 - 9221 Workstation Subsystem Controller.

IBM 4230 Models 202 and 211 Impact Matrix Printers

The IBM 4230 Model 202 and 211 Impact Matrix Printers may attach to systems as follows:

- **IPDS Mode:** The 3174 Control Unit - Terminal port (using Release A5.4, Release B4.0) or the 3274 Control Unit on a Category A port (using Release D65.1; PTR 2893 for local non-SNA), the 4361 Processor - Workstation Adapter port (feature #9261), ES/9370 Processor Workstation Controller (feature #6020; using Release 5.1), a 9371 Micro Channel 370 3270 Adapter (feature #6120 -VM/VSE only) or ES9000 - 9221 Workstation Subsystem Controller.
- **Non-IPDS Mode:** The 3174 Control Unit - Terminal port (using Release A5.4, Release B4.0), or the 3274 Control Unit on a Category A terminal port (using Rel. C49.0 and Rel. D65.1), the 3276 Control Unit - Terminal port, or the 43X1 Processor Display/Printer Adapter or Workstation Adapter, the ES/9370 Processor Workstation Controller (feature #6020; using Release 5.1) a 9371 Micro Channel 370 3270 Adapter (feature #6120 -VM/VSE only) or ES9000 - 9221 Workstation Subsystem Controller.

IBM 4230 Model 2S2 Impact Matrix Printer

The IBM 4230 Model 2S2 Impact Matrix Printer may attach to systems as follows:

- The 3174 Control Unit - Terminal port (using Release A5.4, Release B4.0), or the 3274 Control Unit on a Category A terminal port (using Rel. C49.0 and Rel. D65.1), the 3276 Control Unit - Terminal port, or the 43X1 Processor Display/Printer Adapter or Workstation Adapter, the ES/9370 Processor Workstation Controller (feature #6020; using Release 5.1) a 9371 Micro Channel 370 3270 Adapter (feature #6120 -VM/VSE only) or ES9000 - 9221 Workstation Subsystem Controller.

IBM 4230 Models 4I3, 4S3, 5I3, and 5S3 Impact Matrix Printers

The RS-232C serial interface will attach to:

- IBM AS/400 ASCII workstation controller
- 3174 controller via the Asynchronous Emulation Adapter
- RS/6000
- PS/2 computer COMx ports
- LAN Attachment (i.e., Token Ring or Ethernet) via the Novell-certified IBM 4033 LAN adapter and the Intel NetPort
- IBM-compatible PCs utilizing an RS-232C interface

The RS-422A serial interface will attach to:

- RS/6000
- AS/400 ASCII workstation controller

The IBM PC ASCII (CENTRONICS) Parallel interface will attach to:

- RS/6000 workstations, excluding POWERServer 930
- PS/2 computer LPTx ports and to a Token-Ring or Ethernet LAN via one of these computers
- LAN attachment via the Novell-certified IBM 4033 LAN adapter and the Intel NetPort IBM-compatible PC's utilizing the IBM PC ASCII (Centronics) Parallel interface
- AS/400 twinax terminals including 348X, 3477 and 3197
- Coax terminal 3482

The 4230 may attach to systems as follows:

Models 4S3 and 4I3

The System/36 - Workstation Control Unit, AS/400 system on a Twinaxial Workstation port, the 5294 Control Unit - Workstation port (feature code 3601 required when attaching IPDS Model 4I3), the 5394 and 5494 Control Units.

Model 5I3 in IPDS Mode

The 3174 Controller - Terminal port (using Release A5.4 or later, Release B4.0 or later, Release C1.1 or later), or the 3274 Control Unit on a Category A port (using Release D65.1; PTR 2893 for local non-SNA), the 4361 Processor - Workstation Adapter port (feature code 9261), ES/9370 Processor Workstation Controller (feature code 6020; using Release 5.1), a ES/9371 Processor - 3270 Adapter, or ES9000 - 9221 Workstation Subsystem Controller.

Model 5I3 in Non-IPDS Mode, Model 5S3

The 3174 Controller - Terminal port (using Release A5.4 or later, Release B4.0 or later, Release C1.1 or later), or the 3274 Control Unit on a Category A terminal port (using Rel. C49.0 and Rel. D65.1), the 3276 Control Unit - Terminal port, or the 43X1 Processor Display/Printer Adapter or Workstation Adapter, the ES/9370 Processor Workstation Controller (feature #6020; using Release 5.1) a ES/9371 Processor 3270 Adapter, or ES9000 - 9221 Workstation Subsystem Controller.

Fonts

Although the 4230 Printer can print with downloaded symbol sets, the 4230 Printer prints only with single-byte resident symbol sets when driven by PSF.

Because of differences between font technologies, text printed with symbol sets will not have the same appearance as text printed with the raster fonts of the same names.

Infoprint Manager for Windows NT and Windows 2000

Use the font mapping file supplied with Infoprint Manager. Refer to *Working with Fonts* on the *Infoprint Manager for Windows NT and Windows 2000* web page for more information about using fonts.

Infoprint Manager for AIX

Use the font mapping file supplied with Infoprint Manager. Refer to *Infoprint Manager for AIX: Administrator's Guide* for more information about using fonts.

PSF for OS/390

To use the resident raster fonts, the system programmer must identify them to PSF using the APSRMARK utility. Refer to *Print Services Facility for OS/390: Customization* for more information about using resident fonts.

PSF/VM

You cannot print with resident fonts, but you can print with downloaded raster fonts. Refer to *Print Services Facility/VM: System Programming Guide* for more information about using fonts.

PSF/VSE

To use the resident raster fonts, the system programmer must identify them to PSF using the APTRMARK utility. Refer to *Print Services Facility/VSE: System Programming Guide* for more information about using resident fonts.

PSF for AS/400

Refer to *AS/400 Printer Device Programming* for more information about using fonts.

Operator-Adjustable Forms

To align data on preprinted forms, the 4230 Printer operator can adjust the physical top and left margins, which will offset the page image on the printing medium. The horizontal (left margin) adjustment range is from -6.9 mm (-0.27 inches) to +38.35 mm (+1.51 inches). The vertical (top margin) adjustment range is from -30.5 mm (-1.2 inches) to +38.1 mm (+1.5 inches). This adjustment does not affect the size of the valid printable area; however, using this adjustment can produce positioning errors if the horizontal adjustment is too large for the form being used.

Print-Quality Levels

The 4230 Printer allows you to select different levels of print quality. Higher quality corresponds to slower print speeds. To select a print-quality level, use the QUALITY subcommand on the COPYGROUP command in the form definition. To use Fast Draft Quality, you must enable it using a printer configuration menu on the operator panel. Refer to your printer publications on how to do this. If the printer is not configured, all requests to print using Fast Draft will automatically be printed in DP Quality. Specify the values shown in Table 82 on the QUALITY subcommand to get the correct print-quality level.

Table 82. 4230 Printer Print-Quality Selection Values

Print-Quality Level	Hexadecimal Value Range	Decimal Value Range
Reserved	X'00'	
Fast Draft Quality	X'01' through X'2A'	1 through 42
DP Quality	X'2B' through X'55'	43 through 85

Table 82. 4230 Printer Print-Quality Selection Values (continued)

Print-Quality Level	Hexadecimal Value Range	Decimal Value Range
DP Text Quality	X'56' through X'AA'	86 through 170
NLQ Quality	X'AB' through X'FE'	171 through 254
Printer Customized Default	X'FF'	255

Not all symbol sets can be printed at all print-quality levels. Table 83 identifies the print-quality levels that can be used for some of the 4230 Printer symbol sets and suggests the name of a corresponding coded font that may be used for each symbol set. Refer to the 4230 Printer publications for a list of 4230 Printer symbol sets.

Table 83. 4230 Printer Symbol Sets and Corresponding Coded Fonts

Symbol Sets	4230 Printer Print Quality			
	Fast Draft	DP	DP text	NLQ
APL10		X0AE10		
Courier Bold 10 Pitch			X0CB10	X0CB10
Courier Bold 12 Pitch			X0CB12	X0CB12
Courier Bold 15 Pitch			X0CB15	X0CB15
Courier Double Wide Italic 15 Pitch			X0CW15	X0CW15
Courier Double Wide 15 Pitch			X0CD15	X0CD15
Courier Italic 10 Pitch			X0CI10	X0CI10
Courier Italic 12 Pitch			X0CI12	X0CI12
Courier Italic 15 Pitch			X0CI15	X0CI15
Courier 10 Pitch			X0CR10	X0CR10
Courier 12 Pitch			X0CR12	X0CR12
Courier 15 Pitch			X0CR15	X0CR15
Essay Bold Mixed Pitch			X0EBR9	X0EBR9
Essay Italic Mixed Pitch			X0EIR9	X0EIR9
Essay Standard Mixed Pitch			X0ESR9	X0ESR9
Gothic Bold 10 Pitch	X0GB10	X0GB10		
Gothic Bold 12 Pitch	X0GB12	X0GB12		
Gothic Italic 12 Pitch	X0GI12	X0GI12		
Gothic Text 10 Pitch	X0GT10	X0GT10		
Gothic Text 12 Pitch	X0GT12	X0GT12		
Gothic Text 15 Pitch	X0GT15	X0GT15		
Katakana	X0KN10	X0KN10		
OCR-A				X0AOA
OCR-B				X0OCRB

PSF selects symbol sets according to the following hierarchy:

1. If you select a symbol set that matches the print quality specified in the form definition, PSF prints the file.
2. If you select a symbol set but do not specify a print quality, the print quality selected in the printer configuration or the printer default print quality is used.

3. If you select a symbol set that does not match the print quality specified, the printer attempts to print the text using a “best fit” font, which it selects. Some pages may be duplicated, and some information on the page in error may be missing.
4. If you select a symbol set that is not available on the 4230 Printer, PSF does not print the remainder of the file.
5. With PSF for AS/400, if you select a symbol set that is not available on the 4230 Printer, and you specified absolute fidelity, PSF does not print the remainder of the file. If you specified content fidelity, PSF substitutes another symbol set and prints the file.

Printer Capabilities

The capabilities of the 4230 Printer are different from those of most of the other printers supported by PSF in the following ways:

- Differences in the contents of the character sets in the fonts provided by PSF and in the symbol sets resident in the 4230 Printer may result in inconsistent printed output between the two types of fonts.
- Although the 4230 Printer can print with downloaded symbol sets, it uses only resident symbol sets when driven by PSF.
- The PSF for OS/390 and PSF/VSE default fonts specified in the CHARS parameter in the PRINTDEV statement cause errors in which PSF issues messages saying “resource not found”. Change or override the CHARS parameter to use a 4230 Printer symbol set.
- The 4230 Printer prints both text and images in only 0° character orientation. All orientations other than 0° are supported for graphics. The 4230 Printer does not support rotated fonts.
- The 4230 Printer prints images with 144-pel resolution.
- The 4230 Printer does not support multiple subgroups within a copy group in a form definition. Printing of multiple copies of individual pages within a subgroup is not supported.

Chapter 23. 4232 Impact Printer (4232)

This section describes 4232 Impact Printer's characteristics. The 4232 Impact Printer is a tabletop, serial, dot-matrix, impact printer that prints text, images, graphics, and bar codes at up to 480 characters per second, depending on the model and print quality selected.



Figure 48. 4232 Impact Printer

Table 84 summarizes the printer characteristics for the 4232 Impact printer.

Table 84. 4232 Impact Printers

Printer Characteristics	Characteristic Value
Maximum printing rate: characters per second (cps)	600 cps
Print technology	Impact Dot Matrix
Datastreams	PPDS, Epson, ASCII
Form type	Continuous Cut-Sheet
Continuous forms input paths	1 standard
Continuous forms output paths	1 standard
Finisher attachments	n/a
Manual forms feed	yes
Envelope printing	n/a
MICR printing	no
Duplex printing	no
Color	no
Operator-adjustable forms	yes

Table 84. 4232 Impact Printers (continued)

Printhead resolution (pels-per-inch)	144 x 144
Maximum characters per second (cps) per month (duty cycles)	16,000,000

Printable Area

The size of the printable area must be set using a printer configuration option. If the defined printable area is not large enough to contain the page of data, a data-check exception (position check) occurs.

Media Specifications

The 4232 Impact Printer accepts the following media:

Media types:

Operator-changeable forms modules, continuous forms up to 6 parts, cutsheet, document-on-demand/zero tear-off

Media widths:

3 inches to 15 inches (76 mm to 381 mm)

Media lengths:

3 inches to 14 inches (76 mm to 356 mm) continuous forms, 5 inches to 14 inches (127 mm to 356 mm) cutsheet

Attachments

The RS-232C serial interface will attach to:

- IBM AS/400 ASCII workstation controller
- 3174 controller via the Asynchronous Emulation Adapter
- RS/6000
- PS/2 computer COMx ports and to a Token-Ring or Ethernet LAN via one of these computers
- LAN Attachment (i.e., Token Ring or Ethernet) via the Novell-certified IBM 4033 LAN adapter
- IBM-compatible PCs utilizing an RS-232C interface

The RS-422A serial interface will attach to:

- RS/6000
- AS/400 ASCII workstation controller

The IBM PC ASCII (Centronics) Parallel interface will attach to:

- RS/6000 workstations, excluding POWERserver 930
- PS/2 computer LPTx ports and to a Token-Ring or Ethernet LAN via one of these computers
- LAN attachment via the Novell-certified IBM 4033 LAN adapter
- IBM-compatible PCs utilizing the IBM PC ASCII (Centronics) Parallel interface
- AS/400 twinax terminals including 348X, 3477 and 3197
- Coax terminal 3482

IBM 4232 Impact Matrix Printer ASCII Software Support

The IBM 4232-302 can use the IBM Personal Printer Data Stream (PPDS)* in a Proprinter II (4202) emulation when attached to Serial (RS-232C/RS-422A) interfaces or the IBM PC ASCII (Centronics) Parallel interface. 4224-emulation may also be available. In 4224-emulation mode, the 4232 will support PPDS bar code and vector graphics commands. For more information, reference 4224 RPQ 8V0428 or the *4232 Printer User's Guide Models 102 and 202*.

The following systems support the 4232-302:

Table 85. Caption. Description

System	Software - Minimum Level	Data Stream/Emulation
IBM PS/2	OS/2 1.1 OS/2 LAN Server 1.0 OS/2 Extended Services 1.0 OS/2 Communications Manager/2 1.0 DOS 3.3 Microsoft Windows 3.0 PC Support/400 W/S Function V2.2	PPDS/4202 or 4224 PPDS/4202 or 4224 PPDS/4202 PPDS/4202 PPDS/4202 or 4224 PPDS/4202 PPDS/4202
IBM RS/6000	AIX Version 3.1.5	PPDS/4202 or 4224
IBM AS/400	OS/400 V2.3 Host Print Transform OS/400 V2.2	PPDS/4202 PPDS/4202

IBM 4232-302 IBM OS/2, IBM AIX, and Novell NetWare LAN Operating System Support via the IBM 4033 LAN adapter

The IBM 4232-302 will support the following via attachment to the IBM 4033 LAN adapter:

Table 86. Caption. Description

System	Software - Minimum Level	Data Stream
Token Ring	OS/2 LAN Server 1.2, 1.3	PPDS
Ethernet	OS/2 LAN Server 1.2, 1.3	PPDS
Token Ring	IBM AIX Ver. 3.1.5	PPDS
Ethernet	IBM AIX Ver. 3.1.5	PPDS
Token Ring	Novell NetWare 2.2, 3.11	PPDS
Ethernet	Novell NetWare 2.2, 3.11	PPDS

Operator-Adjustable Forms

To align data on preprinted forms, the 4232 Impact Printer operator can adjust the physical top and left margins, which will offset the page image on the printing medium. The horizontal (left margin) adjustment range is from -6.9 mm (-0.27 inches) to +38.35 mm (+1.51 inches). The vertical (top margin) adjustment range is from -30.5 mm (-1.2 inches) to +38.1 mm (+1.5 inches). This adjustment does not affect the size of the valid printable area; however, using this adjustment can produce positioning errors if the horizontal adjustment is too large for the form being used.

Chapter 24. 4247 Printer (4247)

This section describes 4247 Printer's characteristics. The 4247 Printer is a tabletop, serial, impact, matrix printer that prints text, images, graphics, and bar codes at up to 700 characters per second, depending on the model and print quality selected.



Figure 49. 4247 Printer

Table 87 summarizes the printer characteristics for the 4247 Printer.

Table 87. 4247 Printer

Printer Characteristics	Characteristic Value
Maximum printing rate: characters per second (cps)	700 cps (A00/001) 400 cps (002)
Print technology	Impact Dot Matrix
Datastreams	PPDS, Epson, ASCII, IPDS, DSE, SCS
Form type	Continuous Cut-Sheet
Continuous forms input paths	3 standard 3 optional
Continuous forms output paths	1 standard
Finisher attachments	n/a
Manual forms feed *An Automatic Sheet Feed Device is available	yes*
Envelope printing	n/a
MICR printing	no
Duplex printing	no
Color	no

Table 87. 4247 Printer (continued)

Operator-adjustable forms	yes
Printhead resolution (pels-per-inch)	144 x 144
Maximum characters per second (cps) per month (duty cycles)	20,000,000

Printable Area

The size of the printable area is set using a printer configuration option. If the defined printable area is not large enough to contain the page of data, a data-check exception (position check) occurs.

Selecting the Printing Medium

This section describes how to select the various available paper sources on the 4247-001 Printer for Coaxial and Twinaxial applications, using the SCS or IPDS support in the printer.

Note: For the ASCII data streams supported over the parallel port, select the same paper source as on the 4247 Model A00 Printer.

Specifying the Source of the Medium for a 4247-001 Printer

Although the 4247-001 printer is a continuous forms printer, options can enable it to support a second continuous forms source, or an automatic cut sheet feeder source, or both. The maximum possible paper sources for the 4247-001 are:

Front Continuous forms paper fed through the front of the printer. This uses either the Front Push, Rear Pull, or Push-Pull tractor configurations.

Rear Continuous forms paper fed through the rear of the printer. This is only with the Rear Push tractor configuration.

ASF Bin 1

Automatic Sheet Feeder Bin 1

ASF Bin 2

Automatic Sheet Feeder Bin 2

ASF Bin 3

Automatic Sheet Feeder Bin 3

Manual

Manual cut sheet

Identifying the Paper Source (Media IDs)

The method you use to select the manual cut sheet feed varies, depending on whether the printer is IPDS or SCS, or attached by Twinaxial or Coax. More information follows in the specific sections about PSF, AS/400, and GDDM.

Selecting Paper Sources Compatible with Other Printers

Many non-impact cutsheet printers, 4230, or 42 x 4 printers with an automatic sheet feed (ASF) option have existing applications that use media ID values 1-3, specified in an AFP Form Definition, or in job control language, DDS or Printer Files that support a DRAWER or BIN parameter. To configure the 4247 Printer so that you can print these jobs without changing the application or job submission, put the 4247-001 printer into either the 4230-emulation or the 4224-emulation mode and have ONLY the ASF paper handling device attached.

Note: No tractors can be installed. In this configuration, the paper sources are identified by the host application as follows:

ASF Bin 1

Media ID = 1

ASF Bin 2

Media ID = 2

ASF Bin 3

Media ID = 3

Media Specifications

The 4247 Impact Printer accepts the following media:

Media types:**Continuous forms:**

Up to eight-part forms using front feed

Cutsheet forms:

Up to four-part forms manual feed, three-part auto feed

Media widths:**Continuous forms:**

3 inches to 17 inches (76 mm to 432 mm)

Cutsheet forms:

4.5 inches to 17.5 inches (102 mm to 444 mm) manual; 6 inches to 12 inches (152 mm to 305 mm) automatic

Media lengths:**Continuous forms:**

3 inches to 24 inches (76 mm to 609 mm)

Cutsheet forms:

4 inches to 24 inches (102 mm to 609 mm) manual, 5 inches to 14 inches (127 mm to 356 mm) automatic

3 inches to 24 inches (76 mm to 609 mm) continuous forms, 5 inches to 14 inches (127 mm to 356 mm) cutsheet

Attachments

The parallel interface will attach to:

- RS/6000 workstations (excluding POWERserver 930).
- Token Ring or Ethernet networks via the Network Print Server features.
- IBM PS/2 and IBM Personal Computer LPTx ports and to a Token Ring or Ethernet LAN via one of these computers.
- IBM-compatible PCs utilizing the parallel interface.
- AS/400 twinax terminals including IBM 348x InfoWindow II display stations, IBM 3477 InfoWindow display station, and IBM 3197 display workstation.
- 3482 InfoWindow II display.

The Coax interface (feature 4170) will attach to:

- BM 3174 Controller - Terminal port (using Release A5.5 or later, Release B4.0 or later, Release C6.0 or later).
- ES/9370 Processor Workstation Controller (feature code 6020 or 6120).
- ES/9371 Processor - 3270 Adapter.
- ES9000 - 9221 Workstation Subsystem Controller (feature 6120).
- Token Ring or Ethernet networks via the i-data 7913 RPQ for the IPDS datastream.

The Twinax interface (feature 4140) will attach to:

- AS/400 Advanced Systems.
- AS/400 Advanced Servers.
- AS/400 Advanced 36 Systems.
- IBM System 36.
- IBM 5394 and IBM 5494 Control Units.

- Token Ring or Ethernet networks via the i-data 7913 RPQ for the IPDS datastream.

System support via Parallel Attachment

The 4247-001 can use the IBM Personal Printer Data Stream (PPDS) in IBM 4202 Proprinter III XL or IBM 2381 Personal Printer emulations by choosing the corresponding device driver for the systems listed below as supporting the PPDS datastream and the corresponding emulation on the Operator panel.

In Epson FX emulation mode the 4247-001 can print files coded for the Epson FX-1050 using the Epson ESC/P printer control language.

Also, native 4247 support is provided for AIX and the Host Print Transform function in OS/400. The following systems support the 4247-001:

Table 88. System Support Through Parallel Attachments for the 4247 Printer

System	Software - Minimum Level	Emulation
IBM PS/2 and IBM Personal Computers	OS/2 2.1 OS/2 LAN Server 3.0 OS/2 Communications Manager/2 1.0 DOS 5.0 Microsoft Windows 3.0	PPDS or Epson FX
IBM RISC System/6000	AIX Version 3.2.5	PPDS or Epson FX
IBM AS/400	OS/400 V2.3 Host Print Transform OS/400 V2.3 PC Support/400 W/S Function V2.2 Client Access/400 V3.1 Personal Communication for AS/400 for Windows V4.0 Personal Communication for AS/400 for OS/2 V4.0 IBM 5250 Enhanced Emulation for Windows V1.1 IBM 5250 Enhanced Emulation for DOS V2.4	PPDS or Epson FX

Network Operating System Support via Parallel Attachment

The Network Print Server features are supported in the following environments:

Table 89. Network Operating System Support through Parallel Attachments for the 4247 Printer

Protocol	Operating System
IPX/SPX	Novell NetWare 3.11 and above Novell NetWare 4.01 and above using bindery emulation
TCP/IP	Novell NetWare 3.11 and above IBM LAN Server 1.3 and above Novell NetWare 4.01 and above using bindery emulation
NETBIOS/ NETBEUI	IBM LAN Server 1.3 and above
TCP/IP	IBM LAN Server 1.3 and above
NETBIOS/ NETBEUI	Microsoft LAN Manager 2.0c and above
TCP/IP	Microsoft LAN Manager 2.0c and above
NETBIOS/ NETBEUI	Windows NT 3.1 and above

Table 89. Network Operating System Support through Parallel Attachments for the 4247 Printer (continued)

Protocol	Operating System
TCP/IP	Windows NT 3.1 and above
TCP/IP	AIX 3.2.5, 4.1
Supported TCP/IP print methods are LPD, FTP, and Reverse Telnet.	

IBM 4247-001 Coax Software Support

Table 90. Coax Software Support for the 4247 Printer

IBM System or Controller	IBM Software (minimum release level)	4247 Mode	4224/4230 Emulation	3268/3287 Emulation
System/370 and 390 Non-IPDS Mode	GDDM Version 3.1 VM/ESA V2.1 VM/RSCS V3.1 VM/VTAM V4.3 MVS/ESA V4.2.0 MVS/VTAM V4.3 VSE/ESA V1.3.3 VSE/VTAM V3.4 CICS/VSE V2.2.0	Yes	Yes	Yes
System/370 and 390 IPDS Mode	GDDM Version 3.1 GDDM Version 3.2 PSF/VM V2.1.1 PSF/MVS V2.1.0 PSF/MVS V2.2.0 PSF for OS/390 PSF/VSE V2.2.1	No Yes No No Yes Yes	Yes Yes Yes Yes Yes Yes	No No No No No No

IBM 4247-001 Twinax Software Support

Table 91. Twinax Software Support for the 4247 Printer

IBM System or Controller	IBM Software (minimum release level)	4247 Mode	4224/4230 Emulation	3268/3287 Emulation
System/36	SSP Release 5.1 IPDS Adv. func. PRPQ DisplayWrite/36 Business Graphics Utility Operation Control Language	No	Yes	Yes
AS/400 Non-IPDS Mode	OS/400 Version 3 Rel 1 SSP Release 7.1 OfficeVision/400 Business Graphics Util. GDDM CL and DDS	Yes No Yes Yes Yes Yes	Yes Yes Yes Yes Yes Yes	No No No No No No

Table 91. Twinax Software Support for the 4247 Printer (continued)

IBM System or Controller	IBM Software (minimum release level)	4247 Mode	4224/4230 Emulation	3268/3287 Emulation
AS/400 IPDS Mode	OS/400 Version 3 Rel 1	Yes	Yes	Yes
	OS/400 Version 3 Rel 6	Yes	Yes	Yes
	GDDM	Yes	Yes	Yes
	Adv Funct. Print Ut V2R1	Yes	Yes	Yes
	PSF/400 Release 3.1	Yes	Yes	Yes
System/370 and 390	PSF/MVS V2.2.0 and later PSF for OS/390	Yes	Yes	No

Using PSF

In PSF for OS/390, PSF/VSE, and PSF/VM (S/390 PSFs), identify the desired paper source in the FORMDEF, using the appropriate Media ID number as defined in "Identifying the Paper Source (Media IDs)" on page 130. For selecting the Manual Cut Sheet, use **100** as the Media ID number.

You can use Page Printer Formatting Aid (PPFA) to create Form Definitions for S/390 and AIX environments. PPFA is also available for AS/400 as an optional feature of the IBM AFP PrintSuite for OS/400. The following is a sample of PPFA commands that you could use to select the first ASF bin on a 4247 printer:

```
SETUNITS 1 IN 1 IN;
FORMDEF 4247B1 REPLACE YES
BIN 5;
```

In AS/400, you can specify a Form Definition with the PRTAFPDTA command and DEVTYPE=**AFPDS. In OS/400 V3R2 and V3R7 or later releases, you can specify Form Definitions in the Printer File.

Selecting AS/400 Media

To select the input media source in AS/499, use a combination of two Printer File parameters: Form Feed (FORMFEED) and Source Drawer (DRAWER). For a 4247 Printer with both Continuous Feed and ASF installed, with the printer configured in either the 4247 Printer mode or the emulation (4230/42x4) mode, you should use the following selection parameters:

```
Front CF:  FORMFEED (*CONT)           (See notes 1 & 2)
Rear CF:   FORMFEED (*AUTOCUT) DRAWER (2) (See note 2)
ASF Bin1:  FORMFEED (*AUTOCUT) DRAWER (5)
ASF Bin2:  FORMFEED (*AUTOCUT) DRAWER (6)
ASF Bin3:  FORMFEED (*AUTOCUT) DRAWER (7)
Manual:    FORMFEED (*CUT)           (See note 3)
```

Notes:

1. You can also select the Front CF source by using FORMFEED (*AUTOCUT) DRAWER (1); however, FORMFEED (*CONT) is the recommended method.
2. In AS/400, when you specify that the paper is cut sheet (*AUTOCUT) instead of continuous forms, the Forms Alignment message normally issued for continuous forms cannot be issued.
3. You can select the manual feed source only if you are running on an IPDS printer.

If the 4247 Printer is configured for Compatibility Paper Source Selection as described above, and only an ASF is installed, you can select a bin with the following parameters:

```

ASF Bin1:  FORMFEED  (*AUTOCUT)  DRAWER (1)
ASF Bin2:  FORMFEED  (*AUTOCUT)  DRAWER (2)
ASF Bin3:  FORMFEED  (*AUTOCUT)  DRAWER (3)

```

In OS/400 Version 3 Release 2 and Release 7, the FORMFEED parameter has been enhanced; you can now explicitly select the rear continuous form input source by using the following parameters:

```
Rear CF:  FORMFEED  (*CONT2)
```

Using GDDM

When the 4247 Printer is attached to GDDM in the S/390 environment, you can select media input sources by using the IPDSBIN processing option.

The IPDSBIN processing option has the format (IPDSBIN,*m,n*), where *m* is the main document bin and *n* is the header page bin. The values for 4247 Printer are:

```

0 = printer default
1 = front CF
2 = rear CF
5 = ASF Bin1
6 = ASF Bin2
7 = ASF Bin3
65 = envelopes
97-100 = manual feed bin

```

GDDM will not handle the linking of bins. You must specify the correct value according to the printer setup.

Using 'forms' parameters

When users specified forms, prior to the 4247 printer, for continuous forms printers with only a single continuous forms paper source, they used the FORMS parameters in JCL or, for the AS/400, the FORMTYPE parameter. You can still use this method to direct the operator change to the correct forms for the job. But you cannot use this method to cause the printer to switch between the Front and Rear continuous forms sources.

Operator-Adjustable Forms

To align data on preprinted forms, the 4247 Printer operator can adjust the physical top and left margins, which will offset the page image on the printing medium. The horizontal (left margin) adjustment range is from -6.9 mm (-0.27 inches) to +38.35 mm (+1.51 inches). The vertical (top margin) adjustment range is from -30.5 mm (-1.2 inches) to +38.1 mm (+1.5 inches). This adjustment does not affect the size of the valid printable area; however, using this adjustment can produce positioning errors if the horizontal adjustment is too large for the form being used.

Print-Quality Levels for IPDS Models

The 4247 Printer allows you to select different levels of print quality. Higher quality corresponds to slower print speeds. To select a print-quality level, use the QUALITY subcommand on the COPYGROUP command in the form definition. To use Fast Draft Quality, you must enable it using a printer configuration menu on the operator panel. Refer to your printer publications on how to do this. If the printer is not configured, all requests to print using Fast Draft will automatically be printed in DP Quality. Specify the values shown in Table 92 on the QUALITY subcommand to get the correct print-quality level.

Table 92. 4247 Printer Print-Quality Selection Values

Print-Quality Level	Hexadecimal Value Range	Decimal Value Range
Reserved	X'00'	
Fast Draft Quality	X'01' through X'2A'	1 through 42

Table 92. 4247 Printer Print-Quality Selection Values (continued)

Print-Quality Level	Hexadecimal Value Range	Decimal Value Range
DP Quality	X'2B' through X'55'	43 through 85
DP Text Quality	X'56' through X'AA'	86 through 170
NLQ Quality	X'AB' through X'FE'	171 through 254
Printer Customized Default	X'FF'	255

Not all symbol sets can be printed at all print-quality levels. Table 93 identifies the print-quality levels that can be used for some of the 4247 Printer symbol sets and suggests the name of a corresponding coded font that may be used for each symbol set. Refer to the 4247 Printer publications for a list of 4247 Printer symbol sets.

Table 93. 4247 Printer Symbol Sets and Corresponding Coded Fonts

Symbol Sets	4247 Printer Print Quality			
	Fast Draft	DP Quality	DP text	NLQ
APL10		X0AE10		
Courier Bold 10 Pitch			X0CB10	X0CB10
Courier Bold 12 Pitch			X0CB12	X0CB12
Courier Bold 15 Pitch			X0CB15	X0CB15
Courier Double Wide Italic 15 Pitch			X0CW15	X0CW15
Courier Double Wide 15 Pitch			X0CD15	X0CD15
Courier Italic 10 Pitch			X0CI10	X0CI10
Courier Italic 12 Pitch			X0CI12	X0CI12
Courier Italic 15 Pitch			X0CI15	X0CI15
Courier 10 Pitch			X0CR10	X0CR10
Courier 12 Pitch			X0CR12	X0CR12
Courier 15 Pitch			X0CR15	X0CR15
Essay Bold Mixed Pitch			X0EBR9	X0EBR9
Essay Italic Mixed Pitch			X0EIR9	X0EIR9
Essay Standard Mixed Pitch			X0ESR9	X0ESR9
Gothic Text 10 Pitch	X0GB10	X0GB10		
Gothic Bold 10 Pitch	X0GB12	X0GB12		
Gothic Text 12 Pitch	X0GI12	X0GI12		
Gothic Bold 12 Pitch	X0GT10	X0GT10		
Gothic Italic 12 Pitch	X0GT12	X0GT12		
Gothic Text 15 Pitch	X0GT15	X0GT15		
Katakana	X0KN10	X0KN10		
OCR-A				X0AAO
OCR-B				X0BOA

PSF selects symbol sets according to the following hierarchy:

1. If you select a symbol set that matches the print quality specified in the form definition, PSF prints the file.

2. If you select a symbol set but do not specify a print quality, the print quality selected in the printer configuration or the printer default print quality is used.
3. If you select a symbol set that does not match the print quality specified, the printer attempts to print the text using a “best fit” font, which it selects. Some pages may be duplicated, and some information on the page in error may be missing.
4. If you select a symbol set that is not available on the 4247 Printer, PSF does not print the remainder of the file.
5. With PSF for AS/400, if you select a symbol set that is not available on the 4247 Printer, and you specified absolute fidelity, PSF does not print the remainder of the file. If you specified content fidelity, PSF substitutes another symbol set and prints the file.

Printer Capabilities

The capabilities of the 4247 Printer are different from those of most of the other printers supported by PSF in the following ways:

- Differences in the contents of the character sets in the fonts provided by PSF and in the symbol sets resident in the 4247 Printer may result in inconsistent printed output between the two types of fonts.
- Although the 4247 Printer can print with downloaded symbol sets, it uses only resident symbol sets when driven by PSF.
- The PSF for OS/390 and PSF/VSE default fonts specified with the CHARS parameter in the PRINTDEV statement cause errors in which PSF issues messages saying “resource not found”. Change or override the CHARS parameter to use a 4247 Printer symbol set.
- The 4247 Printer prints both text and images in only 0° character orientation. All other orientations other than 0° are supported for graphics. The 4247 Printer does not support rotated fonts.
- The 4247 Printer prints images with 144-pel resolution..
- The 4247 Printer does not support multiple subgroups within a copy group in a form definition. Printing of multiple copies of individual pages within a subgroup is not supported.

Chapter 25. 4400 Thermal Label Printer (4400)

The IBM 4400 Thermal Label printers are a family of high-quality, direct thermal and thermal transfer printers designed for printing labels and tags.



Figure 50. 4400 Model 004 Thermal Label Printer with Validator Option Attached

Table 94 summarizes the printer characteristics.

Table 94. 4400 Thermal Label Printers

Printer Characteristics	Characteristic Value 4400 Model 004/006	Characteristic Value 4400 Model 008
Maximum printing rate: inches per second (ips)	8 ips at 300 dpi 10 ips at 203 dpi	6 ips at 300 dpi 8 ips at 203 dpi
Print technology	Thermal	
Datastreams	ASCII, CodeV and IGP, IPDS, SCS	
Form type	Continuous	
Number of input areas	1 standard	
Number of output areas	1 standard	
Finisher attachments	n/a	
Manual forms feed	no	

Table 94. 4400 Thermal Label Printers (continued)

Envelope printing	n/a
MICR printing	no
Duplex printing	no
Color	no
Operator-adjustable forms	yes
Printhead resolution (dots-per-inch)	203 dpi (at 8 ips) 300 dpi (at 10 ips)

Printable Area

The size of the printable area is set using a printer configuration option or by using the Set Media Size IPDS command. If the defined printable area is not large enough to contain the page of data, the 4400 Thermal Label Printer stops printing, issues a negative acknowledgement reply (NACK), and enters home state.

Media Specifications

The 4400 Thermal Printers accepts the following media:

Media types:

Roll or fanfold; die-cut or continuous; labels, tags and tickets; paper, film or synthetic stock; thermal transfer or direct thermal

Media widths:

Model 004

0.75 inches to 4.5 inches (19 to 114 mm)

Model 006

2.0 inches to 6.8 inches (51 to 171 mm)

Model 008

3.0 inches to 8.75 inches (76 to 222 mm)

Media thickness:

0.0025 inches to 0.010 inches (0.07 to 0.25 mm)

Roll core diameter:

3.0 inches (76 mm)

Maximum roll diameter

8.0 inches (203 mm)

Thermal transfer ribbons:

Standard ribbon length: 2,050 feet (625 m)

Attachments

The IBM 4400 Thermal Label Printers attach to the systems, controllers, and processors described below:

Table 95. Attachments for the 4400 Thermal Label Printer

Interface Type	System/Control Unit/Processor	Attachment
ASCII	AS/400	ASCII Workstation Controller port on 9402 (except Model Y10), 9404, and 9406
	3197, 3477, 3486/87/88	Terminal (Parallel port only)
	3174 Controller	Asynchronous Emulation Adapter
	ES/9370	ASCII Subsystem
	Micro Channel 370	ASCII serial or parallel port
	RS/6000	ASCII serial or parallel port
	PC, PS/2	ASCII serial or parallel port
	IBM-Compatible PCs	ASCII serial or parallel port
	Non-IBM Systems	ASCII serial or parallel port
Coax	3174 Controllers	Coaxial ports (Release A3.0 or higher)
	ES/9370, ES/9000	Workstation Subsystem
	Processors	Controller port (#6020 or #6120
	S/390 Parallel Enterprise Servers	via 3174 Controller
Twinax	AS/400	Twinaxial Workstation Controller port on 9402, 9404, and 9406
	AS/400 Advanced 36	Twinaxial Workstation Controller
	S/36	Workstation Controller port on 5360, 5362, 5363, and 5364
	5394 and 5494 Control Unit	Workstation port
LAN	Ethernet	Ethernet 10/100 BaseT Adapter

Software Requirements

The following table summarizes the IPDS support by platform.

Table 96. IPDS Support for the 4400 Thermal Printer

Base Support:	PSF/MVS V2.2.0 PSF for OS/390	PSF/VSE V2.2.1	PSF/400 V4.3 or later	PSF V3.1.0 or later
Base Support:				
4028 Dev. Type 3816 Dev. Type 240 DPI Resolution 300 DPI Resolution	Yes	Yes	Yes	Yes
Roll Input	Yes	Yes	Yes	Yes
Roll Output	Yes	Yes	Yes	Yes
AFP/IPDS Towers: (Not including If3)	All	All	All	All
Printer Connectivity:				
Ethernet TCP/IP	Yes	Yes	Yes	Yes
Twinax	No	No	Yes	No

Table 96. IPDS Support for the 4400 Thermal Printer (continued)

Base Support:	PSF/MVS V2.2.0 PSF for OS/390	PSF/VSE V2.2.1	PSF/400 V4.3 or later	PSF V3.1.0 or later
Base Support:				
Font Download Raster	Yes	Yes	Yes	Yes
Resident AFP Font Collection				
4028 Core Coordinated	Yes	Yes	Yes	Yes

IBM 4400 IPDS

Infoprint Manager Summary:

Table 97. IPDS Support with Infoprint Manager for the 4400 Thermal Printer

	Infoprint Manager for AIX V3.2 or later	Infoprint Manager for NT 1.1 or later
Base Support:		
4028 Dev. Type 3816 Dev. Type 240 DPI Resolution 300 DPI Resolution	Yes	Yes
Roll Input	Yes	Yes
Roll Output	Yes	Yes
AFP/IPDS Towers: (Not including If3)	All	All
Printer Connectivity: Ethernet TCP/IP	Yes	Yes
Font Download Raster	Yes	Yes
Resident AFP Font Collection		
4028 Core Coordinated	Yes	Yes

Printer Emulations

With a coax interface, the IBM 4400 Printer emulates the following IBM Coax Printer models:

- Non-IPDS
 - 3287 Models 1 and 2
 -
 - 4234 Model 1
- IPDS
 - 4028
 - 3816

With a twinax interface, the IBM 4400 printer emulates the following IBM twinax models:

- 4234 Model 2
- 5225

Note: Refer to the *IBM 4400 Thermal Label Printer Coax/Twinax Programmer's Reference Manual* for details and limitations concerning the twinax and coax emulations.

The ASCII Emulation software provides the following emulations:

- Printer Protocols
 - IBM Proprinter III XL
 - Epson FX-1050
 - Printronix P-Series
 - Printronix P-Series XQ
 - Printronix Serial Matrix
- Page Orientations:
 - Portrait/Inverted Portrait
 - Landscape/Inverted Landscape
- Graphics:
 - Bit Image Graphics
 - P-Series Compatible Plot Mode
- Vertical Page Formatting
 - Printronix P-Series Electronic Vertical Format Unit (EVFU)
 - Serial Matrix Vertical Formatting Unit (VFU)
- Character Sets:
 - IBM PC
 - ECMA-94 Latin 1
 - Multinational
 - DEC Multinational
 - IBM Code Page 437 and 850
 - International symbol sets in the following categories:
 - Arabic Sets
 - Cyrillic Sets
 - European Sets
 - Greek Sets
 - Hebrew Sets
 - Turkish Sets
- Font Typefaces:
 - Courier
 - Letter Gothic
 - OCR-A
 - OCR-B
 - CG Triumvirate Bold Condensed
 - Ability to download True Type.

Refer to the *IBM 4400 Thermal Label Printer ASCII Programmer's Reference Manual* for details and limitations concerning the ASCII emulations

When the Ethernet 10/100 BaseT Network Interface Card is installed, the following Network Operating Systems and protocols are supported:

Table 98. Ethernet Support for the 4400 Thermal Printer

Operating System	Protocol
OS/2 Warp 3 & 4 OS/400 (V3.2 and later) Windows 98 Windows NT Windows 2000 UNIX ¹	TCP/IP

Table 98. Ethernet Support for the 4400 Thermal Printer (continued)

Operating System	Protocol
Windows 95	NetBIOS over TCP/IP
Novell NetWare V3.11, and later Novell NetWare V4.01, and later	IPX/SPX and TCP/IP
1. The Ethernet Interface supports network printing under various TCP/IP environments including most variations of UNIX.	

Refer to the *IBM 4400 Ethernet Interface User's Manual* for details and limitations concerning the Ethernet NIC Network Support.

Chapter 26. 6400 Line Matrix Printer (6400)

This section describes the 6400 Printer's characteristics. In this publication, these printers are called the 6400 printers, unless a functional difference between models occurs. The 6400 Printer is a continuous-forms, line-dot matrix, impact printers that use the shuttle-matrix print technology to print text, images, graphics, and bar codes at up to 1500 lpm for the 6400 Printer depending on the model.



Figure 51. 6400 Printer

Table 99 summarizes the printer characteristics.

Table 99. 6400 Line Matrix Printers

Printer Characteristics	Characteristic Value
Maximum printing rate: lines per minute (lpm)	500 lpm (050/P50) 1000 lpm (010/P10) 1,500 lpm (015)
Print technology	Impact Dot Matrix
Datastreams	PPDS, Epson, ASCII, SCS, IPDS
Form type	Continuous
Number of input areas	1 standard
Number of output areas	1 standard
Finisher attachments	n/a
Manual forms feed	n/a
Envelope printing	n/a
MICR printing	no
Duplex printing	no
Color	no
Operator-adjustable forms	yes
Printhead resolution (pels-per-inch)	120 x 144
Maximum characters per second (cps) per month (duty cycles)	n/a

Printable Area

The size of the printable area is set using a printer configuration option or by using the Set Media Size IPDS command. If the defined printable area is not large enough to contain the page of data, the 6400 Printer stops printing, issues a negative acknowledgement reply (NACK), and enters home state.

Media Specifications

The 6400 Line Matrix Printer accepts the following media:

Media types:

One to six-part forms

Media widths:

3 inches to 17 inches (76 mm to 432 mm) with tear strips; when using rear exit, the maximum is 16 inches (406 mm)

Media lengths:

3 inches to 24 inches (76 mm to 610 cm)

Attachments

The IBM 6400 Model 004 Printer attaches to systems, controllers, and processors as described below:

Table 100. System, Controller, and Processors Attachments for the 6400 Printer

Interface Type	System/Control Unit/Processor	Attachment
ASCII	AS/400	ASCII Workstation Controller port on 9402 (except Model Y10), 9404, and 9406
	3197, 3477, 3486/87/88	Terminal (Parallel port only)
	3174 Controller	Asynchronous Emulation Adapter
	ES/9370	ASCII Subsystem
	Micro Channel370	ASCII serial or parallel port
	RS/6000	ASCII serial or parallel port
	LAN Attachments	ASCII serial or parallel port
	PC, PS/2	ASCII serial or parallel port
	IBM-compatible PCs	ASCII serial or parallel port
	Non-IBM systems	ASCII serial or parallel port
Coax	3174 Controllers	Coaxial ports (Release A3.0 or higher)
	ES/9370, ES/9000 Processors	Workstation Subsystem Controller port (FC 6020 or 6120)
	S/390 Parallel Transaction Servers	via 3174 Controller
Twinax	AS/400	Twinaxial Workstation Controller port on 9402, 9404, and 9406
	AS/400 Advanced 36	Twinaxial Workstation Controller
	S/36	Workstation Controller port on 5360, 5362, 5363 and 5364
	5394 5494 Control Unit	Workstation port

IBM 6400 Model 004 Printer ASCII Software Support:

The IBM 6400 Model 004 Printer can use the IBM Personal Printer Data Stream (PPDS) in IBM Proprinter III XL emulation or the Epson FX 1050 emulation when attached to Serial (RS-232C/RS-422A) interfaces, or the IBM PC ASCII (Centronics) Parallel interface. For more information, refer to the 6400 ASCII Programmer's Reference (S246-0118).

Also, native IBM 6400 Printer support is provided for the IBM RS/6000 systems. Drivers are supplied on the printer configuration utility diskette.

Table 101. ASCII Support for the 6400 Printer

System	Software - Minimum Level	Emulation
IBM PS/2, IBM PC	OS/2 2.1	Proprinter III XL, Epson FX
	OS/2 LAN Server 1.0	Proprinter III XL, Epson FX
	OS/2 Extended Services 1.0	Proprinter III XL, Epson FX
	OS/2 Communications Manager/2 1.0	Proprinter III XL, Epson FX
	DOS 3.3 through 6.3	Proprinter III XL, Epson FX
	Microsoft Windows 3.1	Proprinter III XL, Epson FX
IBM RS/6000	AIX Version 3.1.5	Proprinter III XL, Epson FX

Table 101. ASCII Support for the 6400 Printer (continued)

System	Software - Minimum Level	Emulation
IBM AS/400	OS/400 Version 2.3 Host Print Transform	Proprinter III XL, Epson FX
	OS/400 Version 2.3	Proprinter III XL, Epson FX
	PC Support/400 Version 2.3	Proprinter III XL, Epson FX
	IBM 5250 Enhanced Emulation for DOS Version 2.4	Proprinter III XL, Epson FX
	IBM 5252 Emulation for Windows Version 1.1	Proprinter III XL, Epson FX
	Personal Communications for AS/400 for Windows Version	Proprinter III XL, Epson FX
	Personal Communications for AS/400 for OS/2 Version 4.0	Proprinter III XL, Epson FX
	Client Access/400 Version 3.1	Proprinter III XL, Epson FX
3174 with AEA	Release A5.4 or later, Release B4.0 or later, or Release C1.1 or later	Proprinter III XL, Epson FX

Network Operating System Support

The Network Print Server features are supported in the following environments:

Table 102. Caption. Description

Protocol	Operating System
IPX/SPX	Novell NetWare 3.11 and above Novell NetWare 4.01 and above using bindery emulation
TCP/IP	Novell NetWare 3.11 and above Novell NetWare 4.01 and above using bindery emulation IBM LAN Server 1.3 and above Microsoft LAN Manager 2.0c and above Windows NT 3.1 and above AIX 3.2.5, 4.1
NETBIOS/NETBEUI	IBM LAN Server 1.3 and above Microsoft LAN Manager 2.0c and above Windows NT 3.1 and above

Supported TCP/IP print methods are LPD, FTP, and Reverse Telnet.

Operator-Adjustable Forms

Using the Set Top of Forms key on the operator panel, the operator can select where the first line of printing is relative to the top edge of the paper.

To align data on preprinted forms, the 6400 Printer operator can adjust the physical top and left margins, which offsets the page image on the printing medium. The horizontal (left margin) adjustment range is from -6.9 mm (-0.27 inches) to +38.35 mm (+1.51 inches). The vertical (top margin) adjustment range is from -30.5 mm (-1.2 inches) to -38.1 mm (+1.5 inches). This adjustment does not affect the size of the valid printable area; however, using this adjustment can produce positioning errors if the horizontal adjustment is too large for the form being used.

Print-Quality Levels in IPDS Mode

The 6400 Printer allows you to select different levels of print quality. A higher print-quality level corresponds to slower print speeds. To select a print-quality level, use the QUALITY subcommand on the COPYGROUP command in a form definition created using Page Printer Formatting Aid/370 (PPFA/370). You must enable Draft Quality by using a printer configuration menu on the operator panel. Refer to your printer publications on how to do this. If the printer is not configured, all requests to print using Draft Quality are automatically printed in DP Quality. Specify the values shown in Table 103 on the QUALITY subcommand to get the correct print-quality level.

Table 103. 6400 Printer Print-Quality Selection Values

Print-Quality Level	Hexadecimal Value Range	Decimal Value Range
Reserved	X'00'	
DP Quality	X'01' through X'55'	1 through 85
DP Text Quality	X'56' through X'AA'	86 through 170
NLQ Quality	X'AB' through X'FE'	171 through 254
Printer Customized Default	X'FF'	255

Not all symbol sets can be printed at all print-quality levels. Table 104 identifies the print-quality levels that can be used for **some** of the 6400 Printer symbol sets and suggests the name of a corresponding coded font that can be used for each symbol set. Refer to the 6400 Printer publications for a more complete list of 6400 Printer symbol sets.

Table 104. 6400 Printer Symbol Sets and Corresponding Coded Fonts

Symbol Sets	6400 Printer Print Quality		
	Draft	DP	NLQ
APL10		X0AE10	X0AE10
Courier Bold 10 Pitch			X0CB10
Courier Bold 12 Pitch			X0CB12
Courier Bold 15 Pitch			X0CB15
Courier Double Wide Italic 15 Pitch			X0CW15
Courier Double Wide 15 Pitch			X0CD15
Courier Italic 10 Pitch			X0CI10
Courier Italic 12 Pitch			X0CI12
Courier Italic 15 Pitch			X0CI15
Courier 10 Pitch			X0CR10
Courier 12 Pitch			X0CR12
Courier 15 Pitch			X0CR15
Essay Bold Mixed Pitch			X0EBTR
Essay Italic Mixed Pitch			X0EITR
Essay Standard Mixed Pitch			X0ESTR
Gothic Text 10 Pitch	X0GB10	X0GB10	
Gothic Bold 12 Pitch	X0GB12	X0GB12	
Gothic Italic 12 Pitch	X0GI12	X0GI12	
Gothic Text 10 Pitch	X0GT10	X0GT10	
Gothic Text 12 Pitch	X0GT12	X0GT12	

Table 104. 6400 Printer Symbol Sets and Corresponding Coded Fonts (continued)

Symbol Sets	6400 Printer Print Quality		
	Draft	DP	NLQ
Gothic Italic 12 Pitch	X0GT12	X0GT12	
Gothic Text 13 Pitch	X0GT13	X0GT13	
Gothic Text 13 Pitch	X0D224	X0D224	
Gothic Text 13 Pitch	X0D225	X0D225	
Gothic Text 13 Pitch	X0D226	X0D226	
Gothic Text 13 Pitch	X0D227	X0D227	
Gothic Text 15 Pitch	X0GT15	X0GT15	
Gothic Text 18 Pitch	X0GT18	X0GT18	
Katakana		X0KN10	X0KN10
Letter Gothic Bold 12 Pitch	X0LB12	X0LB12	
OCR-A			X0AOA
OCR-B			X0OCRB

PSF selects symbol sets according to the following hierarchy:

1. If you select a symbol set that matches the print quality specified in the form definition, PSF prints the file.
2. If you select a symbol set but do not specify a print quality, the print quality selected in the printer configuration or the printer default print quality is used.
3. If you select a symbol set that does not match the print quality specified, the printer attempts to print the text using a “best fit” font, which it selects.
4. **PSF for OS/390, PSF/VM, and PSF/VSE** If you select a symbol set that is not available on the 6400 Printer, PSF does not print the remainder of the file.
5. With PSF for AS/400, if you select a symbol set that is not available on the 6400 Printer, and you specified absolute fidelity, PSF does not print the remainder of the file. If you specified content fidelity, PSF substitutes another symbol set and prints the file.

Printer Capabilities

The capabilities of the 6400 Printer are different from those of most of the other printers supported by PSF in the following ways:

- Differences in the contents of the character sets in the fonts provided by PSF and in the symbol sets resident in the 6400 Printer may result in inconsistent printed output between the two types of fonts.
- The 6400 Printer prints only with resident symbol sets.
- The PSF for OS/390 and PSF/VSE default fonts specified with the CHARS parameter in the PRINTDEV statement cause errors in which PSF issues messages saying “resource not found”. Change or override the CHARS parameter to use a 6400 Printer symbol set.
- The 6400 Printer prints text and images in 0° and 180° character rotation and prints graphics in all four rotations. The 6400 Printer does not print text in 90° or 270° rotation.
- The 6400 Printer has a 120 x 140-pel printhead, but the printer microcode enables the 6400 Printer to print with simulated 144 x 144-pel resolution.
- The 6400 Printer does not support multiple subgroups within a copy group in a form definition, nor does it print multiple copies of individual pages within a subgroup.

Chapter 27. Infoprint 62 Printer (4370)

This section describes the Infoprint 62 printer characteristics. The Infoprint 62 (Models 002 and 003) are continuous-form printers that use LED electrophotographic print technology to print text, images, graphics, and bar codes.



Figure 52. Infoprint 62 Printer

Table 105 summarizes the printer characteristics for the Infoprint 62 printers.

Table 105. Infoprint 62 Printer Characteristics

Printer Characteristic	Characteristic Value
Print technology	Light Emitting Diode
Datastreams	IPDS
Form type	Continuous
Number of input bins	Standard: Stack height up to 3000 sheets of 64 gsm paper

Table 105. Infoprint 62 Printer Characteristics (continued)

Printer Characteristic	Characteristic Value
Number of output bins	Standard: Stack height up to 3000 sheets of 64 gsm paper
	Optional: Stack height up to 2000 sheets with Power Stacker
Finisher attachments	n/a
Manual forms feed	n/a
Envelope printing	n/a
MICR printing	no
Duplex printing	no
Color	no
Adjust print-quality levels	yes
Printhead resolution	240 dots-per-inch (4370-002) 300 dots-per-inch (4370-003)
Maximum printing rates for letter (8.5 x 11 inches)	
inches per second	8.8
inches per minute	528
Maximum printing rates for letter in pages per minute ¹	
1-up landscape (8.5 inches long) simplex	62
1-up landscape (8.5 inches long) duplex	n/a
2-up portrait (11 inches long) simplex	n/a
2-up portrait (11 inches long) duplex	n/a
Maximum printing rates for A4 (210 x 297 mm)	
mm per second	225.78
mm per minute	13,546.8
Maximum printing rates for A4 in pages per minute ¹	
1-up landscape (210 mm long) simplex	64
1-up landscape (210 mm long) duplex	n/a
2-up portrait (297 mm long) simplex	n/a
2-up portrait (297 mm long) duplex	n/a
Maximum usage in pages per month (duty cycles) ²	
Letter: 1-up landscape (8.5 inches long)	600,000 simplex
Letter: 2-up landscape (11 inches long)	n/a
A4: 1-up landscape (210 mm long)	620,000 simplex
A4: 2-up landscape (297 mm long)	n/a
<p>1. Maximum printing rate is the maximum number of pages of the indicated size and configuration that can be printed at the constant speed of paper movement shown for each printer. Rates for pages of different sizes and configuration can be calculated by dividing the form length into the printer speed. Actual printing rate will be less if the printer cannot reach this rate due to complexity or density of the data or the ability of the system to deliver data at this rate.</p> <p>2. Maximum usage is based on operating 7 days a week, 24 hours a day, at maximum printing rate with normal maintenance and operations activity. IBM does not recommend reaching this monthly maximum on consistent basis.</p>	

Printable Area

Width The maximum print width for the Infoprint 62 is 14.6 inches (370.84 mm), which is the width of the print head. The maximum width for any given form cannot be wider than the width of the form, minus 1.0 inches (25.4 mm). That is 0.5 inches (12.7 mm) on each side of the print line.

Length

The printer is designed to print lengthwise to the perforation at its rated speed. As with other continuous forms printers, print quality degradation occurs near the perforation. No degradation occurs at 0.33 inches (8.5 mm) the perforation for character data, and 0.5 inches (12.7 mm) for solid area fill, logos, or images.

Figure 53 shows an example of the printable area of a form. The printable area shown is 8.17 by 10.66 inches.

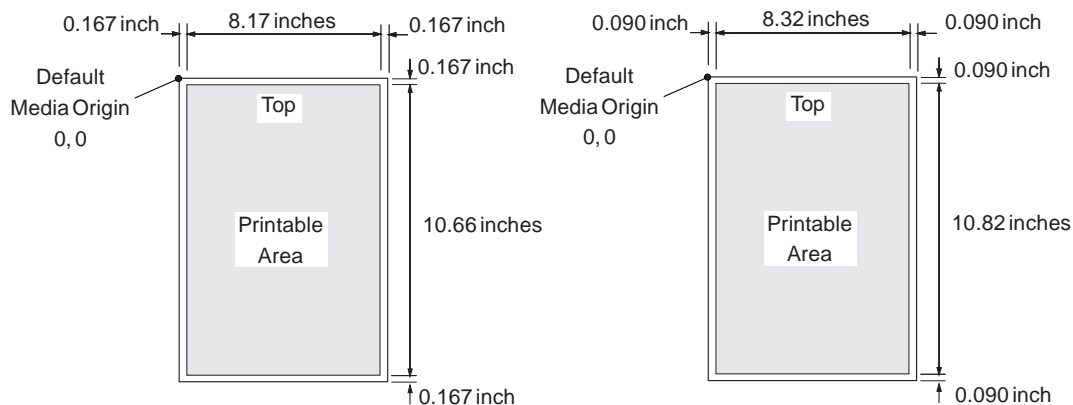


Figure 53. Printable Area in IPDS Mode on the Infoprint 62

Media Specifications

The Infoprint 62 accepts the following media:

Media types:

Preprinted or blank forms, pre-punched forms, perforated forms, security forms, approved paper labels, color paper

Media widths:

7 inches to 16 inches (178 to 406 mm); maximum print width is 14.6 inches (371 mm)

Media lengths:

3 inches to 22 inches (76.2 to 559 mm) standard; 7 inches to 12 inches (178 to 305 mm) with optional Power Stacker

Media weights:

17 to 54 lbs. (64 to 204 gsm) letter basis; 17 to 44 lbs. (64 to 165 gsm) bond; 44 to 125 lbs. (71 to 204 gsm) tag and label

Attachments

The IBM Infoprint 62 Continuous Forms Printer must be attached to either an Ethernet or Token-Ring LAN, or a S/390 Parallel Channel or ESCON Channel. The standard adapter is Ethernet 10BaseT. Attachment to Ethernet 10Base2, Token Ring, or a S/390 Parallel Channel or ESCON require available features.

Token-Ring

The IBM Infoprint 62 Printer Token-Ring Attachment (#4121) will attach to the following devices:

- 8228 Token-Ring Multistation Access Unit attached to an AS/400, PS/2, or RS/6000 processor
- 8230 Token-Ring Controlled Access Unit attached to an AS/400, PS/2, or RS/6000 processor
- 8228 Token-Ring Multistation Access Unit attached to a 3172, 3746, 3725, 3174, 3745, or 3720 attached to a 3090, ES/9000, or 308X processor.
- 8230 Token-Ring Controlled Access Unit attached to a 3172, 3746, 3725, 3745, 3174, or 3720 attached to a 3090, ES/9000, or 308X processor.
- The printer may be located a maximum distance of 100 meters (328 feet) from the 8228 Multistation Access Unit or from the 8230 Controlled Access Unit.
- The distance between the 8228 Multistation Units can be increased with either the 8220 or 8219 Optical Fiber Repeater.

Ethernet

The Infoprint 62 standard Ethernet 10BaseT attachment will attach to the following devices:

- Twisted pair cabling attached to an RS/6000, PS/2, or AS/400
- Twisted pair cabling attached to an IBM 3172 or 3745 attached to a 3090, ES/9000, or 308X processor.
- An IBM 8250 or 8260 Twisted Pair Hub

The Infoprint 62 Ethernet 10Base2 attachment (FC #4162) will attach to the following devices:

- Thin Ethernet Coaxial attached to a RS/6000, PS/2, or AS/400
- Thin Ethernet Coaxial attached to an IBM 3172 or 3745 attached to a IBM 3090, ES/9000, or 308X processor.

System/390 Parallel Channel:

System/390 parallel channel attachment is supported in the PSF for OS/390, PSF/MVS, PSF/VM, and PSF/VSE printing environments.

For S/390 parallel channel attachment, a control unit position on a S/370 parallel block multiplexer channel is required on an IBM 3090, ES/9000 processor, a S/390 Parallel Enterprise Server, or a Multiprise 2000 Server.

Attachment is also supported via the 9034 ESCON Converter Model 1 for the S/390 Parallel Channel.

ESCON Channel

The ESCON channel is supported in the PSF for OS/390, PSF/MVS, PSF/VM, and PSF/VSE printing environments.

- The IBM Infoprint 62 may be attached natively to IBM ESCON channel (3090-J, 9021, 9121, 9221, 9672, 2003).
- Attachment is also supported via the 9032/9033 ESCON Directors and 9036 ESCON Remote Channel Model 1 and Model 2.

The ESCON attachment may be shared between multiple MVS systems. To allow access by a different host, the operator must drain the printer and vary it offline to one host before varying it online to the second host.

A "Multi-Host Environment" ESCON configuration option is provided that when used with PSF for OS/390 or PSF/MVS ASSIGN/UNASSIGN support guarantees a printer on a shared attachment cannot be online to multiple hosts concurrently. A second host trying to assign the printer will be denied access with a notice that the printer is assigned elsewhere. Multi-Host Environment support increases configuration flexibility and simplifies operational procedures for ESCON-attached printers.

The Multi-Host Environment is supported only by OS/390 V1R3.0 or higher operating with either of the following:

- PSF 3.1.0 for OS/390
- PSF/MVS 2.2.0 with APAR OW29992
- PSF for OS/390

All host systems (which may be VM guests) must be OS/390 V1R3.0 or higher.

Appendix A. Migrating Your 3800 Printer Applications

Compatibility among PSF-Supported Printers

The following sections describe compatibility considerations when routing jobs among PSF-supported printers.

Page Presentation

Page presentation refers to the position of a printed page of data on a sheet. PSF supports two page presentations:

- **Portrait**, or narrow forms, in which the printed page is viewed with the shorter edges of the form at the top and the bottom of the page and the longer edges at the sides of the page
- **Landscape**, or wide forms, in which the printed page is viewed with the longer edges of the form at the top and the bottom of the page and the shorter edges at the sides of the page

All currently marketed PSF-supported printers have the same default media origins. Because the media origin relates to the print direction (ACROSS, DOWN, BACK, and UP), it also is used in determining the page presentation. For continuous-forms printers, the ability to use forms that feed through the printer with either a narrow or a wide leading edge adds another factor to the determination of page presentation.

See Figure 54 on page 158 for examples of media origins and print directions supported by PSF printers.

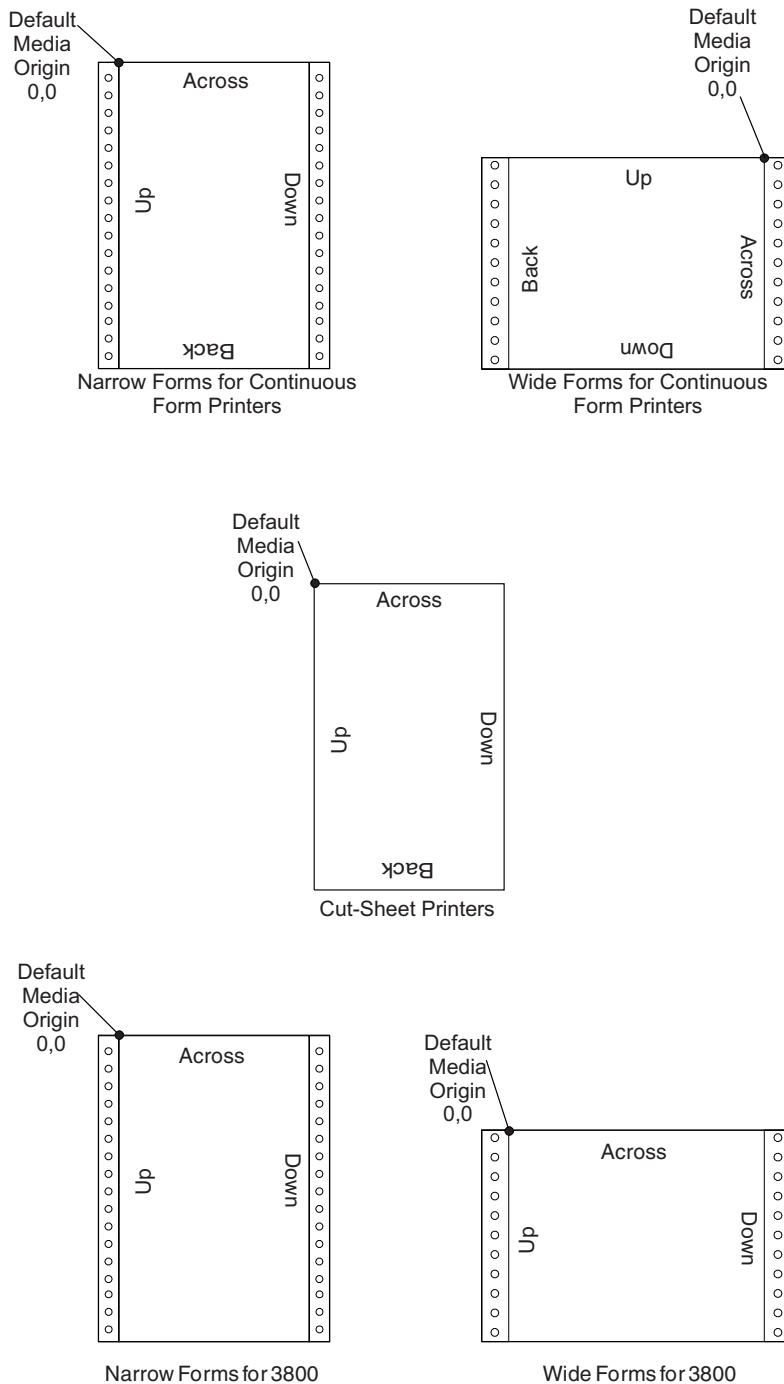


Figure 54. Media Origins and Print Directions for PSF-Supported Printers

Page-presentation and print-direction controls are included in the form definition to allow presentation compatibility across PSF-supported printers. The result of these controls is to change the media origin for the pages printed using the copy group containing the controls. Not all printers support changing of the media origin. The print direction specified in the page definition or in the composed-text data does not need to be changed when a form definition containing these compatibility controls is used. Rather, the print direction in the page definition or composed-text data should be used to determine which print-direction control to specify in the form definition.

You can build form definitions for page-presentation compatibility using PPFA. For more information, refer to *IBM Page Printer Formatting Aid: User's Guide*.

When Not to Use Compatibility Form Definitions

You do not need to use form definitions that contain page-presentation and print-direction controls when you are using:

- Only cut-sheet printers.
- Only narrow forms on a continuous form printer (other than a 3800).
- Only a 3800.
- Print data that is formatted in the BACK or UP direction, which is specified in the page definition or by the program formatting the data.

When To Use Compatibility Form Definitions

You do need to use form definitions that contain page-presentation and print-direction controls when you are:

- Printing data that was formatted for a newer continuous forms printer. See “Example: ACROSS Print Direction with Wide Forms” on page 161.
- Using wide forms on an AFCCCU printer when the print data is formatted in the DOWN print direction.
- Using both narrow and wide forms on an AFCCU continuous forms printer.

Compatibility between an AFCCU continuous forms printer and 3800

PSF provides form definitions that you can use for page-presentation compatibility between a 3800 and an AFCCCU continuous forms printer. Figure 55 on page 160 shows the output on the 3800 and on the other printers using these form definitions.

The examples in Figure 55 on page 160 assume that you are using the same forms on the printers; that is, not changing from wide to narrow forms between printers, or from narrow to wide forms between printers. However, you could change forms in any of the four examples without affecting the page presentation of your output as long as the print direction in the form definition matches the print direction in the page definition or composed-text data.

If you migrate an application from one form to another, remember that the top and left margins change places.

Note: The compatibility form definitions shown in Figure 55 on page 160 specify a page position of 0.0 inch across and 0.5 inch down. This page position is within the printable area of the 3800 as well as that of the AFCCU continuous forms printers.

If you want output formatted for the 3800 (as shown below) to look the same on the AFCCU Continuous Form Printers

use this IBM-supplied form definition:

or create a form definition specifying

the direction specified in the page definition is:

F10101LA

Landscape Presentation
Across Direction

ACROSS

F10101PD

Portrait Presentation
Down Direction

DOWN

F10101PA

Portrait Presentation
Across Direction

ACROSS

F10101LD

Landscape Presentation
Down Direction

DOWN

NOTE: You can use these form definitions for printing on any of the Continuous Form Printers

Figure 55. PSF-Supplied Form Definitions.. These form definitions are for Compatibility Between the 3800 and the AFCCU continuous forms printers. Note that the second and fourth entries use data that is formatted in the DOWN print direction.

Compatibility between Cut-Sheet Printers and AFCCU continuous forms printers

PSF provides form definition F1C10110 for page-presentation compatibility between cut-sheet printers and AFCCU continuous forms printers. See "Example: DOWN Print Direction with Wide Forms" on page 161

on how to use this form definition. “Example: ACROSS Print Direction with Narrow Forms” on page 162 contains an example of when page-presentation controls are not needed for printing the same file on cut-sheet and AFCCU continuous forms printers.

A factor to consider if you are creating your own form definition for compatibility between cut-sheet printers and an AFCCU continuous forms printer is the printable area of the printers.

Example: ACROSS Print Direction with Wide Forms

If your data is formatted in the ACROSS print direction for landscape page presentation, as is commonly used for a 3800, and will be printed on wide forms on an AFCCU continuous forms printers, you must use a form definition with correct page-presentation controls to produce readable output. If not, the print data may go beyond the valid printable area on the AFCCU continuous forms printer, as shown in Figure 56 because the hardware origin for the AFCCU continuous forms printer is different from the hardware origin of the 3800.

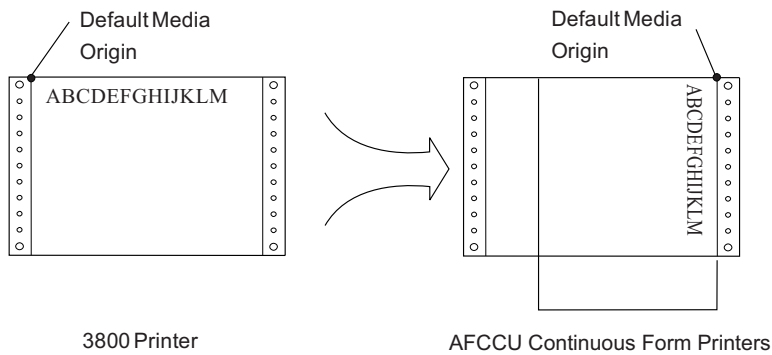


Figure 56. Valid-Printable-Area Error: AFCCU Continuous Forms Printer Output with Incorrect Form Definition

If, however, you use a form definition with the correct page-presentation controls, your output will be printed correctly, as shown in Figure 57. In this example, you could use the PSF-supplied form definition, F10101LA, which specifies a landscape page presentation and an ACROSS print direction. This form definition can also be used for data formatted in an ACROSS print direction to print in the landscape page presentation on narrow forms. The page-presentation controls are not required in this case, but you can now use this form definition regardless of whether the data is to print on wide forms or on narrow forms.

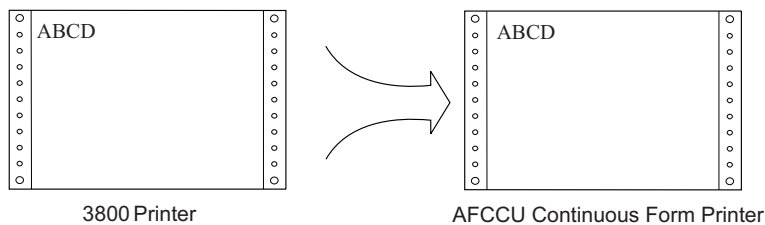


Figure 57. Using PSF Form Definition F10101LA to Prevent Valid-Printable-Area Errors

Example: DOWN Print Direction with Wide Forms

If your data is formatted in the DOWN print direction for landscape page presentation on a cut-sheet printer or on 3800 narrow forms and will be printed on wide forms on an AFCCU continuous forms printer, you must use a form definition with correct page-presentation controls to produce readable output. If not, the data will be printed in the landscape page presentation; however, the data will be upside down, as shown in Figure 58 on page 162, because the hardware origin for an AFCCU continuous forms printer is located on the leading-left corner of the short side of the form, regardless of whether a narrow form or a wide form is used.

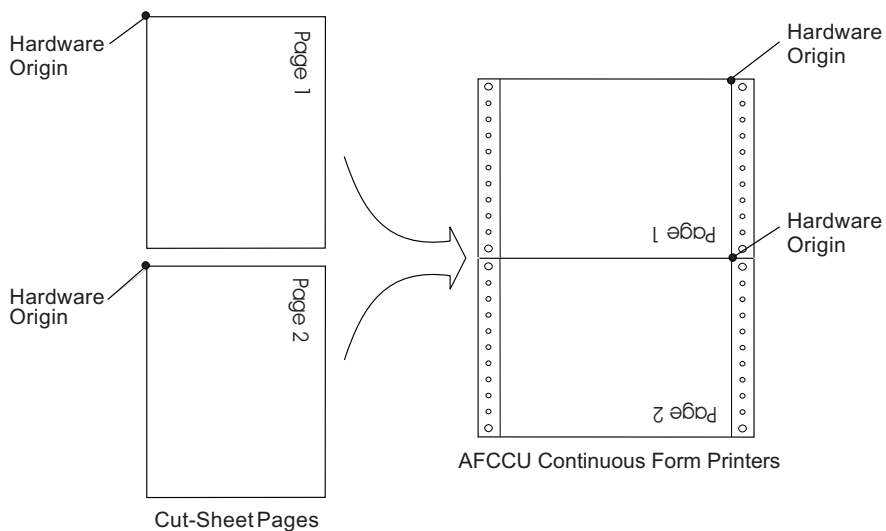


Figure 58. Upside-Down Printing: AFCCU Continuous Forms Printers Output with Incorrect Form Definition

If, however, you use a form definition with the correct page-presentation controls, your output will be printed correctly, as shown in Figure 59. In this example, when migrating from a cut-sheet printer, you can use the PSF-supplied form definition, F1C10110, which specifies the landscape page presentation and the DOWN print direction. If you are migrating from 3800 narrow forms instead of cut sheets, you can use the PSF-supplied form definition, F10101LD, which specifies the landscape page presentation and the DOWN print direction.

The F1C10110 form definition can also be used for data formatted in the DOWN print direction to print on narrow forms on an AFCCU continuous forms printer. The page-presentation controls are not required in this case, but you can now use this form definition regardless of whether the data is to print on wide forms or on narrow forms on the AFCCU continuous forms printer. See “Example: ACROSS Print Direction with Narrow Forms” for more information.

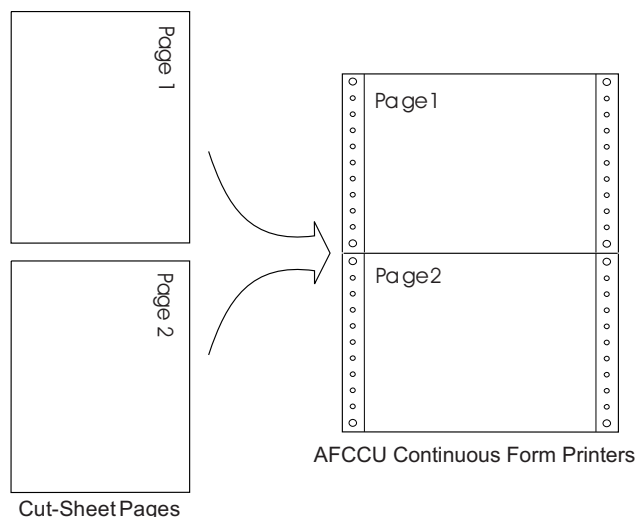


Figure 59. Using PSF Form Definition F1C10110 to Prevent Presentation Errors

Example: ACROSS Print Direction with Narrow Forms

If your data is formatted in the ACROSS print direction for portrait page presentation on a cut-sheet printer and will be printed on narrow forms on an AFCCU continuous forms printer, the form definition you specify

does not need to contain page-presentation controls to produce readable output on these printers. However, you must consider the differences in printable areas between the printers.

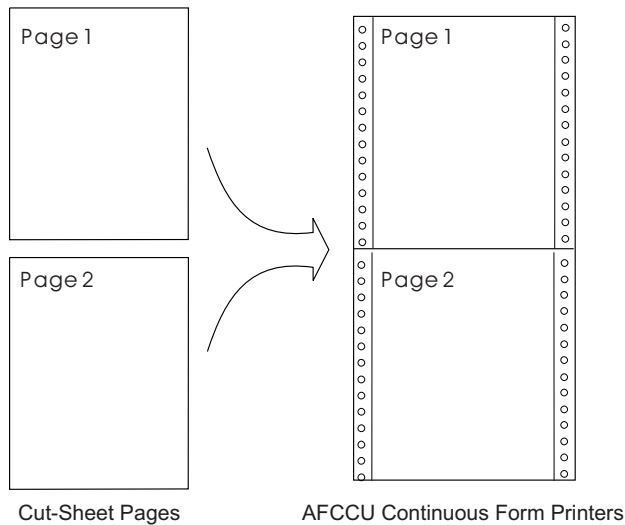


Figure 60. No Compatibility Form Definition Required

When you replace an IBM 3800 printer with IBM's Infoprint 3900 printer or Infoprint 4000 printer, you need to migrate the applications that were running on the 3800 printer. Printing Systems has offerings that assist in migrating the applications.

The 3800-3 and 3800-6 printers have two different operating modes:

- 3800 Advanced Function Presentation (AFP) mode operating under Print Services Facility (PSF)
- 3800-1 compatibility mode (also called "line mode") operating under JES alone.

There are migration considerations for applications running in either of these modes. This document describes the migration considerations and IBM's solution for them. This document covers migration for IBM 3800 printers only. It does not cover migration from OEM printers that emulate 3800 printers. In general, migration issues are the same for functions that faithfully emulate 3800 printer functions. However, OEM printers may include functions that were not supported on 3800. Notably Siemens (now OCE) printers included an "enhanced" line mode, also called "e-mode" that added additional formatting capabilities. These functions are not discussed in this document and are not addressed by the offerings described. If you are migrating from an OEM printer, contact Printing Systems Technical Support for information specific to that printer.

In addition to having a unique non-AFP operating mode, the 3800 printer is the only IBM printer equipped with a forms flash. In either 3800 AFP mode or 3800 line mode, the operator can load what is essentially a large photo negative into the printer, and the printer will flash that negative onto the printed pages. If applications are using a forms flash, this function must be replaced with an Electronic Overlay for AFP applications, or with a flash diskette if the application is migrated to hardware line-mode.

3800 AFP Mode

The 3800-3 printer was the first IBM printer to support AFP. In general, 3800 AFP operates the same as AFP on the newest Infoprint 4000 printers. But there are some differences caused by improvements in implementation over the years. These differences are:

Fonts The 3800 AFP fonts are now called "unbounded box" fonts. All AFP printers since the 3800 use a more advanced format of raster fonts called "bounded box". The 3800 AFP fonts will not print on any other AFP printer. You must have bounded-box fonts instead. If your applications are using only IBM-supplied fonts, there is no problem. All the AFP fonts supplied by IBM for the 3800 are

also supplied in bounded-box format for the 3900 and Infoprint 4000. However, if your applications use customized fonts, these fonts must be converted to bounded-box format to enable printing on a 3900 or 4000.

Form Origin

The 3800 form origin is always top/left - just inside the left tractor strip on the leading edge of the paper. Later AFP continuous-forms printers (3835, 3900, and Infoprint 4000) have the capability to set the form origin to other corners of the sheet, based on PRESENT and DIRECTION parameters in the Form Definition. The default orientation is the top left of the short edge of the physical sheet, which provides compatibility with cut-sheet printers. For forms that are longer than they are wide (for example 11 inches long by 9.5 inches wide), the default origin for these printers is the same as for the 3800. Unfortunately for forms that are wider than they are long (for example 12 inches wide by 8.5 inches long), the default for non-3800 printers is not the same as the 3800 printer origin. One option is to create a form definition for each job which specifies the correct options to place the origin at the 3800 position. Another option is to use a function provided by PSF/MVS 2.2, allowing you to set bits in PSF Exit 7 indicating jobs for which 3800 form origin will be applied. Logic in the exit can select specific job, jobs of certain classes, or any other criteria which could be deduced from the job JCL available to the exit.

3800 Compatibility Mode

No other AFP printers have a 3800-1 compatibility mode. Jobs running in 3800-1 compatibility mode, or "line-mode" as it is sometimes called, usually present the largest challenge to printer upgrade. These jobs use non-AFP resources:

- Forms control buffers (FCB)
- Library characters sets (LCS)
- Graphical character modules (GRAPHMODs)
- Copy modifications (COPYMODs)

In addition, printing of characters is handled differently in line mode for situations where characters print partially off the page, or where characters of different sizes are merged together in the same print line.

It is strongly recommended that customers perform a full conversion of their jobs to AFP to gain the advantages of AFP and simplify their operational procedures. However for those customers who cannot or do not wish to convert their applications, there are two offerings that address 3800 compatibility mode jobs:

Hardware RPQs for specific 3900 and Infoprint 4000 printers

These RPQs allow the printers to emulate 3800 compatibility processing. The RPQs and specific printers are:

- RPQ 8B3997: 3900-01
- RPQ 8B3937: 3900-0W1, 3900-0W3, Infoprint 4000 IS1 (240 dpi and 229 ipm only)

PSF/MVS 2.2 function "3800 Line Mode conversion"

This is a standard feature of PSF/MVS 2.2 that allows PSF to process many 3800 compatibility jobs without change to the job, JCL, or resources.

In general, the hardware RPQ should be used for accounts that do not have PSF, or do not plan to migrate to AFP in the near future. The PSF function should be used for accounts that are currently running PSF but are unable to convert their 3800 line-mode applications to AFP in a timely fashion. However, there are other differences in the characteristics, limitations, and implementation options of these two offerings which may play a factor in the decision of whether to use one or the other of them. The major considerations are:

- 3800 Compatibility Hardware RPQ:
 - If also running AFP jobs, operator must switch printer between AFP mode and line-mode
 - Uses 3800 line-mode resources (character sets, GRAPHMODs, and so forth)
 - Does not require PSF, unless AFP printing is also desired

- Performance limitation for jobs with dense or complex data
- PSF/MVS Line-Mode Function:
 - Can intermix line-mode and AFP job. Do not need to switch printer mode.
 - Requires AFP bounded-box fonts.
 - Requires PSF/MVS.
 - Cannot handle jobs which use COPYMODS.
- Both options:
 - If using 3800 Forms Flash, flashes must be converted
 - 3800 Tape-to-Print feature is not supported
 - Post-Processing equipment, supplies, paper, and attachments must be compatible with the 3900 or 4000 printers

Hardware RPQ for 3800 Compatibility

The 3800 Compatibility Mode RPQ provides a separate microcode load for the supported 3900 or 4000 printer that enables it to run as a 3800-3 or -6 operating in 3800-1 compatibility mode. This RPQ is intended to facilitate the migration of 3800 workloads without the need to convert resources or JCL, or install higher levels of software. The RPQ is supported only when the printer is attached via a S/370 parallel channel. The RPQ is also supported only on operating systems which supported the 3800-3 operating in 3800-1 compatibility mode: MVS and VM.

With this RPQ, the printer operates in either of two modes: normal AFP mode, or 3800 compatibility mode. PSF is not required if the account elects to run only in 3800 compatibility mode. PSF is required for running the printer in normal AFP mode. Details for defining the printer and switching it between Compatibility Mode and AFP mode are included with the RPQ.

With the exception of the forms flash, the 3900 or 4000 operating in compatibility mode should process all 3800 compatibility mode print streams in the same fashion as the 3800. In particular, the FCB, LINECT, COPIES, COPYMOD, SETPRT, GRAPHMOD, MODIFY, CHARS, TRC, OPTCD=J, and line merge functions should operate as usual.

The 3800 Tape-to-Print feature is **NOT** supported with the 3900 or 4000, even with this RPQ installed.

3800 Forms Flash is not physically supported by the 3900 or 4000. Each forms flash must be replaced by an electronic version of the forms flash. A Services Offering is available to create these electronic forms flashes; there is no tool available for this.

The electronic flash is created as a file on a diskette which can be loaded into the printer controller. The flash can be maintained on diskette, or stored on the printer hard drive (up to 8 flash files can be stored on the printer hard drive). Once the electronic flash has been created, operational procedures are similar to those for loading of the forms flash. When the JCL forms flash parameter creates a console message to load the forms flash, the operator will instead enter a console request to load one of the flash files stored in the printer, or load the 3.5-inch diskette containing the electronic overlay in the diskette reader of the 3900 or 4000 controller. Each overlay will be on a separate diskette. The elapsed time for this operator activity should be the same or less than that required for physically loading the forms flash. It is probable that an installation will have several such diskettes, one for each electronic overlay needed. Operational procedures must be updated accordingly, and consideration given to storage and organization of the diskettes. Since the overlay diskettes are conventional DOS diskettes, normal PC utilities can (and should) be used to create backup copies of the overlay diskettes. At least one set should be stored in a safe area outside the immediate printer area for backup purposes. Current practices for backup copies of forms flashes should be reviewed for applicability.

Performance Considerations

The controllers inside the 3800 and the 3900-01 printers were specifically designed to maximize throughput of printer data. By contrast, the 3900-0W1, 3900-0W3, and Infoprint 4000 IS1 printers use as

their controllers IBM RISC processors that are not specialized for printer data. This is not an issue when printing in AFP mode. PSF sends IPDS data to the printer in large blocks which the RISC processors handle quite efficiently. However, in line mode there is no PSF and no IPDS. Instead, the operating system is sending the data in CCW records, one CCW per print record. The RISC processors are not tuned to receiving, processing, and acknowledging many small individual records in a short time frame. The more print records per inch of paper length, the higher processing rate is required.

In general, a job which averages more than 66 print records per 11 inches of paper may not print at rated speed. Many jobs defined with more than 6 lines per inch will average less than 66 records per 11 inches, since records are not printed on every line of every page, and since the 3800 has a 1/2-inch unprintable border at top and bottom of each sheet. However, jobs defined with 6 lines per inch can average more than 66 records per 11 inches if multiple records are printed per line. This can occur if COPYMODS are used, or if a technique called line-merge is used. Line-merge is a 3800 technique for printing multiple records on the same print line. Each of these records requires its own CCW. For this reason, applications should be reviewed carefully, and arrangements can be made with IBM Printing Systems Division to test jobs which might have performance problems.

RPQ Installation Considerations

Procedures for installing, operating, maintaining the new 3900 or 4000 printer must be carefully planned and followed, as with any new printer installation. Some considerations for this step are reviewed in the final section of this document.

- Forms flashes must be converted to electronic overlays, and procedures set in place for usage, storage, organization and back up of the electronic flashes.
- Operators must be trained in the procedures for executing Compatibility Mode functions on the new printer. Documentation on the new operator functions and options is included with the RPQ.
- The RPQ is installed from diskettes by the CE. The diskettes contain microcode for operating compatibility mode and also for new printer console options for managing the printer in Compatibility Mode.
- Critical applications should be tested prior to production cut-over. Adequate lead time should be allowed for overlay generation and testing with applications.

PSF/MVS Line Mode Function

PSF/MVS 2.2 includes a function for 3800 Line Mode Conversion. This capability is documented in the *PSF/MVS 2.2 System Programmer's Guide*, S544-3672. This function allows many jobs which executed in compatibility mode on the 3800-3 or 3800-6 printers to run without application or JCL changes on a 3900, Infoprint 4000, or other AFP printer. This function differs from the hardware RPQs in these significant areas:

- PSF/MVS is required for function. (With the hardware RPQ, PSF is not required if only compatibility mode jobs are being processed. However PSF is required if AFP print jobs are also to be processed.)
- AFP jobs can be intermixed in the job stream with compatibility mode jobs. The printer does not have to be switched between two different modes of operation. This may make it easier for your customer to begin the step toward full AFP implementation.
- AFP fonts must be supplied in place of the 3800 character sets and GRAPHMODs.
- 3800 jobs which use the **COPYMOD** function cannot be processed by PSF Line Mode.

How PSF/MVS Line Mode Works

The PSF/MVS Line Mode function allows PSF to dynamically build and use inline page definition and form definition resources for compatibility mode jobs. The resources are built using information in the job's FCB and JCL parameters for LINECT, COPIES, and FLASH.

PSF accesses the job's FCB in SYS1.IMAGELIB to obtain information for building the page definition. Page height will include the full printable page area to allow room for character ascenders and descenders

that may have been truncated by a 3800 executing in compatibility mode. In compatibility mode, the 3800 will print a partial character, even if the top or bottom of the character extends beyond the printable area. PSF will not print a partial character. If any part of the character is off the page, an error is generated. However, the 3800 had a 1/2-inch unprintable area at top and bottom of the sheet. Including this area in the PSF page size guarantees that characters which could be printed on the 3800 in line mode are also printable under PSF Line Mode.

PSF uses information on the dimensions of paper currently loaded in the printer to create a form definition that contains the presentation options for orienting the print on the paper in the same direction as the 3800 would. The form definition can also contain unique page offsets identified for the job in PSF Exit 4. If a forms flash is used for the job, the form definition will reference an electronic overlay of the same name. The account must ensure that an electronic overlay with the same name (prefixed "O1") has been created and placed in the PSF resource library.

In addition, the account must ensure that all 3800 character sets and GRAPHMODs are available as AFP bounded-box fonts in the PSF resource library. AFP versions of all 3800-supplied character sets are supplied with PSF/MVS. Equivalent AFP fonts must be created or substituted for any non-standard character sets used by compatibility mode print jobs.

The PSF/MVS Line Mode function cannot be used to process jobs which specify the JCL keyword **MODIFY=xxxx**. These jobs use the 3800 COPYMOD function. There is no equivalent for the COPYMOD in PSF Line Mode capability. Jobs using COPYMODs must be converted to AFP, or printed using the hardware 3800 compatibility RPQ. If a job using COPYMODs is encountered, PSF will issue an error message and place the job on HOLD.

You should also be alert for jobs which use a special post-processing routine and character set to create the 3800-1 version of rotated print. While it may be possible to convert the rotated character set for the AFP printer, it is much easier to remove the rotate post processing step and use standard AFP fonts and AFP capabilities to rotate the job.

Invoking PSF/MVS Line Mode Function

The PSF/MVS Line Mode function is triggered through PSF/MVS Exit 4 for jobs which print through the JES Spool. If accounts are using PSF Direct Printing, instead of using the JES Spool, Line Mode can be enabled for Direct Printing using Exit 14. Samples APSUX04X and APSUX14X are provided in the SAMPLIB shipped with PSF/MVS. For simplicity, for the remainder of this document we will reference only Exit 4. Accounts using PSF Direct Printing will find similar functions available in Exit 14.

To activate Line Mode processing, in Exit 4 you indicate which jobs should be processed as Line Mode. Since the exit has access to all the JCL parameters for the job, you may choose to identify jobs based on any of these parameters, for example: Job Name or Job Class. You may also set up a table in the exit to indicate special print offsets for different jobs based on any of the parameters available to the exit. This allows PSF Line Mode function to emulate the print offsets that could be entered by 3800 operators for matching print to special forms.

PSF/MVS Line Mode will provide compatibility mode processing only for those jobs selected by Exit 4. However, not all jobs selected by the Exit will be processed in Line Mode. Any job that has a PAGEDEF or FORMDEF parameter coded in its JCL will be ignored for compatibility mode processing. PSF will assume that the job has been designed for AFP printing and process it as a normal AFP job.

As noted above, the PSF Line Mode function cannot process jobs that use COPYMODs. If a job which specifies MODIFY in the JCL is identified in Exit 4 for line mode processing, PSF will issue an error message and request that the job be held by the system. Note that if the same job were not identified in Exit 4, it would print as a normal AFP job with the MODIFY parameter simply ignored.

Considerations for Line-Merge Jobs

Additional processing is needed for jobs which use an application technique called line-merge to mix character sets on the same print line. On the 3800 this is done by coding Table Reference Characters (TRCs) and a "print-no-space" carriage control byte in the print records. This coding will also cause a line merge on an AFP printer; however, the line merge operates differently. The 3800 merges character per character, the AFP printers merge pel per pel. If the merge occurs between characters of different widths (pitches), the resulting print position will be different on an AFP printer than on the 3800.

The PSF Line Merge Function provides special processing for jobs that use line merge. If Exit 4 indicates that the job uses Line Merge, PSF will process every record of job (instead of just the first record in the data set) examine each record for line merge, and reproduce the 3800 line merge positioning. Because of the extra processing involved, PSF only does this for jobs which indicate in Exit 4 that the processing is needed. If you do not know which of its jobs use line merge, a good approach is to examine print job JCL to identify jobs that are using multiple fonts and therefore may be mixing these fonts on a printline using line merge. These jobs would require both of the following JCL parameters:

- OPTCD=J which indicates that table reference characters (TRCs) are used to select different fonts for different records.
- CHARS=(xxxx,yyyy,....) indicating multiple character sets.

If all the character sets listed in the CHARS parameter are fixed pitch and all of them have the same pitch, such as GT10 and GB10, you will not have a problem. The line merge will work the same on the AFP printer, without extra processing by PSF Line Mode. But if any of the character sets in the CHARS parameter are mixed pitch, such as the tri-pitch BITR, or if any two have different pitches, such as GT10 and GT12, then you have a potential line-merge problem. For these it would be wise to indicate additional Line Merge processing.

Printers Supported by PSF/MVS Line Mode

PSF/MVS Line Mode was designed for processing 3800 jobs on continuous form AFP printers such as 3835, 3900, and Infoprint 4000. It can also be used to print 3800 jobs on AFP cut-sheet printers, if the print jobs will fit on the cut-sheet paper. While 3800 jobs that printed on 8.5 inch wide paper should easily fit on cut sheet paper, those designed for 12 inch or 14 inch paper probably will not. PSF/MVS Line Mode will not rotate 3800 jobs on cut-sheet printers to try and make them fit the paper.

PSF/MVS Line Mode will not support printing on a 3800 printer. Some accounts may wish to transfer jobs from compatibility mode to AFP mode on a 3800 printer. However because of limitations of the 3800, the PSF/MVS Line Mode function will not process jobs destined for a 3800 printer. An error message will be issued. PSF will terminate processing of the job and request that the job be held by the system.

The PSF/MVS Line Mode function can be used with Cut-Sheet Emulation. Cut-Sheet Emulation is an automatic 2-UP provided by Infoprint 4000 printers in conjunction with PSF. Line Mode jobs can also be printed in duplex, on a duplex printer. A special bit must be set in Exit 4 to indicate that duplexing is desired.

Implementing PSF/MVS Line Mode

The following steps must be taken to use PSF/MVS Line Mode processing:

- Install PSF/MVS 2.2.
- Ensure AFP fonts are available in the PSF resource library for all 3800 LCSs and GRAPHMODs used by the jobs being processed.
- Ensure Electronic Overlays are created and available in the PSF resource library for all 3800 forms flashes used.
- Screen the 3800 jobs to identify any using COPYMODS or merging lines with different sized characters.
 - COPYMODS cannot be processed using PSF Line Mode
 - Jobs merging fonts of different sizes must be flagged for extra processing by PSF.

- Modify PSF/MVS Exit 4 to indicate jobs that require Line Mode Processing and those that require additional line-merge processing.

Now you are ready to process 3800 compatibility mode jobs on your AFP printer.

3900 or 4000 Installation Considerations

As with installation of any new printer, particularly one in the 3900 or 4000 class, careful preparation must be made for installing, operating, and maintaining the new printer. The IBM *Introduction and Planning Guide* for the printer should be carefully reviewed, and installation checklists should be carefully followed. The list below cannot be considered a comprehensive list. However, it does point out some of the issues to be considered when upgrading from a 3800 printer to a 3900 or 4000.

- If installing the 3900 or 4000 for use only with the Hardware RPQ for 3800 compatibility, the printer would be defined to the system as a 3800 Line Printer. System definitions would not need to be changed. However if the new printer will be used to process AFP print jobs as well as compatibility print jobs, it must also be defined to the operating system and to PSF as a 3900 or 4000 printer.
- Review attachment requirements for the new printer. For example, Infoprint 4000 printers and the 3900 wide and duplex printers require a minimum data streaming rate of 1.9 MB, and are not supported on 3044 Model 1 channel extenders. If you are using non-IBM channel extenders, check with your channel-extender vendor regarding support for the new printer.
- The specifications of all paper stocks used should be reviewed to insure they meet the specifications for the new printer. For example, the 3800 could accept paper weights as low as fifteen pounds; the lowest weight for the 3900 is sixteen pounds.
- Supplies (toner, developer, and so forth) must be ordered for the new machine.
- BTS equipment must be installed or modified as needed.

Appendix B. Font Information for IPDS Printers

Font Terminology, Names of Font Groups, and Font Structure

The first few pages of this appendix describe font terminology, the names of groups of fonts, and font structure. The appendix then lists the fonts available in the printers that contain resident fonts.

IBM ships fonts in a product called the IBM AFP Font Collection. To learn more about the AFP Font collection, refer to the *Fonts Summary for AFP Font Collection* and the *Technical Reference for IBM Expanded Core Fonts*. The AFP Font Collection contains the following fonts:

- IBM Expanded Core Fonts
 - Boldface
 - BookMaster Latin1
 - BookMaster Specials
 - Courier
 - Courier APL2
 - Gothic Katakana
 - Gothic Text
 - Helvetica
 - IBM Logo
 - Letter Gothic
 - OCR(OCR-A and OCR-B)
 - Prestige
 - Times New Roman

IBM Font Structure and Terminology

In IBM font terminology, a font has three components:

- Coded font
- Font character set
- Code page

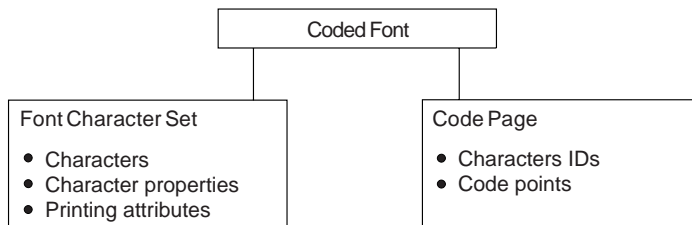


Figure 61. Font Components

Coded Font

A *coded font* translates your request for type (for example, text you previously entered at a computer terminal) into characters for printing. A coded font, which associates a specific code page with a specific font character, consists of two parts:

- References to specific font character sets
- References to specific code pages

1. A pel is a pixel, picture element, or dot. The sequence of dots that form a character is called a *raster pattern*. The number of dots per inch that a printer generates is called the :hp1.print resolution:ehp1. or pel density. A resolution of 240 pels means that a printer prints 240 pels per inch both vertically and horizontally, or 57 pels per square inch (240 x 240).

A character must be included in the specified font character set and listed on the specified code page before it can be printed.

Font Character Set

A *font character set* contains the characters of a single type family, typeface, and type size. In addition, a font character set specifies *character properties* and printing attributes.

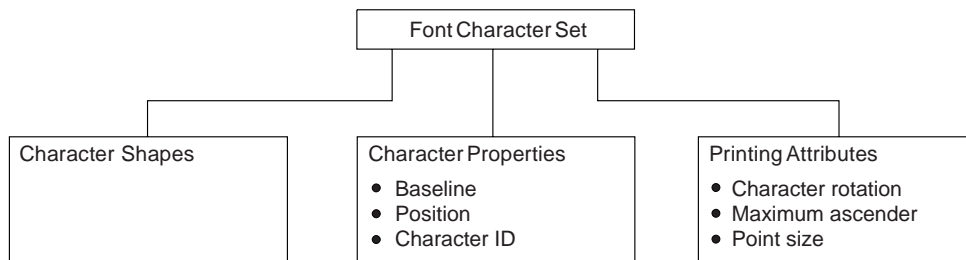


Figure 62. Composition of a Font Character Set

Characters, Character Properties, and Printing Attributes: *Characters* are the letters, numerals, punctuation marks, or other symbols of a font.

Character properties describe how a character is positioned relative to the characters around it. Some character properties include the following:

- The baseline of a character, showing its alignment on the writing line
- The dimensions of space in which the character is printed
- The position of the character within that space
- The identifier of the character (the character ID or graphic character ID)

Each character is assigned a character ID; for example, the character A (uppercase A) is assigned the character ID LA020000.

The purpose of a character ID is to distinguish the character from other, similar characters. For example, the following characters look similar; however, they are different and are assigned different character IDs:

Minus sign (–)

Character ID SA000000

Hyphen (-)

Character ID SP100000

Em dash (—)

Character ID SM900000

The *printing attributes* define how the font character set will be printed. Some printing attributes include rotation of characters, maximum ascender, and point size.

Code Page

A *code page* maps each character of text to the characters in a font character set. Figure 63 on page 173 shows how a code page maps text to the characters in a font character set. As you enter your text at a computer terminal, each keyboard character is translated into a *code point*. When the text is printed, each code point is matched to a character ID on the code page you specified. The character ID is then matched to the image of the character in the font character set you specified. The image in the character set is the image that is printed.

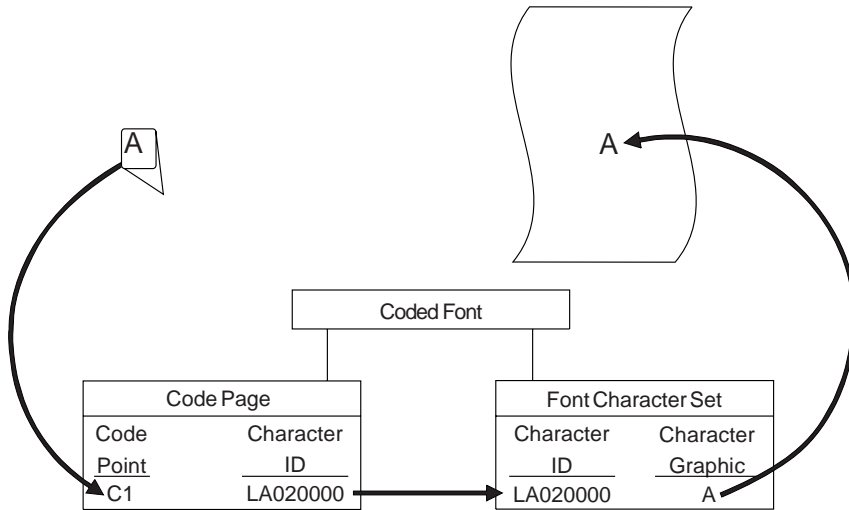


Figure 63. Translation of a Keyboard Character into a Printed Character

A character ID is an 8-byte character data string. A code point is an 8-bit binary number representing one of 256 potential characters (the maximum number of characters available on a code page). Code points are usually shown as hexadecimal representations of their binary values.

Binary

11000001

Decimal

193

Hexadecimal

C1

Figure 64 on page 174 shows an example of part of a code page. When the printer receives hexadecimal code point C1 for the code page shown (code page T1V10037), it prints an uppercase A (character ID LA020000).

T1V10037 Country Extended: United States, Canada

CPGID	GCSGID	Undefined Code Point	Type
37	697	SP010000	ExpCore 4028 Compatibility Licensed Program

Hex Codes 1st→ 2nd↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	SM030000 &	SP100000 -	LO610000 ø	LO620000 Ø	SM190000 °	SM170000 μ	SD150000 ^	SM110000 {	SM140000 }	SM070000 \	ND100000 0
-1	SP300000	LE110000 é	SP120000 /	LE120000 É	LA010000 a	LJ010000 j	SD190000 ~	SC020000 §	LA020000 A	LJ020000 J	SA060000 ÷	ND010000 1
-2	LA150000 â	LA150000 ê	LA160000 Â	LE160000 Ê	LB010000 b	LK010000 k	LS010000 s	SC050000 ¥	LB020000 B	LK020000 K	LS020000 S	ND020000 2
-3	LA170000 ä	LE170000 ë	LA180000 Ä	LE180000 Ë	LC010000 c	LL010000 l	LT010000 t	SD630000 ·	LC020000 C	LL020000 L	LT020000 T	ND030000 3
-4	LA130000 à	LE130000 è	LA140000 À	LE140000 È	LD010000 d	LM010000 m	LU010000 u	SM520000 ©	LD020000 D	LM020000 M	LU020000 U	ND040000 4
-5	LA110000 á	LI110000 í	LA120000 Á	LI120000 Í	LE010000 e	LN010000 n	LV010000 v	SM240000 §	LE020000 E	LN020000 N	LV020000 V	ND050000 5
-6	LA190000 ã	LI150000 î	LA200000 Ã	LI160000 Î	LF010000 f	LO010000 o	LW010000 w	SM250000 ¶	LF020000 F	LO020000 O	LW020000 W	ND060000 6

Figure 64. Part of IBM Code Page T1V10037

Different Code Pages

Code pages accommodate various national languages by using characters and special symbols appropriate to the language. Code pages can have identical character IDs assigned to different code points.

For example, the character é (lowercase e accent acute, character ID LE110000) has the following code point assignments in two different code pages:

- Hexadecimal code point 51 in code page T1V10037 (Country Extended: United States, Canada, Figure 64)
- Hexadecimal code point 5A in code page T1V10280 (Country Extended: Italy)

Global Resource Identifier (GRID)

You might encounter the term *GRID* in other Advanced Function Presentation (AFP) publications. A GRID, an acronym for Global Resource Identifier, is used by AFP printers to identify resident fonts, to perform font substitution, and by some operating systems and applications to identify fonts used in text. A GRID is often used by PSF to determine if a printer-resident font is available for activation or if a font must be downloaded.

GRID values are also used in font substitution scenarios. For example, if a font is requested that is not resident in the printer, nor is it resident on the host system, an alternate font may be selected for download (or activation) by PSF. GRID tables are built into PSF for this purpose. These tables are also used to cross-reference font resources names and GRID values.

A GRID is similar to a coded font in that it identifies a character set, a code page, and the size of the characters to be printed. It does this by using the following four identifiers that can be used to uniquely identify font resources:

- A Font Global Identifier (FGID) is used to identify a typeface. For example, FGID 2305 is assigned to Helvetica Bold. Note that FGID 2305 applies to ANY Helvetica Bold typeface regardless of the language complement being used.
- A Code Page Global Identifier (CPGID) is used to identify a code page. For example, CPGID 1148 is used to identify code page T1001148.
- A Graphic Character Set Global Identifier (GCSGID) is used to identify a unique collection (list) of characters and is how the language complement is specified. For example, GCSGID 2039 is used to identify the characters required to support the Latin1 language complement. Note that GCSGID 2309 applies to ANY Latin1 language complement regardless of the typeface being used.

Since a GCSGID simply identifies a list of characters, it can (and is) used in both character sets and code pages. When used in a code page, the GCSGID identifies the list of characters contained in the code page and is the value most commonly used in a GRID. The printers and PSF have GCSGID superset/subset tables that are used to resolve the requested GCSGID down to a font that supports it.

- Font Width is used to provide size criteria. The FGID and GCSGID together provide enough information to determine the typeface and language complement. Font width indicates which point size to use. Font width, however, is not a point size value. It is based on 1440ths, a unit of measure commonly used by printers and formatters.

GRID Width Calculations: For uniformly spaced fonts, the font width calculation is 1440 divided by the pitch. Pitch is the number of characters that can fit in 1 horizontal inch.

Table 106. Font Width Calculation for Uniformly Spaced Fonts

Width	Pitch	Calculation
240	6	1440/6
168	8.57	1440/8.57
144	10	1440/10
120	12	1440/12
108	13.3	1440/13.3
96	15	1440/15
84	17.1	1440/17.1
72	20	1440/20

For mixed-pitch character sets, the width calculation is the width of the 12–pitch space character (that is, 1440 divided by 12).

Table 107. Font Width Calculation for Mixed-Pitch Character Sets

Width	Pitch	Calculation
120	12	1440/12

For proportionally spaced (typographic) fonts, the width calculation is one-third the point size converted to 1440ths of an inch. There are approximately 72 points to 1 inch or 20 1440ths per point.

Table 108. Font Width Calculation for Proportionally Spaced Fonts

Width	Points	Calculation
40	6	(6x20)/3
47	7	(7x20)/3
53	8	(8x20)/3
60	9	(9x20)/3
67	10	(10x20)/3

Table 108. Font Width Calculation for Proportionally Spaced Fonts (continued)

Width	Points	Calculation
73	11	(11x20)/3
80	12	(12x20)/3
93	14	(14x20)/3
107	16	(16x20)/3
120	18	(18x20)/3
133	20	(20x20)/3
160	24	(24x20)/3
200	30	(30x20)/3
240	36	(36x20)/3
320	48	(48x20)/3
400	60	(60x20)/3
480	72	(72x20)/3

Tables Listing Printer-Resident Fonts

This rest of this appendix contains tables listing fonts resident in specific printers. These fonts can be shipped on diskettes, cartridges, font cards, in printer microcode, or in some type of printer storage, depending on the printer. With PSF/MVS and PSF/VSE, you can use a utility to mark host versions of these fonts that will allow PSF to activate the fonts resident in the printers. On PSF/MVS, the utility is called APSRMARK; on PSF/VSE, APTRMARK. PSF/VM, PSF/400, and PSF/6000 use tables to map resident fonts to the equivalent host fonts, providing access to the resident fonts on select printers.

Notes:

1. The lists of printer resident fonts in this appendix may not be complete. Your printer may contain fonts not listed here. Also, your PSF libraries may contain host-equivalent fonts that are not resident in your printer. In either case, using fonts not listed in this section may produce unexpected results.
2. Some of the fonts listed in these tables are IBM font licensed programs, which may or may not be installed in your PSF font libraries. Before marking a font on PSF/MVS with APSRMARK or on PSF/VSE with APTRMARK, ensure that the host-equivalent font is available.
3. For some of the bold fonts listed, the bold printing is done by your printer. Refer to your printer publications for more information.
4. Fonts shipped with the IBM AFP Font Collection are already marked and do not have to be marked using APSRMARK or APTRMARK, thereby enabling you to use the fonts resident in the AFCCU printers.

Abbreviations Used in the Tables

The tables throughout this appendix use the following abbreviations:

- DEC** Decimal (a numbering system based on 10)
FGID Font typeface global identifier
FW Font width (the width of the space character in 1/1440ths-inch units)
GCSGID Graphic character set global identifier
CPGID Code page global identifier
GRID Global resource identifier
HEX Hexadecimal (a numbering system based on 16)
IB Italic Bold
IM Italic Medium

Point Vertical height (number in 1/72 of an inch)
PPDS Page Printer Data Stream
PS Proportional Space Font
RB Roman Bold
RIDF Resource ID Format
RL Roman Light
RM Roman Medium
RT Resource Type
TYPO Typographic spacing (proportionally spaced, measured vertically in points [1/72 of an inch])

Fonts Resident in the AFCCU Printers

This section lists the resident fonts and code pages for the AFCCU printers: Infoprint 60, Infoprint 62, Infoprint 3000, Infoprint 4000, and Infoprint Color 130 Plus. The AFCCU printers support the resident fonts as *Type 1 scalable outline fonts*, depending on the PSF support. The default font is Courier Roman Medium 12 pitch (10 point), using code page 500, version 2. The GRID for the default font is FGID=416, GCSGID=1269, CPGID=500, and font width=120. The host equivalents of the AFCCU resident fonts are shipped in the IBM AFP Font Collection and are marked PUBLIC, so that on PSF/MVS 2.2.0 with APAR OW08340, you can use them to activate the printer resident fonts. You do not need to run any APSRMARK jobs to mark them.

If the IBM AFP Font Collection is not installed, you can run the following APSRMARK jobs on PSF/MVS to mark the host equivalents of the resident fonts: APSWMCPG, APSWMCR, APSWMHLV, APSWMTNR, and APSW4028.

Activating Resident Fonts in the AFCCU Printers

Use one of the following IPDS commands to activate resident fonts in the AFCCU printers.

Load Font Equivalence Command: The Load Font Equivalence (LFE) command maps font local identifiers specified in text, graphics, or bar code data, to font Host Assigned IDs (HAIDs) and to Global Resource IDs (GRIDs). If the GRID specified in the LFE command matches a GRID contained in the printer, the font is activated.

Activate Resource (Load Resource Equivalence) Command: The Activate Resource (AR) command (previously known as Load Resource Equivalence) maps Host Assigned IDs to global names of another format. The format for the global name is identified by a resource type and resource ID combination. If the printer contains a font that matches the global name in the AR command, that font is activated.

Table 109 shows the combinations of resource types (RT) and resource ID formats (RIDF) supported by the AFCCU printers.

Table 109. Resource Type and Resource ID Formats

Resource Type	RT HEX	Resource ID Format	RIDF HEX
Single-Byte Coded Raster Font	X'01'	IBM GRID	X'03'
Single-Byte Coded Raster Font	X'01'	MVS Host Available	X'06'
Code Page	X'06'	IBM Grid	X'03'
Font Character Set	X'07'	Coded Font Format	X'07'
Single-Byte Coded Font Index	X'08'	IBM GRID	X'03'
Single-Byte Coded Font Index	X'08'	MVS Host Unalterable	X'06'
Coded Font	X'10'	Coded Font Format	X'07'
Coded Font	X'10'	IBM GRID	X'03'

IBM Expanded Core Fonts Resident in the AFCCU Printers

The Expanded Core Fonts shown in Table 110 through Table 116 on page 180 are supported as resident, scalable fonts. These tables show the valid Font Global ID (FGID) and code pages for each font.

XOA-RRL Replies for Font Character Sets: The resident font set supports a font character set of any valid font width when queried as an individual font character set. When queried for a list of font character sets, using Execute Order Anytime (XOA)-Request Resource List (RRL), the resident character sets are reported with a font width of zero. A font width of zero indicates that the font is scalable. All of the following fonts are scalable.

See Table 118 on page 181 for the code pages associated with these fonts.

Table 110. Arabic Expanded Core Fonts

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	Font Character Set
Boutros Typing Roman Bold	01A4	0420	04F0	1264	CZ4404
Boutros Typing Roman Medium	01A0	0416	04F0	1264	CZ4204
Boutros Typing Italic Bold	01AC	0428	04F0	1264	CZ4504
Boutros Typing Italic Medium	01A8	0424	04F0	1264	CZ4304
ITC Boutros Modern Rokaa Italic Bold	0903	2307	04F0	1264	CZH504
ITC Boutros Modern Rokaa Italic Medium	0902	2306	04F0	1264	CZH304
ITC Boutros Modern Rokaa Roman Bold	0901	2305	04F0	1264	CZH404
ITC Boutros Modern Rokaa Roman Medium	0900	2304	04F0	1264	CZH204
ITC Boutros Setting Italic Bold	0907	2311	04F0	1264	CZN504
ITC Boutros Setting Italic Medium	0906	2310	04F0	1264	CZN304
ITC Boutros Setting Roman Bold	0905	2309	04F0	1264	CZN404
ITC Boutros Setting Roman Medium	0904	2308	04F0	1264	CZN204

Table 111. Hebrew Expanded Core Fonts

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	Font Character Set
Narkissim Italic Bold	0907	2311	04F1	1265	CZN505
Narkissim Italic Medium	0906	2310	04F1	1265	CZN305
Narkissim Roman Bold	0905	2309	04F1	1265	CZN405
Narkissim Roman Medium	0904	0424	04F1	1265	CZN205
Narkiss Tam Italic Bold	0903	2307	04F1	1265	CZH505
Narkiss Tam Italic Medium	0902	2306	04F1	1265	CZH305
Narkiss Tam Roman Bold	0901	2305	04F1	1265	CZH405
Narkiss Tam Roman Medium	0900	2304	04F1	1265	CZH205
Shalom Italic Bold	01AC	0428	04F1	1265	CZ4505
Shalom Italic Medium	01A8	0424	04F1	1265	CZ4305
Shalom Roman Bold	01A4	0420	04F1	1265	CZ4405
Shalom Roman Medium	01A0	0416	04F1	1265	CZ4205

Table 112. Latin1 Expanded Core Fonts

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	Font Character Set
Boldface	4F00	20224	07F7	2039	CZ8400
Courier Italic Bold	01AC	0428	04F5	1269	CZ4500
Courier Italic Medium	01A8	0424	04F5	1269	CZ4300
Courier Roman Bold	01A4	0420	04F5	1269	CZ4400
Courier Roman Medium	01A0	0416	04F5	1269	CZ4200
Gothic Text	0130	304	07F7	2039	CZ6200
Helvetica Italic Bold	0903	2307	04F5	1269	CZH500
Helvetica Italic Medium	0902	2304	04F5	1269	CZH300
Helvetica Roman Bold	0901	0428	04F5	1269	CZH400
Helvetica Roman Medium	0900	0424	04F5	2039	CZH200
Letter Gothic	0190	400	04F7	2039	CZ5200
Letter Gothic Bold	0194	404	04F7	2039	CZ5400
Prestige	01B0	432	04F7	2039	CZ7200
Prestige Bold	013E	318	04F7	2039	CZ7400
Prestige Italic	013F	319	04F7	2039	CZ7300
Times New Roman Bold	0905	2309	04F5	1269	CZN400
Times New Roman Italic Bold	0907	2311	04F5	1269	CZN500
Times New Roman Italic Medium	0906	2310	04F5	1269	CZN300
Times New Roman Medium	0904	2308	04F5	1269	CZN200

Table 113. Latin2/3/5 Expanded Core Fonts

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	Font Character Set
Courier Italic Bold	01AC	0428	04F5	1269	CZ4502
Courier Italic Medium	01A8	0424	04F5	1269	CZ4302
Courier Roman Bold	01A4	0420	04F5	1269	CZ4402
Courier Roman Medium	01A0	0416	04F5	1269	CZ4202
Helvetica Italic Bold	0903	2307	04F5	1269	CZH500
Helvetica Italic Medium	0902	2306	04F5	1269	CZH302
Helvetica Roman Bold	0901	2305	04F5	1269	CZH402
Helvetica Roman Medium	0900	2304	04F5	1269	CZH202
Times New Roman Bold	0905	2309	04F5	1269	CZN402
Times New Roman Italic Bold	0907	2311	04F5	1269	CZN502
Times New Roman Italic Medium	0906	2310	04F5	1269	CZN302
Times New Roman Medium	0904	2308	04F5	1269	CZN202

Table 114. Latin4 Expanded Core Fonts

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	Font Character Set
Courier Italic Bold	01AC	0428	04F5	1269	CZ4507

Table 114. Latin4 Expanded Core Fonts (continued)

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	Font Character Set
Courier Italic Medium	01A8	0424	04F5	1269	CZ4307
Courier Roman Bold	01A4	0420	04F5	1269	CZ4407
Courier Roman Medium	01A0	0416	04F5	1269	CZ4207
Helvetica Italic Bold	0903	2307	04F5	1269	CZH507
Helvetica Italic Medium	0902	2306	04F5	1269	CZH307
Helvetica Roman Bold	0901	2305	04F5	1269	CZH407
Helvetica Roman Medium	0900	2304	04F5	1269	CZH207
Times New Roman Bold	0905	2309	04F5	1269	CZN407
Times New Roman Italic Bold	0907	2311	04F5	1269	CZN507
Times New Roman Italic Medium	0906	2310	04F5	1269	CZN307
Times New Roman Medium	0904	2308	04F5	1269	CZN207

Table 115. Symbols Expanded Core Fonts

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	Font Character Set
Courier Roman Bold	01A4	0420	04FB	1275	CZ4401
Courier Roman Medium	01A0	0416	04FB	1275	CZ4201
Helvetica Roman Bold	0901	2305	04FB	1275	CZH401
Helvetica Roman Medium	0900	2304	04FB	1275	CZH201
Times New Roman Bold	0905	2309	04FB	1275	CZN401
Times New Roman Bold	0904	2308	04FB	1275	CZN201

Table 116. Cyrillic Greek Expanded Core Fonts

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	Font Character Set
Courier Italic Bold	01AC	0428	0514	1300	CZ4503
Courier Italic Medium	01A8	0424	0514	1300	CZ4303
Courier Roman Bold	01A4	0420	0514	1300	CZ4403
Courier Roman Medium	01A0	0416	0514	1300	CZ4203
Helvetica Italic Bold	0903	2307	0514	1300	CZH503
Helvetica Italic Medium	0902	2306	0514	1300	CZH303
Helvetica Roman Bold	0901	2305	0514	1300	CZH403
Helvetica Roman Medium	0900	2304	0514	1300	CZH203
Times New Roman Bold	0905	2309	0514	1300	CZN403
Times New Roman Italic Bold	0907	2311	0514	1300	CZN503
Times New Roman Italic Medium	0906	2310	0514	1300	CZN303
Times New Roman Medium	0904	2308	0514	1300	CZN203

Table 117 lists the scalable OCR, APL, and Katakana fonts resident in the AFCCU printers.

Table 117. OCR, APL, and Katakana Fonts Resident in the AFCCU Printers

Typeface	FGID HEX	FGID DEC	GCSGID HEX	GCSGID DEC	CPGID HEX	CPGID DEC	Font Character Set
APL	0133	307	0518	1304	125, 136, 38E	293, 310, 910	CZ420P
APL Bold	0142	322	0518	1304	125, 136, 38E	293, 310, 910	CZ440P
OCR A	0131	305	03C8	968	36C, 37C	876,892	CZ4407
OCR B	0132	306	03C9	969	36D, 37D	877, 893	CZ4207
Katakana Gothic	0130	304	051A	1306	122, 381, 403, 411	290, 897, 1027, 1041	CZH507

Code Pages for the IBM Expanded Core Fonts: Table 118 lists the code pages used with the resident IBM Expanded Core Fonts. Although all the IBM Expanded Core fonts code pages are referenced in Table 118, the AFCCU printers support only the Latin1 Country Extended, Latin1 EBCDIC Publishing, Latin1 ASCII, and Latin EBCDIC DCF code pages.

Table 118. Code Pages for the Expanded Core Fonts

Language Supported	CPGID HEX	CPGID DEC	GCSGID HEX	GCSGID DEC	Code Page Name
Latin 1 Country Extended Code Pages:					
US English, Canadian English, Canadian French, Dutch, Brazilian Portuguese, Portuguese	0025	0037	02B9	0697	T1V10037
German	0111	0273	02B9	0697	T1V10273
Belgian	0112	0274	02B9	0697	T1V10274
Brazilian	0113	0275	02B9	0697	T1V10275
Danish, Norwegian	0113	0277	02B9	0697	T1V10277
Finnish, Swedish	0116	0278	02B9	0697	T1V10278
Italian	0118	0280	02B9	0697	T1V10280
Japanese	0119	0281	02B9	0697	T1V10281
Portuguese	011A	0282	02B9	0697	T1V10282
Castillian Spanish, Latin American Spanish	011C	0284	02B9	0697	T1V10284
UK English	011D	0285	02B9	0697	T1V10285
French, Catalan	0129	0297	02B9	0697	T1V10297
Multinational, Belgium French, Belgium Dutch, Swiss French, Swiss German, Swiss Italian	01F4	0500	02B9	0697	T1V10500
Icelandic	0367	0871	02B9	0697	T1V10871
Latin 1 EBCDIC Publishing Code Pages:					
Multinational, Belgium French, Belgium Dutch, Swiss French, Swiss German, Swiss Italian	0169	0361	0479	1145	T1000361
German	017E	0382	0479	1145	T1000382
Belgian	017F	0383	0479	1145	T1000383

Table 118. Code Pages for the Expanded Core Fonts (continued)

Language Supported	CPGID HEX	CPGID DEC	GCSGID HEX	GCSGID DEC	Code Page Name
Latin 1 Country Extended Code Pages:					
Brazilian Portuguese	0180	0384	0479	1145	T1000384
Canadian French	0181	0385	0479	1145	T1000385
Danish, Norwegian	0182	0386	0479	1145	T1000386
Finnish, Swedish	0183	0387	0479	1145	T1000387
French, Catalan	0184	0388	0479	1145	T1000388
Italian	0185	0389	0479	1145	T1000389
Japanese	0186	0390	0479	1145	T1000390
Portuguese	0187	0391	0479	1145	T1000391
Castillian Spanish	0188	0392	0479	1145	T1000392
Latin American Spanish	0189	0393	0479	1145	T1000393
UK English	018A	0394	0479	1145	T1000394
US English, Canadian English	018B	0395	0479	1145	T1000395
Latin 1 ASCII Code Pages:					
Multinational, US English, UK English, Dutch, German, Finnish, French, Italian, Spanish, Swedish	01B5	0437	0397	0919	T1000437
Multinational (Same as all Country extended Code Pages)	0352	0850	0304	0980	T1000850
Portugese (Primary = 850)	035C	0860	03DE	0990	T1000860
Icelandic (Primary = 850)	035D	0861	03DF	0991	T1000861
Canadian French (Primary = 850)	035F	0863	03E1	0993	T1000863
Nordic (Primary = 850)	0361	0865	03E3	0995	T1000865
IBM PC Desktop Publishing	03EC	1004	047A	1146	T1001004
IOS Latin 1	0333	0819	02B9	0697	T1000819
Latin 2/3/4/5 EBCDIC and ASCII Code Pages:					
Croatian, Czech, East German, Hungarian, Polish, Romanian, Slovak, Slovenian	0354	0852	0306	0982	T1000852
Latin2 Multilingual	0366	0870	03BF	0959	T1000870
Latin2 ISO/ ANSI 8 Bit	0390	0912	03BF	0959	T1000912
Latin3 Multilingual PC	0355	0853	0307	0983	T1000853
Latin3 Multilingual	0389	0905	0506	1286	T1000905
Latin4 ISO/ASCII	042D	1069	04E8	1256	T1001069
Latin4 EBCDIC	0392	0914	04E8	1256	T1000914
Latin5 PC	0359	0857	03DB	0987	T1000857
Latin5 ISO/ANSI 8 Bit	0398	0920	0480	1152	T1000920
Latin5	0402	1026	0480	1152	T1001026
Latin EBCDIC DCF Code Pages:					
DCF Release 2 Compatibility	03EA	1002	046C	1132	T1001002
US Text Subset	03eb	1003	046D	1133	T1DCDCFS

Table 118. Code Pages for the Expanded Core Fonts (continued)

Language Supported	CPGID HEX	CPGID DEC	GCSGID HEX	GCSGID DEC	Code Page Name
Latin 1 Country Extended Code Pages:					
Text with Numeric Spacing	042C	1068	04EB	1259	T1001068
GML List Symbols	040F	1039	04EA	1258	T1001039
Cyrillic and Greek EBCDIC and ASCII Code Pages:					
Cyrillic Multilingual (Primary = 1025)	0370	0880	03C0	0960	T1000880
Cyrillic ISO/ASCII 8 Bit	0393	0915	047E	1150	
Cyrillic PC	0357	0855	03D9	0985	T1000855
Cyrillic #2 PC	0362	0866	03E4	0996	T1000866
Cyrillic Multilingual	0401	1025	047E	2250	
Greek 183 (Primary = 875)	01A7	0423	00DA	0218	
Greek ISO/ASCII 8 Bit	032D	0813	039D	0925	T1000813
Greek PC (Primary = 869)	0353	0851	0305	0981	T1000851
Greek PC	0365	0869	03E6	0998	T1000869
Greek	036B	0875	039D	0925	T1000875
GML List Symbols	040F	1039	04EA	1258	T1001039
Arabic EBCDIC and ASCII Code Pages:					
Arabic Bilingual	01A4	0420	00EB	0235	T1000420
Arabic PC	0360	0864	03E2	0994	T1000864
Arabic ISO/ASCII 8 Bit	03F0	1008	048A	1162	T1001008
Arabic Extended ISO/ASCII 8 Bit	0405	1029	0482	1154	T1001029
Arabic Extended ISO/ASCII 8 Bit	0416	1046	0499	1177	T1001046
GML List Symbols	040F	1039	04EA	1258	T1001039
Hebrew EBCDIC and ASCII Code Pages:					
Hebrew ISO/ASCII 8 Bit	0394	0916	03AD	0941	T1000916
Hebrew Publishing	0404	1028	04AF	1199	T1001028
Hebrew	01A8	0424	03AD	0941	T1000424
Hebrew Character Set A (Primary = 424)	0323	0803	047B	1147	T1000803
Hebrew PC (Primary = 862)	0358	0856	03DA	0986	T1000856
Hebrew PC	035E	0862	03E0	0992	T1000862
GML List Symbols	040F	1039	04EA	1258	T1001039
Symbols:					
Symbols, Set 7	0103	0259	0154	0340	T1000259
Symbols, Set 7 ASCII	0383	0899	0154	0340	T1000899
Symbols, Adobe	043F	1087	04E9	1257	T1001087
Symbols, Adobe ASCII	040E	1038	04E9	1257	T1001038
Symbols, Modified Set 7	0443	1091	04A7	1191	T1001091
Symbols, Modified Set 7 ASCII	0444	1092	04A7	1191	T1001092
Symbols, Set 8	016B	0363	0276	0630	T1000363

Table 118. Code Pages for the Expanded Core Fonts (continued)

Language Supported	CPGID HEX	CPGID DEC	GCSGID HEX	GCSGID DEC	Code Page Name
Latin 1 Country Extended Code Pages:					
Math Symbols	033D	0829	038D	0909	T1M00829, T1000829

For more information about core fonts and the AFCCU printers, see the *Font Summary for AFP Font Collection*, S544–5633.

Appendix C. Related Publications

The following publications contain additional information about Printing Systems printers and printing software.

You can use any of the following methods to send comments about the publications:

- Reader's Comment Form in each publication
- Internet id:
- IBM Mail Exchange id: IEA USIB4TDB
- Fax number: 1-800-524-1519

Many of the following publications can be found on the Printing Systems home page at <http://www.ibm.com/printers>.

The titles and the order numbers for publications can change from time to time. To verify the current title or order number for a publication, contact your IBM representative.

Table 119. *Advanced Function Presentation Publications*

Publication	Order Number
<i>IBM Page Printer Formatting Aid: User's Guide</i>	S544-5284
<i>Printing and Publishing Collection Kit</i>	SK2T-2921
<i>Guide to Advanced Function Presentation</i>	G544-3876
<i>Advanced Function Presentation: Programming Guide and Line Data Reference</i>	S544-3884
<i>Overlay Generation Language/370: User's Guide and Reference</i>	S544-3702

Table 120. *Data Stream and Object Architectures*

Publication	Order Number
<i>Mixed Object Document Content Architecture Reference</i>	SC31-6802
<i>Intelligent Printer Data Stream Reference</i>	S544-3417
<i>Bar Code Object Content Architecture Reference</i>	S544-3766
<i>Presentation Text Object Content Architecture Reference</i>	SC31-6803
<i>Graphics Object Content Architecture Reference</i>	SC31-6804
<i>Image Object Content Architecture Reference</i>	SC31-6805

Table 121. *IBM AFP Fonts Publications*

Publication	Order Number
<i>Technical Reference for IBM Expanded Core Fonts</i>	S544-5228
<i>Font Summary for AFP Font Collection</i>	S544-5633
<i>IBM AFP Fonts: Type Transformer User's Guide</i>	G544-3796
<i>AFP Font Collection: Type Transformer for Windows User's Guide</i>	S544-5726
<i>IBM AFP Fonts: Introduction to Typography</i>	G544-3122
<i>IBM AFP Fonts: Licensed Program Specifications</i>	G544-5229
<i>IBM AFP Fonts: Technical Reference for Code Page</i>	S544-3802

Table 122. IBM AFP DBCS Fonts Publications

Publication	Order Number
<i>Technical Reference for AFP Font Collection Japanese Fonts</i>	S544-5685
<i>Technical Reference for AFP Font Collection Korean Fonts</i>	S544-5686
<i>Technical Reference for AFP Font Collection Simplified Chinese Fonts</i>	S544-5688
<i>Technical Reference for AFP Font Collection Traditional Chinese Fonts</i>	S544-5688

Table 123. IBM Infoprint Manager for AIX Publications

Publication	Order Number
<i>AFP Upload Configuration Guide Using SNA Server/6000</i>	S544-5422
<i>Infoprint Manager: Reference Information</i>	S544-5475
<i>Infoprint Manager for AIX: Administrator's Guide</i>	S544-5595
<i>Infoprint Manager for AIX: User's and Operator's Guide</i>	S544-5596

Table 124. IBM Infoprint Manager for Windows NT and Windows 2000 Publications

Publication	Order Number
<i>Infoprint Manager for Windows NT and Windows 2000: Planning Guide</i>	G544-5716
<i>Infoprint Manager: Reference</i>	S544-5475
<i>Infoprint Manager for Windows NT and Windows 2000: Getting Started</i>	G544-5717

Table 125. IBM Infoprint Server for OS/390 V2R8- V2R10

Publication	Order Number
<i>OS/390 Infoprint Server V2R8 - V2R10 Messages and Diagnosis</i>	G544-5690
<i>OS/390 Infoprint Server V2R8 - V2R10 User's Guide</i>	S544-5692
<i>OS/390 Infoprint Server V2R8 - V2R10 Operation and Administration</i>	S544-5693
<i>OS/390 Infoprint Server V2R8 - V2R10 Customization</i>	G544-5694
<i>OS/390 Infoprint Server V2R8 - V2R10 Introduction</i>	G544-5696
<i>OS/390 Infoprint Server V2R8 - V2R10 Migration</i>	G544-5697

Table 126. IBM Infoprint Server for OS/390 V2R8- V2R10

Publication	Order Number
<i>z/OS Infoprint Server Introduction</i>	S544-5742
<i>z/OS Infoprint Server Migration</i>	G544-5743
<i>z/OS Infoprint Server Customization</i>	S544-5744
<i>z/OS Infoprint Server Operation and Administration</i>	S544-5745
<i>z/OS Infoprint Server User's Guide</i>	G544-5746
<i>z/OS Infoprint Server Messages and Diagnosis</i>	G544-5747

Table 127. Network Printer 12 Publications

Publication	Order Number
<i>Network Printer 12 Quick Setup Guide</i>	G544-5371
<i>Network Printer 12 Users' Guide</i>	S544-5370
<i>Ethernet and Token Ring Quick Configuration Guide</i>	G544-5499

Table 127. Network Printer 12 Publications (continued)

Publication	Order Number
<i>Ethernet and Token Ring Configuration Guide</i>	G544–5240
<i>IPDS Installation Instruction</i>	G544–5506
<i>Twinax/Coax Configuration Guide</i>	G544–5241
<i>PCL/PostScript Technical Reference</i>	S544–5344
<i>IPDS and SCS Technical Referencee</i>	G544–5312

Table 128. Network Printer 17 Publications

Publication	Order Number
<i>Network Printer 17 Quick Setup Guide</i>	G544–5346
<i>Network Printer 17 User's Guide</i>	S544–5343
<i>Ethernet and Token Ring Quick Configuration Guide</i>	G544–5499
<i>Ethernet and Token Ring Configuration Guide</i>	G544–5240
<i>IPDS Installation Instruction</i>	G544–5506
<i>Twinax/Coax Configuration Guide</i>	G544–5241
<i>PCL/PostScript Technical Reference</i>	S544–5344
<i>IPDS and SCS Technical Referencee</i>	G544–5312

Table 129. Infoprint Color 8 Printer Publications

Publication	Order Number
<i>Infoprint Color 8: Quick Start</i>	G544–5707
<i>Infoprint Color 8: Handy Reference</i>	S544–5708
<i>Infoprint Color 8: User's Guide</i> ¹	ipc8ug0
<i>Infoprint Color 8: Ethernet/Token Ring Installation and Configuration Guide</i>	S544–5709
1. This publication is only available as online information. It can be found in the <i>IBM Printing Systems Digital Library</i> at www.ibm.com/printers	

Table 130. InfoPrint 12 Publications

Publication	Order Number
<i>Infoprint 12: User's Guide</i>	G544–5751
<i>Infoprint 12: Network Printer Card User's Guide</i>	G544–5727
<i>Infoprint 12: Online Reference</i> ¹	IP12REF English R1
1. This publication is only available as online information. It can be found in the <i>IBM Printing Systems Digital Library</i> at www.ibm.com/printers	

Table 131. Infoprint 20 Printer Publications

Publication	Order Number
<i>InfoPrint 20 Quick Reference Card</i>	G544–5512
<i>InfoPrint 20 User's Guide</i>	S544–5516
<i>Ethernet and Token Ring Quick Configuration Guide</i>	G544–5499
<i>Ethernet and Token Ring Configuration Guide</i>	G544–5240
<i>PCL/PostScript Technical Reference</i>	S544–5344

Table 131. Infoprint 20 Printer Publications (continued)

Publication	Order Number
<i>IPDS and SCS Technical Reference</i>	G544-5312

Table 132. Infoprint 21 Printer Publications

Publication	Order Number
<i>InfoPrint 21 Quick Reference Card</i>	G544-5700
<i>InfoPrint 21 User's Guide</i>	G544-5701
<i>Ethernet and Token Ring Quick Configuration Guide</i>	G544-5499
<i>Ethernet and Token Ring Configuration Guide</i>	G544-5240
<i>Twinax/Coax Configuration Guide</i>	G544-5241

Table 133. Infoprint 32 and Infoprint 40 Printer Publications

Publication	Order Number
<i>InfoPrint 32 Infoprint 40 Quick Reference Card</i>	G544-5480
<i>InfoPrint 32 Infoprint 40 User's Guide</i>	G544-5484
<i>PCL/PostScript Technical Reference</i>	S544-5344
<i>Ethernet and Token Ring Quick Configuration Guide</i>	G544-5499
<i>Twinax/Coax Configuration Guide</i>	G544-5241
<i>IPDS and SCS Technical Reference</i>	G544-5312

Table 134. Infoprint 60 Printer Publications

Publication	Order Number
<i>InfoPrint 60 Introduction and Planning Guide</i>	G544-5242
<i>InfoPrint 60 User's Guide</i>	S544-5432
<i>InfoPrint 60 Finisher User and Planning Information</i>	S544-5604
<i>InfoPrint 60 Finisher Application Design Guide</i>	S544-5643
<i>Cut-Sheet Paper Reference for use with IBM Electrophotographic Printers</i>	G544-3915
<i>InfoPrint 60 Attachment Configuration Handbook</i>	S544-3977
<i>InfoPrint 60 Variable Size Paper and Tabs Guide</i>	S544-5522
<i>InfoPrint 60 PCL Supplement</i>	S544-5649

Table 135. Infoprint 70 Printer Publications

Publication	Order Number
<i>InfoPrint 70: Using Your Infoprint 70</i>	SA18-7727
<i>InfoPrint 70: Quick Reference Card</i>	SC18-2495
<i>InfoPrint 70: Introduction and Planning Guide</i>	GA18-7726

Table 136. Infoprint 2000-DP1 Printer Publications

Publication	Order Number
<i>Infoprint 2000 for IPDS Printing: User's Guide</i>	S544-5764
<i>Infoprint 2000 Model DP1 for IPDS: Planning and Configuration Guide</i>	G544-5765
<i>Infoprint 2000 Model DP1 for IPDS: Quick Reference Guide</i>	G544-5766

Table 137. Infoprint 62 Publications

Publication	Order Number
<i>Infoprint 62 Operator's Guide</i>	S544-5385
<i>Infoprint 62 Introduction and Planning Guide</i>	G544-5384
<i>Continuous Forms - Forms Design Reference</i>	G544-3921

Table 138. Infoprint 3000 Printer Publications

Publication	Order Number
<i>Infoprint 3000 Introduction and Planning Guide</i>	G544-5563
<i>Infoprint 3000 Operator's Guide</i>	S544-5564
<i>Continuous Forms - Forms Design Reference</i>	G544-3921
<i>Infoprint 3000 Infoprint 4000 and 3900 Advanced Function Printers Safety Information</i>	G544-5565

Table 139. Infoprint 4000 Printer Publications

Publication	Order Number
<i>Infoprint 4000 Operator's Guide</i>	S544-5428
<i>Infoprint 4000 and 3900 Advanced Function Printers Operator's Guide</i>	G544-5427
<i>Continuous Forms - Forms Design Reference</i>	G544-3921
<i>Introduction and Planning Guide</i>	G544-5427
<i>Print On Demand Executive Summary and Planning Guide</i>	G544-3876
<i>Print On Demand User's Guide</i>	G544-5325

Table 140. Infoprint Color 100 Printer Publications

Publication	Order Number
<i>Infoprint Color 100 Introduction and Planning Guide</i>	G544-5612
<i>IBM Infoprint Color 100 Print Media Guide</i>	G544-5648
<i>Infoprint Color 100 Operator's Guide</i>	S544-5611

Table 141. Infoprint Color 130 Plus Printer Publications

Publication	Order Number
<i>Infoprint Color 130 Plus: Installation Planning Guide</i>	G544-5772
<i>Infoprint Color 130 Plus: Quick Reference Guide</i>	G544-5781
<i>Infoprint Color 130 Plus Operator's Guide</i>	G544-5771

Table 142. 4230 Printer Publications

Publication	Order Number
<i>4230 Printer User's Guide Models 102 and 202</i>	SA40-0564
<i>4230 Printer Models 101, 1S2, 201, 2S2, 4S3, and 5S3</i>	SA40-0593

Table 143. 4232 Printer Publications

Publication	Order Number
<i>4232 Printer User's Guide Models 102 and 202</i>	SA24-4386

Table 144. 4247 Printer Publications

Publication	Order Number
4247 Models 001, 002 User's Guide	SA24-4408
4247 Model 003 User's Guide	S544-5780
4247 Model A00 User's Guide	SA24-4404
4247 Models 001, 002 with Coaxial Attachment Quick Reference Guide	SA24-4409
4247 Models 001, 002 with Twinaxial Attachment Quick Reference Guide	SA24-4411

Table 145. 4400 Printer Publications

Publication	Order Number
4400 Series Thermal Printers: Quick Start Guide	G544-5730
4400 Series Thermal Printers: User's Guide	G544-5731
10/100Base-T Ethernet™ Interface User's Manual	G544-5769
4400 Series Thermal Printers: ASCII Programmer's Reference Manual	G544-5733
4400 Series Thermal Printers: IGP Programmer's Reference Manual	G544-5734
4400 Series Thermal Printers: Code V™ Programmer's Reference Manual	G544-5735
4400 Series Thermal Printers: Coax/Twinax Programmer's Reference Manual	G544-5736
4400 Series Thermal Printers: IPDS Programmer's Reference Manual	G544-5737

Table 146. 6400 Line Matrix Printer

Publication	Order Number
6400 Line Matrix Printers Setup Guide Cabinet and Pedestal Models	S544-5640
6400 Line Matrix Printers Operator's Guide Cabinet and Pedestal Models	S544-5641
6400 Line Matrix Printers Ethernet Interface User's Manual	GC31-3878

Table 147. Print Services Facility for OS/390 Publications

Publication	Order Number
Print Services Facility for OS/390 User's Guide	S544-5430
Print Services Facility for OS/390: Customizaion	S544-5622

Table 148. Print Services Facility/VM Publications

Publication	Order Number
Print Services Facility/VM: Application Programming Guide	S544-3677
Print Services Facility/VM: System Programming Guide	S544-3680

Table 149. Print Services Facility/VSE Publications

Publication	Order Number
Print Services Facility/VSE: Application Programming Guide	S544-3666
Print Services Facility/VSR: System Programming Guide	S544-3665

Table 150. Print Services Facility for AS/400 Publications

Publication	Order Number
<i>AS/400 Printer Device Programming</i>	SC41-3713
<i>AS/400 Data Description Specifications</i>	SC41-9620

Table 151. Other AFP Products Publications

Publication	Order Number
<i>Composed Document Print Facility: Data Stream Interface, Typographic Fonts Interface</i>	SC33-6134
<i>Document Composition Facility and Document Library Facility: General Information</i>	GH20-9158
<i>Overlay Generation Language/370: User's Guide and Reference</i>	S544-3702
<i>Page Printer Formatting Aid/370: User's Guide and Reference</i>	S544-3700
<i>Using Image Handling Facility</i>	SH12-5280

Glossary

Glossary

Source Identifiers

This publication includes terms and definitions from the *IBM Dictionary of Computing*, SC20-1699.

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Definitions that are specific to IBM products are so labeled; for example, "In SNA", or "In the 3820".

References

The following cross-references are used in this glossary:

Contrast with. This refers to a term that has an opposite or substantively different meaning.

See. This refers the reader to multiple-word terms in which this term appears.

See also. This refers the reader to terms that have a related, but not synonymous, meanings.

Synonym for. This appears in the commentary of a less desirable or less specific term and identifies the preferred term that has the same meaning.

Synonymous with. This appears in the commentary of a preferred term and identifies less desirable or less specific terms that have the same meaning.

A

ABIC. See *Adaptive Bilevel Image Compression*

accumulator. (1) A register in which the result of an operation is formed. (I) (A) (2) A 3800 hardware feature that provides a separate storage area to hold data in raster form. It can be used either for composing a sheet of data that combines a large amount of variable and constant data or for storing an electronic overlay in raster form so that the overlay is merged with variable data as the page is printed.

Adaptive Bilevel Image Compression (ABIC). A 4-bit image capable of displaying up to 16 shades of gray.

Advanced Function Common Control Unit (AFCCU). Used to describe all printers that have controllers based on RS/6000 and Power PC technology.

Advanced Function Image and Graphics feature. A hardware feature that can be purchased and installed on an AFP printer to support printer microcode image decompression of IOCA data streams that were compressed using standard compression routines. AFIG also corrects the resolution of an input image to match the printer's resolution, thereby providing resolution independence for scanned input.

Advanced Function Presentation (AFP). A set of licensed programs, together with user applications, that use the all-points-addressable concept to print on presentation devices. AFP includes creating, formatting, archiving, retrieving, viewing, distributing, and printing information. See *presentation device*.

AFCCU. Advanced Function Common Control Unit

AFIG. See *Advanced Function Image and Graphics feature*.

AFP. See *Advanced Function Presentation*.

AFP data stream. A presentation data stream that is processed in AFP environments. MO:DCA-P is the strategic AFP interchange data stream, and IPDS is the strategic AFP printer data stream.

AFPDS. A term formerly used to identify the composed-page MO:DCA-based data stream interchanged in AFP environments. See also *MO:DCA* and *AFP data stream*.

all points addressable (APA). The ability to address, reference, and position text, overlays, and images at any defined position or pel on the printable area of the paper. This capability depends on the ability of the hardware to address and to display each picture element.

alternate medium source. The ability to select print medium from more than one source (bin).

APA. All points addressable.

APAR. See *Authorized program analysis report*.

application program. (1) A program that performs a particular data processing task, such as inventory control or payroll. (2) A program that produces the print data set.

authorized program analysis report (APAR). A report of a problem caused by a suspected defect in a current unaltered release of a program.

A4 paper. Paper size that is 210 by 297 mm (8.27 by 11.7 inch).

A5 paper. Paper size that is 148 by 210 mm (5.83 by 8.27 inch).

B

Bar Code Object Content Architecture (BCOCA). An architected collection of constructs used to interchange and present bar code data.

bar code symbology. A bar code language. Bar code symbologies are defined and controlled by various industry groups and standards organizations. Bar code symbologies are described in the public domain bar code specifications. Synonymous with *symbology*.

baseline. The imaginary line on which successive characters are aligned in the inline direction.

BCOCA. See *Bar Code Object Content Architecture*.

bin. A paper source on cut-sheet printers. See also *cassette*.

bounded-box font. A font designed to use bounded character boxes. Contrast with *unbounded-box font*.

BTS. Burster-trimmer-stacker.

burst. To separate continuous-forms paper into single sheets.

burster-trimmer-stacker (BTS). A printer hardware feature that separates continuous forms into single sheets, trims the carrier strip from both edges of the forms, and stacks the sheets.

C

cassette. In a cut-sheet printer, a movable paper storage enclosure. See also *bin*.

CCITT. See International Telegraph and Telephone Consultative Committee.

changeable media origin. The ability of the printer to accept a command that changes the point on the medium where printing begins.

channel-attached. In PSF, a device that is linked to the host system using only S/390 channel protocols. For example, a 3800 printer cabled to the host system with a S/390 channel adapter is considered a channel-attached printer. Contrast with *SNA-attached*.

character. (1) A member of a set of elements used for the representation, organization, or control of data. Characters may be letters, digits, punctuation marks, or other symbols represented in the form of a spatial arrangement of adjacent or connected strokes or in the form of other physical conditions in data media. (2) A letter, numeral, punctuation mark, or special graphic used for the production of text. (3) In bar codes, a single group of bars and spaces that represent an individual number, letter, punctuation mark, or other symbol. (4) A byte of data. (5) See also *graphic character*.

character graphic. See also *graphic character*.

character graphic. A visual representation of a character, other than a control character, that is normally produced by writing, printing, or displaying. (T)

character identifier. The standard identifier for a character regardless of its style. For example, all uppercase As have the same character identifier.

character rotation. The alignment of a character with respect to its character baseline, measured in degrees in a clockwise direction. Examples are 0°, 90°, 180°, and 270°. Zero-degree character rotation exists when a character is in its customary alignment with the baseline.

character set. (1) A finite set of different graphic or control characters upon which agreement has been reached and that is considered complete for some purpose; for example, each of the characters in ISO Standard 646 *7-bit Coded Character Sets for Information Processing Interchange*. (2) For page printers, the font library member that contains the character graphics and their descriptions.

code page. A set of assignments, each of which assigns a code point to a character. Each code page has a unique name or identifier. Within a given code page, a code point is assigned to one character. More

than one character set can be assigned code points from the same code page. See also *coded font*.

code page global identifier (CPGID). (1) A 5-digit registered identifier used to specify a particular assignment of code points to graphic characters. (2) See also *graphic character set global identifier*.

code point. A 1-byte code representing one of 256 potential characters.

coded font. (1) A font library member that associates a code page and a font character set. For double-byte fonts, a coded font associates more than one pair of code pages and font character sets. (2) A font that can be fully described using a code page, character set, type style, posture, weight classification, and width classification. For actual presentation, a size must be specified. Some coded fonts require all of these attributes. Others, called symbol sets, require only code page and character set. See also *code page* and *character set*.

coded overlay. An overlay that is stored in the printer in a coded (not raster) format. Contrast with *raster pattern overlay*.

color selection. The ability to specify a color other than black to achieve more than one color of printed data. For example, the 4224-2C2 supports selection of several colors, depending on the color of ribbon installed in the printer. Other printers support the selection of black or the *color of the medium*, which can cause white lettering on a background that has been shaded black, for example.

command. A request from a terminal or a specification in a batch-processing print file for the operation of a particular program.

common-use forms. A set of paper sizes selected as being the most common in use throughout the world.

communication attached. In PSF, a device that is SNA-attached and that uses a communication controller. For example, a 3812 printer attached to a 3174 control unit that is attached to a 3175 Communication Controller can be considered to be a communication-attached printer. Contrast with *local attached*.

compatibility mode. A mode of operation for printing the output of 3800 Model 1 application programs on a 3800 page printer with little or no change to the application or JCL. Contrast with *page mode*.

composed text. Text data and text-control information that dictates the format, placement, and appearance of data to be printed.

composed-text data. Obsolete term for text data that has been composed into pages. Text formatting

programs such as DCF can create text data consisting entirely of structured fields. Synonym for *MO:DCA-P data*.

compressed pattern storage (CPS). Storage that holds the extended (double-byte) fonts for the 3800 Model 6 or Model 8 printers.

compression algorithm. An algorithm used to compress image data. Compression of image data can decrease the volume of data required to represent an image.

concatenated data set. In MVS, a group of logically connected data sets that are treated as one data set for the duration of a job step. See also *data set*, *partitioned data set*, and *library*.

conditional processing. A page-definition function that allows input data records to partially control their own formatting.

continuous forms. A series of connected forms that feed continuously through a printing device. The connection between the forms is perforated to allow the user to tear them apart. Before printing, the forms are folded in a stack arrangement with the folds along the perforations. Contrast with *cut-sheet paper*.

continuous-forms stacker. An output assembly on a continuous-forms printer that refolds and stacks the continuous forms after printing.

copy group. (1) One or more copies of a sheet of paper. Each copy can have modifications, such as text suppression, page position, forms flash, overlays, paper-source, and duplex printing. (2) In Print Services Facility, an internal object in a form definition that identifies the overlays and defines page placement and modifications to the form. (3) Synonymous with medium map.

copy modification. In the 3800 Printing Subsystem Model 1, a feature that allows the printing of predefined data on all pages of specified copies of a print file.

Core Interchange font. Synonym for *IBM Core Interchange font*.

CPGID. See *code page global identifier*.

CPS. Compressed pattern storage.

CSE. Cut-sheet emulation

current print position. The picture element that defines the character reference point or the upper-left corner of an image.

cut-sheet emulation (CSE). The ability of a continuous-forms printer to provide output that is similar to output from a cut-sheet printer. Some continuous-forms printers provide an operator option to enable cut-sheet emulation mode.

cut-sheet paper. The medium that is cut into uniform-size sheets before being loaded into the printer. Contrast with *continuous forms*.

D

DASD. Direct access storage device.

data check. A synchronous indication of a condition caused by invalid data or incorrect positioning of data. Reporting of some data checks can be suppressed.

data control block (DCB). A control block used by access method routines in storing and retrieving data.

data map. An internal object in a page definition that specifies fonts, page segments, fixed text, page size, and the placement and orientation of text. Synonymous with page format.

data set. A named set of records stored and processed as a unit. See also *file.*, *concatenated data set*, *partitioned data set*, and *sequential data set*.

data types. The type of data objects that can be printed by the printer. Each type of data object has its own architecture. An overview of the architectures is presented in the *Mixed Object Document Content Architecture Reference*.

Two types of text data are: PTOCA PT1 and PTOCA PT2. PT1 provides the basic function needed to control text data. PT2 provides additional migration controls for underscoring, overstriking, and making a temporary baseline move.

Two types of image data are: IOCA FS10 image and IM image. IOCA image provides more function than IM Image; for example, compression and resolution independence is possible with IOCA image.

Some printers support vector graphics called GOCA DR/2V0.

Some printers also have the capability of printing BCOCA BCD1 bar code data without requiring special fonts or special processing in the host system.

DCB. Data control block.

DCF. .See *Document Composition Facility*.

Decompression Performance Enhancement feature.

A feature you can purchase and install on your AFP printer to provide printer hardware image decompression of IOCA data streams that were compressed using standard compression routines. The DPE capability improves the decompression performance offered with the AFIG feature.

default. An alternate value, attribute, or option that is assumed when none has been specified, and one is needed to continue processing.

deferred printing mode. A printing mode that spools output through JES to a data set instead of printing it immediately. Output is controlled using JCL statements. Contrast with direct printing mode.

Device resolution. Printers can also be categorized by the resolution they support. For example, .br 240-pel resolution is supported by such printers as: 3800, 3820, 381x, 3160, 3930, the AFCCU-based 3900 family of printers, and the group 3 printers. 240- or 300-pel (configurable) is supported by the 3130 printer. 300-pel resolution is supported by such printers as: 391X, 3935, 4028, the PPDS and the PCL printers (such as the 4019 and 4029). 600-pel resolution is supported by the InfoPrint 4000 DR1/DR2 printer, as well as the Network Printers 12, 17, and 24.

direct access storage device (DASD). A computer storage device in which access time is effectively independent of the location of the data.

direct printing. A PSF for OS/390 printing mode that allows PSF exclusive use of the printer. Output is printed directly and is not controlled by the Job Entry Subsystem (JES).

disabled mechanisms. The ability to identify one mechanism of the printer as disabled. An example is the ability to print from one medium source when the other source is disabled.

Distributed Print Function (DPF). A component of PSF for OS/2 that you can use to print jobs sent to PSF for OS/2 from PSF for OS/390, PSF/VM, PSF/VSE, or PSF for AS/400. DPF receives host PSF output and resources for spooling and printing with PSF for OS/2. DPF also stores PSF for OS/390 and PSF/VSE resources in the DPF resource library, so that the host system does not have to send PSF resources each time documents are spooled. Through DPF, PSF for OS/2 2.0 provides a function similar to that provided by Remote PrintManager (RPM) Version 3.0 under DOS.

document. (1) A machine-readable collection of one or more objects that represent a composition, a work, or a collection of data. (2) A publication or other written material.

Document Composition Facility (DCF). An IBM licensed program that provides a text formatter called SCRIPT/VS. SCRIPT/VS can process files marked up with a unique set of controls and tags.

double-byte coded font. A font in which the characters are defined by 2 bytes; the first defining a coded font section, and the second defining a code point. Double-byte coded fonts are required to support languages requiring more than 256 graphic characters. Two bytes are required to identify each graphic character. Kanji is printed using a double-byte font. Contrast with *single-byte coded font*.

download. To transfer data from one computer for use on another one. Typically, users download to a printer, from a larger computer to a diskette or fixed disk on a smaller computer, or from a system unit to an adapter.

downloaded fully described fonts. The IPDS form of host fonts downloaded to a printer. PSF converts pairs of host font character sets and code pages into IPDS form before downloading to the printer for printing.

DPE. See *Decompression Performance Enhancement feature*.

DPF. See Distributed Print Function.

drain. An operator action to halt the flow of jobs to a printer, usually to stop the printer or to change print options.

duplex printing. Printing on both sides of a sheet of paper. Contrast with *simplex printing*. See also *normal duplex printing* and *tumble duplex printing*.

E

EBCDIC. Extended binary-coded decimal interchange code.

electronic overlay. A collection of constant data, such as lines, shading, text, boxes, or logos, that is electronically composed in the host processor and stored in a library, and that can be merged with variable data during printing. Contrast with *page segment*. See also *page overlay* and *medium overlay*.

Enterprise System Connection. See *ESCON channel*.

ESA. Enterprise System Architecture.

ESCON channel. A channel having an Enterprise Systems Connection channel-to-control unit I/O interface that uses serial-by-bit optical cable as a transmission medium.

exception. A condition that exists when the printer:

- Detects an invalid or unsupported command, order, control, or parameter value from the host.
- Finds a condition requiring host-system notification.
- Detects a condition that requires the host system to resend data.

exception highlighting. The markings placed on the printed page to indicate the source of a data stream error. Two types of highlight markings are used:

- *Print-error marker.* a solid rectangle.
- *Print-error vector.* a line drawn from a printed error code to the point on the page where the error occurred.

extended binary-coded decimal interchange code (EBCDIC). A coded character set of 256 eight-bit characters.

F

FCB. See *forms control buffer*.

FGID. See *font global identifier*.

file.

- In PSF for OS/2, a collection of related data.
- In PSF for OS/390, a member of a partitioned data set or a sequential data set.
- In PSF/VM, a CMS file.
- In PSF/VSE, a member in a library.sublibrary.

fixed metrics. Measurement information in specific units such as pels, inches, or centimeters for individual or collections of graphic characters. See also *font metrics*.

fold memory. The ability of a form to refold at the fold perforation after exposure to heat during the fusing process.

font. (1) A family or assortment of characters of a given size and style; for example, 9 point Bodoni Modern. (A). (2) One size and one typeface in a particular type family, including letters, numerals, punctuation marks, special characters, and ligatures. (3) A paired character set and code page that can be used together for printing a string of text characters. A double-byte font can consist of multiple pairs of character sets and code pages. (4) See *coded font*, *double-byte coded font*, and *symbol set*.

font character set. Synonym for character set.

font global identifier. (1) A number that identifies the character style and size for certain printers. (2) A unique value that identifies the type family, typeface, and, sometimes, the point size of a character set.

font metrics. Measurement information that defines individual character values, such as height, width, and space, as well as overall font values, such as averages and maximums. Font metrics may be expressed in specified fixed units, such as pels, or in relative units that are independent of both the resolution and size of the font.

font pruning. An action in which PSF reduces the number of characters downloaded to the printer by sending only those characters in a character set that are actually referenced by the code page. Font pruning can save time needed to download the characters and can reduce the amount of raster pattern storage used by the printer but can increase processor use.

font width. (1) A characteristic value, parallel to the character baseline, that represents the size of all graphic characters in a font. (2) In a font character set, nominal font width is a font-designer defined value corresponding to the nominal character increment for a font character set. The value is generally the width of

the space character and is defined differently for fonts with different spacing characteristics.

- For fixed-pitch, uniform character increment fonts: the fixed character increment, which is also the space character increment.
- For PSM fonts: the width of the space character.
- For typographic, proportionally-spaced fonts: 1/3 of the vertical font size, which is also the default size of the space character

The font designer can also define a minimum and a maximum horizontal font size to represent the limits of scaling. (3) In font referencing, the specified font width is the desired size of the font when the characters are presented. If this size is different from the nominal horizontal font size specified in a font character set, the character shapes and character metrics might need to be scaled prior to presentation.

form. A division of the physical medium; multiple forms can exist on a physical medium. For example, a roll of paper might be divided by a printer into rectangular pieces of paper, each representing a form. Envelopes are an example of a physical medium that comprises only one form. The IPDS architecture defines four types of forms: cut-sheets, continuous forms, envelopes, and computer output on microfilm. Each type of form has a top edge. A form has two sides, a front side and a back side. Synonymous with sheet.

form definition. A resource used by PSF that defines the characteristics of the form that includes overlays to be used (if any), paper source (for cut-sheet printers), duplex printing, text suppression, the position of composed-text data on the form, and the number and modifications of a page.

format. (1) The shape, size, and general makeup of a printed document. (2) To prepare a document for printing. (3) The arrangement of text on the page.

forms control buffer (FCB). A buffer for controlling the vertical format of printed output. The forms control buffer is a line-printer control that is similar to the punched-paper, carriage-control tape used on IBM 1403 printers. On AFP page printers, the forms control buffer is replaced by the page definition. See *page definition*.

forms flash. In the 3800, a printer function that prints photographic images with variable text data that is composed into pages. The printer operator must insert a frame containing a photographic negative into the printer to use the forms-flash function.

fully described font. In the IPDS architecture, an LF1-type raster font containing font metrics, descriptive information, and the raster representation of character shapes, for a specific graphic character set. A fully described font can be downloaded to the printer using the Load Font Control and Load Font commands. Synonym for *raster font*. See *downloaded fully described fonts* and *resident fully described fonts*.

G

GCSGID. See *graphic character set global identifier*.

GDDM. See *Graphical Data Display Manager*.

global resource identifier (GRID). An 8-byte identifier used to identify an external name of a font, or, in AS/400, to identify fonts used in text. A GRID, which identifies a character-set and code-page combination, consists of the GCSGID, CPGID, FGID, and font width.

GOCA. See *Graphics Object Content Architecture*.

graphic character. A visual representation of a character, other than a control character, that is normally produced by writing, printing, or displaying. (T)

graphic character set global identifier (GCSGID). (1) A unique value that identifies the list of graphic character identifiers included in a component. (2) See *also code page global identifier*.

Graphical Data Display Manager. A series of IBM programs that can create, among other functions, device-independent visual data such as page segments and send it to devices such as displays, plotters, printers, and personal computers.

Graphics Object Content Architecture (GOCA). An architected collection of constructs used to interchange and present graphics data.

gray-scale image. The ability to print an image in shades of gray as well as in black.

GRID. See *global resource identifier*.

guaranteed print labeling. A method of print labeling that ensures the integrity of the identification label by preventing the user from writing over the label. If attempts are made to override print labeling, processing of the print file is terminated, and an audit record is written.

group 3. A term used in VM-specific environments to define channel-attached high-end printers such as the 3825, 3827, 3828, 3829, 3835-1, 3835-2, and 3900-1. Group 3 printers are also referred to as CCU (Common Control Unit) printers, because the hardware control unit was based on a common design. Because this publication encompasses more than VM-specific information, the term `:q.group 3:eq.` is not used in this publication, except for definition purposes in the Glossary section.

group 4. A term used in VM-specific environments to define SNA-attached that use coax or twinax, and include such printers as the 3130, 381x, 3930, 3935, 391x, and 4028. The group 4 printers can be communications-attached with 37xx or 3x7x controllers, or through an SNA token ring LAN. Because this publication encompasses more than VM-specific

information, the term “group 4” is not used in this publication, except for definition purposes in the Glossary section.

H

hard page segment. (1) A page segment that is declared in the Map Page Segment structured field and loaded in the printer as a resource that can be reused during the job without being reloaded to the printer. (2) Within another element, as an inline resource. (3) Contrast with *soft page segment*.

hardcopy. (1) A copy of a display image generated on an output device such as a printer or plotter, and which can be carried away. (T) (2) A printed copy of machine output in a visually readable form; for example, printed reports, listings, documents, and summaries.

hardware default font. The font used by the printer if no other font is specified.

hexadecimal. Pertaining to a numbering system with base of 16; valid numbers use the digits 0 through 9 and characters A through F, where A represents 10 and F represents 15.

host system. (1) A data processing system that prepares programs and the operating environments for another computer or controller. (2) The data processing system to which a network is connected and with which the system can communicate.

HP-PCL. Hewlett-Packard Printer Control Language, the data stream used by a type of Hewlett-Packard printer, some of which are supported by PSF for OS/2 and PSF for AIX.

I

IBM Compatibility fonts. A group of fonts supplied as part of Print Services Facility, Print Management Facility, and Application System/400. Many of these fonts are derived from fonts created for specific IBM printers (such as the IBM 3800 Model 1, the IBM 6670 Information Distributor, and the IBM Proprinter) or applications (such as Document Composition Facility). The fonts are called compatibility fonts because they allow applications created for the 3800 Model 1 and 6670 to be migrated to newer page printers without having to change the fonts specified in the applications. Examples of IBM compatibility fonts include APL, Boldface, Document, Essay, Format, Gothic, Letter Gothic, Orator, Prestige, Roman, Script, Serif, and Text type families as well as a set of Proprinter Emulation fonts.

IBM Core Interchange fonts. A group of fonts supplied as part of Print Services Facility that are common across all SAA and AIX operating systems and whose objective is to facilitate document interchange

across these systems with full fidelity. These fonts are also compatible with fonts provided by Microsoft on their DOS/Windows workstations and with the base fonts provided by Adobe on their PostScript printers, providing document portability across both IBM and non-IBM computer systems. The fonts are provided in the Courier, Times New Roman, and Helvetica type families in both roman medium and bold weights and in italic medium and bold weights.

IBM MMR. See *IBM Modified Modified Read*.

IBM Modified Modified Read (MMR). A compression algorithm.

IM image command set. In the IPDS architecture, a collection of commands used to present IM image data in a page, page segment, or overlay.

image. Toned and untoned pels arranged in a pattern.

image data. Rectangular arrays of raster information that define an image.

Image Object Content Architecture. An architected collection of constructs used to interchange and present images.

IMM. See *IBM Modified Modified Read*.

impact printer. A printer in which printing results from mechanical impacts. (I) (A) Contrast with *nonimpact printer*.

impression. The data printed on one side of a sheet. Printer speed is often measured in terms of impressions per minute (ipm).

inline. Synonymous with *inline direction*.

inline direction. The direction of successive characters in a line of text. Synonym for *inline*.

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.

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

International Telecommunications Union-Telecommunications Standardization Sector (ITU-TSS). See *International Telegraph and Telephone Consultative Committee (CCITT)*.

International Telegraph and Telephone Consultative Committee. An organization (one of four permanent organs of the International Telecommunication Union [ITU], headquartered in Geneva, Switzerland) that is concerned with the problems relating to international telephony and telegraphy. The CCITT Plenary Assembly

meets at regular intervals to prepare a list of technical questions related to telephone and telegraph services. The Assembly assigns these questions to study groups, which then prepare recommendations to be presented at the next plenary meeting. Approved recommendations are published for the use of engineers, scientists, and manufacturers around the world.

The committee's name has been changed to International Telecommunications Union-Telecommunications Standardization Sector (ITU-TSS).

IOCA. See *Image Object Content Architecture*.

IPDS. See *Intelligent Printer Data Stream*.

J

JCL. Job control language. See *job control language*.

JES. Job entry subsystem. See *job entry system*.

job control language (JCL). A control language used to identify a job to an operating system and to describe the requirements of the job.

job entry subsystem (JES). A system facility for spooling, job queuing, and managing I/O.

K

kanji. Nonphonetic Chinese characters used in Japanese written language. In a font representing kanji characters, each character is represented by a double-byte font.

L

LAN. Local Area Network

landscape page presentation. The position of a printed sheet that has its long edges as the top and bottom and its short edges as the sides. Contrast with *portrait page presentation*.

library.

- In PSF for OS/2, a directory, a list of files stored on a disk or diskette.
- In PSF for OS/390, a partitioned data set or a series of concatenated data sets.
- In PSF/VM, a collection of CMS files, generally with the same file type.
- In PSF/VSE, a library sublibrary.

line data. Data prepared for printing on a line printer, such as a 3800 Model 1. Line data is usually characterized by carriage-control characters and table reference characters. Contrast with *MO:DCA-P* data.

line merging. Printing two or more records of line data at the same location on the page. Line merging is used

with line data to mix different fonts on the same line, to underscore or overstrike, and on impact printers to create darker print.

line printer. A device that prints a line of characters as a unit. (I) (A) Contrast with *page printer*.

lines per inch (lpi). (1) .The number of lines that can be printed vertically within an inch. (2) A unit of measurement for the specification of the placement of the baseline.

local attached. In PSF, an SNA-attached device that does not have a communications controller in its configuration. For example, a 3812 printer connected to a channel-attached 3174 control unit defined to the host system through VTAM is considered to be a local-attached printer. Contrast with *communication attached*.

logical page. A presentation space. One or more object areas or data blocks may be mapped to a logical page. A logical page has specifiable characteristics, such as size, shape, orientation, and offset. The shape of a logical page is the shape of a rectangle. Orientation and offset are specified relative to a medium coordinate system. See also *page*.

logical page origin. (1) The point on the logical page from which positions of images, graphics, page overlays, and text with 0-degree inline direction are measured. (2) The point on the logical page represented by $X_p=0$, $Y_p=0$ in the X_p coordinate system.

lpi. Lines per inch.

LU type 1. An SNA logical unit type that provides a communication protocol among host application programs and terminals. Some printers also use this protocol to communicate with host application programs.

LU type 6.2. An SNA logical unit type that converges functions from existing LU types to provide a single, interchangeable communication protocol.

M

macro. Synonym for *macroinstruction*.

macroinstruction. An instruction that causes the execution of a predefined sequence of instructions.

magnetic ink character recognition (MICR). Character recognition of characters printed with ink that contains particles of a magnetic material. (I) (A)

magnetic toner. Toner used with specific printers to print magnetic ink character recognition (MICR) fonts.

manual forms feed. The ability to manually feed a medium into a printing device rather than having the device automatically feed the medium.

Map Page Segment structured field (MPS). The Map Page Segment structured field identifies the page segments to be loaded into the printer and to remain in the printer while the entire print file is printed.

marking. A method that refers to the updating of certain structured fields that identifies a resource for use by Remote PrintManager or as being printer resident.

maximum speed. The highest speed of which the printer is capable in characters per second (cps), lines per minute (lpm), or impressions per minute (ipm), for a given size sheet.

media destination. The destination to which sheets are sent as the last step in the print process. Some printers support several media destinations to allow options such as print job distribution to one or more specific destinations, collated copies without having to send the document to the printer multiple times, and routing output to a specific destination for security reasons. Contrast with *media source*.

media destination by copy. The ability to select the destination for an individual copy of a sheet. This function is not supported by PSF.

media origin. The first hardware addressable point on the physical medium. The point from which the logical page origin is positioned by the medium map. This point is represented by $X_m=0$, $Y_m=0$ in the X_m , Y_m coordinate system. The media origin is defined relative to the top edge of the medium. Synonymous with *medium origin*.

media source. The source from which sheets are obtained for printing. Some printers support several media sources, so that media with different characteristics (such as size, color, and type) can be selected. Contrast with *media destination*.

media source by copy. The ability to select the source of the media for each copy of a sheet, when making multiple copies of a sheet.

medium. The physical material (for example, paper) on which data is printed. See also *form*.

medium map. An internal object in a form definition that controls the modifications to a form, page placement, and overlays. Synonymous with *copy group*.

medium origin. Synonym for *media origin*.

medium overlay. An electronic overlay that is invoked by the medium map of a form definition for printing at a fixed position on the form. See *page overlay*.

MICR. See *magnetic ink character recognition*.

MICR printing. The ability of a printer to either print with magnetic toner or to allow MICR printing through a postprocessing device.

microfilm device. An output device that presents a hardcopy on microfilm.

Mixed Object Document Content Architecture. An architected, device-independent data stream for interchanging documents.

mixed-pitch font. A font that simulates a typographic font. The characters are in a limited set of pitches; for example, 10 pitch, 12 pitch, and 15 pitch.

MO:DCA. See *Mixed Object Document Content Architecture*.

MO:DCA-P. Print data that has been composed into pages. Text formatting programs such as DCF can produce composed text data consisting entirely of structured fields.

MOF. Metric-only font.

monospaced font. A font in which the graphics characters have a uniform character increment. Synonymous with *uniformly spaced font*. Contrast with *proportionally spaced font*.

MPS. See *Map Page Segment structured field*.

Multiple Virtual Storage (MVS). An IBM operating system running on a S/370 or S/390 processor.

multiple-up. The printing of more than one page of application data on a single surface of a sheet of paper.

MVS. See *Multiple Virtual Storage*.

N

N_UP printing. In basic N_UP printing, the dividing of a side of a sheet into a fixed number of equal-size partitions. For example, N_UP 4 divides each side of the sheet into four equal partitions. In enhanced N_UP printing, the sheet can be divided into 8 partitions, anywhere on the sheet.

NACK. See *negative acknowledgment reply*.

narrow forms. Forms that have their longer edges at the sides and their shorter edges at the top and bottom.

negative acknowledge reply (NACK). A reply from a printer to a host indicating that an exception has occurred.

nonimpact printer. A printer in which printing is not the result of mechanical impacts; for example, thermal printers, electrostatic printers, and photographic printers. (I) (A) Contrast with *impact printer*.

normal duplex printing. Printing on both sides of the paper so that the sheets can be bound on the long edge of the paper. Contrast with *simplex printing*. See also *tumble duplex printing*.

O

object. A resource or a sequence of structured fields contained within a larger entity, such as a page segment or a page.

offset stacking. A function that allows the printed output pages to be offset for easy separation of print jobs.

OGL/370. See *Overlay Generation Language/370*.

operator-adjustable forms. On certain printers, the ability of the operator to adjust the page image on the medium to align data for correct placement on preprinted forms.

option. (1) A specification in a statement that may be used to influence the execution of the statement. (2) A choice offered from a list of possibilities.

orientation. The number of degrees an object is rotated relative to a reference; for example, the orientation of an overlay relative to the logical page origin. Orientation usually applies to blocks of information, whereas character rotation applies to individual characters. See also *text orientation*.

origin. A picture element (pel) position from which the placement and orientation of text, images, and page segments are specified. For example, pages, overlays, and page segments have origins.

outline font. A font technology in which the graphic character shapes are represented in digital form by a series of mathematical expressions that define the outer edges of the strokes. The resulting graphic character shapes can be either solid or hollow. Outline fonts can be scaled (sized) to any size. The IBM outline font character sets have a CZ prefix. Contrast with *raster font*.

overlay. A collection of constant data, such as lines, shading, text, boxes, or logos, that is electronically composed in the host processor and stored in a library and that can be merged with variable data during printing. See also *forms flash.*, *page overlay*, *medium overlay*, and *electronic overlay*.

Overlay Generation Language/370 (OGL/370). An IBM licensed program you can use to design objects for electronic overlays, such as lines, boxes, shadings, and irregular shapes, to create graphics.

P

page. (1) A data stream object delimited by a Begin Page structured field and an End Page structured field. A page can contain text, image, graphics, and bar code data. (2) The final representation of such an object on a physical medium. (3) See also *logical page*.

page definition. A resource used by PSF that defines the rules of transforming line data into pages and text controls.

page format. Synonym for *data map*.

page mode. The mode of operation in which a page printer can accept a page of data from a host processor to be printed on an all-points-addressable output medium. Data may consist of pages containing text, images, overlays, or page segments. Contrast with *compatibility model*.

page origin. Synonym for *logical page origin*.

page overlay. An electronic overlay that can be invoked for printing and positioned at any point on the page by an Include Page Overlay structured field in the print data. See *medium overlay*.

page position. A control in the copy group to assign the top-left boundary point of the logical page on a sheet for a data set. The page position is determined from the media origin.

page printer. Any of a class of printers that accepts MO:DCA-P pages, constructed of page data and images, among other things. Contrast with *line printer*.

Page Printer Formatting Aid (PPFA). An IBM licensed program you can use to create and store form definitions and page definitions, which are resource objects used for managing print jobs. By writing a command stream specifying form definitions, page definitions, or both, for executing PPFA, you can store the objects specified in the library. You can then use these objects to format printed output.

page segment. A resource containing MO:DCA data and images, prepared before formatting and included during printing. A page segment can contain text and images and can be included on any addressable point on a page or electronic overlay. A page segment assumes the environment of an object in which it is included.

PAGEDEF. A JCL parameter that specifies a page definition. See *page definition*.

parameter. (1) A variable that is given a constant value for a specified application and that may denote the application. (I) (A) (2) An item in a menu for which the user specifies a value or for which the system provides a value when the menu is interpreted. (3) Data passed between programs or procedures.

partial page. A page that does not contain all the intended data. Partial pages can be printed after an error is sensed.

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.

partitioned data set (PDS). A data set in direct access storage that is divided into partitions, called members, each of which can contain a program, part of a program, or data. Contrast with *sequential data set*.

pattern storage (PST). An area of storage that holds the raster patterns for fonts and images.

PDS. See *partitioned data set*.

pel. Synonym for *picture element*.

PEM. Print-error marker. See *exception highlighting*.

PEV. Print-error vector. See *exception highlighting*.

physical medium. A physical entity on which information is presented. Examples of a physical medium are a display screen, paper, foils, microfilm, or labels.

picture element. (1) In computer graphics, the smallest element of a physical medium that can be independently assigned color and intensity. (T) (2) The smallest element that can be printed or displayed on a physical medium. Picture elements per inch is often used as a measurement of presentation granularity. Synonymous with *pel*.

pitch. The character size represented by the number of characters that can be printed horizontally in an inch; for example, 10 pitch has 10 graphic characters per inch. Uniformly spaced fonts are measured in pitch. Contrast with *point*.

point. A unit of about 1/72 inch used in measuring type. Contrast with *pitch*.

point size. The height of a font in points.

portrait page presentation. The position of a printed sheet that has its short edges as the top and bottom and its long edges as the sides. Contrast with *landscape page presentation*.

PPFA. See *.Page Printer Formatting Aid*.

presentation device. A device that produces character shapes, graphics pictures, images, or bar code symbols on a physical medium. Examples of a physical medium are a display screen, paper, foils, microfilm, or labels.

Presentation Text Object Content Architecture (PTOCA). An architected collection of constructs used to interchange and present presentation text data.

print data stream. The data stream created by PSF and transmitted to the printer.

print direction. (1) The direction in which characters are added to a line. (2) In PSF, the specification of inline direction for the printing of text.

print-error marker. See *exception highlighting*.

Print-error vector. See *exception highlighting*.

print job. The data that the user submits to PSF to be printed. A print job can request the printing of multiple data sets.

print labeling. A controlled method of placing identification labels on each page of PSF printed output. See also *guaranteed print labeling*.

print position. Any location on a medium where a character can be printed.

print quality. (1) The measure of printed output against existing standards and in comparison with jobs printed previously. (2) The ability of some page printers to print data at more than one level of print quality, such as *asdraft* and *near-letter* quality.

print-quality levels. The capability on certain printers for you to specify more than one level of print quality, such as *draft* or *near letter quality*.

print server. (1) A functional unit that provides shared services to workstations over a network; for example, a file server, a print server, or a mail server. (T) (2) In a network, a data station that provides facilities to other stations; for example, a file server, a print server, or a mail server. (A) (3) In the AIX operating system, an application program that usually runs in the background and is controlled by the system program controller. (4) In TCP/IP, a system in a network that handles the requests of a system at another site, called a client-server.

Print Services Facility (PSF). A licensed program that manages and controls the input data stream and output data stream required by supported IBM page printers. PSF combines print data with other resources and printing controls to produce AFP output.

printable area. The area on a sheet of the paper where print can be placed.

printer. A presentation device that produces character shapes, graphics pictures, images, or bar-code symbols on a physical medium. Examples of a physical medium are a display screen, paper, foils, microfilm or labels. See *presentation device*.

printer-parameter member. In PSF/VSE, the member of a phase library containing user-specified printer parameters to print a job on a page printer. The printer-parameter macroinstruction provided with PSF/VSE stores the user-specified parameters as a member of a phase library.

printhead resolution. The number of pels that can be printed in an inch, both horizontally and vertically.

program temporary fix (PTF). A temporary solution or bypass of a problem diagnosed by IBM as resulting from a defect in a current unaltered release of the program.

programming request for price quotation (PRPQ). A customer request for a price quotation on alterations or additions to the functional capabilities of system control programming or licensed programs. The RPQ may be used in conjunction with computing system RPQs to solve unique data processing problems.

proportionally spaced font. A typographic font, or in some usages a mixed-pitch font. See *typographic font* and *mixed-pitch font*.

PSF. See *Print Services Facility*.

PSF Direct. A function of PSF for OS/2 or PSF for AIX that enables another PSF program (PSF for OS/390, PSF/VM, PSF/VSE, or PSF for AS/400), using the LU6.2 SNA protocol, to print remotely on PSF for OS/2 or PSF for AIX printers. The PSF program sends the print data stream directly to the PSF for OS/2 or PSF for AIX printer, bypassing the OS/2 or RISC/6000 spool. The operator of the originating system controls printing on the PSF for OS/2 or PSF for AIX printers, as though the printers were attached to the originating system.

PTF. Program temporary fix.

PTOCA. See *Presentation Text Object Content Architecture*.

R

raster font. A font technology in which the graphic characters are defined directly by the raster bit map. Contrast with *outline font*.

raster pattern. A pattern of bits with 0 (off) and 1 (on) that define the pels in an image. A 1-bit is a toned pel.

raster pattern overlay. An overlay loaded in the printer as a raster pattern rather than as a sequence of printer commands. Contrast with *coded overlay*.

raster pattern storage (RPS). An area of storage that holds raster patterns for fonts and images.

repositioning. A process in which Print Services Facility, following an indication from the printer or from JES of a potentially recoverable error, locates the correct spool record for recomposing one or more pages for printing.

request for price quotation (RPQ). A customer request for a price quotation on alterations or additions to the functional capabilities of a computing system,

hardware product, or device. The RPQ may be used in conjunction with programming RPQs to solve unique data processing problems.

resident fully described fonts. Fonts stored in a printer but that have most of the attributes that can be specified for host fonts.

resident symbol sets. A type of font stored in a printer that has fewer attributes than can be specified for fully described fonts.

resolution. (1) In computer graphics, a measure of the sharpness of an image, expressed as the number of lines and columns on the display screen. (2) The number of pels per unit of linear measure.

resource. (1) A collection of printing instructions used by Print Services Facility in addition to the print data set, to produce the printed output. PSF resources include coded fonts, font character sets, code pages, page segments, overlays, form definitions, and page definitions. (2) Any source of aid used for performing a task, for example disk storage space, computer processing time, and communications lines.

rotation. Synonym for *character rotation*. See also *orientation*.

routine. A program or sequence of instructions called by a program that may have some general or frequent use. (I) (A)

RPQ. See *request for price quotation*.

rule. A solid or patterned line of any weight, extending horizontally or vertically across a column, row, or page.

S

SCS. See *SNA Character String*.

SDLC. Synchronous Data Link Control.

security label. In a trusted computing base, a security label used to maintain multiple levels of security on a system. This label is a combination of a security class and a security level.

sense data. (1) Data describing an I/O error. Sense data is presented to a host system in response to a Sense I/O command. (2) In SNA, the data sent with a negative response indicating the reason for the response.

sequential data set. In MVS, a data set whose records are organized on the basis of their physical positions, such as on magnetic tape. Contrast with *partitioned data set*.

sheet. A division of the physical medium on which data is presented. The IPDS architecture defines four types of sheets: cut-sheet forms, continuous forms,

envelopes, and computer output on microfilm. Each sheet has a front and a back side. Some types of media consist of multiple sheets. For example, a roll of continuous forms can be divided at the perforations into rectangular sheets. Each sheet usually has carrier or tractor-feed strips, also. Microfilm is another example of a medium comprising multiple sheets, whereas envelopes comprise only one sheet. Synonymous with *form*.

simplex printing. Printing on only one side of the paper. Contrast with *duplex printing*.

single-byte coded font. A font in which the characters are defined by a 1-byte code point. A single-byte coded font has only one coded font section. Contrast with *double-byte coded font*.

SNA. Systems Network Architecture.

SNA Character String. In SNA, a character string composed of EBCDIC controls, optionally intermixed with end-user data, that is carried within a request/response unit.

SNA-attached. In PSF, a device linked to the host system through VTAM that uses an SNA protocol to transfer data. The device does not need to be physically connected to the host; some printers are attached to a control unit, a communication controller, or both, and they can transfer data over telecommunication lines. For example, a 3820 attached to a communication controller using the LU 6.2 communication protocol to transfer data to a communication controller is considered an SNA-attached printer. Contrast with *channel-attached*.

soft page segment. A resource that is not declared in the Map Page Segment structured field but is sent to the printer inline with data. Contrast with *hard page segment*.

spooled printing. A printing mode in which a print file is sent to a spooling subsystem. The spooling subsystem then directs the file to a printer.

storage. (1) A unit into which recorded text can be entered, in which it can be retained and processed, and from which it can be retrieved. (T) (2) The action of placing data into a storage device. (I) (3) A storage device. (A)

structured field. A self-identifying string of bytes and its data or parameters.

subgroup. A set of modifications within a copy group that applies to a certain number of copies of a form. A copy group can contain more than one subgroup.

suppression. Synonym for *text suppression*.

symbol set. A coded font that is usually simpler in structure than a fully described coded font. Symbol sets are used where typographic quality is not required.

Examples of devices that may not provide typographic quality are dot-matrix printers and displays.

symbology. Synonym for *bar code symbology*.

Synchronous Data Link Control (SDLC). A discipline for managing synchronous information transfer over a data link connection.

SYSOUT. See *system output stream*.

system output stream (SYSOUT). An indicator used in a data definition (DD) statement to signify that a data set is to be written on a system output unit.

Systems Network Architecture (SNA). In IBM networks, the description of the layered logical structure, formats, protocols, and operational sequences that are used for transmitting information units through networks, as well.

T

table reference character (TRC). An optional control character in an input record that identifies the font to be used to print the record. The table reference character corresponds to a font number defined in a page definition font list or to the order of font names listed in the job control CHARS parameter.

TCP/IP-attached. Includes all printers attached through the 7913, or attached directly to either token-ring or Ethernet LAN through TCP/IP. These are primarily the group 4 printers (that are attached through the 7913) and the AFCCU printers (through direct LAN attachment).

text. A graphic representation of information on an output medium. Text can consist of alphanumeric characters and symbols arranged in paragraphs, tables, and columns.

text orientation. A description of the appearance of text as a combination of print direction and character rotation.

text suppression. The intentional omission of portions of text, specified in a copy group in the form definition.

throughput. (1) A measure of the amount of work performed by a printer over a period of time, for example, the number of impressions per minute. (2) A measure of the amount of work performed by a computer system over a period of time, for example, the number of jobs per day. (I) (A)

token ring. A network configuration in which tokens are passed in a circuit from node to node. A node that is ready to send can capture the token and insert data for transmission.

trace. A record of the execution of a computer program. It exhibits the sequences in which the instructions were executed. (A)

TRC. Table reference character.

tumble duplex printing. Duplex printing for sheets that are to be bound on the short edge of the paper regardless of whether the printing is portrait or landscape. Contrast with *normal duplex printing*.

two-channel switch. A hardware feature that allows an I/O device to be attached to two channels. A dynamic switch can be added, which allows both interfaces to be enabled at the same time with channel selection determined by programming.

type size. (1) A measurement in pitch or points of the height and width of a graphic character in a font. (2) One of the many attributes of a font; other attributes, for example, are weight and width.

typeface. A collection of fonts all having the same style, weight, and width. Each font differs from the others by point size or type family.

typographic font. A font in which the distance between characters varies. The distance from one character to another is adjusted to improve the visual flow of text by eliminating excess space.

U

UCS. See *universal character set*.

unbounded-box font. A font designed to use unbounded character boxes. Contrast with *bounded-box font*.

unformatted print records. Line data made up of fields of data that have not been formatted into print lines. PSF uses a page definition to format these records for printing on page printers.

uniformly spaced font. A font in which the characters have the same character increment. Contrast with *proportionally spaced font*.

universal character set (UCS). A printer feature that permits the use of a variety of character arrays.

UPA. See *user printable area*.

user printable area (UPA). The area within the valid printable area (VPA) where user-generated data can print without causing an exception condition. See also *valid printable area*.

V

valid printable area (VPA). The intersection of a logical page with the area of the medium presentation

space in which printing is allowed. If the logical page is a secure overlay, the area in which printing is allowed is the physical printable area. If the logical page is not a secure overlay, and if a user printable area is defined, the area in which printing is allowed is the intersection of the physical printable area with the user printable area. If a user printable area is not defined, the area in which printing is allowed is the physical printable area. See also *logical page* and *user printable area*.

value. A quantity assigned to a constant, a variable, a parameter, or a symbol in a command.

Virtual Telecommunications Access Method (VTAM). A set of programs that maintains control of the communication between terminals and application programs running under DOS/VS, OS/VS1, and OS/VS2 operating systems.

VPA. See *valid printable area*.

VTAM. Virtual Telecommunications Access Method.

W

wide forms. (1) Forms that have their longer edges at the top and bottom and their shorter edges at the sides. (2) Forms that have perforations on the longer edge of the paper and tractor holes on the shorter edge.

X

XA. Extended Architecture.

X-axis. In printing, an axis perpendicular to the direction in which the paper moves through the printer. See also *Y-axis*.

Y

Y-axis. In printing, an axis parallel with the direction in which the paper moves through the printer. See also *X-axis*.

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