Card for IPDS and SCS/TNe

IPDS Emulation User's Guide

Printers

- Lexmark C770, C772
- Lexmark C780, C782
- Lexmark C920
- Lexmark C935
- Lexmark T640, T642, T644
- Lexmark W840

Multifunction Products

- Lexmark X644e MFP, X646e MFP
- Lexmark X646ef MFP
- Lexmark X782e MFP
- Lexmark X850e MFP, X852e MFP, X854e MFP
- Lexmark X940e MFP, X945e MFP

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1 Introduction

1.1 About This Guide

Thank you for purchasing the **Card for IPDS and SCS/TNe** which provides emulation support for Intelligent Printer Data Stream (IPDS) and SNA Character String (SCS)**.** This provides high quality IBM host connectivity print output. With the appropriate adapter and host software, your printer becomes an IBM host workstation printer capable of printing AFP, IPDS, or SCS documents from an AS/400, iSeries, System/370, System/390, or zSeries. **Unless otherwise stated, the term "printer" covers both printers and Multifunction Products (MFPs).**

This guide contains information to assist you in using the front panel to change **IPDS MENU** settings, understand the **IPDS MENU** settings, and IPDS function support.

If you need information on **configuring the printer and host settings** to receive IPDS jobs, refer to the *IPDS Printer and Host Setup Guide*.

If you need information on the **SCS/TNe emulation** provided with the Card, please refer to the *SCS/TNe Emulation User's Guide*.

Information on **how to install the Card** is on separate documentation shipped with your printer. Refer to the documentation that was shipped with your printer for information on how to install the Card.

If you need **basic information** about your printer setup and printer operation, please refer to the printer's specific documentation.

1.2 Equipment Requirements and Specifications for IPDS Emulation Printing

This manual applies to the following printers:

- Lexmark C770, C772 (IPDS color and monochrome printing, SCS monochrome printing only)
- Lexmark C780, C782 (IPDS color and monochrome printing, SCS monochrome printing only)
- Lexmark C920 (IPDS color and monochrome printing, SCS monochrome printing only)
- Lexmark C935 (IPDS color and monochrome printing, SCS monochrome printing only)
- Lexmark T640, T642, T644
- Lexmark W840

This manual applies to the following Multifunction Products (MFPs):

- Lexmark X644e MFP, X646e MFP
- Lexmark X646ef MFP
- Lexmark X782e MFP (IPDS color and monochrome printing, SCS monochrome printing only)
- Lexmark X850e MFP, X852e MFP, X854e MFP
- Lexmark X940e MFP, X945e MFP (IPDS color and monochrome printing, SCS monochrome printing only)

To print IPDS jobs, the printer must have the optional Card for IPDS and SCS/TNe installed, a minimum of 64 MB of user memory (DRAM), and one of the following:

- Standard Network (Ethernet connection integrated into printer system board on selected printer models)

- MarkNet internal LAN print server (optional card providing Ethernet or Fiber network connection)
- Lexmark 802.11g Wireless Print Adapter
- Coax/Twinax Adapter for SCS internal adapter for connection to a host via coax or twinax cables. Refer to the IPDS Printer and Host Setup Guide for a list of printers that support this adapter.

1.3 Customer Support

Information on how to configure the host and printer during the initial installation is found in the Card for IPDS and SCS/TNe IPDS Printer and Host Setup Guide.

If you can not find answers in this guide about using the IPDS emulation, or require firmware updates, please contact your point of purchase, your local Lexmark office, or check the Lexmark support web site at http://support.lexmark.com

1.4 Conventions Used in the Manual

- Printer menu keys and operator panel texts are written in bold.
- **Option names** usually correspond to menu texts and are **bold** when used in sentences or shown as the first column on a table listing options and general descriptions of the listed options.
- ”Option values” described within sentences are written in “quotation marks”. They are **bolded** when shown as the first column on a table describing values for an option.
- Some book titles are written in *italic*.
- `On screen text` is written in `Courier` typeface.
- Keyboard keys are written in angle brackets, e.g. <Enter> or <F1>.
- Bold is sometimes used for **emphasis** or as **subheaders** for blocks of text within a section.
- *Italics* are used to label *Examples*, *Notes* and blocks of text with very *Important* information.
- **Unless otherwise stated, the term “printer” covers both printers and MFPs.**

2 Using the Operator Panel or Touch Screen for IPDS MENU Setup

The IPDS emulation option settings may be changed from the control panel (either the printer operator panel or MFP touch screen), from a browser, or from MarkVision Professional. This section of the guide shows how to change and save option settings using the operator panel. If you are familiar with changing IPDS options, skip this chapter. See 3 Setup Operations Reference on page 19 for a listing of all possible values for each option.

The following sections show how to change, save, and verify option settings:

- 2.2 Changing IPDS Settings Using the Operator Panel on page 12
- 2.3 Changing IPDS Settings Using the MFP Touch Screen on page 16

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- Remote Configuration of Printer IPDS Settings on page 76

Note: Please refer to your printer's documentation for more detailed instructions on how to use the operator panel. The layout of the operator panel may vary on the different models.

Note: Printer IPDS settings are for the most part used as default. They are only used in the absence of specific instructions from the host. Thus, the settings you choose from your IPDS print job may override default settings, including those you set yourself.

2.1 IPDS MENU Setup Options vs. Printer Setup Options

Changes to the option settings under the **IPDS MENU** will only affect the way IPDS jobs print. These changes will not affect PostScript™, PCL™, or SCS jobs.

Changes to printer settings under the various printer menus will affect the way PostScript and PCL jobs are printed. Many of these printer settings will also affect IPDS jobs.

This guide discusses changing the **IPDS MENU** settings. Please refer to your printer's documentation for information on changing other printer settings.

Refer to the *SCS/TNe Emulation User's Guide* for information on setting up and using the SCS/TNe emulation.

2.2 Changing IPDS Settings Using the Operator Panel

2.2.1 Accessing the IPDS MENU

Access the IPDS emulation options and settings from the **IPDS MENU** on the printer. To reach the menu:

1. From a **Ready** status, press the **Menu** button on the operator panel. This opens the menu index in the operator panel's screen.
2. Use the navigation buttons ▼ or ▲ to scroll through the main menus displayed on the screen.
3. Each time you press a navigation button ▼ or ▲ , the ✓ on the screen moves to indicate the choice that will be active when you select it.
4. When ✓ is displayed next to the **Option Card Menu,** press the **Select** button .
5. When ✓ is displayed next to **IPDS MENU,** press .

The same method is used to scroll through lists of menus and options. As you move through the menus, the top line in the screen shows the name of the group (menu or option) to which the displayed items (options or settings) belong.

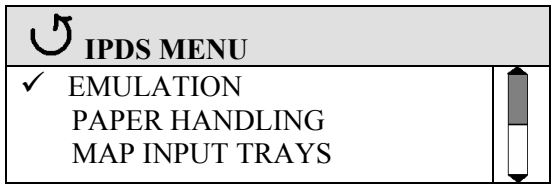
When you select an option, you will either scroll through the list of values presented, as shown in section 2.2.2, on page 12, or enter a number through one of the methods shown in section 2.2.3 on page 14.

User-selected default settings remain in effect until you save new settings or restore the factory defaults. Concerning activation, see section 2.2.4 on page 15.

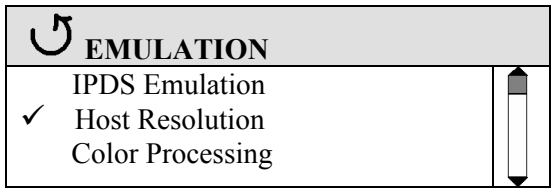
2.2.2 Example: Selecting a New Value as a Setting

1. Navigate to the **IPDS MENU** as explained in section 2.2.1 on page 12.
2. Press ▼ or ▲ to scroll to the desired menu. The names of menus are shown in all capital letters. Press .

   In the following example, you select **EMULATION**, which happens to be the first on the list.



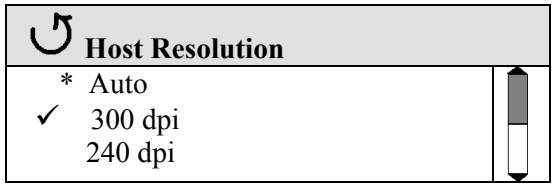
3. Press ▼ or ▲ to scroll further until ✓ is next to the item you need. Press (✓).
   In the following example, you select an option called **Host Resolution**.



4. Press ▼ or ▲ to scroll further until ✓ is next to the item you need. Press (✓).

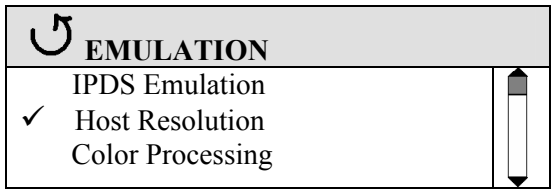
   In the following example you select an option setting – "300 dpi" – in the following manner:

   The * (asterisk) beside Auto means that Auto is the currently active setting. (It also happens to be factory default in this example.) Scroll so that ✓ is next to 300 dpi and press (✓).



5. While the printer is saving the setting, it will display **Submitting Selection**.

6. When the setting is saved, the display will revert to the previous menu level.



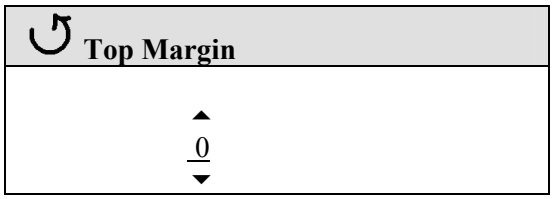
   If you want to check the value of the setting, press (✓) again. You will see an asterisk * beside the currently active setting; in this example "300 dpi".
   Press the **Back** button (↺) in order to leave the screen without changing the setting.

7. If you need to make additional settings within the same menu – such as **EMULATION**, scroll through the list. To reach another menu, such as **MAP OUTPUT BINS**, press (↺).

8. When you are finished, exit by pressing ↺ to return to the **Ready** screen. You may need to press it several times until **Ready** appears.

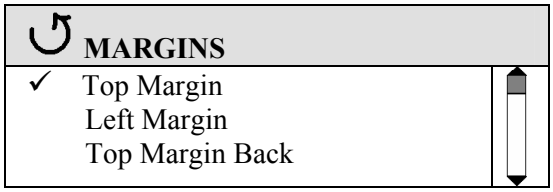
2.2.3 Example: Changing a Numerical Setting

Example: If you select **Option Card Menu > IPDS MENU > MARGINS > TRAY1 > ADJUST Top Margin**, you see the following display:

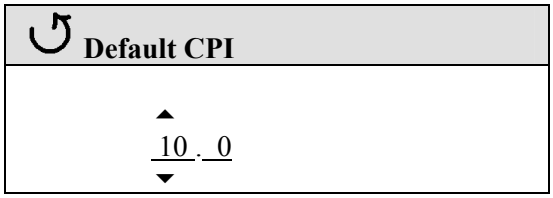


You can either use the numeric pad or the navigation buttons ▼ to decrease a value or ▲ to increase the value. Press ✓ to save the desired value.

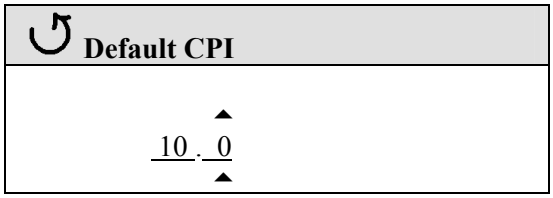
When the setting is saved, the display will revert to the previous menu level.



Some numerical values contain more than one field. For example, **Option Card Menu > IPDS MENU > EMULATION Default CPI**.



The value before the decimal point and the value after the decimal point are set independently of each other. Use the navigation buttons ◄ ► to move between the fields. The currently editable field is marked with ▲ above the field and ▼ below it.



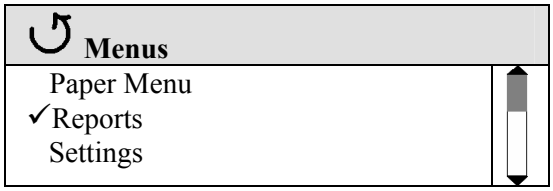
2.2.4 Saved Option Changes Become Active on New Session

All saved settings will become active on the next IPDS host session.

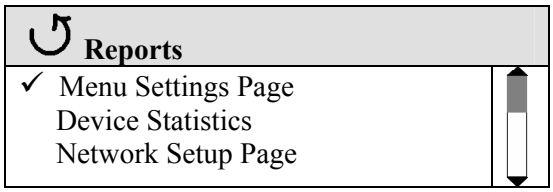
If the printer **IPDS Timeout** is NOT set to "Host Controlled**"** (**Option Card Menu > IPDS MENU > EMULATION > IPDS Timeout** = "Host Controlled"), power the printer **OFF** and **ON** to activate the new settings. For more information on **IPDS Timeout**, see page 29.

2.2.5 Printing the Menu Settings Page (printers)

1. Make sure the printer is **ON.**.
2. Press  on the operator panel.
3. Press ▼ until the ✓ appears next to **Reports**, and then press  .



4. Press ▼ until the ✓ appears next to **Menu Settings Page**, and then press  .



5. The message **Printing Menu Settings** is displayed.
6. The printer returns to **Ready** state after the list of current active settings prints.

2.3 Changing IPDS Settings Using the MFP Touch Screen

2.3.1 Accessing the IPDS MENU

The IPDS emulation options and settings are accessed from the **IPDS MENU**. To reach the menu:

1. Make sure the printer is powered **ON** and the **Ready** message appears.
2. Touch the key icon **(Menus)** 

on the touch screen.
3. Use the icons ▼ or ▲ to scroll through the main menus displayed on the screen.
4. Touch **Option Card Menu.**
5. Now you will see a list of options. Touch **IPDS MENU**.

The same method is used to scroll through lists of menus and options. As you move through the menus, the top line in the screen shows the navigation path, so that you can always see the name of the group (menu or option) to which the displayed items (options or settings) belong.

When you select an option, you will either scroll through the list of values presented, as shown in section 2.3.2 on page 16, or enter a number as shown in section 2.3.3 on page 17.

User-selected default settings remain in effect until you save new settings or restore the factory defaults. Concerning activation of saved settings, see section 2.3.4 on page 17.

2.3.2 Example: Selecting a New Value as a Setting

1. Navigate to **IPDS MENU** as explained in section 2.3.1 on page 16.
2. For this example, touch **EMULATION**, which happens to be the first option group on the list.
3. Now you will see a list of options. Touch ▼ or ▲ to scroll through the options until you see the item you need. In this example, locate and touch **Host Resolution**.
4. Now you will see a list of settings. The currently active setting, in this example **Auto,** is always presented first. Touch ◄ or ► to scroll through the settings until you see the item you need. In this example locate and touch “300 dpi”.
5. Touch 

(**Submit**).

   Note: If you just want to check the active setting of an option without making changes, touch 

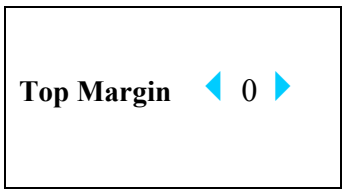
*(**Back**) and no changes will be saved.*
6. While the printer is saving the setting, **Submitting Selection** will be displayed.
7. When the setting is saved, the screen will revert to the previous menu level.

8. If you need to change multiple settings within the same menu – such as **EMULATION**, scroll through the menu options and change the settings. When you touch Submit (**Submit**), all changes will be saved.

9. When you are finished in this list of menu options, exit by touching Back (**Back**) to return to the previous menu level or  (**Home**) to return to the **Ready** state.

2.3.3 Example: Changing a Numerical Setting

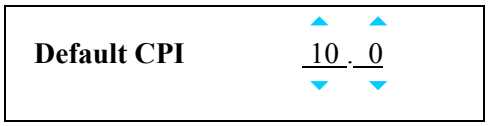
Example: If you select **Menus > Option Card Menu > IPDS MENU > MARGINS > TRAY1 > ADJUST > Top Margin**, you see the following on the screen:



Use the navigation icons, ◀ to decrease the value or ▶ to increase a value. Touch Submit (**Submit**) to save the desired value.

When the setting is saved, the screen will revert to the previous menu level.

Some numerical values contain more than one field. For example, **Menus > Option Card Menu > IPDS MENU > EMULATION > Default CPI**.



The value before the decimal point and the value after the decimal point are set independently of each other. Set each field independently using the ▲ above the field and/or the ▼ below it.

2.3.4 Saved Option Changes Become Active on New Session

All saved settings will become active on the next IPDS host session.

If the printer **IPDS Timeout** is NOT set to "Host Controlled**"** (**Menus > Option Card Menu > IPDS MENU > EMULATION > IPDS Timeout** = "Host Controlled"), power the printer **OFF** and **ON** to activate the new settings. For more information on **IPDS Timeout**, see page 29.

2.3.5 Printing the Menu Settings Page (MFPs)

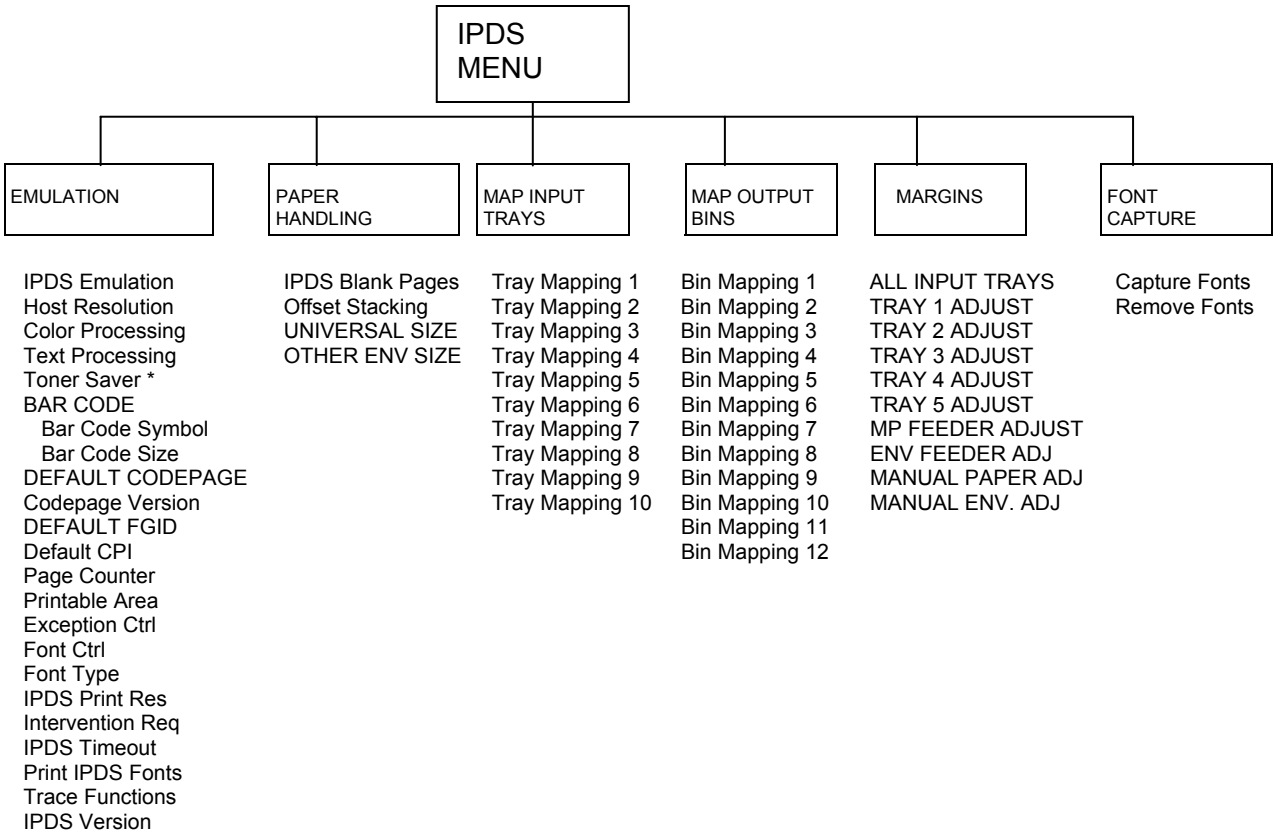
1. Make sure the printer is powered **ON** and the **Ready** message appears.
2. Touch 

(**Menus**).
3. Scroll down ▼ if necessary, then touch **Reports**.
4. Now you will see a list of items. Scroll down ▼ if necessary, then touch **Menu Settings Page.**
5. The message **Printing Menu Settings** is displayed.
6. The printer returns to **Ready** state after the list of current active settings prints.

3 Setup Operations Reference

3.1 IPDS MENU - Map of All Options

This section describes the menu structure for the IPDS emulation. Settings are displayed on the printer under the sub-menus reached from the **IPDS MENU**, located under the **Option Card Menu**.



** Available only in monochrome products*

Note: Only those menu items that are supported by the product are displayed.

In all of the following descriptions an asterisk "*" indicates the default factory value.

3.2 Overview of EMULATION Menu Options and Values

The following lists all menu options found under the **EMULATION** menu. Values only display when they are available on your printer.

An asterisk "*" indicates the default factory value. The selected value for each of these options can be printed; see Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18.

Option name	**Values**
IPDS Emulation	Resident*, 3812/3816
Host Resolution	Auto*, 240, 300, 600
Color Processing	Black (Default on mono printers) Shades of Grey Color (Default on color printers)
Text Processing	Black (Default on mono printers) Shades of Grey Color (Default on color printers)
Toner Saver	Printer Setting*, Host Controlled (Available only in mono printers)
BAR CODE	
Bar Code Symbol	Host Controlled, Always Print*
Bar Code Size	Resident*, 4028, 43xx
DEFAULT CODEPAGE	Codepages A – E Arabic Eur 420…Estonian 1157 Codepages F – K Fin/Swe 278...Int. Set 5 500*...Katakana 290 Codepages L – Z Latin 2 870…USA/Canada 1140
Codepage Version	Version 1*, Version 0
DEFAULT FGID	See the option description on page 25.
Default CPI	10.0*, range: 5.0 – 30.0
Page Counter	Normal Update*, Early Update
Printable Area	Whole Page*, Print Page, Physical Page, Full Page, 4028 Whole Page, 4028 Print Page
Exception Ctrl	Report All*, Sup Beyond VPA, Sup Undef Char, Suppress Both

Font Ctrl Relaxed*, Strict

Font Type Use Scalable*, Use Bitmap

IPDS Print Res 600 dpi, 1200 dpi, 1200 Image Q, 2400 Image Q, 4800 CQ
Default values are dependent on printer or MFP model.

Printers:

Lexmark C770, C772	4800 CQ
Lexmark C780, C782	4800 CQ
Lexmark C920	2400 Image Q
Lexmark C935	2400 Image Q
Lexmark T640, T642, T644	600 dpi
Lexmark W840	600 dpi

MFPs:

Lexmark X644e MFP, X646e MFP	600 dpi
Lexmark X646ef MFP	600 dpi
Lexmark X782e MFP	4800 CQ
Lexmark X850e MFP, X852e MFP, X854e MFP	600 dpi
Lexmark X940e MFP, X945e MFP	2400 Image Q

Intervention Req Report*, Do not report

IPDS Timeout Host Controlled*, 15 seconds, 30 seconds, 60 seconds, 90 seconds, 2 minutes, 3 minutes, 5 minutes, 10 minutes

Print IPDS Fonts Yes*, No

Trace Functions Disable*, PAR Std. Output, PAR Slot 1 Output, PAR Slot 2 Output, USB Std. Output, USB Slot 1 Output, USB Slot 2 Output

IPDS Version Display IPDS version number in the operator panel.

A description of each **EMULATION** menu option follows.

3.3 EMULATION – Options Descriptions

In the following an asterisk "*" indicates the default factory value. The selected value for each of these options can be printed; see Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18.

3.3.1 IPDS Emulation

This option selects the printer emulation to be used when processing IPDS data. It is important to select the correct emulation before receiving IPDS data. The IPDS Printer and Host Setup Guide includes guidelines for selecting the emulation.

Resident* This printer's native emulation

3812/3816 IBM 3812/3816 emulation

Printing with Double Byte Character Set (DBCS) is not supported in the "3812/3816" emulation.

3.3.2 Host Resolution

Specifies the resource resolution support for raster font and IM1 image reported to the host in the XOA OPC command. The resolution selected determines the printer resident raster fonts which are activated. For example, 240 dpi raster fonts will be activated with a setting of "240", but not at the "300" or "600" setting.

Auto* Reply to host indicates support for IM1 image and any dpi raster fonts. Captured raster fonts of any resolution are only activated when the activation request is accompanied by a matching Font Resolution and Metric Technology Triplet.

240 240 dpi raster font and 240 IM1 image support is reported to the host. Captured raster fonts of other resolutions will not be activated unless a matching Font Resolution and Metric Technology Triplet is received with the request.

300 300 dpi raster font and 300 IM1 image support is reported to the host. Captured raster fonts of other resolutions will not be activated unless a matching Font Resolution and Metric Technology Triplet is received with the request.

600 600 dpi raster font and 600 IM1 image support is reported to the host. Captured raster fonts of other resolutions will not be activated unless a matching Font Resolution and Metric Technology Triplet is received with the request.

Note: If you select the "3812/3816" emulation in the **IPDS Emulation** option, the **Host Resolution** is forced to "240 dpi".

3.3.3 Color Processing

Specifies how graphics, image, and bar code color commands are processed. See section 10.5, on page 82, for more information on color printing.

Color Print in full color. (Default for color printers.)

Shades of Grey Process color commands and print all colors as shades of grey.

Black Process color commands and print all colors as black. (Default on mono printers.)

3.3.4 Text Processing

Specifies how text color commands are processed.

Color Print in full color. (Default for color printers.)

Shades of Grey Process color commands and print all colors as shades of grey.

Black Process color commands and print all colors as black. (Default on mono printers.)

3.3.5 Toner Saver

Specifies the action taken on mono printers when the **IPDS Print Quality Control** command is received.

Printer Controlled* Use the values in the printer menu's **Settings > Quality Menu > Toner Darkness** option to control print quality. The value specified in the **IPDS Print Quality Control** command is ignored.

Host Controlled Use the value specified in the **IPDS Print Quality Control** command to control print quality. See XOA Print Quality Control on page 79 for additional information.

3.3.6 BAR CODE

3.3.6.1 Bar Code Symbol

Specifies the action taken when the IPDS data stream specifies suppress printing of the bar code symbol. The default setting of "Always Print" is useful when older applications have accidentally specified suppression of the bar code symbol.

Host Controlled Use the value specified in the **Write Bar Code** command to control printing of the bar code.

Always Print* Always print the bar code. Ignore the value specified in the **Write Bar Code** command to control printing of the bar code.

3.3.6.2 Bar Code Size

This option controls the size of the bar code when using the Resident IPDS emulation. When the 3812/3816 emulation is selected, this setting is ignored. Bar codes will be printed in a size that closely matches the IBM 3812/3816 family of printers.

Resident* Prints the bar code in a size that gives best quality on this printer.

4028 Bar codes are printed in a size that closely matches the IBM 4028 printer.

43xx Bar codes are printed in a size that closely matches the IBM 43xx family of printers.

3.3.7 DEFAULT CODEPAGE

- This option defines the default code page with the appropriate character set to be used. The list is a limited selection of all supported code pages associated with the three types of supported fonts, which are known as “Compatibility”, “Core Interchange”, and “Coordinated”. For details see Appendix on

Font and Code Page Information, starting on page 91.

Values are in alphabetical order. The operator panel will display codepage options beginning with the letters A - E, then F – K and L - Z. Select the appropriate path to reach the desired code page. See table below.

Codepages A – E	CPGID	Codepages F – K	CPGID	Codepages L – Z	CPGID
Arabic Eur	420	Fin/Swe	278	Latin 2	870
ASCII	367	Fin/Swe	1143	Latin 2	1110
Aus/Ger	273	Fin/Swe Alt	288	Latin 2	1153
Aus/Ger	1141	French/Cat	297	Latin 3	905
Aus/Ger Alt	286	French/Cat	1147	Latin 4	1069
Baltic	1112	Greek	423	Latin 9 Eur	924
Baltic	1156	Greek Eur	875	OCR-A	892
Belgium	274	Hebrew Eur	424	OCR-B	893
Brazil	275	Hebrew Set A	803	PC Multi	850
Can. French	260	Iceland	871	PC Multi Eur	858
Can. French	276	Iceland	1149	PC std	437
Cyrillic	880	Int. Set 5	500*	Portugal	037
Cyrillic	1025	Int. Set 5	1148	Portugal	282
Cyrillic	1154	Italy	280	Publishing	361
Den/Nor	277	Italy	1144	Spain/L. Am	284
Den/Nor	1142	Japan (Eng)	281	Spain/L. Am	1145
Den/Nor Alt	287	Katakana	290	Spain Alt	289
Estonian	1122			Turkish Lat 3	905
Estonian	1157			Turkish Lat 5	1026
				Turkish	1155
				UK	285
				UK	1146
				USA/Canada	037
				USA/Canada	1140

Note 1: The code pages with the designation “Alt” – as well as Can. French 276, ASCII 367, OCR-A 892, and OCR-B 893 – are supported by one or both of the Compatibility Font Sets. OCR-A 892 and OCR-B 893 are also supported by the Coordinated Font Set. All of the other code pages in the above list are in the Core Interchange Font Set.

Note 2: The Euro symbol is supported in code pages 1140-1159, 1153-1158 and in code pages whose text description includes the designation Eur, such as Arabic Eur 420.

3.3.8 Codepage Version

This option determines which version of a code page is used. Some of the code pages are available in two versions. Some characters differ between the two versions of the same code page. If characters print differently than those entered on the keyboard, check the code page version.

Version 1* Use version 1 of appropriate code pages.

Version 0 Use version 0 of appropriate code pages.

3.3.9 DEFAULT FGID

Selects the default Font Global Identifier (FGID) to be used by the IPDS emulation when the host does not send an FGID at the start of a job.

Select an FGID for the emulation chosen in the **IPDS Emulation** option. In the table below the emulations are cross-referenced to pages in the appendix on "Font and Code Page Information", starting on page 91. The FGIDs in the referenced tables are available in the operator panel.

Option name	Values
Resident FGID	See page 93, 97, and 102 for a list of supported FGIDs. Default FGID is **416*.** When using a CPI value of 10.0 FGID 416 is equal to FGID 11.
3812/3816 FGID	See page 95, 97, and 102 for a list of supported FGIDs. Default FGID for 3812/3816 is **11*.**

3.3.10 Default CPI

Selects the default characters per inch (CPI) to be used by the IPDS emulation when the host does not send a CPI value at the start of a job. The option does not apply to the fixed pitch fonts.

10.0* Default CPI. The range is 5.0 to 30.0.

3.3.11 Page Counter

This option selects the method used for updating IPDS page counters. (This option is not available on all printers.)

Normal Update* Jam and stacked page counters are updated when pages are printed.

Early Update All page counters are updated when they are processed but not printed. Pages may be lost if power or printer failure occurs and when a paper jam occurs.

Note: When "Early Update" is selected, **Intervention Required** messages are not reported to the IPDS Host.

3.3.12 Printable Area

This option defines the printable area on the page and how clipping is performed. Top, bottom, and side margins for your print jobs are set through your print application.

Whole Page* The printable area is 50 pels (4 mm) inside the physical page. The printable area is reported to the host. Clipping occurs if data is printed outside the printable area. All four edges will clip.

Print Page The printable area is 50 pels (4 mm) inside the physical page. The printable area is reported to the host. If the logical page is outside the printable area it is moved down and to the right. The right and bottom edges will be clipped.

Physical Page The printable area is the physical page (edge to edge). The physical page printable area is reported to the host.

Important: Printing within 50 pels of the paper edge may result in poor print quality. Continual printing within 50 pels (4 mm) of the paper edge is not recommended. It can result in paper jams due to toner contamination of the paper path and toner appearing on the back side of duplex jobs. Toner contamination of the paper path can make more frequent maintenance necessary.

Note 1: The Lexmark T640, T642, T644, and W840 printers, and the Lexmark X644e MFP, X646e MFP, X646ef MFP, X850e MFP, X852e MFP, X854e MFP can physically print edge to edge. The logical page is not clipped.

Note 2: The Lexmark C770, C772, C780, C782, and X782e MFP can print to within approximately 40 pels (3.4 mm) from all four edges of the paper.

Note 3: The Lexmark C920, can print to within approximately 20 pels (1.7 mm) of the feed direction top and bottom edge and to within approximately 3 pels (.25 mm) of the non-feed direction edges.

Note 4: The Lexmark C935 and the Lexmark X940e MFP and X945e MFP can print to within approximately 4 mm of the leading paper edge and to within approximately 2 mm of all other edges.

Full Page The job is formatted for a page using a printable area of edge to edge. When the page is printed, the page image is compressed approximately 2% in both the horizontal and vertical directions.

Note: Full Page is not available on all products. Full page will only appear in the menu when supported by the printer.

4028 Whole Page The printable area is 50 pels (4 mm) inside the physical page. A printable area that more closely matches the values reported by the IBM 4028 printer is reported to the host. Clipping occurs if data is printed outside the printable area. All four edges will be clipped.

4028 Print Page The printable area is 50 pels (4 mm) inside the physical page. A printable area that more closely matches the values reported by the IBM 4028 printer is reported to the host. If the logical page is outside the printable area it is moved down and to the right. The right and bottom edges will be clipped.

3.3.13 Exception Control

It is often practical to suppress exception reporting on undefined characters and on position errors (printing outside the valid printable area, VPA). This option overrides the **Exception Handling Control** in the IPDS data stream.

Report All* No suppression of exceptions. Exception reporting is controlled by the IPDS data stream.

Sup Beyond VPA Exception reporting on position errors (outside VPA) is suppressed. The printer IPDS emulation will print the IPDS job but not report "08C1" printable area exceptions or "0411" bar code exceptions to the host.

Sup Undef Char If an undefined character is found, exception reporting is suppressed. The printer IPDS emulation will print the IPDS job but not report "0821" undefined character exceptions to the host.

Suppress Both Both position errors and undefined character exceptions are suppressed.

3.3.14 Font Control

This option defines how strict the reporting will be if a selected font does not correspond to a valid combination of code page and character set.

Relaxed* The printer makes an intelligent decision concerning whether the selected combination of code page and character set is adequately supported. A “Relaxed” setting will report very few exceptions. If the selected font is not found, the printer will substitute with the closest matching font. If a font/code page combination is selected, which is not fully supported, characters may be missing.

Strict A “Strict” setting reports exceptions when a requested font/code page or substituted font/code page combination is not valid. The “Strict” setting prints all characters.

3.3.15 Font Type

This option selects the type of fonts used by the printer when a standard resident fixed pitch Courier, Prestige, or Letter Gothic Font is requested by the host.

Use Scalable* Use printer resident scalable fonts for Courier, Prestige, and Letter Gothic fonts when bitmap font IDs are received from the host.

Use Bitmap Use printer resident bitmap fonts for Courier, Prestige, and Letter Gothic fonts when bitmap font IDs are received from the host.

3.3.16 IPDS Print Res

This option defines the internal print resolution used to print IPDS jobs. Host resources received in the job are converted to the **IPDS Print Res** setting before printing. This is a separate setting from **Print Resolution** menu option in the printer's **Settings > Quality Menu**.

This setting alters the quality of text with scalable fonts, bar codes, graphics, and scalable images. Bitmap fonts and non-scalable images are not affected.

The default setting usually produces the best print quality. Refer to **IPDS Print Res** on page 21 for default settings for all products. Resolutions that are not available on are not displayed.

600 dpi	Print at 600 pel resolution.
1200 dpi	Print at 1200 pel resolution.
1200 Image Q	Print with 1200 Image Quality. Select **1200 Image Q** when your job contains grayscaled images that will benefit from enhanced line screening.
2400 Image Q	Print with 2400 Image Quality. Select **2400 Image Q** when your job contains grayscaled images that will benefit from enhanced line screening.
4800 CQ	Print with 4800 Color Quality

Memory Considerations

Additional memory above the total recommended may be required when receiving color or complex pages. Additional memory may also increase print speed. See page 118 for information on the minimum total recommended memory for each resolution setting.

3.3.17 Intervention Required

This option defines if the emulation should report Intervention Required messages to the host. Types of Intervention Required messages include a paper jam, paper out, cover open or offline message. These types of messages mean the printer is not ready to print.

Report*	Report Intervention Required messages to the host. This is the typical setting.
Do Not Report	Do not report Intervention Required messages to the host. Used only in special cases.
Note:	When **Page Counter** is set to "Early Update", **Intervention Required** messages are not reported to the host.

3.3.18 IPDS Timeout

This option is also called the printer **IPDS Timeout**. It allows the host to directly control when an IPDS LAN session with a printer ends (disconnects), or allows the printer IPDS emulation to determine when to timeout and print jobs waiting on other ports.

Notes: The **Option Card Menu > IPDS MENU > EMULATION >IPDS Timeout** value is only used by the printer IPDS emulation when the printer is LAN attached using the Standard Network port or the MarkNet internal print server.

The **Option Card Menu > IPDS MENU > EMULATION > IPDS Timeout** value is not active when the printer is connected to a host through an Adapter for SCS card. The IPDS timeout is controlled by the Coax or Twinax timeout value on the Adapter for SCS card.

The printer is capable of receiving jobs on multiple printer ports. While the printer is busy printing jobs from one printer port, jobs on other printer ports remain in a waiting status. When the host disconnects from the printer or when the printer IPDS emulation times out, the printer automatically switches to another printer port to start a new job.

"Host Controlled" should be selected as the **IPDS Timeout** value when the host port value is 9100. The printer defaults to "Host Controlled" when receiving IPDS jobs on port 9100.

"Host Controlled" or a timeout value ("15 seconds" to "10 minutes") may be used when the host port value is 5001 or 9600.

Note: The host port value is specified when configuring the printer parameters on the host. Refer to the *IPDS Printer and Host Setup Guide* to determine the port values supported by your printer and valid host settings compatible with the printer **IPDS Timeout** values.

Host Controlled* The printer IPDS emulation remains active until the host disconnects from the printer. **Host timer/timeout** values control when the host will disconnect. When the host disconnects, the printer will print jobs from other printer ports.

***Host Timer/Timeout** Values and Actions:*
The **host timer/timeout** value should be set to a small value (15 to 30 seconds) so the host will quickly disconnect after an IPDS job is printed. All IPDS resources downloaded to the printer will be deleted when the host disconnects. A disabled or large **host timer/timeout** value will cause the printer IPDS emulation to remain active. The **BUSY** message will remain on the printer operator panel even though the printer has completed processing and printing the IPDS job.

15 seconds
30 seconds
60 seconds
90 seconds
2 minutes
10 minutes

IPDS emulation timeout values.
These values are only used by the printer IPDS emulation when the host sends IPDS jobs on port 5001or 9600 to the Standard Network port or a MarkNet internal print server. If the host does not send another IPDS job or send additional IPDS resource data to the printer within the printer **IPDS timeout** value specified, the printer IPDS emulation will time out, place all IPDS resources in temporary storage (see Storage of IPDS Resources below), and allow the printer to print jobs from other printer ports.

***Host Timer/Timeout** Values and Actions:*
While the printer is printing jobs from other printer ports, the host is still connected to the printer. The **host timer/timeout** value must be disabled or set to a large value to prevent the host from disconnecting and deleting the resources downloaded to the printer. If the **host timer/timeout** value is not disabled or set to a very large value, communication errors may also occur.

Important: The **host timer/timeout** value and the printer **IPDS Timeout** value must not be set to the same number of seconds. The difference in these values should always be 30 or more seconds.

Notes:

Up to two sessions are available on port 9600. When all 9600 sessions are active, the printer will open a new TCP/IP session and immediately close the session.

On port 5001, up to 5 sessions are available when the printer **IPDS Timeout** is set to "Host Controlled"**.** Only two sessions are available when the printer **IPDS Timeout** is set to "15 seconds" – "10 minutes". When these two sessions are active, the printer will continually respond busy to any other TCP/IP session requests.

Storage of IPDS Resources

IPDS resources from the last active port 5001 or 9600 session are temporarily stored in the printer memory when **IPDS Timeout** values ("15 seconds" to "10 Minutes") are selected and the **host timer/timeout** values are set to a large value or disabled. Operator actions and processing of other jobs may cause the resources to be deleted. Events such as the following will cause deletion of the downloaded resources.

- The host ends the IPDS port 5001 or 9600 session.
- TCP/IP communications is interrupted on the port 5001 or 9600 session.
- Another IPDS session is started on port 5001, 9100, or 9600.
- **IPDS MENU** option values are changed.
- Processing of a non-IPDS job that requires more memory than is available in printer memory.
- The printer is powered **OFF**.

If the IPDS resources are deleted, the printer will return a **Printer Reset** exception to the host. The message **Resources Lost** may be displayed for a short time on the printer operator panel. The host will download the resources again with the next IPDS job.

3.3.19 Print IPDS Fonts

This option prints a font sample list of all the printer resident fonts available in the current emulation followed by a list of currently captured IPDS fonts.

Yes Print IPDS font list.

No Do not print IPDS fonts.

To prevent loss of host downloaded resources a font list can not be printed when an IPDS session is active with a host. Note that the printer can be in the **Ready** state and still have a port 5001 or port 9600 active LAN IPDS session or a Coax or Twinax IPDS session active through the Adapter for SCS. The message **Active IPDS Ses. Ignoring Request** will be displayed when you select **Yes** on the operator panel and an IPDS host session is active. You must end the IPDS session from the host or power the printer **OFF** and **ON** to print a font list. Host downloaded resources will be deleted when you end the IPDS session or power the printer **OFF**.

Note: This function can not be operated remotely.

3.3.20 Trace Functions

This option determines if the Trace function is enabled. Trace data is sent to the selected port. Unless you have a computer running a capture program attached to the port selected to receive the trace data, the printer may hang **BUSY**. Print performance is degraded when the trace function is active.

Note: Port selections will only appear when the port is available on the printer. The Trace function is used by service personnel for trouble shooting and service.

Disable*	Disable Trace
PAR Std. Output	Enable the standard parallel port for trace data output
PAR Slot 1 Out	Enable the optional parallel port in slot 1 for trace data output
PAR Slot 2 Out	Enable the optional parallel port in slot 2 for trace data output
USB Std. Output	Enable the standard USB port for trace data output
USB Slot 1 Out	Enable the optional USB port in slot 1 for trace data output
USB Slot 2 Out	Enable the optional USB port in slot 2 for trace data output

Note: This function can not be operated remotely.

3.3.21 IPDS Version

This option displays the current IPDS version / level.

Note 1: This option can not be used remotely.

Note 2: The IPDS level is also shown on the printed **Menu Settings Page.** It is found as “IPDS Emulation” under the **Device Information** heading. See Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18.

3.4 Overview of PAPER HANDLING Menu Options and Values

The following lists all menu options found under the **PAPER HANDLING** menu. Values only display when they are available on your printer. An asterisk "*"indicates the default factory value. The selected value for each of these options can be printed; see Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18.

Option Name	Values
IPDS Blank Pages	Print*, Do Not Print
Offset Stacking	Host Controlled*, Disabled
UNIVERAL SIZE	The valid values for **Paper Length** and **Paper Width** are listed in section 3.5.3 on page 33.
OTHER ENV SIZE	The valid values for **Envelope Length** and **Envelope Width** are listed in section 3.5.4 on page 34.

A description of each **PAPER HANDLING** option follows.

3.5 PAPER HANDLING Menu – Option Descriptions

In the following an asterisk "*" indicates the default factory value. The selected value for each of these options can be printed; see Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18.

3.5.1 IPDS Blank Pages

This option determines if blank pages in IPDS jobs are printed.

Print* Print all IPDS pages.

Do Not Print Skip printing of blank IPDS pages. Duplex pages are skipped only if both sides are blank.

3.5.2 Offset Stacking

This option controls the offset stacking function. It is only displayed when offset stacking is supported in the printer standard bin or when an optional finisher with offset stacking capability is installed. Offset stacking is only available in selected bins and may be limited to selected media.

Bin selection has a higher priority than offset stacking commands in the IPDS job. The job must be routed to a bin that supports offset stacking and have offset stacking specified in the job before offset stacking will be performed.

See section 5.1 on page 53 for additional information on offset stacking.

Host Controlled* Offset stacking is controlled by the commands received in the IPDS job.

Disabled Offset stacking is not performed. Offset stacking commands received in the IPDS jobs are ignored.

3.5.3 UNIVERSAL SIZE

The IPDS emulation uses the paper size setting specified in the printer menu to determine the size loaded. The paper size is returned to the host. A printer paper size of "Universal" is displayed in the printer menu when a non-standard size paper is detected in an auto size sensing tray or is selected as the paper size loaded into a non-size sensing tray or feeder.

This option allows you to specify the physical paper size returned to the host when a non-standard paper size is loaded. The paper size is specified in 300 dots per inch.

Important: A **34 Short Paper, 34 Wrong Paper Size**, or paper jam error may be displayed if printing occurs past the length of the physical paper. You should specify the actual paper size to avoid errors.

Product	Menu Option	Value Range	Function
Lexmark C920	**UNIVERSAL SIZE > Paper Length**	5100*, 1749 to 6824	Specifies Universal paper length. See note below.
	UNIVERSAL SIZE > Paper Width	3510*, 1062 to 3510	Specifies Universal paper width. See note below.
Lexmark C770, C772, C780, C782, C935 Lexmark T640, T642, T644 Lexmark X644e MFP, X646e MFP, X646ef MFP, X782e MFP, X850e MFP, X852e MFP, X854e MFP, X940e MFP, X945e MFP	**UNIVERSAL SIZE > Paper Length**	4200*, 1500 to 4200	Specifies Universal paper length. See note below.
	UNIVERSAL SIZE > Paper Width	2550*, 825 to 2703	Specifies Universal paper width. See note below.
Lexmark W840	**UNIVERSAL SIZE > Paper Length**	6000* 1200 to 6000	Specifies Universal paper length. See note below.
	UNIVERSAL SIZE > Paper Width	3510* 825 to 3510	Specifies Universal paper width. See note below.

Note: The printer paper trays and feeders are limited to feeding of specific media sizes. Refer to your printer documentation when loading a non-standard media size to determine if that media size can be fed from that tray or feeder.

Note: The printer **Paper Menu** > **Universal Setup** settings for paper width and paper height must be set equal to the **IPDS MENU > PAPER HANDLING > UNIVERSAL SIZE** menu settings. Otherwise, a **paper jam**, **34 Short Paper** or **34 Wrong Paper Size** error may be displayed.

Conversion example:

Paper Size = 215.9 x 355.6 mm (8.5 x 14.0 in)

$$\text{Paper Width} = 215.9\ \text{mm} / 25.4\ \frac{\text{mm}}{\text{in}} = 8.5\ \text{in} \times 300\ \frac{\text{dots}}{\text{in}} = 2550$$

$$\text{Paper Length} = 355.6\ \text{mm} / 25.4\ \frac{\text{mm}}{\text{in}} = 14.0\ \text{in} \times 300\ \frac{\text{dots}}{\text{in}} = 4200$$

3.5.4 OTHER ENV SIZE

The IPDS emulation uses the envelope size setting specified in the printer menu to determine the envelope size loaded. The envelope size is returned to the host. A printer envelope size of "Other Envelope" may be selected in some printer menus when a non-standard size envelope is loaded into a non-size sensing tray or feeder.

This option allows you to specify the envelope size returned to the host when "Other Envelope" is selected in the printer menu as the envelope size. The envelope size is specified in 300 dots per inch. See the conversion example for **UNIVERSAL SIZE** (section 3.5.3).

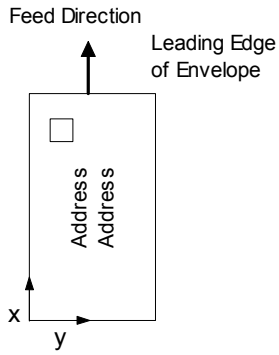
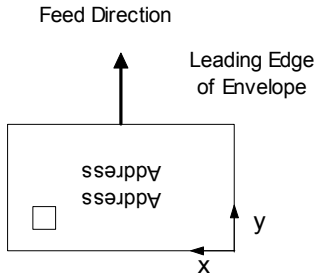
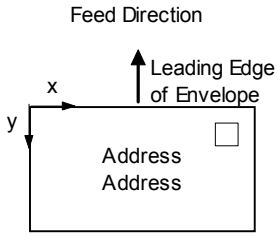
Important: A **34 Short Paper Error** may be displayed if printing occurs past the length of the physical envelope. You must specify the actual envelope size to avoid incorrect text positioning or clipping of text. Some printers do not report an error when the size is incorrect and the text is clipped.

Product	Menu Option	Value Range	Function
Lexmark C770, C772, C780, C782, C920, C935 **Lexmark T640, T642, T644, Lexmark X644e MFP, X646e MFP, X646ef MFP, X782e MFP, X850e MFP, X852e MFP, X854e MFP, X940e MFP, X945e MFP**	**OTHER ENV SIZE > Envelope Length**	4200*, 1500 to 4200	Specifies Other Envelope length. See note below.
	OTHER ENV SIZE > Envelope Width	2550*, 825 to 2550	Specifies Other Envelope width. See note below.
Lexmark W840	**OTHER ENV SIZE > Envelope Length**	5100*, 1200 to 5100	Specifies Other Envelope length. See note below.
	OTHER ENV SIZE > Envelope Width	3510*, 825 to 3510	Specifies Other Envelope width. See note below.

Note: The printer trays and feeders are limited to feeding of specific media sizes. Refer to your printer documentation when loading a non-standard media size to determine if that media size can be fed from that tray or feeder.

Feed directions are shown in the illustrations on page 36.

Envelope feed directions

Lexmark C770 and C772 **Lexmark C780 and C782** **Lexmark T640, T642, and T644** **Lexmark X644e MFP and X646e MFP** **Lexmark X646ef MFP** **Lexmark X782e MFP**	
Lexmark C920 **Lexmark C935** **Lexmark X940e MFP and X945e MFP**	
Lexmark W840 **Lexmark X850e MFP, X852e MFP, and X854e MFP**	

x = Left Margin y = Top Margin

3.6 MAP INPUT TRAYS Menu Options

This option defines the mapping of the host's request for a physical feeder or input tray in the printer. Any host input source can be mapped to any printer input source. The printer input source is mapped to an IPDS host number. Input sources include the multi-purpose feeder, envelope feeder, manual paper feed, and manual envelope feed.

Some models may not support all printer input sources listed below. The optional sources will only be displayed when installed on the printer. The Tray x Hp values are only displayed when the an optional finisher that supports hole punching is installed. Pages can be hole punched using the "Tray x Hp" value settings. See Hole Punching on page 66 for additional information.

You can configure up to 10 mappings. Select a **Tray Mapping x** in the **MAP INPUT TRAYS** menu group (the value x represents any given Tray Mapping number). This displays a list of Tray Values which identify the available printer input sources. When you select a Tray Value, the operator panel displays a numerical setting screen to set the IPDS tray selection number that will select that printer input source.

Tray Mapping 1 through Tray Mapping 10

Tray Mapping x is a sub-menu selection item. Each item refers to the number of the mapping, not to the physical printer tray.

Tray Value

Tray Values specify the physical printer tray. The tray values specified below are available under the specified printer's Tray Mapping sub-menu when the physical tray is installed and available.

Check your printer documentation for information on optional tray and feeder support. Values that may be displayed when trays on feeders are installed are shown below.

Tray 1, Tray 1 Hp, Tray 2, Tray 2 Hp, Tray 3, Tray 3 Hp, Tray 4, Tray 4 Hp, Tray 5, Tray 5 Hp, Env Feeder, Manual Paper, Manual Paper Hp, Manual Env, No Map

IPDS Tray Selection Number Values

The value range for the **IPDS Tray Selection Number** is 0 to 255. If an IPDS tray selection number is mapped (used) twice, the lowest tray mapping (if available) is used.

A typical relationship between IPDS Numbers and input sources would be

Tray Map. No.	→	Input Source Value	→	IPDS (Tray Selection) Number
Tray Mapping 1		Tray 1		0
Tray Mapping 2		Tray 2		1
Tray Mapping 3		Tray 3		2
Tray Mapping 4		Tray 4		3
Tray Mapping 5		Tray 5		4
Tray Mapping 6		Envelopes (Feeder)		64 (40H)
Tray Mapping 7		Envelopes (Manual)		64 (40H)
Tray Mapping 8		Manual Paper		99 (63H)
Tray Mapping 9		MP Feeder		98 (62H)
Tray Mapping 10		No Map		---

Note: The labels *Tray Mapping 1 - Tray Mapping 10* refer to the **number** of the mapping, not the physical tray.

Important!

For **MAP INPUT TRAYS** to work correctly, the **Paper Size/Type** for each printer input tray must be set differently in the printer's **Paper Menu**. See example 1 below. The only time you set the **PAPER TYPE** the same for more than one input tray is when you want to link the input trays involved. See example 2.

Examples of tray mapping

Example 1 - Making a higher capacity input tray the default tray

You may want to use one of the higher capacity input trays for IPDS **0**. To swap the IPDS tray selection number for Tray 1 and Tray 2, you will need to do the following:

1. Set **Tray Mapping 2** for **Tray 2** to **IPDS 0**.
2. Set **Tray Mapping 1** for **Tray 1** to **IPDS 1**.

This will give you:
Tray Mapping 1= IPDS 1 mapped to Tray 1
Tray Mapping 2= IPDS 0 mapped to Tray 2

Note: You must set the **Paper Size/Type** for the high capacity tray to a different value from all other trays. For instance, you could choose a different custom paper type. This setting is found in the printer's **Paper Menu**.

Example 2 - Linking input trays

To link multiple input trays as one big input tray, you need to make changes under the printer's **Paper Menu.** You need to set the same **Paper Size/Type** for each of the trays you want to link to the same value.

For example, the host expects colored paper in Tray 1 and you want to link Tray 2 and Tray 3, which have plain paper. Do the following:

Leave the **MAP INPUT TRAYS** at their defaults:

Tray Mapping 1 = IPDS 0 mapped to Tray 1
Tray Mapping 2 = IPDS 1 mapped to Tray 2
Tray Mapping 3 = IPDS 2 mapped to Tray 3

Insert letter-size colored paper in Tray 1. Insert letter-size plain paper in Trays 2 and 3.

The paper size is detected by the printer:

Tray 1 Size = Letter

Tray 2 Size = Letter

Tray 3 Size = Letter

Set the paper type for each tray**.** In this example, you would configure the three trays as follows:

Tray 1 Type = Colored Paper

Tray 2 Type = Plain Paper

Tray 3 Type = Plain Paper

The printer will feed paper from Tray 3 when Tray 2 is empty.

Example 3 - Understanding what happens when an IPDS tray selection number is mapped twice

If an IPDS tray selection number is mapped (used) twice, the lowest tray mapping number is activated (if available). For example if Tray Mapping 6 and 7 both map to IPDS 64 as shown below, the printer will select media from the Env Feeder.

Tray Mapping 6 = IPDS 64 mapped to Env Feeder

Tray Mapping 7 = IPDS 64 mapped to Manual Env

In other words, the printer attempts to map to (select media from) the Env Feeder first, and if it is not installed, the printer defaults to Manual Env.

3.7 MAP OUTPUT BINS Menu Options

This option defines the mapping of the host's request for a physical output bin in the printer. The printer physical bin is mapped to an IPDS output bin selection number that is specified in the IPDS data stream. Printer output bins include the top of the printer (standard bin) and optional output bins that attach to the printer.

Some printer models may not support all bins listed. The optional printer output bin value will only be displayed when the physical output bin is installed on the printer. Bin x Hp values and Fin High Cap Hp values are only displayed when an optional finisher that supports hole punching is installed. Pages can be hole punched using the "Hp" value settings. See Hole Punching on page 66 for additional information.

You can configure up to 12 mappings. This allows the Standard Bin, up to 10 optional bins, and a special high capacity setting **(Fin High Cap)** explained in section 3.7.1 on page 40.

Select a **Bin Mapping x** in the **MAP OUTPUT BINS** menu group (the value x represents any given Bin Mapping number)**.** This displays a list of Output Bin Values that identify the available printer physical bins. When you select an Output Bin Value, the operator panel displays a numerical setting screen to set the IPDS bin selection number that will select that physical bin.

Bin Mapping 1 through Bin Mapping 12	Bin Mapping x is a sub-menu selection item. Each item refers to the number of the mapping, not to the physical printer output bin.
Output Bin Value	Output Bin Values specify the physical printer output bin. The output bin values specified below are available under the specified printer's Bin Mapping sub-menu when the physical bin is installed and available. General Descriptions of Output Bin Values are found on page 40. Check your printer documentation for information on optional bin and finisher support. Values that may be displayed when optional bins or optional finishers are installed are shown below. Standard Bin, Bin 1, Bin 2, Bin 3, Bin 4, Bin 5, Bin 6, Bin 7, Bin 8, Bin 9, Bin 10, Fin High Cap, Bin 1 Hp, Bin 2 Hp, Fin High Cap Hp, No Map
IPDS Bin Selection Number Values	The value range for the **IPDS Bin Selection Number** is 1 to 255. If an IPDS bin selection number is mapped (used) twice, the lowest bin mapping (if available) is used. General Descriptions of IPDS Bin Selection Numbers are found on page 41.

3.7.1 Descriptions of Output Bin Values

Output bin values are associated with physical bins on the printer. Bin values will only appear in the menu when the physical bin is available on the printer.

A description for each output bin value is given below.

Std Bin – Selects the printer standard output bin.

Output Bin 1 – Output Bin 10 – Selects additional standard output bins available on the printer or optional physical output bins when installed.

Fin High Cap – Selects the optional finisher output bin with the highest capacity. The order of option installation does not affect the physical bin associated with the Fin High Cap bin value. This value is always associated with the highest capacity physical bin of the optional finisher.

Bin Mapping 12 = Fin High Cap = IPDS number 25 is a default value on all printers. Assuming the optional finisher is installed and this default value is not changed, jobs that select IPDS bin number 25 on the host will always be routed to the finisher bin with the highest capacity.

When hole punching is available in a physical bin, bin selection values may be followed by 'Hp' which indicates hole punching is available. Examples are: Output Bin 1 Hp, Output Bin 2 Hp, Fin High Cap Hp. When a value with 'Hp' is selected, all pages in an IPDS job routed to this bin are hole punched. See Hole Punching on page 66 for additional information.

3.7.2 Descriptions of IPDS Bin Selection Numbers

Host applications select printer physical bins by sending IPDS bin selection numbers ranging from 1 to 255. These IPDS bin numbers may be mapped to any physical bin on the printer by changing the printer physical bin selected by the IPDS bin selection number. Assuming printer default output bin mapping, when IPDS number 1 is received in an IPDS job, the pages are routed to the printer Standard Bin. When IPDS bin selection number 2 is received in an IPDS job, the pages are routed to the second printer physical output bin.

Bin Mapping 12 = Fin High Cap = IPDS bin selection number 25, is a default value on all printers. Assuming the optional finisher is installed and this default value is not changed, jobs that select IPDS bin selection number 25 on the host will always be routed to the finisher bin with the highest capacity.

3.7.3 Default Bin Mapping

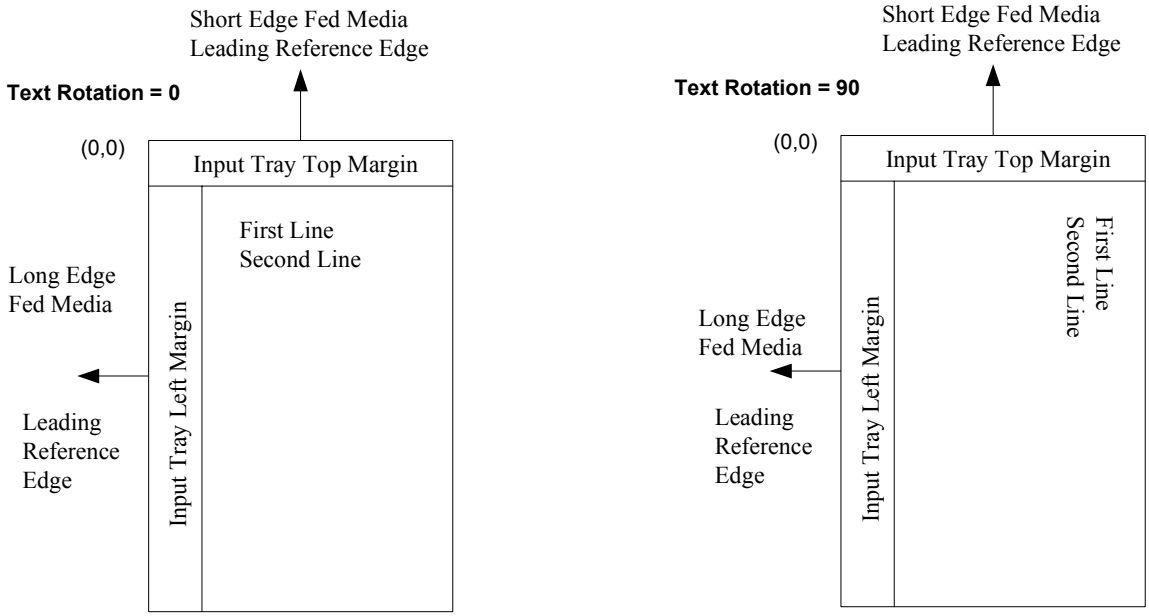
The default bin mapping shown below represents a typical relationship between IPDS output bin selection numbers and the printer physical output bins. The default mapping when optional output bins are installed on the printer is shown in the table below for all printers. In the table below, the labels *Bin Mapping 1-Bin Mapping 12* refer to the **number** of the mapping, not the printer physical output bin. All printers do not support ten optional output bins. Default settings will be assigned for all output bins available on your printer.

Bin Mapping No.	→	Output Bin Value	→	IPDS (Bin Selection) Number
Bin Mapping 1		Standard Bin		1
Bin Mapping 2		Bin 1		2
Bin Mapping 3		Bin 2		3
Bin Mapping 4		Bin 3		4
Bin Mapping 5		Bin 4		5
Bin Mapping 6		Bin 5		6
Bin Mapping 7		Bin 6		7
Bin Mapping 8		Bin 7		8
Bin Mapping 9		Bin 8		9
Bin Mapping 10		Bin 9		10
Bin Mapping 11		Bin 10		11
Bin Mapping 12		Fin High Cap		25

3.8 MARGINS Menu Options

Use margin settings to adjust the position of the page image. Margin settings, which could be compared to movements of the tractor feeder and paper knob of a matrix printer, affect all IPDS jobs and are not affected by IPDS commands in the job.

The input tray and input feeder **Left Margin** and **Top Margin** option settings should not be confused with the IPDS left and top margin settings sent from the host. Input tray **Left Margin** settings adjust the page image left or right in relation to the media leading reference edge as it is fed through the printer. Input tray **Top Margin** settings adjust the page image up or down in relation to the media leading reference edge as it is fed through the printer. The illustrations below apply to paper and envelopes when a finisher is not installed.



Margins may be adjusted for all input trays and feeders using the **ALL INPUT TRAYS** menu. Additional adjustments may be made to the **ALL INPUT TRAYS** margin settings for an individual tray or feeder using the tray or feeder specific margin menu. Most often, the **ALL INPUT TRAYS** margin settings will remain at the default setting of zero and adjustments will be made using the specific tray or feeder margin menu. The **ALL INPUT TRAYS** margin adjustment PLUS the specific tray or feeder margin adjustment determines the total margin adjustment for a specific tray or feeder.

Margin Adjustment = ALL INPUT TRAYS setting + Specific Tray / Feeder Setting

The IPDS emulation is limited by the printer's printable area. The **MARGINS** menu may be used to adjust page images outside the valid printable area. The page image will be clipped. Valid Printable Area (VPA) exception conditions will not be reported to the host.

Margin adjustments are in 1/300ths of an inch.

See the Examples below.

The selected value for each of these options can be printed; see Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18.

Example 1 – Margins

The **ALL INPUT TRAYS Left Margin** is set to the default of **0**. The **TRAY 1 ADJUST Left Margin** is set to **+25**. This adjusts the page image left margin for all pages printed from tray 1 by 25/300ths of an inch to the right of the margin specified in the IPDS job.

Example 2 – Margins

The **ALL INPUT TRAYS Left Margin** has been adjusted to **–25**. This moves the left margin for pages printed for all IPDS jobs 25/300ths of an inch to the left. The **TRAY 1 ADJUST Left Margin** has been adjusted to **+25**. For tray 1, the additional **TRAY 1 ADJUST Left Margin** value will also be used to adjust the left margin. The tray 1 left margin adjustment will be zero for pages printed from tray 1. The **ALL INPUT TRAYS Left Margin** adjustment PLUS the **TRAY 1 ADJUST Left Margin** adjustment equals the total left margin adjustment. {–25 pels +25 pels = 0 adjustment}

Margin and Tray Linking Interaction

When trays are linked, the margins set in the **ALL INPUT TRAYS** menu and the margins set for the tray specified in the IPDS data stream will be used to adjust the page image on the paper.

Example 1 – Margin and Tray Linking

Tray 1 is requested as the input source from the host. If tray 1 and tray 2 are linked and tray 1 runs out of paper, paper will be pulled from tray 2. The margin adjustments applied when printing from tray 2 will be the **ALL INPUT TRAYS** margins PLUS the **TRAY 1 ADJUST** margins set for the requested IPDS input source (tray 1).

Example 2 – Margin and Tray Linking

Tray 2 is requested as the input source from the host. If tray 1 and tray 2 are linked and tray 2 runs out of paper, paper will be pulled from tray 1. The margin adjustments applied when printing from tray 1 will be the **ALL INPUT TRAYS** margins PLUS the **TRAY 2 ADJUST** margins set for the requested IPDS input source (tray 2).

Example 3 – Margin and Tray Linking

Tray 2 is requested as the input source from the host. If tray 2, tray 3, and tray 4 are linked and tray 2 runs out of paper, paper will be pulled from tray 3 until it is empty and then from tray 4. The margin adjustments applied when printing from tray 3 or tray 4 will be the **ALL INPUT TRAYS** margins PLUS the **TRAY 2 ADJUST** margins set for the requested IPDS input source (tray 2).

Margin and Tray Mapping Interaction

When the host's IPDS Tray Selection Number has been mapped to another input source using the **MAP INPUT TRAYS** option, the value of the **MAP INPUT TRAYS** option will determine the margin adjustment applied to pages printed from the selected tray.

Example – Margin and Tray Mapping

The host input source IPDS Tray Selection Number 1 normally selects the printer physical tray 2. If IPDS Tray Selection Number 1 has been mapped to **Tray 1**, the **TRAY 1 ADJUST** margin values will be applied to all pages in a job that have tray 2 specified as the input source.

Each margin menu option has four sub-menus. The exception is the envelope menu options, which have only two. The available margin menu options and their sub-menus are shown below.

Margin menu option	Top Margin	Left Margin	Top Margin Back	Left Margin Back
ALL INPUT TRAYS	x	x	x	x
TRAY 1 ADJUST	x	x	x	x
TRAY 2 ADJUST	x	x	x	x
TRAY 3 ADJUST	x	x	x	x
TRAY 4 ADJUST	x	x	x	x
TRAY 5 ADJUST	x	x	x	x
MP FEEDER ADJUST	x	x	x	x
ENV FEEDER ADJ	x	x		
MANUAL PAPER ADJ	x	x	x	x
MANUAL ENV ADJ	x	x		

Margin menu options will only appear when the printer option is installed or when the printer supports feeding the media. The following sections describe each of the margin menu options.

3.8.1 ALL INPUT TRAYS Menu

This menu option allows the top and left margins for simplex and duplex pages to be adjusted. Margin settings of this menu option apply to pages printed from any tray or feeder. Adjustments to the **ALL INPUT TRAYS** margin settings can be made by adjusting the individual margin settings for a specific tray or feeder. Negative values indicate a decrease in the margin value from the default margin of zero.

ALL INPUT TRAYS	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for pages printed from all input trays and feeders.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for pages printed from all input trays and feeders.
Left Margin Back	0*, -127 to 127	Adjusts the duplex page back side left margin for pages printed from all input trays and feeders.
Top Margin Back	0*, -127 to 127	Adjusts the duplex page back side top margin for pages printed from all input trays and feeders.

3.8.2 TRAY 1 ADJUST Menu

This menu option allows additional adjustment to the top and left margins for simplex and duplex pages printed from tray 1. **TRAY 1 ADJUST** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all pages printed from tray 1. See margin settings examples under MARGINS Menu Options on page 42 for additional information.

TRAY 1 ADJUST	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for pages printed from tray 1.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for pages printed from tray 1.
Left Margin Back	0*, -127 to 127	Adjusts the duplex page back side left margin for pages printed from tray 1.
Top Margin Back	0*, -127 to 127	Adjusts the duplex page back side top margin for pages printed from tray 1.

3.8.3 TRAY 2 ADJUST Menu

This menu option allows additional adjustment to the top and left margins for simplex and duplex pages printed from tray 2. **TRAY 2 ADJUST** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all pages printed from tray 2. See margin settings examples under MARGINS Menu Options on page 42 for additional information.

TRAY 2 ADJUST	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for pages printed from tray 2.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for pages printed from tray 2.
Left Margin Back	0*, -127 to 127	Adjusts the duplex page back side left margin for pages printed from tray 2.
Top Margin Back	0*, -127 to 127	Adjusts the duplex page back side top margin for pages printed from tray 2.

3.8.4 TRAY 3 ADJUST Menu

This menu option allows additional adjustment to the top and left margins for simplex and duplex pages printed from tray 3. **TRAY 3 ADJUST** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all pages printed from tray 3. See margin settings examples under MARGINS Menu Options on page 42 for additional information.

TRAY 3 ADJUST	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for pages printed from tray 3.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for pages printed from tray 3.
Left Margin Back	0*, -127 to 127	Adjusts the duplex page back side left margin for pages printed from tray 3.
Top Margin Back	0*, -127 to 127	Adjusts the duplex page back side top margin for pages printed from tray 3.

3.8.5 TRAY 4 ADJUST Menu

This menu option allows additional adjustment to the top and left margins for simplex and duplex pages printed from tray 4. **TRAY 4 ADJUST** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all pages printed from tray 4. See margin settings examples under MARGINS Menu Options on page 42 for additional information.

TRAY 4 ADJUST	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for pages printed from tray 4.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for pages printed from tray 4.
Left Margin Back	0*, -127 to 127	Adjusts the duplex page back side left margin for pages printed from tray 4.
Top Margin Back	0*, -127 to 127	Adjusts the duplex page back side top margin for pages printed from tray 4.

3.8.6 TRAY 5 ADJUST Menu

This menu option allows additional adjustment to the top and left margins for simplex and duplex pages printed from tray 5. **TRAY 5 ADJUST** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all pages printed from tray 5. See margin settings examples under MARGINS Menu Options on page 42 for additional information.

TRAY 5 ADJUST	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for pages printed from tray 5.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for pages printed from tray 5.
Left Margin Back	0*, -127 to 127	Adjusts the duplex page back side left margin for pages printed from tray 5.
Top Margin Back	0*, -127 to 127	Adjusts the duplex page back side top margin for pages printed from tray 5.

3.8.7 MP FEEDER ADJUST Menu

This menu option allows additional adjustment to the top and left margins for simplex and duplex pages printed from the multipurpose feeder. **MP FEEDER ADJUST** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all pages printed from the MP feeder.

See margin settings examples under MARGINS Menu Options on page 42 for additional information.

MP FEEDER ADJUST	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for pages printed from the MP feeder.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for pages printed from the MP feeder.
Left Margin Back	0*, -127 to 127	Adjusts the duplex page back side left margin for pages printed from the MP feeder.
Top Margin Back	0*, -127 to 127	Adjusts the duplex page back side top margin for pages printed from the MP feeder.

3.8.8 ENV FEEDER ADJ Menu

This menu option allows additional adjustment to the top and left margins for jobs printed from the envelope feeder. **ENV FEEDER ADJ** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all pages printed from the envelope feeder.

ENV FEEDER ADJ	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for envelopes printed from the envelope feeder.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for envelopes printed from the envelope feeder.

3.8.9 MANUAL PAPER ADJ Menu

This menu option allows additional adjustment to the top and left margins for simplex and duplex pages printed from the manual tray. **MANUAL PAPER ADJ** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all pages printed from the manual tray.

MANUAL PAPER ADJ	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for pages printed from the manual tray.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for pages printed from the manual tray.
Left Margin Back	0*, -127 to 127	Adjusts the duplex page back side left margin for pages printed from the manual tray.
Top Margin Back	0*, -127 to 127	Adjusts the duplex page back side top margin for pages printed from the manual tray.

3.8.10 MANUAL ENV ADJ Menu

This menu option allows additional adjustment to the top and left margins for jobs printed from the manual tray. **MANUAL ENV ADJ** margin settings adjust the value of the **ALL INPUT TRAYS** corresponding margin setting for all envelopes printed from the manual tray. See margin settings examples under MARGINS Menu Options on page 42 for additional information.

MANUAL ENV ADJ	Value	Function Performed
Left Margin	0*, -127 to 127	Adjusts the page front side left margin for envelopes printed from the manual tray.
Top Margin	0*, -127 to 127	Adjusts the page front side top margin for envelopes printed from the manual tray.

3.9 Overview of the FONT CAPTURE Menu Options

The following lists all menu options found under the **FONT CAPTURE** menu, which only displays if a user flash memory or a disk is installed in the printer. An asterisk "*"indicates the default factory value. The selected value for each of these options can be printed; see Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18. In addition, if you "Print IPDS fonts" (see section 3.3.19 on page 30), the printout will include a list of currently captured fonts and resources.

Option name	**Values**
Capture Fonts	Disable*, Save To Disk, Save To Flash
Remove Fonts	No*, Yes

A description of each **FONT CAPTURE** option follows.

3.10 FONT CAPTURE Menu Options

The **FONT CAPTURE** menu only displays if a user flash memory or a disk is installed in the printer.

In the following an asterisk "*" indicates the default factory value. The selected value for each of these options can be printed; see Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18.

3.10.1 Capture Fonts

This option controls the capturing of eligible bitmap fonts (LF1 format), eligible outline fonts (LF3 format), and TrueType fonts downloaded from the host. If the IPDS job specifies a font that is a permanent resident printer font, or a font that has already been captured, the host selects the resident or captured font and does not download the font. This saves time and network traffic. See Working with Captured Fonts on page 70 for further details.

Important:

You should always check your font licensing information before making a font eligible for capture.

Disable* No fonts are captured. Fonts already captured remain in the printer.

Save To Disk Capture fonts and store them on the printer disk. A disk with sufficient space has to be available in order to store captured fonts. This setting displays only if a disk is installed.

If the disk is password protected, no fonts will be captured. To capture fonts, remove the password protection, capture the fonts, and password protect the disk again.

Save To Flash Capture fonts and store them in user flash memory. A flash with sufficient memory has to be available in order to store captured fonts. This setting displays only if a flash is available.

If the flash is password protected, no fonts will be captured. To capture fonts, remove the password protection, capture the fonts, and password protect the flash again.

3.10.2 Remove Fonts

This function is used for the removal of all captured fonts stored on a user flash or disk.

If the flash or disk is password protected, the message **Flash Protected, Fonts Not Erased** or **Disk Protected, Fonts Not Erased** displays. If both the flash and the disk are password protected, the messages appear after each other. Remove the password protection to allow removal of the fonts.

Removing captured fonts from the flash removes the fonts but does not free the memory for other usage. Flash memory can ONLY be freed by formatting the flash. Formatting deletes *all* fonts stored in the flash.

No* Cancel action. No fonts are removed.

Yes Remove all captured fonts. This includes all fonts stored on both disk and flash.

4 Duplex Printing Using Preprinted Media

The IPDS emulation uses the value selected in the printer's **Paper Menu** under **Paper Loading** to determine how paper is loaded.

For each media type, you can select **Duplex** or **Off**. If you have set the value in the printer menu to **Duplex** and have loaded preprinted media (such as letterhead) correctly for duplex printing, any IPDS job received from the host, whether duplex or simplex, will print correctly on the paper.

Refer to your printer manual for more information on the **Paper Loading** option and how to load preprinted paper for duplex printing.

5 Finishing Support

Finishing support includes offset stacking, stapling, hole punch, center fold-in and saddle staple.

The tables below show the finishing support provided with your printer and finishing support when an optional finisher is installed.

The Lexmark C770, C780, X644e MFP and X646e MFP do not support optional finishers.

Finishing functions for all products except Lexmark C935, X940e MFP, X945e MFP, Lexmark X850e MFP, X852e MFP, and X854e MFP

Function/ Support with Optional Finisher	Hole Punch	Offset Stacking	Staple Bin	Staple position	Maximum Staple Packet Size*
Lexmark C772	–	Finisher Physical Bin 1	Finisher Physical Bin 1	Single (Top Left)	25 Sheets
Lexmark C782	–	Finisher Physical Bin 1	Finisher Physical Bin 1	Single (Top Left)	25 Sheets
Lexmark C920 (see Notes 2 and 3)	Finisher Physical Bin 1 and 2	Finisher Physical Bin 2	Finisher Physical Bin 2	Single (Top Left)	30 Sheets
Lexmark T640, T642, and T644 (see Note 1)	–	Finisher Physical Bin 1	Finisher Physical Bin 1	Single (Top Left)	25 Sheets
Lexmark W840	Finisher Physical Bin 2	Std Bin, Finisher Physical Bin 2	Finisher Physical Bin 2	Front Dual Rear	50 Sheets
Lexmark X646ef MFP (see Note 1)	–	Finisher Physical Bin 1	Finisher Physical Bin 1	Single (Top Left)	25 Sheets
Lexmark X782e MFP	–	Finisher Physical Bin 1	Finisher Physical Bin 1	Single (Top Left)	25 Sheets

* - 20 lb. plain letter paper
– Indicates **not** supported.

Note 1: The Lexmark T640, T642, T644, and X646ef MFP models support several different output devices. The optional finisher is always installed as the first output device and provides one additional output bin.

Note 2: The Lexmark C920 finishing functions only apply to letter and A4 paper sizes. For all other sizes, the job will print but finishing functions will not be performed.

Note 3: Paper is stacked face up in finisher physical bin 1.

Finishing functions for Lexmark C935, X940e MFP, X945e MFP, Lexmark X850e MFP, X852e MFP, and X854e MFP (Note 3).

The finishing functions do not apply to all paper sizes. When a function can not be applied to a specific paper, the job will print but finishing functions will not be performed.

Function/ Support with Optional Finisher	Hole Punch	Offset Stacking	Staple Bin	Staple position (Note 1)	Maxi-mum Staple Packet Size*	Center Fold (Note 2)	Saddle Staple (Note 2)
Lexmark C935, X940e MFP, X945e MFP, Lexmark X850e MFP, X852e MFP, X854e MFP	Finisher Physical Bin 2	Finisher Physical Bin 2	Finisher Physical Bin 2	Front Rear Dual Double Dual	50 Sheets	Finisher Physical Bin 3 (Advanced Finisher only)	Finisher Physical Bin 3 (Advanced Finisher only)

* - 20 lb. plain letter paper
– Indicates **not** supported.

Note 1: Letter and A4 paper must be loaded Long Edge Fed (LEF) for Double Dual stapling to be performed.

Note 2: Two optional finisher units are supported. The Standard Finisher has two bins and does not support Center Fold-in or Saddle staple (Saddle stitch-in). The Advanced Finisher supports all listed finishing functions. Letter and A4 paper must be loaded Short Edge Feed (SEF) for Center fold-in and Saddle stitch-in to be performed.

Note 3: Advanced finishing functions for the Lexmark X850e MFP, X852e MFP, and X854e MFP are supported on base printer code LC3.BE.P339 (or greater) with IPDS code 3.01-01257 (or greater).

5.1 Offset Stacking

Offset stacking of IPDS jobs is available when offset stacking is supported in the printer standard bin or when an optional finisher with offset stacking capability is installed. For offset stacking to occur, the following must happen:

- **Host Controlled** must be selected in **Option Card Menu > IPDS MENU > EMULATION > PAPER HANDLING > Offset Stacking**. **Host Controlled** is the default value. See section 3.5.2 on page 33 for additional information.
- Offset stacking commands must be received with the IPDS job.
- The bin selection specified in the IPDS job must be mapped to a bin that supports offset stacking. See MAP OUTPUT BINS Menu Options on page 40 for additional information on bin mapping.

Output bin selection takes precedence over offset stacking.

Hole punching may be performed with offset stacking.

Note: The **Offset Pages** menu item under the printer's **Settings > Finishing Menu** does not affect offset stacking of IPDS jobs.

Note: Offset stacking is not supported for all papers sizes or types. Refer to your finisher or printer documentation for additional information.

5.1.1 AS/400 and iSeries Offset Stacking

When offset stacking is available, the IPDS emulation reports to the host that offset stacking is supported. The AS/400 and iSeries automatically send offset stacking commands with each job. The host default output bin selection number is 1, which selects the printer standard bin. If the printer supports offset stacking in the standard bin, the job will be offset.

Following are different ways to ensure that jobs are offset. The following examples assume that an optional finisher is installed and offset stacking is supported in the finisher physical bin 1.

- Change the host output bin selection number to 2 in the default printer file using the `CHGPRTF` command. (Assumes printer default bin mappings.)
- Create a new printer file using the `CRTPRTF` command and set the host output bin selection number to 2. (Assumes printer default bin mappings.)
- In the printer's **Option Card Menu > IPDS MENU > MAP OUTPUT BINS** menu, change **Bin Mapping 1** output bin value from **Standard Bin** to **Bin 1**. (Assumes the host output bin selection number is 1.) This routes all jobs that would normally have gone to the printer standard bin to finisher bin 1, which supports offset stacking. See MAP OUTPUT BINS Menu Options on page 40 for details on bin mapping.

The following examples assume that an optional finisher is installed and offset stacking is supported in the finisher physical bin 2.

- Change the host output bin selection number to 3 in the default printer file using the `CHGPRTF` command. (Assumes printer default bin mappings.)
- Create a new printer file using the `CRTPRTF` command and set the host output bin selection number to 3. (Assumes printer default bin mappings.)
- In the printer's **Option Card Menu > IPDS MENU > MAP OUTPUT BINS** menu, change **Bin Mapping 1** output bin value from **Standard Bin** to **Bin 2**. (Assumes the host output bin selection number is 1.) This routes all jobs that would normally have gone to the printer standard bin to

finisher bin 2, which supports offset stacking. See MAP OUTPUT BINS Menu Options on page 40 for details on bin mapping.

5.1.2 Mainframe Offset Stacking

For MVS JES2/JES3 offset stacking is controlled by the **COPYMARK** parameter contained in the printer device definition statement in the JES2/JES3 initialization member. The following examples illustrate the options and syntax for both JES2/JES3.

Example 1- JES2
JES2 Specifications using the **COPYMARK** parameter. (See note):

COPYMARK=DATASET	Offset stacking increment on dataset boundary.
COPYMARK=JOB	Offset stacking increment on job boundary.
COPYMARK=CONSTANT	No offset stacking is performed.

Example 2 – JES3
JES3 Specifications using the **COPYMARK** parameter. (See note):

COPYMARK=C	Offset stacking increment on dataset boundary.
COPYMARK=J	Offset stacking increment on job boundary.
COPYMARK=N	No offset stacking is performed.

Note: Copy marks are not generated by the IPDS emulation.

Example 3 - Output bin selection
The host default output bin selection number is 1, which selects the printer standard bin. If offset stacking is supported in the printer standard bin, offset stacking will be performed.

Following are different ways to ensure jobs are offset. The following examples assume that an optional finisher is installed and offset stacking is supported in the finisher physical bin 1.

- Specify OUTBIN in the JCL statements as follows:
  ```
  //OUT1 OUTPUT OUTBIN=2
  //DDNAME DD SYSOUT=CLASS,OUTPUT=(*,OUT1)
  ```
- Specify OUTBIN=2 in the OUTPUT DD card of your IEBGENER job.
- In the printer's **Option Card Menu > IPDS MENU > MAP OUTPUT BIN** menu, change **Bin Mapping 1** output bin value from **Standard Bin** to **Bin 1**. (Assumes the host output bin selection number is 1.) This routes all jobs that would normally have gone to the printer standard bin to finisher bin 1, which supports offset stacking. See MAP OUTPUT BINS Menu Options on page 40 for details on bin mapping.

The following examples assume that an optional finisher is installed and offset stacking is supported in the finisher physical bin 2.

- Specify OUTBIN in the JCL statements as follows:
  ```
  //OUT1 OUTPUT OUTBIN=3
  //DDNAME DD SYSOUT=CLASS,OUTPUT=(*,OUT1)
  ```
- Specify OUTBIN=3 in the OUTPUT DD card of your IEBGENER job.
- In the printer's **Option Card Menu > IPDS MENU > MAP OUTPUT BIN** menu, change **Bin Mapping 1** output bin value from **Standard Bin** to **Bin 2**. (Assumes the host output bin selection

number is 1.) This routes all jobs that would normally have gone to the printer standard bin to finisher bin 2, which supports offset stacking. See MAP OUTPUT BINS Menu Options on page 40 for details on bin mapping.

5.2 Stapling

Stapling is available when an optional finisher is installed.

When stapling is specified in the IPDS job, the job bin selection will be ignored and the job will be routed to a bin that supports stapling.

Jobs are stapled according to the following printer and finisher restrictions. It is the user's responsibility to load a media type and size that can be stapled by the optional finisher. Refer to your printer documentation for media types and sizes supported by the optional finisher and for any additional restrictions that may apply.

- Jobs that exceed the maximum staple packet size may or may not be stapled. Results will be different for different finisher units.
- Stapling has a higher priority than output bin selection.
- Stapling and hole punch may be performed on the same job.

Note: The **Staple Job** menu item under the printer's **Settings > Finishing Menu** does not affect stapling of IPDS jobs.

5.2.1 AS/400 and iSeries Stapling

Stapling is controlled in the printer file parameters on the AS/400 and iSeries. Printer files may be created using the '`CRTPRTF`' command or changed using the '`CHGPRTF`' command. Check to see that all PTFs that affect stapling have been applied before calling for technical support.

Finishing capabilities for optional finishers vary. Differences are explained below.

5.2.1.1 Lexmark C772, C782, C920, T640, T642, T644, X646ef MFP, and X782e MFP Optional Finisher

The optional finisher supports only one staple position. You can not physically change the position of the staple. The printer automatically rotates text before stapling when the finisher is installed. If necessary, reformat your job on the host with a different text orientation to avoid stapled sets that are hard to read.

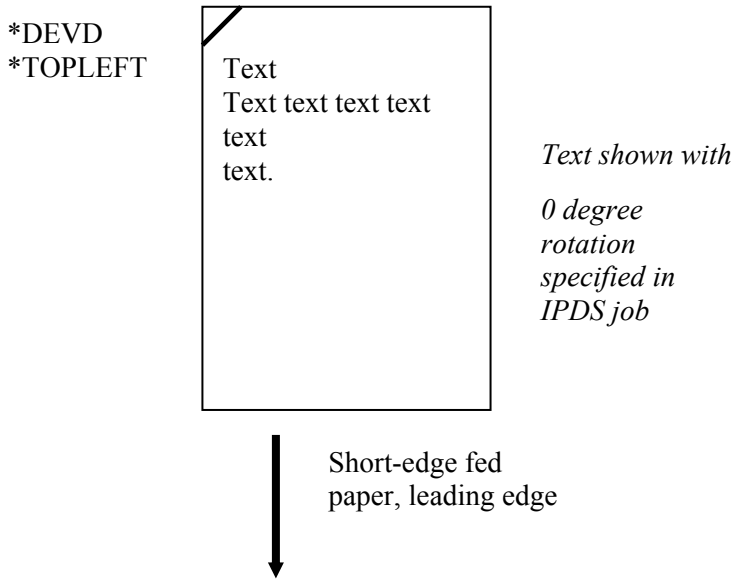
Refer to your printer or finisher documentation to determine the finishing support and staple location for various paper sizes. Finishing functions may not be applied to all paper sizes.

Parameters in the printer file that affect stapling

Printer device type	*IPDS
Output bin	For Lexmark C772, C782, T640, T642, T644, X646ef MFP, and X782e MFP use 2. For Lexmark C920, use 3.
Corner staple	*DEVD `or` *TOPLEFT

The *DEVD staple position is the top left. Specifying any other setting may cause an exception to be reported to the host.

Drawing of staple placement



5.2.1.2 Lexmark C935, W840, X850e MFP, X852e MFP, X854e MFP, X940e MFP, and X945e MFP Optional Standard Finisher

The optional Standard Finisher supports Corner staple and Dual staple (IPDS Edge stitch). The printer automatically rotates the text 180 degrees for short-edge fed paper and 90 degrees for long-edge fed paper. If necessary, reformat your job on the host with a different text orientation to avoid stapled sets that are hard to read.

Refer to your printer or finisher documentation to determine the finishing support and staple location for various paper sizes. Finishing functions may not be applied to all paper sizes.

See Lexmark C935, X940e MFP, X945e MFP, X850e MFP, X852e MFP, and X854e MFP Optional Advanced Finisher Functions (on page 60) for information on additional functions supported.

The **Printer device type** must always be *IPDS.

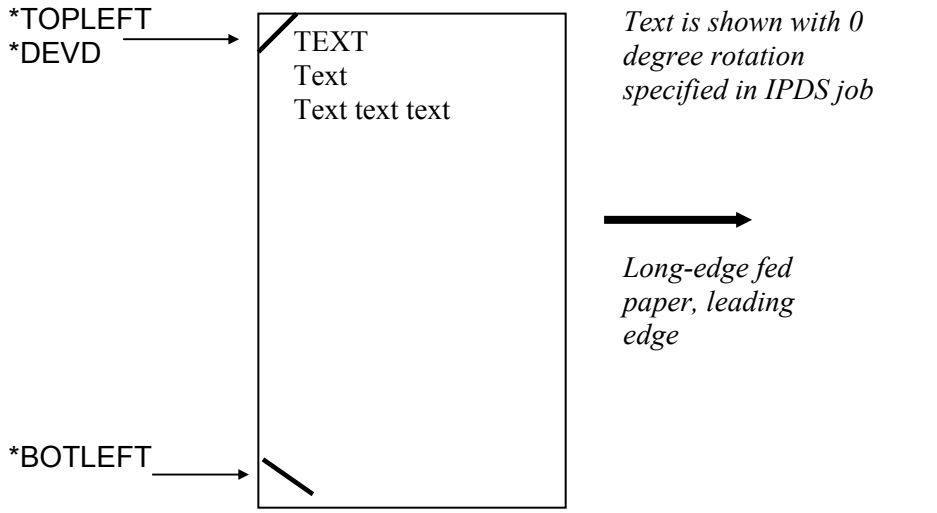
How to specify Printer File parameters is shown below.

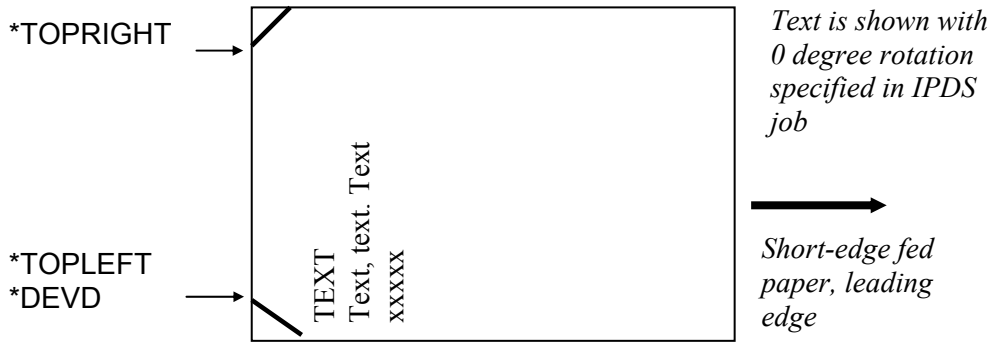
5.2.1.2.1 Corner Staple

Parameters in the printer file

`Corner staple` ……`*TOPLEFT, *BOTLEFT, *TOPRIGHT or *DEVD`

Drawings of staple placement





5.2.1.2.2 Dual Staple (IPDS Edge stitch with 2 staples)

Parameters in the printer file

Edge stitch

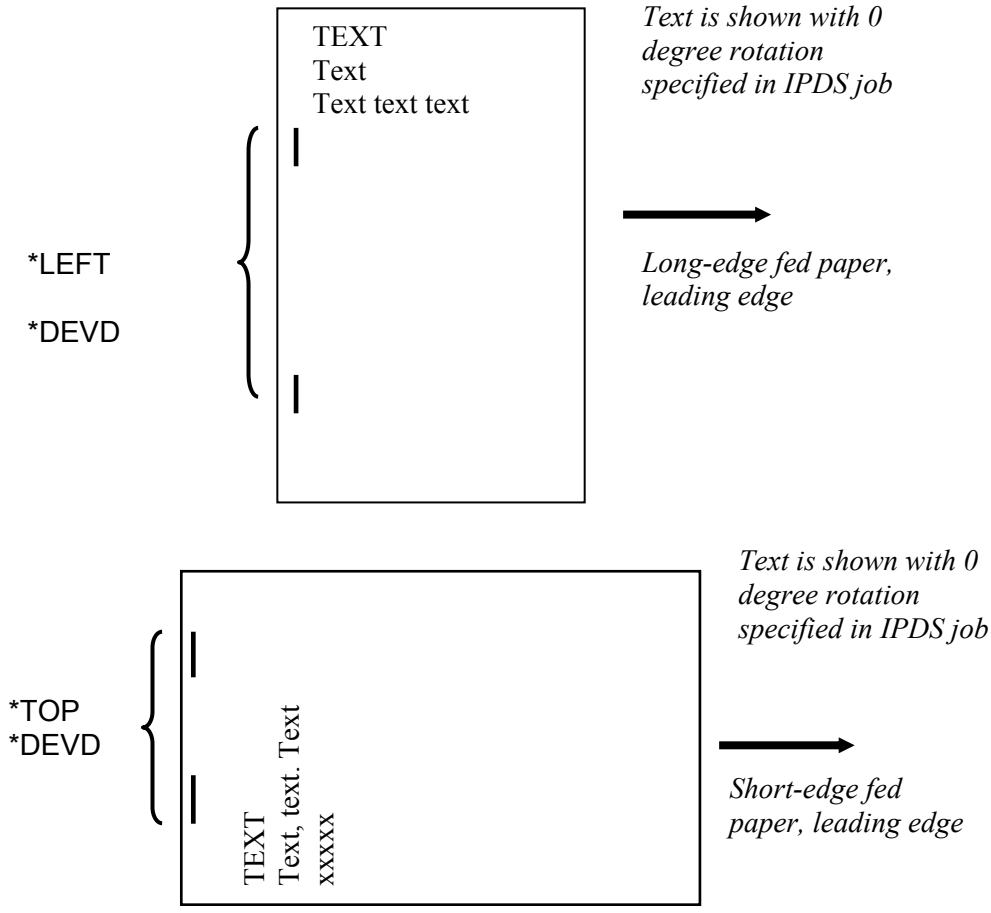
```
Reference edge............ *LEFT, *TOP or *DEVD
Reference edge offset..... *DEVD
Number of staples......... *DEVD or 2
Staple offsets............ *DEVD
```

Two staples are placed on the left or top reference edge of the paper.

*TOP must only be used with short edge fed paper.
*LEFT must only be used with long edge fed paper.
An invalid staple position parameter may cause an exception to be reported to the host.

The “Reference edge offset”, “Number of staples”, and “Staple offsets” parameters are not supported, and are ignored if set to other values.

Drawings of staple placement



5.2.1.3 Lexmark C935, X940e MFP, X945e MFP, X850e MFP, X852e MFP, and X854e MFP Optional Advanced Finisher Functions

The Lexmark C935, X940e MFP, X945e MFP, X850e MFP, X852e MFP, and X854e MFP support a Standard Finisher and an Advanced Finisher. Advanced finishing functions for the X850e MFP, X852e MFP, and X854e MFP are supported on base printer code LC3.BE.P339 (or greater) with IPDS code 3.01-01257 (or greater). The Advanced Finisher supports Corner staple, Dual staple (IPDS Edge stitch with 2 staples), Double Dual staple (IPDS Edge stitch with 4 staples), Center Fold (IPDS Center Fold-in), and Saddle staple (IPDS Saddle stitch-in). The printer automatically rotates the text 180 degrees for short-edge fed paper and 90 degrees for long-edge fed paper. If necessary, reformat your job on the host with a different text orientation to avoid stapled or folded sets that are hard to read.

Finishing functions may not be applied to all paper sizes. Refer to your printer or finisher documentation to determine the finishing support and staple location for various paper sizes.

The **Printer device type** must always be *IPDS.

How to specify the Printer File parameters for Double Dual staple, Center Fold, and Saddle staple is shown below. Examples for Corner staple and Dual staple are in section 5.2.1.2 on page 58.

5.2.1.3.1 Double Dual Staple (IPDS Edge Stitch with four staples)

Double Dual staple (IPDS Edge stitch with four staples) may be controlled by the Edge stitch parameters in the Printer File. Four staples are placed on the long edge of the paper. Double Dual staple is only supported on Letter and A4 when the paper is loaded for Long Edge Fed (LEF) printing.

Parameters in the printer file

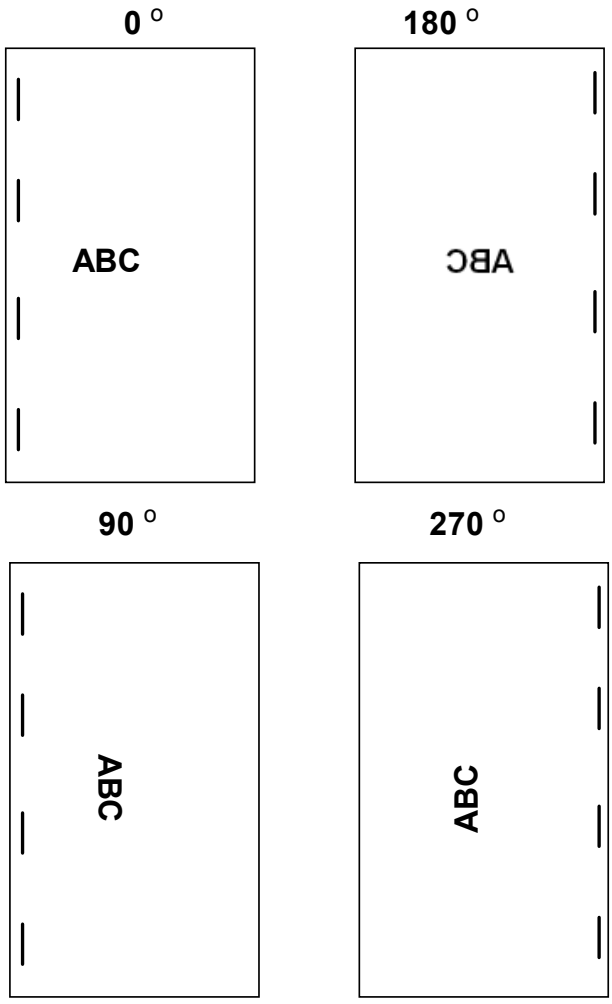
Edge stitch

```
Reference edge..... *LEFT or *DEVD
Reference edge offset..... *DEVD
Number of staples..... 4
Staple offsets..... *DEVD
```

Reference edge: *LEFT or *DEVD – NACKs may be generated for other parameters.
Reference edge offset: *DEVD – All other values ignored.
Number of staples - 4
Note: If the number of staples is 2, Edge stitch with two staples will be performed.

Staple Offsets: *DEVD – All other values ignored.

Drawings of positions



5.2.1.3.2 Center Fold (IPDS Center Fold-in)

Center Fold-in may be specified using various application programs using the Operation Type Center Fold-in (X'08' in the IPDS data stream).

Center Fold-in folds the paper along the centerline of the paper with the printed side folded in. Center Fold-in is only supported on selected paper sizes. Refer to your printer or finisher documentation for the paper sizes supported.

Center Fold-in is only supported on Letter and A4 paper when the paper is loaded for Short Edge Fed (SEF) printing. All jobs specifying Center Fold-in will be routed to the finisher physical bin 3. Center Fold-in has a higher priority than bin selection, offset, and hole punch. These functions will be ignored when specified with Center Fold-in.

5.2.1.3.3 Saddle Staple (IPDS Saddle stitch-in)

Saddle staple may be specified using various application programs using the Operation Type Saddle stitch-in (X'12' in the IPDS data stream).

Saddle stitch-in folds the paper inward (printed side in) along the centerline and places two staples in the centerline fold. Saddle stitch-in is only supported on selected paper sizes. Refer to your printer or finisher documentation for the paper sizes supported.

Saddle stitch-in is only supported on Letter and A4 paper when the paper is loaded for Short Edge Fed (SEF) printing. All jobs specifying Saddle stitch-in will be routed to finisher physical bin 3. Saddle stitch-in has a higher priority than bin selection, offset, and hole punch. These functions will be ignored when specified with Saddle stitch-in.

Saddle stitch-in may be controlled by the following parameters in the Printer File

Saddle stitch-in

```
Reference edge............ *LEFT or *DEVD
Reference edge offset..... *DEVD
Number of staples......... *DEVD, Integer (see Number of staples below)
Staple offsets............ *DEVD
```

Reference edge: *LEFT or *DEVD – NACKs may be generated for other parameters.

Reference edge offset: *DEVD – All other values ignored.

Number of staples:

*DEVD – Two staples

Integer – All integer values result in two staples.

Staple offsets: *DEVD – All other values ignored.

5.2.2 Mainframe Stapling

Stapling is controlled in MVS by the PSF Form Definition parameters used within the job being sent to the printer from the host system. The form definition for stapling can be defined either in the host PSF printer member or on the sysout statement of the job being sent.

5.2.2.1 Lexmark C772, C782, C920, T640, T642, T644, X646ef MFP, and X782e MFP Optional Finisher

The optional finisher supports only one staple position. You can not physically change the position of the staple. The printer automatically rotates text before stapling when the finisher is installed.

If necessary, reformat your job on the host with a different text orientation to avoid stapled sets that are hard to read. Refer to your printer or finisher documentation to determine the staple location for various paper sizes.

The form definition to use in the PSF printer member or in the job output statement for simplex printing is: F1FC0010. (See PSF OS/390 Users Guide for other Form Definitions Supplied with PSF, for Staple with Duplex, Tumble etc.)

The following is an example of a job output statement that includes the Form Definition to use IPDS staple function for a simplex job:

```
//OUT1 OUTPUT CLASS=C,COPIES=1,FORMDEF=FC0010
```

5.2.2.2 Lexmark C935, W840, X850e MFP, X852e MFP, X854e MFP, X940e MFP, and X945e MFP Optional Standard Finisher

The optional Standard Finisher supports Corner staple and Dual staple (IPDS Edge stitch). The printer automatically rotates the text 180 degrees for short-edge fed paper and 90 degrees for long-edge fed paper. If necessary, reformat your job on the host with a different text orientation to avoid stapled sets that are hard to read. Refer to your printer or finisher documentation to determine the staple location for various paper sizes.

See Lexmark C935, X940e MFP, X945e MFP, X850e MFP, X852e MFP, and X854e MFP Optional Advanced Finisher Functions (on page 65) for information on additional functions supported.

Below are *examples of job output statements* that include the Form Definition to place staples in the printed output.

Corner staple

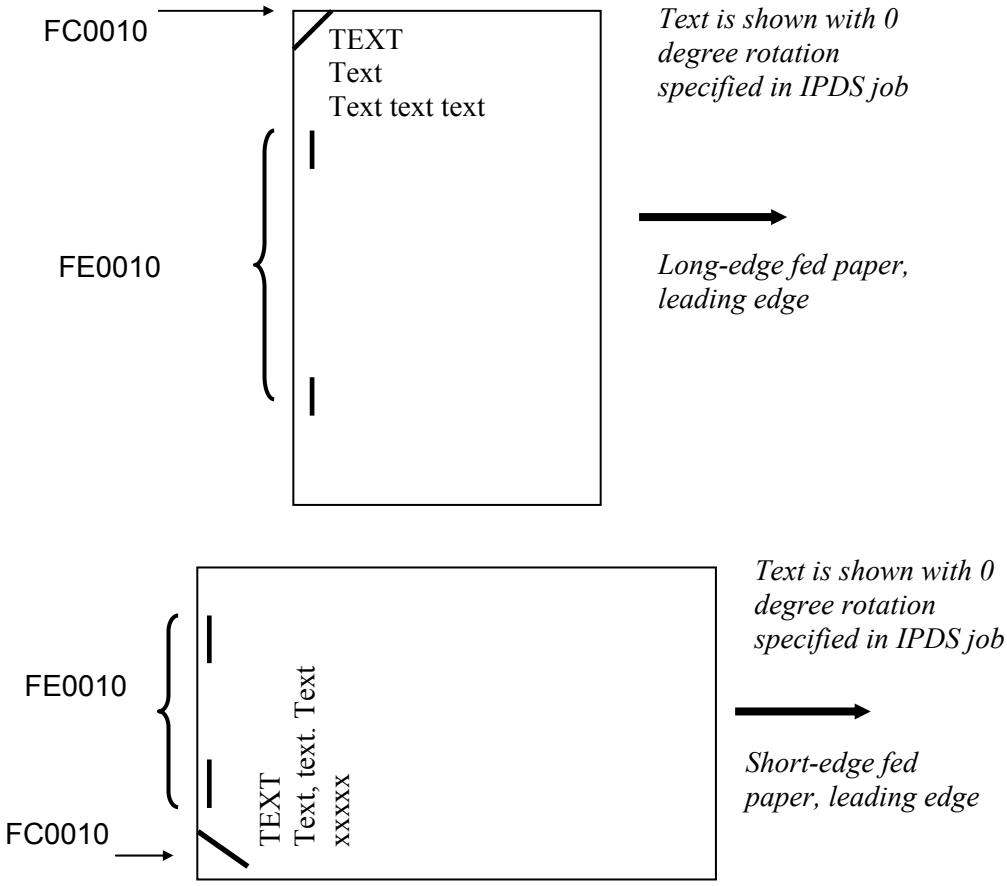
```
//OUT1 OUTPUT CLASS=C,COPIES=1,FORMDEF=FC0010
```

Dual staple

```
//OUT1 OUTPUT CLASS=C,COPIES=1,FORMDEF=FE0010
```

Sending form definitions that specify invalid staple locations may cause an exception to be reported to the host.

Drawings of staple placement for simplex form definitions



5.2.2.3 Lexmark C935, X940e MFP, X945e MFP, X850e MFP, X852e MFP, and X854e MFP Optional Advanced Finisher Functions

The Lexmark C935, X940e MFP, X945e MFP, X850e MFP, X852e MFP, and X854e MFP support a Standard Finisher and an Advanced Finisher. Advanced finishing functions for the Lexmark X850e MFP, X852e MFP, and X854e MFP are supported on base printer code LC3.BE.P339 (or greater) with IPDS code 3.01-01257 (or greater). The Advanced Finisher supports Dual staple (IPDS Edge stitch), Double Dual staple (IPDS Edge stitch with 4 staples), Center Fold (Center Fold-in), and Saddle staple (Saddle stitch-in). The printer automatically rotates the text 180 degrees for short-edge fed paper and 90 degrees for long-edge fed paper. If necessary, reformat your job on the host with a different text orientation to avoid stapled or folded sets that are hard to read.

Finishing functions may not be applied to all paper sizes. Refer to your printer or finisher documentation to determine the finishing support and staple location for various paper sizes

How to specify the Printer File parameters for Saddle staple is shown below. Examples for Corner staple and Dual staple are in section 5.2.2.2 on page 64.

5.2.2.3.1 Saddle Staple (IPDS Saddle stitch-in)

Saddle staple may be specified using various application programs using the Operation Type Saddle stitch-in (X'12' in the IPDS data stream).

Saddle stitch-in folds the paper inward (printed side in) along the centerline and places two staples in the centerline fold. Saddle stitch-in is only supported on selected paper sizes. Refer to your printer or finisher documentation for the paper sizes supported.

Saddle stitch-in is only supported on Letter and A4 paper when the paper is loaded for Short Edge Fed (SEF) printing. All jobs specifying Saddle stitch-in will be routed to finisher physical bin 3. Saddle stitch-in has a higher priority than bin selection, offset, and hole punch. These functions will be ignored when specified with Saddle stitch-in.

The following is an example of a job output statement that includes the Form Definition to perform Saddle stitch-in.

```
//OUT1 OUTPUT CLASS=C,COPIES=1,FORMDEF=FS0010
```

5.3 Hole Punching

Hole punching of IPDS jobs is available when an optional finisher with hole punch capability is installed. See the table on page 51 to determine if your finisher supports hole punching.

A job may select hole punch by specifying it in an IPDS command. When hole punch is selected through an IPDS data stream command, hole punch will override output bin selection and the job will be routed to a bin that supports hole punch.

The following is an example of a job output statement that includes the Form Definition to perform 3-hole punch.

```
//OUT1 OUTPUT CLASS=C,COPIES=1,FORMDEF=F1H10110
```

Pages may also be hole punched by selecting a value in the printer's **Option Card Menu > IPDS MENU > MAP INPUT TRAYS** menu or in the printer's **Option Card Menu > IPDS MENU > MAP OUTPUT BINS** menu. When this method is used, the hole punch command does not have to be received in the job. Refer to your printer or finisher documentation to determine the hole punch location for various paper sizes. The following sections describe how to use the printer menus to hole punch IPDS jobs.

Note: The **Hole Punch** menu item under the printer's **Settings > Finishing Menu** does not affect hole punching of IPDS jobs.

5.3.1 Hole Punching From an Input Source

Hole punching may be performed on paper pulled from any paper input source on the printer. Hole punching from an input source is specified using the printer's **Option Card Menu > IPDS MENU > MAP INPUT TRAYS** menu. See MAP INPUT TRAYS Menu Options on page 37 for additional information. A combination of the printer physical input source and the IPDS data stream requested input source is used to specify hole punching.

Example 1 - To have all pages from Tray 1 hole punched (Default settings are assumed in this example)

To have all pages printed from the printer physical Tray 1 hole punched, specify the following in the **MAP INPUT TRAYS** menu:

1. Select Tray Mapping 1
2. Select Tray 1Hp
3. Select IPDS Number 0

This sets **Tray Mapping 1** to **Tray 1Hp** to **IPDS Number 0**. When the IPDS input source **0** is specified in the data stream, paper is picked from the printer physical Tray 1 and hole punched.

Example 2 - To have selected pages from Tray 1 hole punched (Default settings are assumed in this example.)

To have some pages punched and some pages not punched from Tray 1, specify the following in the **IPDS MENU > MAP INPUT TRAY** menu:

Tray Mapping 1 to Tray 1 to IPDS Number 0 (Default Setting)
(When **IPDS Number 0** is the requested source in the IPDS data stream, pages are pulled from the printer physical Tray 1 and are not hole punched. **0** is the IPDS default input source value.)

Tray Mapping 8 to Tray 1 Hp to IPDS Number 4.
(When **IPDS Number 4** is the requested source in the IPDS data stream, pages are pulled from the printer physical Tray 1 and all pages are hole punched.)

5.3.2 Hole Punching to an Output Bin

Hole punching may be performed on paper routed to any optional finisher output bin. Hole punching to an output bin is specified using the printer's **Option Card Menu > IPDS MENU > MAP OUTPUT BINS** menu. See MAP OUTPUT BINS Menu Options on page 40 for additional information. A combination of the printer physical output bin and the IPDS data stream specified output bin is used to specify hole punching.

Example 1 - To have all pages stacked in a finisher bin hole punched (Default settings are assumed in this example. Check the finishing support table on page 51 to determine the bins that support hole punch.)

To have all pages stacked in an output bin hole punched, specify the following in the **IPDS MENU > MAP OUTPUT BINS** menu:

Finisher Physical Bin 1	Finisher Physical Bin 2
1. Select **Bin Mapping 1**	1. Select **Bin Mapping 1**
2. Select **Output Bin 1 Hp**	2. Select **Output Bin 2 Hp**
3. Select IPDS Number **1**	3. Select IPDS Number **1**

When the requested output bin number is **1** in the IPDS data stream, pages are hole punched and stacked in the finisher physical output bin selected.

Example 2 - To have selected pages stacked in an output bin hole punched (Default settings are assumed in this example. Check the finishing support table on page 51 to determine the bins that support hole punch.)

To have some pages punched and some pages not punched as they are stacked in the finisher physical output bin, specify the following in the **IPDS MENU > MAP OUTPUT BINS** menu:

Finisher Physical Bin 1	Finisher Physical Bin 2
1. Select **Bin Mapping 1**	1. Select **Bin Mapping 1**
2. Select **Output Bin 1**	2. Select **Output Bin 2**
3. Select IPDS Number **1**	3. Select IPDS Number **1**
4. Select **Bin Mapping 4**	4. Select **Bin Mapping 4**
5. Select **Output Bin 1 Hp**	5. Select **Output Bin 2 Hp**
6. Select IPDS Number **2**	6. Select IPDS Number **2**

Note: **IPDS Number 1** is the default IPDS data stream output bin.

When **IPDS Number 1** is the requested output bin in the IPDS data stream, pages are stacked in the finisher physical output bin and are not hole punched.

When **IPDS Number 2** is the requested output bin in the IPDS data stream, pages are stacked in the finisher physical output bin and are hole punched.

6 IPDS Job Cancel

6.1 Canceling IPDS Jobs

IPDS jobs may be cancelled using the normal cancel sequence for the printer.

Cancel Job while an IPDS job is being processed causes an "IPDS cancel exception" to be sent to the host. The host responds by placing the first non-completed IPDS job in a held status and sending the remaining jobs on the queue.

IPDS resources are saved by the printer unless the host requests deletion of these resources.

Selecting a specific job to cancel can be difficult when several small jobs are queued to print from the host.

6.2 How to Cancel a Job Using the Printer Operator Panel

1. Press the **Select** button ✓ on the operator panel while your IPDS job is printing.

BUSY
✓ Cancel Job
Status / Supplies
Held Jobs

2. The printer will clear the paper path and display a **Stopping** message.

Stopping ….

3. Only one Print Job will be shown in the next menu. Press ✓.

↺ **Select to cancel**
✓ Print Job xxxxxxxx

To continue printing without canceling the job, press the **Back** button ↺.

4. The printer will automatically return to its normal state, which will be **BUSY** if it is in the process of printing other jobs.

Cancelling Print Job xxxxxxxx

6.3 How to Cancel a Job Using the MFP Touch Screen

1. While any job is printing, the **Cancel Job** icon will be displayed on the control panel. Touch the icon.
2. In the “Print” column, select the job you want to cancel by touching the print job icon.
3. Touch the **Delete Selected Job** icon.
4. The screen will display a message to indicate that the job is being deleted.
5. The screen will return to the Home display.

7 Working with Captured Fonts

7.1 Capture Font and Remove Font

Capture is a function whereby downloaded fonts can be stored on disk or user flash. The flash memory and hard disk may be printer optional storage media ordered separately from the printer.

Menu path: **Option Card Menu > IPDS MENU > FONT CAPTURE.** This menu group has two items: **Capture Fonts** and **Remove Fonts.**

These menu items are described in FONT CAPTURE Menu Options on page 49.

A captured font is treated as if it is a printer-resident font. Unlike resident fonts, which can not be deleted, captured fonts may be deleted when storage space is required. Fonts that are resident on the printer will not be downloaded for capture by the host.

Captured fonts are:

- only available to the IPDS emulation.
- retained in the printer across job boundaries, IPDS sessions and power cycles.
- available for use by any host connected to the printer.

Fonts captured to flash memory or a disk remain in the printer until:

- cleared by using the **Remove Fonts** menu item or
- overwritten with a later capture of a font with the same object ID or characteristics

Fonts activated from flash or disk and in use during a session will not be cleared by **Remove Fonts**. Activated fonts will remain in memory until the activation is removed by the host or the session with the host is ended.

When there is not enough space remaining to capture a font, a message will be displayed. Select **Continue** on the operator panel or touch screen to clear the message. Some printers may automatically continue after a short period of time. The job will be printed without capturing any remaining fonts. Only one such message is displayed during an IPDS session. This prevents the printer from halting each time a new font is received.

7.2 Preparing Fonts for Capture

Fonts that can be captured are: eligible bitmap fonts (LF1 format), eligible outline fonts (LF3 format), and eligible TrueType fonts. TrueType fonts can only be captured to disk.

The resolution of the captured font must match the IPDS emulation resolution for the font to be used by the host application. For instance, a font captured with a 300 pel resolution can not be used by the IPDS emulation when it is emulating an IBM 3812/3816 printer. The fonts used in emulating a 3812/3816 printer have a resolution of 240 pels.

Important: Fonts intended for capturing must be marked **eligible for capture** on the host before they will be downloaded to the printer for capture. You should **always** check your font licensing information before making a font eligible for capture. Sensitive fonts should not be made eligible for capture.

Basic information about how mark a font as eligible on the AS/400 or iSeries is on page 71. Basic information about how to mark a fonts as eligible on a Mainframe is on page 72.

7.2.1 Capturing Fonts from an AS/400 or iSeries

7.2.1.1 Program Requirements

On an AS/400, PSF/400 V4R2 or later is required for making fonts eligible for capture. All iSeries releases support font capture.

7.2.1.2 Making Fonts Eligible for Capture on the Host

Two steps are required to capture fonts. These are:

1. Make the font resource eligible for capture.

To mark a font resource eligible for capture, set `FNTCAPTURE` to `*YES`. This is done when you create the font resource using the `CRTFNTRSC` command or change the font resource using the `CHGFNTRSC` command. A raster font is built from a font character set and a code page. Both of these font resources must be marked eligible for the raster font to be captured. Additional information on font capture may be found in iSeries Printer Device Programming Version 5 (SC41-5713-04).

2. Identify the printer as being capable of capturing fonts.

Set the `FNTCAPTURE` parameter to `*YES` in the printer `PSFCONFIG`.

Note: If you need to make TrueType fonts eligible for capture, you should probably use the Font Installer for AFP Systems.

7.2.2 Capturing Fonts from a Mainframe Host

7.2.2.1 Mainframe Program Requirements

Font capture is supported by PSF/MVS 2.2.0 with APAR OW08340 and PSF/VSE 2.2.1 with APAR DY43969.

7.2.2.2 Making Fonts Eligible for Capture on a Mainframe

Note: The procedures/documentation below are for OS390/MVS/PSF platform. The following are the software release requirements for font capture feature within this platform. (For details on font capture with PSF refer to the PSF Customization Guide, Program Number: 5655-B17)

OS390/MVS 2.4 or later
PFS for MVS 2.2 or later

Note: Earlier releases may also support "Font Capture". For details - check your "PSF Customization Guide".

There are basically 3 steps involved regarding font capture as follows:

1. Display current font marking status.
2. Mark fonts for capture.
3. Send job from host to printer with the font and font character set you want printer to capture.

Fonts on the host can be marked either "PUBLIC", "PRIVATE", or "UNMARKED". In order for the printer to capture fonts as resident the fonts must be marked "PUBLIC" on the host. Fonts marked "PRIVATE" are only temporarily downloaded and are removed from printer by the host. "UNMARKED" fonts are treated the same as if they were marked "PRIVATE" and will not be captured as printer resident fonts.

Detailed examples of the three steps are shown below.

Note: If you need to make TrueType fonts eligible for capture, you should probably use the Font Installer for AFP Systems.

STEP 1. DISPLAY CURRENT FONT MARKING STATUS

To determine the marking status of your host fonts you can run the APSRMARK report utility. The following is a sample of the JCL to run the font report listing.

Sample JCL to run font report listing to determine current font marking status:

```
//APSHORT  JOB   (),
//         CLASS=A,
//         MSGCLASS=A,
//         MSGLEVEL=(1,1),
//         NOTIFY=&SYSUID,
//         TIME=1440
//*** NOTE: USE THIS JOB TO PRINT SHORT FONT STATUS MARKINGS ONLY ****
//*** NOTE: CHANGE DSN LINE 13 (IN1 STATEMENT) TO MATCH YOUR FONTLIB *
//*******************************************************************
//STEP1    EXEC  PGM=APSRMARK
//SYSPRINT DD SYSOUT=J
//*
//IN1    DD UNIT=3390,DSN=SYS1.FONTLIBB,DISP=SHR,VOL=SER=OS3R7A
//SYSIN  DD *
  INDD=IN1,MEMBER=ALL,REPORT,SHORT
/*
```

Note: Change report type to "LONG" for font detailed report (replace the "SHORT" option).

STEP 2. MARKING FONTS FOR CAPTURE

In order for printer to capture host fonts as resident printer fonts they must be marked "PUBLIC". The following is a sample of the JCL commands to mark existing fonts as "PUBLIC".

Sample JCL to Mark Fonts "PUBLIC":

```
//APSMARK  JOB   (),
//         CLASS=A,
//         MSGCLASS=A,
//         MSGLEVEL=(1,1),
//         NOTIFY=&SYSUID,
//         TIME=1440
//*******************************************************************
//* THIS JOB WILL MARK FONTS FOR CAPTURE FOR PRINTER FROM FONT LIB.   *
//* MARK THEM AS EITHER PUBLIC OR PRIVATE. TO MARK PUBLIC ENTER       *
//* "PUBLIC" KEYWORD ON LINE 18 INDD STATEMENT. FOR PRIVATE ENTER     *
//* "PRIVATE" KEYWORD ON LINE 18 INDD STATEMENT. THEN SUBMIT.         *
//* TO DISPLAY STATUS MARKING CHANGE RUN REPORT JOB "APSSHORT".       *
//*******************************************************************
//* NOTE: USE "REPLACE" IF MEMBER ALREADY EXIST: SEE FOLLOWING EXAMPLE*
//* NOTE: USE "REPLACE" IF MEMBER ALREADY EXIST: SEE FOLLOWING EXAMPLE*
//* INDD=IN1,OUTDD=OUT1,MEMBER=C0H20000,PUBLIC,REPLACE                *
//*******************************************************************
//* NOTE: BEFORE YOU RUN THIS JOB YOU MUST ALLOCATE NEW FONTLIB DSN   *
//* 1ST CREATE NEW LIB, THEN USE IEBGENER TO COPY FROM OLD LIB        *
//* I.E. SYS1.FONTLIBB TO NEW LIB SYS1.FONTPRIV OR SYS1.FONTPUB       *
```

```
//*******************************************************************
//STEP1    EXEC  PGM=APSRMARK
//SYSPRINT DD SYSOUT=J
//*
//IN1    DD UNIT=3390,DSN=SYS1.FONT300,DISP=SHR,VOL=SER=OS3R7A
//OUT1   DD UNIT=3390,DSN=SYS1.FONTNEW,DISP=SHR,VOL=SER=OS3R7A
//SYSIN  DD *
  INDD=IN1,OUTDD=OUT1,MEMBER=T1V10037,PUBLIC
  INDD=IN1,OUTDD=OUT1,MEMBER=C08400B0,PUBLIC
/*
```

Note: If you want to mark all fonts in a particular font library "PUBLIC" you can create a new font library, copy, and mark all fonts as "PUBLIC" at the same time. The following is a sample of the JCL commands to copy and mark all fonts "PUBLIC" to a new library.

Sample JCL to copy and mark all fonts "PUBLIC" to a new font library:

```
//APSRMARK JOB   (),
//         CLASS=A,
//         MSGCLASS=A,
//         MSGLEVEL=(1,1),
//         NOTIFY=&SYSUID,
 //         TIME=1440
//*******************************************************************
//* THIS JOB WILL COPY/MOVE MEMBERS TO ALTERNATE FONT LIB AND       *
//* MARK THEM AS EITHER PUBLIC OR PRIVATE. TO MARK PUBLIC ENTER     *
//* "PUBLIC" KEYWORD ON LINE 18 INDD STATEMENT. FOR PRIVATE ENTER   *
//* "PRIVATE" KEYWORD ON LINE 18 INDD STATEMENT. THEN SUBMIT.       *
//* TO DISPLAY STATUS MARKING CHANGE RUN REPORT JOB "APSSHORT".     *
//* ****************************************************************
//* NOTE: BEFORE YOU RUN THIS JOB YOU MUST ALLOCATE NEW FONTLIB DSN *
//* 1ST CREATE NEW LIB, THEN USE IEBGENER TO COPY FROM OLD LIB      *
//* I.E. SYS1.FONTLIBB TO NEW LIB SYS1.FONTPRIV OR SYS1.FONTPUB     *
//*******************************************************************
//STEP1    EXEC  PGM=APSRMARK
//SYSPRINT DD SYSOUT=J
//*
//IN1    DD UNIT=3390,DSN=SYS1.FONTLIBB,DISP=SHR,VOL=SER=OS3R7A
//INOUT1 DD UNIT=3390,DSN=SYS1.FONTPRIV,DISP=SHR,VOL=SER=OS3R7A
//SYSIN  DD *
  INDD=IN1,OUTDD=INOUT1,PUBLIC,MEMBER=ALL
/*
```

STEP 3. SENDING JOB FROM HOST TO PRINTER SELECTING FONT CHARACTER SET YOU WANT PRINTER TO CAPTURE

Once you have marked fonts "PUBLIC" you can select the font character set to be captured from either within printer definition member in PSF or from within the in-stream JCL of the job. The following is an example of both.

To select font capture from printer definition member, add the "CHARS" option as follows to your PSF printer member.

```
//         CHARS=(88FB)            /* default font set */
```

To select font capture from in-stream JCL add the "CHARS" option to sysout/output statement as follows.

```
//OUT1 OUTPUT CLASS=A,
DEST=LOCAL,FORMDEF=A10110,PAGEDEF=A06462,CHARS=88FB
```

To print a list of captured fonts, select **Print IPDS Fonts** from **Option Card Menu > IPDS MENU > EMULATION** (see page 30).

8 Remote Configuration of Printer IPDS Settings

8.1 Why Use a Browser

Most IPDS emulation settings stored in the printer (the default IPDS settings) can be changed remotely using a browser. This method of changing settings is especially useful during printer installation to set all of the IPDS options to the values recommended by your system administrator. At a later time, any necessary changes can be made on each printer, either from a browser or via the operator panel.

Using the browser, you can save new settings to a printer. Option changes will become active when the next IPDS host session starts.

It is not possible to do everything from the browser that you can do from the operator panel; see section 8.3 on page 77.

Finally, using a browser can also be useful to display selected information about **IPDS Configuration** and **IPDS Product Information**. This can be used as an alternative or supplement to printing menu settings (as shown in Printing the Menu Settings Page (printers) on page 15 or Printing the Menu Settings Page (MFPs) on page 18).

8.2 Remote Configuration Using a Browser

A browser, such as Microsoft Internet Explorer or Netscape, may be used to remotely configure most IPDS settings on printers attached to a LAN using a Standard Network port or MarkNet internal print servers.

To access and change IPDS option settings through your browser:

1. End all IPDS sessions with the printer. This may involve ending all active AS/400 or iSeries writers and draining all active Mainframe printers. (see Note)
2. Access the printer web page by typing the IP address of the printer as the URL.
3. Select **Configuration**.
4. Select **IPDS Settings**.
5. Select **IPDS Configuration**. All option values that may be changed remotely will be displayed. In addition, the IPDS Version and the setting for Trace Functions will be displayed (read only).
6. Change option settings as desired.
7. Click **Submit** at the bottom of the page. The **Submit** button sends the new values to the printer. These values are saved in the printer and will become active when the next IPDS host session is started.
8. The browser GUI will then display a confirmation that the settings have been submitted and return to the **IPDS Configuration** page, displaying the submitted values.
9. Restart all IPDS sessions. Option changes will become active when the next IPDS host session starts.

Note: If new values are submitted during an IPDS session, the new settings will not be used until the current IPDS session ends and a new IPDS session is established.

Beside the **Submit** button you will see a **Reset Form** button. If you have entered values in the page without submitting, and decide to start all over again, click **Reset Form.** The page will then display the values that were current when you opened the **IPDS Configuration** page.

8.3 Functions that Can Not be Operated Remotely

The following IPDS functions can not be operated remotely:

- Trace Functions – The current setting is shown but can not be changed.
- Print IPDS Fonts – This operation is not shown.
- Remove Fonts – This operation is not shown.
- IPDS Version – The current version is shown but can not be changed.

To enable or disable Trace Functions, or to Print IPDS Fonts, use the operator panel **Option Card Menu > IPDS MENU > EMULATION > Trace Functions.**

To remove captured fonts, use the printer's **Option Card Menu > IPDS MENU > Font Capture > Remove Fonts > Yes**.

9 Printer Messages and Problems

Please refer to the *IPDS Printer and Host Setup Guide* for information on various problems and solutions.

10 Command Reference

10.1 XOA Print Quality Control

Monochrome printers support the Execute Order Any State (XOA) Print Quality Control command. This command specifies the print quality at which jobs will be printed on monochrome printers. Specifying lower print quality levels can save toner. Color printers ignore the Print Quality Control command when it is received. The following table gives the Quality Level value range.

The **Toner Saver** option in the **IPDS MENU** affects the processing of this command. See Toner Saver on page 23 for more information.

Print Quality Control Quality Level Values

Quality Level (Byte 2 Value)	Description
X'01' – X'55'	Lowest print quality. Best toner saving. These quality level settings correspond to setting the printer menu's **Toner Darkness** option to a value of one (in **Settings > Quality Menu**).
X'56' – X'AA'	Use the operator panel value specified in the printer menu's **Toner Darkness** option (in **Settings > Quality Menu**).
X'AB' – X'FE'	Factory default setting. Yields the best print quality with no toner saving. Check your printer documentation to determine the factory default value.
X'FF'	Use the operator panel value specified in the printer menu's **Toner Darkness** option (in **Settings > Quality Menu**).

The last print quality setting is saved across sessions when the printer and host settings are set correctly to allow resources to be saved in the printer.

The following Negative Acknowledgment is returned by printers that support the XOA Print Quality Control command.

Exception	Description	Action Code
X'0292..02'	Invalid XOA Print Quality Control parameter. An invalid quality level value of X'00' was received.	X'01'

10.2 XOH OPC Product Identifier Self Defining Field

The XOH OPC Product Identifier Self Defining field is returned to the host. This information may be useful in locating the printer for maintenance or inventory purposes. The following table specifies the values returned.

Product Identifier Self Defining Field Values: Bytes 0-6

Special Data Area	Value	Description
Bytes 0-1	X'004C'	Length of this Self Defining field
Bytes 2-3	X'0013'	Product Identifier Self Defining Field ID
Byte 4	X'39'	Length of Self Defining Product ID Parameter
Bytes 5-6	X'0001'	Unique Product Identifier Parameter ID

Product Identifier Self Defining Field Values: Bytes 7-12

Special Data Area	Value	Description for	
Bytes 7-12	X'F0F0F5F0F6F1'	005061	Lexmark C770, C772, C780, C782, and X782e MFP
	X'F0F0F5F0F5F6'	005056	Lexmark C920
	X'F0F0F5F0F5F7'	005057	Lexmark C935
	X'F0F0F4F0F6F1'	004061	Lexmark T640, T642, T644, and X646ef MFP
	X'F0F0F4F0F2F4'	004024	Lexmark W840
	X'F0F0F7F0F0F2'	007002	Lexmark X644e MFP and X646e MFP
	X'F0F0F7F5F0F0'	007500	Lexmark X850e MFP, X852e MFP, and X854e MFP
	X'F0F0F7F5F1F0'	007510	Lexmark X940e MFP and X945e MFP

Product Identifier Self Defining Field Values: Bytes 13-63

Special Data Area	Value	Description
Bytes 13-15	X'404040'	Model Number Specific model numbers are not returned
Bytes 16-18	X'D3E7D2'	Manufacturer LXK for Lexmark
Bytes 19-20	X'0000'	Plant
Bytes 21-32	12 Hex Bytes	Sequence Number Printer Serial Number
Bytes 33-34	X'0000'	Tag
Bytes 35-43	9 Hex Bytes	EC Level. IPDS Code Level in following form: xxxxyyyyy
Bytes 44-60	17 Hex Bytes	Device Specific Information Printer Base Code Level in following form: Base Code aa.bb.cccc
Byte 61	X'0F'	Length of Self Defining Product ID Parameter
Bytes 62-63	X'0003'	Printer Name Parameter ID

Product Identifier Self Defining Field Values: Bytes 64 -

Area	Value	Description
Bytes 64-75 or 64 - 81	X'D385A79481999240C3F7F7F0'	Lexmark C770
	X'D385A79481999240C3F7F7F2'	Lexmark C772
	X'D385A79481999240C3F7F8F0'	Lexmark C780
	X'D385A79481999240C3F7F8F2'	Lexmark C782
	X'D385A79481999240C3F9F2F0'	Lexmark C920
	X'D385A79481999240C3F9F3F5'	Lexmark C935
	X'D385A79481999240E3F6F4F0'	Lexmark T640
	X'D385A79481999240E3F6F4F2'	Lexmark T642
	X'D385A79481999240E3F6F4F4'	Lexmark T644 and X646ef MFP
	X'D385A79481999240E6F8F4F0'	Lexmark W840
	X'D385A79481999240E7F6F4F48540D4C6D7'	Lexmark X644e MFP
	X'D385A79481999240E7F6F4F68540D4C6D7'	Lexmark X646e MFP
	X'D385A79481999240E7F7F8F28540D4C6D7'	Lexmark X782e MFP
	X'D385A79481999240E7F8F5F08540D4C6D7'	Lexmark X850e MFP
	X'D385A79481999240E7F8F5F28540D4C6D7'	Lexmark X852e MFP
	X'D385A79481999240E7F8F5F48540D4C6D7'	Lexmark X854e MFP
	X'D385A79481999240E7F9F4F08540D4C6D7'	Lexmark X940e MFP
	X'D385A79481999240E7F9F4F58540D4C6D7'	Lexmark X945e MFP

10.3 Finishing Operations Self-Defining Field

Finishing operations are supported when an optional finisher is installed and the functions are supported by the finisher. Finishing operations are reported in the Finishing Operations Self-Defining Field.The values below are reported to the host when the finishing function is supported by the finisher.

Table 1: Finishing Operations Self-Defining Field

Bytes	Description	Values: Optional Finisher Supporting
0 - 1	Length of this self-defining field, including this field	X'004' to X'008'
2 – 3	Finishing operation self-defining field ID	X'0018'
4 – 7	Operation Type	X'01': Corner staple X'03': Edge stitch X'08': Center fold-in X'12': Saddle stitch-in

10.4 N-up Printing

N-up print support allows multiple pages to be printed on a single sheet. N-up allows 1-4 partitions to be defined per side of a sheet of paper. This allows up to 8 pages to be printed per sheet. Default page placement (N-up) and explicit page placement (N-up EPP) are supported. Refer to the "Load Copy Control and Logical Page Position" command in the Intelligent Printer Data Stream Reference (S544-3417) for more information.

10.5 Color and Simulated Grey Scale Printing

Color or simulated grey scale printing is supported in all IPDS towers. Function Sets (FS) 10, 11, 42, and 45 are supported. Full process color is supported when using FS45. ABIC (Bi-level Q-Coder) compression is not supported. Additional information may be found in the "Image Object Content Architecture (IOCA) Reference" (publication SC31-6805-05).

Full process color using FS45 is supported on iSeries V5R2 and higher.

10.6 TrueType Fonts

TrueType fonts may be downloaded from the host. True Type Font support is only available on selected products that support IPDS code release 3.01-01210 and higher. For some products this code may only be available as a field upgrade. Contact your point-of-purchase for information.

TrueType fonts can be linked to a TrueType base font to form an ordered list of fonts that are essentially processed as a single font. IPDS supports printing of linked fonts. The font linking function fulfills two primary requirements:

- Supports the ability to add user-defined characters to a given font. This requirement is particularly strong in Japanese, Simplified Chinese, and Traditional Chinese markets.
- Supports the ability to extend a font with additional characters. These are not user-defined characters, but characters that did not fit into a single font due to the 64K restriction for TrueType fonts. The most important example for this requirement is the extension of the base Chinese character set for GB18030 support.

For more information about installing and managing TrueType Fonts, consult Chapter 4 in "Using OpenType Fonts in an AFP System" (G544-5876). For detailed information, please consult the product documentation for the Font Installer for AFP Systems.

10.7 Object Container Support

Object container support is only available on selected products that support IPDS code release 3.01-01210 and higher. For some products this code may only be available as a field upgrade. Contact your point-of-purchase for information.

Support for object containers makes it possible to send various types of resource and presentation objects to the printer.

Support is currently provided for:

- TrueType fonts (see page 82)
- JFIF (jpeg) – presentation object
- IOCA tiles (used in IO images)

10.8 IO Images as Resources

Support for IO images as resources is only available on selected products that support IPDS code release 3.01-01210 and higher. For some products this code may only be available as a field upgrade. Contact your point-of-purchase for information.

Support is given for the use of IO images as resources that can be included in a page at a later time without having to include the IO image in an overlay.

10.9 Media Reporting by Object ID (OID)

Media names identified as media IDs are returned to the host for each printer paper source. This information is reported in Bytes 24-36 of the Execute Order Home State (XOH) Obtain Printer Characteristics (OPC) Printable Area Self Defining Field (SDF). The tables below define the values reported to the host.

The printer supports multiple input sources. A Printable Area SDF is returned for each input source in a single XOH-OPC Acknowledgement Reply. The printer only reports media names for media sizes supported by the printer input sources.

Below are tables showing common information returned in the replay and specific media IDs returned sorted by media names.

Additional information may be found in the Mixed Object Content Architecture Reference version 5 (SC31-6802-05).

Table 1: Common Information Returned in the Reply

Special Data Area	Value Returned	Description
Bytes 24-25	X'000C' X'000D'	Single Byte OID Double Byte OID
Byte 26	 X'10'	Input Media ID Type MODCA Input Media Type OID
Byte 27	X'06'	OID Encoding
Byte 28	X'08'	OID Length: Double OID Byte
Bytes 29-34	X'2B1200040301'	Input Media ID common bytes
Bytes 35-36	X'bbbb'	One or two bytes representing the specific Media ID. Values for specific media IDs (bb or bbbb) are found in the following table.

Table 2: Specific Media IDs Returned Sorted By Media Names

Media Name (Note 1)	Media Type	ID	Media type OID (Value for 'bb' or 'bbbb' in table above)	Note
BSNS ENV	North American business envelope (9 Envelope)	143	X'810F'	2
COM 10 ENV	Com 10 envelope (9.5 x 4.125 in.)	75	X'4B'	2
C5 ENV	C5 envelope (229 x 162 mm)	79	X'4F'	2
DL ENV	DL envelope (220 x 110 mm)	77	X'4D'	2
EXEC	North American executive (7.25 x 10.5 in.)	65	X'41'	
ISO A3	ISO A3 white (297 x 420 mm)	10	X'0A'	
ISO A3 CO	ISO A3 colored	11	X'0B'	3
ISO A4	ISO A4 white (210 x 297 mm)	0	X'00'	
ISO A4 CO	ISO A4 colored	1	X'01'	3
ISO A4 TR	ISO A4 transparent	2	X'02'	4
ISO A5	ISO A5 white (148.5 x 210 mm)	20	X'14'	
ISO A5 CO	ISO A5 colored	21	X'15'	3
ISO B5 ENV	ISO B5 envelope	73	X'49'	2

Media Name (Note 1)	Media Type	ID	Media type OID (Value for 'bb' or 'bbbb' in table above)	Note
JIS B4	JIS B4 (257 x 364 mm)	42	X'2A'	
JIS B5	JIS B5 (182 x 257 mm)	43	X'2B'	
LEDGER	North American ledger (11 x 17 in)	69	X'45'	
LEGAL	North American legal white (8.5 x 14 in.)	60	X'3C'	
LEGAL CO	North American legal colored	61	X'3D'	3
LEGAL 13	North American legal 13 (Folio) 8.5 x 13 in.)	63	X'3F'	
LETTER	North American letter white (8.5 x 11 in.)	50	X'32'	
LETTER CO	North American letter colored	51	X'33'	3
LETTER TR	North American letter transparent	52	X'34'	4
MON ENV	Monarch envelope (7.5 x 3.875 in)	76	X'4C'	2
STATEMNT	North American statement (5.5 x 8.5 in.)	69	X'45'	

Notes:

1) The paper size and paper type in the printer's **Paper Menu > Paper Size/Type** option must be set to match the media loaded in the tray. If these do not match the media loaded in the tray, incorrect media type information will be returned to the host.

2) Media type must be set to envelope in the printer's **Paper Menu > Paper Size/Type** option and the media size must be set to the correct envelope size in **Size** option.

3) Media type must be set to Colored Paper in the printer's **Paper Menu > Paper Size/Type** option. If the media type is not set to Colored Paper, the OID for the white media type will be returned.

4) Media type must be set to Transparency in the printer's **Paper Menu > Paper Size/Type** option. If the media type is not set to Transparency, the OID for the white media type will be returned.

When paper is loaded in the tray or feeder and a Paper Type of Card Stock, Labels, Bond, Letterhead, Preprinted, and Custom Type 1-6 is selected, a media ID is not returned to the host. When the **Paper Size** in the printer paper menu is set to an envelope size, the **Paper Type** is ignored and a media ID is returned for the envelope size selected in the **Paper Size** option.

11 Warranty

The limited warranty you received with your printer gives warranty terms and conditions. For warranty information, refer to your printer documentation.

Appendices

A. Technical Specifications

A.1 Product Description

The Card for IPDS and SCS/TNe is an option that is installed in the printer optional firmware card connector. With the Card and either the Standard Network port, a MarkNet internal LAN print server, or the Coax/Twinax Adapter for SCS, the printer becomes an IBM host workstation printer capable of printing AFP or IPDS documents from an AS/400, iSeries, System/390, or zSeries computer.

See the SCS/TNe Emulation User's Guide for SCS printing capabilities over a LAN network connection.

The IPDS emulation supports scalable fonts and higher print resolutions. The default print resolution is selected through an **Option Card Menu >IPDS MENU** setting.

The printer can be configured to take advantage of additional RAM memory. When attached to a LAN through an internal print server, it can save IPDS resources to improve performance for complex IPDS print jobs.

The IPDS emulation supports the IPDS data and resource towers. Fonts and other resources can be downloaded to the printer.

If your printer supports a duplex option, duplex printing is supported for all printer emulations dependent on host software. Up to five input sources are supported through Print Services Facility (PSF).

A.2 IPDS Features List

- Resource Towers (with corresponding Command Sets):
  - Page Segment
  - Overlay
  - Loaded Fonts
  - IO Images as resources
  - Object Containers (TrueType fonts, JPG (JFIF), IOCA tiles)

- Data Towers (with corresponding Command Sets)
  - Text
  - Graphics
  - Bar Codes
  - IM Image
  - IO Image
  - Object Containers (JPG (JFIF), IOCA tiles)

- IPDS Exception Reporting

A.3 For Direct Network Attachment

Hardware Compatibility

When the printer contains an optional Card for IPDS and SCS/TNe, it attaches to a network using the Standard Network port or a MarkNet internal print server.

Software Compatibility

The IBM host software requirements for AFP/IPDS printing are as follows:

- Print Services Facility (PSF)/MVS Version 2.2 or greater
- Application System (AS)/400 Operating System (OS)/400 V3R2, V3R1, V3R6, V3R7, V4R1-R5, V5R1-R4 or greater through PSF/400
- PSF/2 2.0 or greater
- PSF/6000 (for AIX) 2.1 or greater

Note: With AS/400 OS/400 V3R1 or OS/400 V3R6, to print IPDS over TCP/IP through PSF/400, PTF SF29249 - WRKAFP2 is required.

A.4 For Direct Twinaxial Attachment

Hardware Compatibility

When the printer contains the optional Card for IPDS and SCS/TNe and the Adapter for SCS with a twinaxial cable, the printer attaches to the following IBM hardware:

- iSeries
- AS/400e Servers and e-systems
- AS/400 Twinaxial Workstation Controllers
- 5494 Remote Control Unit
- 5394 Remote Control Unit

Note: There must be separate twinax addresses, one for the Adapter for SCS and another for the IPDS emulation.

Software Compatibility

The IBM host software requirements for AFP/IPDS printing are as follows:

- AS/400 PSF/400 V3R1, V3R2, V3R6, V3R7, V4R1-R5, V5R1-R4 or greater
- AS/400 OS/400 V3R1, V3R2, V3R6, V3R7, V4R1-R5, V5R1-R4, or greater
- AS/400 OS/400 V3R6 with System Support Program (SSP) Release 7.5*
- AS/400 SSP Release 7.1*

* IPDS Advanced Function PRPQ is required

A.5 For Direct Coaxial Attachment

Hardware Compatibility

When the printer contains the Card for IPDS and SCS/TNe and the Adapter for SCS with a coaxial cable, the printer attaches to the following IBM hardware:

- IBM 3174 Control Unit
- ES/9000 Work Station Subsystem Controller

Software Compatibility

The host software requirements for AFP/IPDS printing are as follows:

- PSF/MVS V2.2, V2.1.1, V2.1.0
- PSF/VSE V2.2.1, V2.2.0
- PSF/VM V2.1.1, V2.1.0 (with maintenance)
- VTAM Printer Support
- VPS software from Levi, Ray & Shoup (LRS)
- GDDM V2.3 with APARs
- SRSCS V3.2 or later

B. Font and Code Page Information

B.1 International Language Definitions

The IPDS emulation supports a variety of languages. Note that quite a few languages are supported by a number of different code pages.

B.1.1 Latin 1

Afrikaans	Belgian (French and Dutch)
Brazilian Portuguese	Canadian English
Canadian French	Catalan
Danish	Dutch
Finnish	French and Canadian French
German	Icelandic
Italian	Japanese English
Latin American Spanish	Norwegian
Portuguese	Spanish (Castilian)
Swedish	United Kingdom English
United States English	Swiss (German, French and Italian)

These languages are supported by Latin1 IPDS Core Interchange Font Set Code Pages; see the detailed lists in Appendix B.5.1 on page 98, Appendix B.5.2 on page 99, and Appendix B.5.3 on page 99. Note that many of these languages are also supported by the Compatibility Font Sets Code Pages (see Appendix B.3 on page 93).

B.1.2 Latin 2/ROECE, Latin 3, Latin 4, Latin 5

Latin 2/ROECE

Albanian	Croatian
Czech	East German
Hungarian	Polish
Romanian	Serbian
Slovak	Slovenian

Latin 3

Esperanto	Maltese
Turkish	

Latin 4

Baltic Multilingual	Estonian
Greenlandic	Lappish
Latvian	Lithuanian

Latin 5

Turkish	

For a detailed list of supported IPDS “Core Interchange” Font Set Code Pages, see Appendix B.5.4 Latin 2, 3, 4, 5, and 9 Code Pages on page 99.

B.1.3 Cyrillic and Greek

Cyrillic / Cyrillic Multilingual

Bulgarian	Byelorussian
Macedonian	Russian
Serbo-Croatian	Ukrainian

Greek

Greek	

For a detailed list of supported IPDS "Core Interchange" Font Set Code Pages, see Appendix B.5.6 Cyrillic and Greek Code Pages on page 100.

B.1.4 Arabic and Hebrew

For a detailed list of supported IPDS "Core Interchange" Font Set Code Pages, see

- Appendix B.5.7 Arabic Code Pages on page 101
- Appendix B.5.8 Hebrew Code Pages on page 101

B.1.5 Japanese (non-Latin)

Katakana is implemented in a Special Code Page supported only by 3812/3816 Compatibility Font Set used by the **3812/3816** emulation. See page 96.

B.2 About the Three Types of Supported Font Sets

Supported fonts may be selected by their Font Global Identifier (FGID) assigned value.

Compatibility Font Sets (Bitmap)

- The **4028 Compatibility Font Set** includes **300 dpi** fonts**.** This font set is used by the **Resident emulation.** For details, including the supported code pages, see Appendix B.3.1, starting on page 93.
- The **3812/3816 Compatibility Font Set** includes **240 dpi** fonts**.** This font set is used by the **3812/3816 emulation**. For details, including the support code pages, see Appendix B.3.2, starting on page 95.

Core Interchange Font Set (Scalable)

Both printer emulations support the Core Interchange Font Set. For details, see Appendix B.4, starting on page 97, and the associated code pages in Appendix B.5, starting on page 98.

Coordinated Font Set (Scalable)

Both printer emulations support the Coordinated Font Set. For details, see Appendix B.6, starting on page 102.

B.3 Compatibility Font Sets

B.3.1 4028 Compatibility Font Set - 300 dpi bitmap fonts (Resident Emulation)

The bitmap fonts included below are 300 dpi bitmap fonts used by the **Resident** emulation. For some of these fonts the IPDS emulation can use an equivalent scalable font. This is controlled by the **Font Type** option under **Option Card Menu > IPDS MENU > EMULATION**. When this option is set to **Use Scalable**, improved font quality will result, since the scalable fonts use the higher resolution of the printer. Most of these fonts support the Latin 1 languages.

Typeface	FGID	Width	Pitch/Point	Codepage support (CPGID or G-code)
OCR-B	3	144	10.0 *	893 (S), 877 (S)
Courier 10	11	144	10.0 *	G2, 259 (S)
Prestige Pica	12	144	10.0 *	G2, 259 (S)
Courier Italic 10	18	144	10.0 *	G2
OCR-A	19	144	10.0 *	892 (S), 876 (S)
Courier Bold 10	46	144	10.0 *	G2
APL 12	76	120	12.0	310 (S)
Courier 12	85	120	12.0 *	G2, 259 (S)
Prestige Elite	86	120	12.0 *	G2, 259 (S)
Courier Italic 12	92	120	12.0 *	G2
Prestige Elite Bold	111	120	12.0 *	G2
Prestige Elite Italic	112	120	12.0 *	G2
Boldface	159	120	PS	G2
Prestige PS	164	120	PS	G2
Gothic-text 13	203	108	13.3 %	G3
Prestige	221	96	15.0 *	G1
Courier 15	223	96	15.0 *	G1
Courier 17	254	84	17.1 *	G1
Prestige	256	84	17.1 *	G1
Letter Gothic 20	281	72	20.0 *	G1
Gothic-text 20	283	72	20.0 %	G3
Gothic-text 27	290	54	26.7 %	G3
Times™ Roman	5687	40	6 pt #	G3
Times Roman	5687	53	8 pt #	G3
Times Roman	5687	67	10 pt #	G3
Times Roman	5687	80	12 pt #	G3
Times Roman Bold	5707	67	10 pt #	G3
Times Roman Bold	5707	80	12 pt #	G3
Times Roman Bold	5707	93	14 pt #	G3
Times Roman Bold	5707	120	18 pt #	G3
Times Roman Bold	5707	160	24 pt #	G3
Times Roman Italic	5815	67	10 pt #	G3
Times Roman Italic	5815	80	12 pt #	G3
Times Roman Bold Italic	5835	67	10 pt #	G3
Times Roman Bold Italic	5835	80	12 pt #	G3

G-codes

G1 = All code pages listed under the Core Interchange Font Set "Latin 1 Country Extended Code Pages" are supported (see Appendix B.5.1 starting on page 98). In addition, the following Compatibility Font Set Code Pages are supported: ASCII 367; Austrian/German (Aus/Ger Alt 286), Canadian French (Can. French 276 (Alt), Denmark/Norway (Den/Nor Alt 287), Finland/Sweden (Fin/Swe Alt 288), Spain / Latin America (Spain Alt 289).

G2 = All code pages in group G1 plus code page (CPGID) 1002.

G3 = All code pages in group G2 plus code pages (CPGIDs) 437 and 850.

* = These fonts exist in both bitmapped and scalable (outline) versions dependent on the **Font Type** setting.

\# = For these fonts the scalable Times New Roman™ Typefaces in the appropriate sizes from the Core Interchange Font Set are always used.

% = These fonts only exist in scalable versions.

S = See descriptions under Special Code Pages below.

In addition to the above set of fonts, a number of other FGIDs are also recognized by the IPDS printer emulation. These are simulated by substitution with one of the above fonts or by bolding one of the above fonts. See Font Substitution on page 104.

If an FGID is not available, the font will be mapped to another font either at the host or in the printer using a font best-fit algorithm.

Special Code Pages

The following special code pages are supported when the **Resident** emulation is selected.

Codepage (CPGID)	GCSGID	Language / Function / Description
259	340	Symbols, Set 7
310	963	APL (Graphic Escape APL/TN)
876	968	OCR-A (ASCII)
877	969	OCR-B (ASCII)
892	968	OCR-A
893	969	OCR-B
1002	1132	DCF Rel. 2 Compatibility

B.3.2 3812/3816 Compatibility Font Set - 240 dpi bitmap fonts

When the **3812/3816** emulation is selected, these 240 dpi bitmap fonts replace the 300 dpi bitmap font set. For some of these fonts the IPDS emulation can use an equivalent scalable font. This is controlled by the **Font Type** option under **Option Card Menu > IPDS MENU > EMULATION**. When this option is set to **Use Scalable**, improved font quality will result, since the scalable fonts use the higher resolution of the printer. Most of these fonts support the Latin 1 languages.

Typeface	FGID	Width	Pitch/Point	Codepage support (CPGID)
OCR-B	3	144	10.0 *	893 (S)
Orator	5	144	10.0	**
Courier 10	11	144	10.0 *	**
Courier Italic 10	18	144	10.0 *	**
OCR-A	19	144	10.0 *	892 (S)
Gothic-text 10	40	144	10.0	**
Katakana-gothic 10	44	144	10.0	290 (S)
APL 10	45	144	10.0	293 (S)
Gothic-text 12	66	120	12.0	**
Gothic Italic 12	68	120	12.0	**
Script 12	84	120	12.0	**
Courier 12	85	120	12.0 *	**
Prestige 12	86	120	12.0 *	**
Letter-gothic 12	87	120	12.0 *	**
Prestige Italic 12	112	120	12.0	**
Boldface Italic	155	120	PS	**
Essay	160	120	PS	**
Essay Italic	162	120	PS	**
Essay Light	173	120	PS	**
Document	175	120	PS	**
Gothic-text 13	204	108	13.3	**
Gothic-text 15	230	96	15.0	**
Courier 5	244	288	5.0	**
Courier 17	252	84	17.1 *	**
Courier 17ss	254	84	17.1	**
APL 20	280	72	20.0	293 (S)
Gothic-text 20	281	72	20.0	**
Gothic-text 27	290	54	26.7	**
Sonoran serif	751/4407	54	8 pt *	**
Sonoran serif	1051/4407	66	10 pt *	**
Sonoran serif bold	1053/4427	66	10 pt *	**
Sonoran serif italic	1056/4535	66	10 pt *	**
Sonoran serif	1351/4407	78	12 pt *	**
Sonoran serif bold	1653/4427	108	16 pt *	**
Sonoran serif bold	2103/4427	162	24 pt *	**

* = These fonts exist in both bitmap and scalable (outline) versions. Use depends on the Font Type setting. For the Sonoran fonts the character escapement values may not match the host values when the scalable versions are selected.

** = Most of the 3812/3816 Compatibility Fonts support the Latin 1 set of code pages. This includes a number of code pages that support the Euro symbol; for details see especially Appendix B.5.1 starting on page 98. In addition, the following Compatibility Font Set Code Pages are supported: ASCII 367; Austrian/German (Aus/Ger Alt 286), Canadian French (Can. French 276 (Alt), Denmark/Norway (Den/Nor Alt 287), Finland/Sweden (Fin/Swe Alt 288), Spain / Latin America (Spain Alt 289).

S = See descriptions under Special Code Pages below.

In addition to the above set of fonts a number of other FGIDs are also recognized by the IPDS. These are simulated by substitution with one of the above fonts or by bolding one of the above fonts.

Special Code Pages

The following special code pages are supported when the **3812/3816** emulation is selected.

Codepage (CPGID)	GCSGID	Language / Function / Description
290	332	Katakana, Japan Katakana, Japanese
293	380	APL (USA)
892	968	OCR-A
893	969	OCR-B

B.4 IBM Core Interchange Scalable Font Set

The typefaces defined for the IBM Core Interchange Set font provide support for the following groups of languages and are supported in the printer: Latin 1 including DCF, Latin 2, Latin 3, Latin 4 (including Baltic), Latin 5, Cyrillic, Greek, and Symbols. Symbols are provided in medium and bold typefaces only.

Typeface	FGID
Courier Italic Bold	428
Courier Italic Medium	424
Courier Roman Bold	420
Courier Roman Medium	416
Helvetica™ Italic Bold	2307
Helvetica Italic Medium	2306
Helvetica Roman Bold	2305
Helvetica Roman Medium	2304
Times New Roman Bold	2309
Times New Roman Italic Bold	2311
Times New Roman Italic Medium	2310
Times New Roman Medium	2308

These fonts are supported through country or language extended code pages as defined in Appendix B.5, starting on page 98.

To access the IBM Core Interchange Set, the FGIDs above with a font width or point size value must be used. If an FGID is not available, the font is mapped to another font either at the host or in the printer using a font best-fit algorithm.

B.5 IBM Core Interchange Font Set Code Page Support

The code pages supported by the Core Interchange Font Set are listed below.

A selection of these code pages can be set as default from the front panel. See DEFAULT CODEPAGE, on page 24 in the **IPDS MENUS** section, for a list of those code pages that can be selected.

B.5.1 Latin 1 Country Extended Code Pages

Latin 1 Country Extended Code Pages – Languages and/or Countries	Codepage (CPGID)	GCSGID
Austrian / German, Germany, Austria, Aus/Ger	273	697
Austrian / German, German, Austria , Aus/Ger– with Euro	1141	695
Belgium, Belgian	274	697
Brazilian Portuguese, Brazil	275	697
Canadian French, Can. French, Canada	260	341
Danish / Norwegian, Den/Nor, Denmark, Norway	277	697
Danish / Norwegian, Den/Nor, Denmark, Norway – with Euro	1142	695
Finnish / Swedish, Fin/Swe, Finland, Sweden	278	697
Finnish / Swedish, Fin/Swe Finland, Sweden – with Euro	1143	695
French / Catalan, French/Cat, France	297	697
French / Catalan, French/Cat, France – with Euro	1147	695
Icelandic, Iceland	871	697
Icelandic, Iceland – with Euro	1149	695
International Set 5, Int. Set 5: Multinational, Multilingual, Belgian French, Dutch, Swiss French, Swiss German, Swiss Italian; Belgium, Switzerland / International	500	697
International Set 5 Int. Set 5: Multinational, Multilingual, Belgian French, Dutch, Swiss French, Swiss German, Swiss Italian; Belgium, Switzerland / International – with Euro	1148	695
Italian, Italy	280	697
Italian, Italy – with Euro	1144	695
Japanese (English), Japanese (Latin), Japan (Eng)	281	697
Portugal, Portuguese	282	697
Portugal, Portuguese (part of USA / Canada etc.)	037	697
Spain / Latin America, Spain/L. Am, Spanish, Castilian Spanish, Latin American Spanish	284	697
Spain / Latin America, Spain/L. Am, Spanish, Castilian Spanish, Latin American Spanish – with Euro	1145	695
USA / Canada, US English, Canadian English, Canadian French, Dutch, Brazilian, Portuguese, Portuguese; US, Canada, Netherlands, Portugal	037	697
USA / Canada, US English, Canadian English, Canadian French, Dutch, Brazilian Portuguese, Portuguese; US, Canada, Netherlands, Portugal – with Euro	1140	695
UK English	285	697
UK English – with Euro	1146	695

The Euro symbol is supported in all code pages so marked. On the list of selectable default code pages on the operator panel, the designation Eur is not included on code pages 1140-1159 and 1153-1158.

B.5.2 Latin 1 EBCDIC Publishing Code Pages

Latin 1 EBCDIC Publishing - Languages (and Countries)	Codepage (CPGID)	GCSGID
Belgian (Belgium)	383	1145
Brazilian Portuguese (Brazil)	384	1145
Canadian French (Canada (French))	385	1145
Castilian Spanish (Spain, Philippines)	392	1145
Danish / Norwegian (Denmark, Norway)	386	1145
Finnish / Swedish (Sweden, Finland)	387	1145
French / Catalan (France, Switzerland)	388	1145
German (Austria, Germany, Switzerland)	382	1145
Italian (Italy, Switzerland (Italian))	389	1145
Japanese (Latin), Japan (Eng)	390	1145
Latin American Spanish (Latin America (Spanish))	393	1145
Publishing – Multilingual Belgian, Dutch, Swiss; Multinational Belgian French, Belgian Dutch, Swiss French, Swiss German, Swiss Italian (International Set 5)	361	1145
Portuguese (Portugal)	391	1145
UK English (UK, Australia, Ireland, Hong Kong, New Zealand)	394	1145
US English, Canadian English (United States, Canada (English)	395	1145

B.5.3 Latin 1 ASCII Code Pages

Latin 1 ASCII – Languages and/or Countries	Codepage (CPGID)	GCSGID
Baltic Rim Windows – with Euro	1257	1421
Canadian French PC, Canada	863	993
Icelandic PC, Iceland	861	991
ISO/ANSI 8-bit Latin 1	819	697
Nordic PC, Norway, Sweden, Denmark	865	995
PC (standard)	437	919
PC IBM Desktop Publishing	1004	1146
PC Multinational, Multilingual	850	980
PC Multinational, Multilingual – with Euro	858	988
Portuguese PC	860	990

B.5.4 Latin 2, 3, 4, 5, and 9 Code Pages

Latin 2, 3, 4, 5, and 9 Code Pages – Languages and/or Countries	Codepage (CPGID)	GCSGID
Baltic, Baltic Multilingual	1112	1305
Baltic, Baltic Multilingual – with Euro	1156	1393
Baltic Multilingual PC (ASCII)	921	1346
Baltic Multilingual PC (ASCII) – with Euro	901	1394
Baltic Rim Windows (ASCII) – with Euro	1257	1421
Eastern Europe Multilingual PC (ASCII Latin 2) Croatian, Czech, East German, Hungarian, Polish, Romanian, Slovak, Slovenian	852	982
Eastern Europe Multilingual PC (ASCII Latin 2) Croatian, Czech, East German, Hungarian, polish, Romanian, Slovak, Slovenian – with Euro	852	1377
Estonian	1122	1307
Estonian ISO/ANSI – 8 bit ASCII	902	1392
Estonian PC (ASCII)	922	1347
Estonian with Euro	1157	1391
Latin 2 ISO/ANSI – 8 bit ASCII	912	959
Latin 2 Multilingual	870	959

Latin 2, 3, 4, 5, and 9 Code Pages – Languages and/or Countries	Codepage (CPGID)	GCSGID
Latin 2 Multilingual	1110	1111
Latin 2 Multilingual – with Euro	1153	1375
Latin 2 Windows (ASCII) – with Euro	1250	1410
Latin 3 Multilingual – incl. Turkish	905	1286
Latin 3 Multilingual PC (ASCII)	853	983
Latin 4	1069	1256
Latin 4 ISO/ANSI – 8 bit ASCII	914	1256
Latin 5 – incl. Turkish	1026	1152
Latin 5 ISO/ANSI – 8 bit ASCII – incl. Turkish	920	1152
Latin 5 PC (ASCII) – incl. Turkish	857	987
Latin 5 PC (ASCII) – incl. Turkish	857	1380
Latin 9 – with Euro	924	1353
Latin 9 (ASCII) – with Euro	923	1353
Turkish – with Euro	1155	1378
Turkish Windows (ASCII) – with Euro	1254	1414
Turkish: See also Latin 3 and Latin 5		

B.5.5 Latin EBCDIC DCF Code Pages

Latin DCF Code Pages	Codepage (CPGID)	GCSGID
DCF Release. 2 Compatibility	1002	1132
GML List symbols	1039	1258
Text with numeric spacing	1068	1269
US Text Subset	1003	1133

B.5.6 Cyrillic and Greek Code Pages

Cyrillic and Greek Code Pages - Languages and/or Countries	Codepage (CPGID)	GCSGID
Cyrillic #2 PC (ASCII)	866	996
Cyrillic ISO 8-bit ASCII	915	1150
Cyrillic multilingual	880	960
Cyrillic multilingual (primary)	1025	1150
Cyrillic multilingual – with Euro	1154	1381
Cyrillic Russian PC (ASCII) - with Euro	808	1385
Cyrillic PC (ASCII)	855	985
Cyrillic PC (ASCII)– with Euro	872	1383
GML List symbols	1039	1258
Greek (Greece 183)	423	218
Greek (Primary)	875	1371
Greek (Primary)– with Euro (Greek Eur)	875	925
Greek ISO 8-bit ASCII	813	925
Greek ISO 8-bit ASCII – with Euro	813	1371
Greek PC (ASCII)	851	981
Greek PC (ASCII)	869	998
Greek PC (ASCII) – with Euro	869	1373
Greek Windows (ASCII) – with Euro	1253	1413

B.5.7 Arabic Code Pages

Arabic Code Pages	Codepage (CPGID)	GCSGID
Arabic, Arabic Bilingual	420	235
Arabic, Arabic Bilingual – with Euro (Arabic Eur)	420	1461
Arabic ISO/ASCII 8-bit	1008	1162
Arabic ISO/ASCII 8-bit – with Euro	1008	1464
Arabic Extended ISO/ASCII 8-bit – with Euro	1046	1465
Arabic PC (ASCII)	864	994
Arabic PC (ASCII) – with Euro	864	1463
GML List symbols	1039	1258

Note: Arabic code pages/fonts are only supported in an optional font package. The IPDS printer emulation accesses these fonts from a user flash memory installed in the flash memory connector.

B.5.8 Hebrew Code Pages

Hebrew (Israeli) Code Pages	Codepage (CPGID)	GCSGID
GML List symbols	1039	1258
Hebrew	424	941
Hebrew – with Euro (Hebrew Eur)	424	1356
Hebrew ISO/ASCII 8-bit	916	941
Hebrew PC (ASCII)	856	986
Hebrew PC (ASCII) – with Euro	856	1358
Hebrew PC (ASCII)	862	992
Hebrew Publishing	1028	1199
Hebrew Set A	803	1147

Note: Hebrew code pages/fonts are only supported in an optional font package. The IPDS printer emulation accesses these fonts from a user flash memory installed in the flash memory connector.

B.5.9 Symbol Code Pages

Languages (Symbol Setsl	Codepage (CPGID)	GCSGID
GML List symbols	1039	1258
Symbols, Adobe	1087	1257
Symbols, Adobe (ASCII)	1038	1257
Symbols, Set 7	259	340
Symbols, Set 7 (ASCII)	899	340
Symbols, Set 7 Modified	1091	1191
Symbols, Set 7 Modified PC (ASCII)	1092	1191

B.6 IBM Coordinated Font Set

The IBM Coordinated Font Set is supported in only in the following Code Page sets: Latin 1 Country Extended Code Pages, Latin 1 EBCDIC Publishing Code Pages, Latin 1 ASCII, and Latin EBCDIC DCF code pages. See Appendix B.4 IBM Core Interchange Scalable Font Set, on page 97 for a complete listing of fonts.

Typefaces in Outlines (Latin 1)	FGID	GCSGID
Gothic Text (simulated)	304	2039
Letter Gothic	400	2039
Letter Gothic Bold	404	2039
Letter Gothic Italic (Additional)	408	2039
Prestige	432	2039
Prestige Bold	318	2039
Prestige Italic	319	2039

These fonts are scalable. To access the fonts above, you must set the **Font Type** under **Option Card Menu > IPDS MENU > EMULATION** to **Use Scalable** and specify the FGID and the width or point size in the IPDS job.

Boldface and APL fonts are only supported using bitmaps from the Compatibility Font Sets.

If an FGID is not available, the font will be mapped to another font either at the host or in the printer using a font best-fit algorithm.

B.6.1 OCR Scalable Font Set

These fonts are scalable. To access the fonts below, you must set the **Font Type** under **Option Card Menu > IPDS MENU > EMULATION** to **Use Scalable** and specify the FGID and the width or point size in the IPDS job.

Typefaces in Outlines	Encoding	FGID	Code Page (CPGID)	GCSGID
OCR-A	EBCDIC	305	892	968
OCR-A	ASCII	305	876	968
OCR-B	ABCDI	306	893	969
OCR-B	ASCII	306	877	969

B.7 POSTNET Font Support

The IPDS Emulation supports generation of the POSTNET bar code in the IPDS Bar Code tower. In addition, the following FGID may be used to generate a POSTNET bar code.

Typeface	FGID
POSTNET	4094

Code pages that can be used with FGID 4094 include the following.

Codepage (CPGID)	GCSGID	Function / Descriptions
1301	1451	ZIP +4 POSTNET bar code
1302	1452	Facing Identification Marks
1303	1453	Business Reply Bar

In addition the POSTNET font can also be used to replace numeric characters on other code pages.

B.8 Font Substitution

If a font is not available, a different font is substituted using a best-fit algorithm. This substitution is based on the FGID and the font width.

If any of the font IDs in the following tables are used in a document, they are mapped to the substituted font id given.

B.8.1 Resident Emulation Font Substitution

The following substitution IDs are used if the **Font Type** option is set to **Use Scalable**. The **Font Type** is located under **Option Card Menu > IPDS MENU > EMULATION.**

Typestyle	Original FGID	Substituted FGID/Font Width	
Gothic Text 12 Bold	69	85 b	120 fw
Gothic Text 13	204	203	108 fw
Light Gothic 12	91	112	120 fw
Math Symbol 12	80	86	120 fw
Roman Text	41	12	144 fw
Serif Text 10 Italic	43	18	144 fw
Serif Text 12 Bold	72	85 b	120 fw
Serif Text 12 Italic	71	92	120 fw
Sonoran-Serif 8 pt	751 or 4407 54 fw	5687	53 fw
Sonoran-Serif 10 pt	1051 or 4407 66 fw	5687	67 fw
Sonoran-Serif 12 pt	1351 or 4407 78 fw	5687	80 fw
Sonoran-Serif.Bold 10 pt	1053 or 4427 66 fw	5707	67 fw
Sonoran-Serif.Bold 16 pt	1653 or 4427 108 fw	5707	108 fw
Sonoran-Serif.Bold 18 pt	1803 or 4427 120 fw	5707	120 fw
Sonoran-Serif.Bold 24 pt	2103 or 4427 162 fw	5707	60 fw
Sonoran-Serif.Italic 10 pt	1056 or 4535 66 fw	5815	67 fw
Times Roman 6 pt	760	5687	40 fw
Times Roman Bold 12 pt	761	5707	80 fw
Times Roman Bold 14 pt	762	5707	93 fw
Times Roman Bold Italic 10 pt	764	5835	67 fw
Times Roman Bold Italic 12 pt	765	5835	80 fw
Times Roman Italic 12 pt	763	5815	80 fw

b = Bold

The following table applies only if the **Font Type** option is set to **Use Bitmaps**.

Typestyle	Original FGID	Substituted FGID/Font Width	
Courier 12 Bold	108	85 b	120 fw
Courier 17.1 Bold	253	254 b	84 fw
Letter Gothic 12	87	85	120 fw
Letter Gothic 12 Bold	110	85 b	120 fw
Prestige Pica Bold	60	12 b	144 fw

b = Bold

B.8.2 3812/3816 Emulation Font substitution

The following substitution IDs are used if the **Font Type** option is set to **Use Scalable**.

Typestyle	Original FGID	Substituted FGID/Font Width	
Matrix Gothic 10	26	40	144 fw
Roman Text	41	40	144 fw
Serif Text 10	42	40	144 fw
Serif Text 10 Italic	43	68	144 fw
Serif Text 12	70	66	120 fw
Serif Text 12 Italic	71	68	120 fw
Serif Text 12 Bold	72	69	120 fw
Math Symbol 12	80	86	120 fw
Light Gothic 12	91	112	120 fw
Elite 12	107	85	120 fw
Bold PS	176	159	120 fw
Bold Italic PS	177	155	120 fw
Math Symbol 15	225	86	120 fw

The following table applies only if the **Font Type** option is set to **Use Bitmaps**.

Typestyle	Original FGID	Substituted FGID/Font Width	
Prestige Pica Bold	60	12 b	144 fw
Courier 12 Bold	108	85 b	120 fw
Letter Gothic 12 Bold	110	87 b	120 fw
Courier 17.1 Bold	253	252 b	84 fw

b = Bold

C. Bar Code Support: Linear (1-D) Bar Codes

See Appendix D page 113 for information on 2-D bar code support.

Abbreviations used within the tables:

AIM USS	Automatic Identification Manufacturers Uniform Symbol Specification
BCD1	Entries marked with BCD1 are a part of the BCD1 Subset of the full capabilities of the BCOCA architecture, which specifies the minimum support required of all BCOCA receivers.
BSA data	Bar Code Symbol Data
EAN	European Article Numbering
HRI	Human Readable Interpretation
JAN	Japanese Article Numbering
MSI	MSI Data Corporation
POSTNET	POSTal Numeric Encoding Technique (United States Postal Service)
RM4SCC	Royal Mail 4 State Customer Code – also used for a Dutch modification
UPC	Universal Product Code (United States)
UPC/CGPC	Universal Product Code (United States) and the Canadian Grocery Product Code

Additional information may be found in the ”Bar Code Object Content Architecture (BCOCA) Reference” (publication S544-3766-06).

Column Labels:
Type = Value for Bar Code Type
(Bar Code Symbol Descriptor Byte 12; Bar Code Data Descriptor Byte 16)
Mod = Modifier Value
(Bar Code Symbol Descriptor Byte 13; Bar code Data Descriptor Byte 17)

Type	Bar Code Type	Mod	Description
X’01’	Code 3 of 9, AIM USS-39, (BCD1)		The Standard Code 3 of 9 character set and Extended Code 3 of 9 character set are supported. Also known as Code 39.
		X’01’	Print the bar code without a printer generated check digit.
		X’02’	Generate check digit and print it with the bar code.
X’02’	MSI (modified Plessey code (BCD1)	X’01’	Print the bar code with no printer generated check digits.
		X’02’	Print the bar code with a generated IBM modulo-10 check digit, which will be the second check digit (at end of data). The first check digit is the last byte of the BSA data.
		--------	----------
			All of the following variants print the bar code with two check digits.
		X’03’	Both check digits are generated using the IBM modulo-10 algorithm.
		X’04’	The first check digit is generated using the NCR modulo-11

Type	Bar Code Type	Mod	Description
			algorithm, the second using the IBM modulo-10 algorithm. The first check digit equals the remainder; error (exception condition EC-0E00) exists if the first check-digit calculation results in a value of 10.
		X'05'	The first check digit is generated using the IBM-modulo-11 algorithm, the second using the IBM modulo-10 algorithm. The first check digit equals the remainder. Exception condition EC-0E00 exists if the first check-digit calculation results in a value of 10.
		X'06'	The first check digit is generated using the NCR-modulo-11 algorithm, the second using the IBM modulo-10 algorithm. The first check digit equals 11 minus the remainder. A first check digit value of 10 is assigned the value zero.
		X'07'	The first check digit is generated using the IBM-modulo-11 algorithm, the second using the IBM modulo-10 algorithm. The first check digit equals 11 minus the remainder. A first check digit value of 10 is assigned the value zero.
		X'08'	The first check digit is generated using the NCR-modulo-11 algorithm, the second using the IBM modulo-10 algorithm. The first check digit equals 11 minus the remainder. Exception condition EC-0E00 exists if the first check-digit calculation results in a value of 10.
		X'09'	The first check digit is generated using the IBM-modulo-11 algorithm, the second using the IBM modulo-10 algorithm. The first check digit equals 11 minus the remainder. Exception condition EC-0E00 exists if the first check-digit calculation results in a value of 10.
X'03'	UPC/CGPC Version A (BCD1)	X'00'	Print the standard UPC-A bar code with a generated check digit. The data to be encoded consists of eleven digits. The first digit is the number-system digit; the next 10 digits are the article number.
X'05'	UPC/CGPC Version E (BCD1)	X'00'	Print a UPC-E bar code symbol. Of the 10 input digits, six digits are encoded. The check digit is generated using all 10 input data digits. The check digit is not encoded; it is used only to assign odd or even parity to the six encoded digits.
X'06'	UPC 2-Character (Two-digit) Supplemental (Periodicals) (BCD1)	X'00'	Print a UPC two-digit supplemental bar code symbol (bar/space pattern and HRI). This option assumes that the base UPC Version A or E symbol is presented as a separate bar code object. The bar and space patterns used for the two supplemental digits are left-odd or left-even parity, with the parity determined by the digit combination.
		X'01'	The two-digit UPC supplemental bar code symbol is

Type	Bar Code Type	Mod	Description
			preceded by a UPC Version A, Number System 0, bar code symbol. The bar code object contains both the UPC Version A symbol and the two-digit supplemental symbol. The input data consists of the number system digit, the ten-digit article number, and the two supplement digits, in that order. A check digit is generated for the UPC Version A symbol. The two-digit supplemental bar code is presented after the UPC Version A symbol using left-hand odd and even parity as determined by the two supplemental digits.
		X'02'	The two-digit UPC supplemental bar code symbol is preceded by a UPC Version E symbol. The bar code object contains both the UPC Version E symbol and the two-digit supplemental symbol. The input data consists of the ten-digit article number and the two supplemental digits. The bar code object processor generates the six-digit UPC Version E symbol and a check digit. The check digit is used to determine the parity pattern of the six-digit Version E symbol. The two-digit supplemental bar code symbol is presented after the Version E symbol using left-hand odd and even parity as determined by the two digits.
X'07'	UPC 5-Character (Five-digit) Supplemental (Paperbacks) (BCD1)	X'00'	Print the UPC five-digit supplemental bar code symbol (bar/space pattern and HRI). This option assumes that the base UPC Version A or E symbol is presented as a separate bar code object. A check digit is generated from the five supplemental digits and is used to assign the left-odd and left-even parity of the five-digit supplemental bar code. The supplemental check digit is not encoded or interpreted.
		X'01'	The five-digit UPC supplemental bar code symbol is preceded by a UPC Version A, Number System 0, bar code symbol. The bar code object contains both the UPC Version A symbol and the five-digit supplemental symbol. The input data consists of the number system digit, the ten-digit article number, and the five supplement digits, in that order. A check digit is generated for the UPC Version A symbol. A second check digit is generated from the five supplement digits. It is used to assign the left-hand odd and even parity of the five-digit supplemental bar code symbol. The supplement check digit is not encoded or interpreted.
		X'02'	The five-digit UPC supplemental bar code symbol is preceded by a UPC Version E symbol. The bar code object contains both the UPC Version E symbol and the five-digit supplemental symbol. The input data consists of the ten-digit article number and the five-digit supplemental data. The bar code object processor generates the six-digit UPC Version E symbol and check digit. The check digit is used to determine the parity pattern of the Version E symbol. The five-digit supplemental bar code symbol is presented after the Version E symbol. A second

Type	Bar Code Type	Mod	Description
			check digit is calculated for the five-digit supplemental data and is used to assign the left-hand odd and even parity. The supplement check digit is not encoded or interpreted.
X'08'	EAN-8 (includes JAN Short) (BCD1)	X'00'	Print an EAN-8 bar code symbol. The input variable data is 7 digits (2 flag and 5 article ID digits). All seven digits are encoded along with a generated check digit.
X'09'	EAN-13 (includes JAN Standard)(BCD1)	X'00'	Print an EAN-13 bar code symbol. The input variable data is 12 digits (2 flag and 10 article ID digits).
X'0A'	Industrial 2 of 5	X'01'	Print the bar code without a printer generated check digit.
		X'02'	Generate check digit and print it with the bar code.
X'0B'	Matrix 2 of 5	X'01'	Print the bar code without a printer generated check digit.
		X'02'	Generate check digit and print it with the bar code.
X'0C'	Interleaved 2 of 5, AIM USS-I 2/5 (BCD1)		The Interleaved 2 of 5 symbology requires an even number of digits. The printer will add a leading zero if necessary to meet this requirement.
		X'01'	Print the bar code without a printer generated check digit.
		X'02'	Generate check digit and print it with the bar code.
X'0D'	Codabar, 2 of 7 AIM USS-Codabar		The input data consists of a start character, digits to be encoded, and a stop character.
		X'01'	Print the bar code without a printer generated check digit.
		X'02'	Generate check digit and print it with the bar code.
X'11'	Code 128, AIM USS-128	X'01'	Print a Code 128 bar code using subset A, B, or C as appropriate to produce the shortest possible bar code from the given data. The Code 128 page (CPGID = 1303, GCSGID = 1454) is used to interpret the bar code symbol data.
		X'02'	Generate check digit and print with bar code using original (1986) start-character algorithm.
		X'03'	Generate UCC/EAN 128-compatible bar code (no parenthesis – see next modifier). This modifier is functionally identical to modifier X'02'. Generate a check digit and print with bar code.
		X'04'	Generate a UCC/EAN 128-compatible bar code, as in modifier X'03', but use parenthesis in the HRI to distinguish each application identifier. The printer inserts the parentheses in the

Type	Bar Code Type	Mod	Description
			printed HRI when modifier X'04' is specified; these parentheses are not part of the input data.
X'16'	EAN 2 Digit Add-on (Supple-mental) (BCD1)	X'00'	Print the EAN 2-digit supplemental bar code add-on (bar/space pattern and HRI).This option assumes that the base EAN-13 symbol is presented as a separate bar code object. The value of the two digit supplemental data determines their bar and space patterns chosen from number sets A and B.
		X'01'	The two-digit supplemental bar code symbol is preceded by a normal EAN-13 bar code symbol. The bar code object contains both the EAN-13 symbol and the two-digit supplemental symbol. The two-digit supplemental bar code is presented after the EAN-13 symbol using left hand odd and even parity as determined by the two supplemental digits chosen from number sets A and B.
X'17'	EAN 5 Digit Add-on (Supple-mental) (BCD1)	X'00'	Print the EAN 5-digit supplemental bar code (bar/space pattern and HRI). This option assumes that the base EAN-13 symbol is presented as a separate bar code object. A check digit is calcu-lated from the five supplemental digits. The check digit is also used to assign the bar and space patterns from number sets A and B for the five supplemental digits. The check digit is not encoded or interpreted.
		X'01'	The five-digit supplemental bar code symbol is preceded by a normal EAN-13 bar code symbol. The bar code object contains both the EAN-13 symbol and the five-digit supplemental symbol. A check digit is generated from the five-digit supplemental data. The check digit is used to assign the bar and space patterns from number sets A and B. The check digit is not encoded or interpreted.
X'18'	POSTNET		USPS Specification For all POSTNET modifiers that follow, the BSA HRI flag field and the BSD module width, element height, height multiplier, and wide-to-narrow ratio fields are not applicable to the POSTNET bar code symbology. These fields are ignored because the POSTNET symbology defines specific values for these parameters.
		X'00'	Print a POSTNET ZIP Code bar code symbol.
		X'01'	Print a POSTNET ZIP+4 (delivery point) bar code symbol.
		X'02'	Print a POSTNET Advance Bar Code (ABC) bar code symbol.
		X'03'	Print a POSTNET variable-length bar code symbol. The bar code symbol is generated without length checking; the symbol is

Type	Bar Code Type	Mod	Description
			not guaranteed to be scannable or interpretable. The bar code consists of a leading frame bar, the encoded data, a correction digit, and a trailing frame bar.
		X'04'	PLANET Bar Code. Print a POSTNET PLANET bar code symbol. This is a "reverse topology" of POSTNET; tall bars are swapped with short bars.
X'1A'	RM4SCC (Royal Mail 4-State Customer Code)		A 4-state customer code defined by the Royal Mail Postal service of England for use in bar coding postal code information. This symbology is also called the Royal Mail bar code or the 4-State customer code. The symbology (as defined for modifier X'00') is used in the United Kingdom and in Singapore.
		'X'00'	Print an RM4SCC bar code symbol with a printer generated start bit (start bar), checksum character, and a stop bit (stop bar). The start and stop bars identify not only the beginning and end of the bar code symbol, but also the orientation of the symbol. Input data is of variable length. The checksum algorithm is performed on the data characters only. The user is responsible for 2 mm quiet zone (all around) and proper sequencing of the Postal Code data (including International Prefix, Outward Code, Inward Code and Delivery Point Suffix).
X'1A'	RM4SCC (Dutch KIX Postal Bar Code)		This is a variation used in the Netherlands. KIX = KlantenIndeX = customer index.
		X'01'	Print a RM4SCC bar code symbol with NO start bar, NO checksum digit and NO stop bar. The checksum algorithm is performed on the data characters only. The user is responsible for 2 mm quiet zone (all around) and proper sequencing of the Postal Code data (including International Prefix, Outward Code, Inward Code and Delivery Point Suffix).
X'1B'	Japan Postal Bar Code		A bar code symbology defined by the Japanese Postal Service for use in bar coding postal code information.
		X'00'	Print a Japan Postal Bar Code symbol with a start character, checksum character and stop character. The generated bar code symbol will consist of a start code, a 7-digit new postal code, a 13-digit address indication number, a check digit, and a stop code.
		X'01'	Print a Japan Postal Bar Code symbol directly from the bar code data. Each valid character in the BSA data field is converted into

Type	Bar Code Type	Mod	Description
			a bar/space pattern with no validity or length checking. The printer will not generate start, stop, and check digits.
X'1F'	Australia Post Bar Code		A bar code symbology defined by Australia Post for use in Australian post systems. Start, stop, filler bar, and check digits are generated by the printer. Using any characters other than those prescribed for any part of the bar code will result in a NACK.
		X'01'	Standard Customer Barcode (format code = 11). An 8-digit number representing the Sorting Code.
		- - - - -	- -
			Modifiers X'02' to and including X'07' are built up in two parts: the Sorting Code and Customer Information. The Customer Information follows the Sorting Code. The Sorting Code is always 8 digits (valid characters are 0-9).
		X'02'	Customer Barcode 2 using the N encoding table (format code = 59). Customer Information is represented by up to 8 digits (0-9).
		X'03'	Customer Barcode 2 using the C encoding table (format code = 59). Customer Information is represented by up to 5 characters (A-Z, a-z, 0-9, space, #).
		X'04'	Customer Barcode 2 using proprietary encoding (format code = 59). Customer Information is represented by up to 16 digits (numeric 0-3), each of which specifies one of the four types of bar.
		X'05'	Customer Barcode 3 using the N encoding table (format code = 62). Customer Information is represented by up to 15 digits (0-9).
		X'06'	Customer Barcode 3 using the C encoding table (format code = 62). Customer Information is represented by up to 10 characters (A-Z, a-z, 0-9, space, #).
		X'07'	Customer Barcode 3 using proprietary encoding (format code = 62). Customer Information is represented by up to 31 digits (numeric 0-3), each of which specifies one of the four types of bar. -
		X'08'	Reply Paid Barcode (format code = 45). 8-digits (0-9) number representing the Sorting Code.
X'21'	Code 93		The Standard Code 93 character set and Extended Code 93 character set are supported.
		X'00'	Generate check digit and print it with the bar code.

D. Bar Code Support: 2-D Bar Codes

Two-dimensional (2-D) bar codes (sometimes called matrix symbologies) allow large amounts of data to be encoded in a small area. The information is represented in a two-dimensional matrix. The printer supports four 2-D bar code symbologies as shown in the table below.

Column Labels:

Type = Value for Bar Code Type
(Bar Code Symbol Descriptor Byte 12; Bar Code Data Descriptor Byte 16)
Mod = Modifier Value
(Bar Code Symbol Descriptor Byte 13; Bar code Data Descriptor Byte 17)

Type	Bar Code Type	Mod	Description
1C	Data Matrix	00	Print a Data Matrix bar code symbol using error checking and correcting algorithm 200 as defined in the AIM International Symbology Specification – Data Matrix.
1D	MaxiCode	00	Print a MaxiCode bar code symbol as defined in the AIM International Symbology Specification – MaxiCode.
1E	PDF417		PDF417 bar code as defined in the AIM International Symbology Specification – PDF417.
		00	Print a full PDF417 bar code symbol.
		01	Print a truncated PDF417 bar code symbol. The right row indicator is not printed and the stop pattern is printed in a single module width bar. For use in a relatively clean environment where risk of damage to the bar code is minimal.
20	QR Code	02	Print a Model 2 QR Bar Code symbol as defined in AIM International Symbology Specification – QR Code.

The printer supports several additional parameters defined for printing bar codes in the IPDS data stream. These parameters are described in the following sections. Additional information on these parameters may be found in the ”Bar Code Object Content Architecture (BCOCA) Reference” (publication S544-3766-05).

D.1 Data Matrix Special Function Parameter Support

These values are found in the Bar Code Symbol Data. A description of the supported values may be found in the ”Bar Code Object Content Architecture (BCOCA) Reference” (publication S544-3766-05).

Offset	Name	Supported Values
Byte 5 Bit 0	EBCDIC	B’0’, B’1’
Byte 5 Bit 1	Escape Sequence Handling	B’0’, B’1’
Bytes 6-7	Desired Row Size	X’0000’, See table below for supported row sizes.
Bytes 8-9	Desired Number of Rows	X’0000’, See table below for supported number of rows.
Byte 10	Sequence Indicator	X’00’ – X’10’
Byte 11	Total Symbols	X’00’, X’02’ – X’10’
Byte 12	File ID First Byte	X’01’ – X’FE’
Byte 13	File ID Second Byte	X’01’ – X’FE’
Byte 14 Bit 0	UCC/EAN FNC1	B’0’, B’1’
Byte 14 Bit 1	Industry FNC1	B’0’, B’1’
Byte 14 Bit 2	Reader Programming	B’0’, B’1’
Byte 14 Bit 3	HDR/TRL Macro	B’00’, B’01’, B’10’, B’11’

Supported Sizes for a Data Matrix Symbol							
Square Symbols				**Rectangular Symbols**			
Symbol Size		**Data Region**		**Symbol Size**		**Data Region**	
Number of Rows	Row size	Size	Number	Number of Rows	Row size	Size	Number
10	10	8x8	1	8	18	6x16	1
12	12	10x10	1	8	32	6x14	2
14	14	12x12	1	12	26	10x24	1
16	16	14X14	1	12	36	10x16	2
18	18	16x16	1	16	36	14x16	2
20	20	18x18	1	16	48	14x22	2
22	22	20x20	1				
24	24	22x22	1				
26	26	24x24	1				
32	32	14x14	4				
36	36	16x16	4				
40	40	18x18	4				
44	44	20x20	4				
48	48	22x22	4				
52	52	24x24	4				
64	64	14x14	16				
72	72	16x16	16				
80	80	18x18	16				
88	88	20x20	16				
96	96	22x22	16				
104	104	24x24	16				
120	120	18x18	36				
132	132	20x20	36				
144	144	22x22	36				

D.2 MaxiCode Special Function Parameter Support

These values are found in the Bar Code Symbol Data. A description of the supported values may be found in the ”Bar Code Object Content Architecture (BCOCA) Reference” (publication S544-3766-05).

Offset	Name	Supported Values
Byte 5 Bit 0	EBCDIC	B’0’, B’1’
Byte 5 Bit 1	Escape Sequence Handling	B’0’, B’1’
Byte 6	Symbol Mode	X’02’ – X’05’
Byte 7	Sequence Indicator	X’00’ – X’08’
Byte 8	Total Symbols	X’00’, X’02’ – X’08’
Byte 9 Bit 0	Zipper	B’0’, B’1’

D.3 PDF417 Special Function Parameter Support

These values are found in the Bar Code Symbol Data. A description of the supported values may be found in the ”Bar Code Object Content Architecture (BCOCA) Reference” (publication S544-3766-05).

Offset	Name	Supported Values
Byte 5 Bit 0	EBCDIC	B’0’, B’1’
Byte 5 Bit 1	Escape Sequence Handling	B’0’, B’1’
Byte 6	Data Symbols	X’01’ – X’1E’
Byte 7	Rows	X’03’ – X’5A’, X’FF’
Byte 8	Security	X’00’ – X’08’
Byte 9 – 10	Macro Length	X’0000’ – X’7FED’
Byte 11	Macro Data	Values as defined in BCOCA Reference Version 4.

D.4 QR Code (Quick Response Code)

These values are found in the Bar Code Symbol Data. A description of the supported values may be found in the ”Bar Code Object Content Architecture (BCOCA) Reference” (publication S544-3766-05).

Offset	Name	Supported Values
Byte 5 Bit 0	EBCDIC	B’0’, B’1’
Byte 5 Bit 1	Escape Sequence Handling	B’0’, B’1’
Byte 6	EBCDIC code page	X’00’ – X’03’
Byte 7	Version	X’00, X’01 – X’28’
Byte 8	Error correction level	X’00’ – X’03’
Byte 9	Sequence indicator	X’00’ – X’10’
Byte 10	Total symbols	X’00’ or X’02’ – X’10’
Byte 11	Parity Data	X’00’ – X’FF’
Byte 12 Bit 0	UCC/EAN FNC1	B’0’, B’1’ see below
Byte 12 Bit 1	Industry FNC1	B’0’, B’1’ see below
Byte 13	Application indicator	Dependent on Byte 12 (special-function flags). See below

Byte 12 Bit 0 and 1, special-function flags

The special-function flags in Byte 12 specify special functions that can be used with a QR Code symbol. Bits 0 and 1 are alternate data type identifiers. Exception condition EC-0F11 exists if an incompatible combination of the two bits in Byte 12 is specified.

Byte 12 Bit 0 UCC/EAN FNC1:

If this flag is B'1', this QR Code symbol will indicate that it conforms to the UCC/EAN application identifiers standard. Byte 12 Bit 1 must be B'0'.

Byte 12 Bit 1 Industry FNC1

If this flag is B'1', this QR Code symbol will indicate that it conforms to the specific industry or application specifications previously agreed with AIM International. An application indicator must be specified in Byte 13. Byte 12 Bit 0 must be B'0'.

Byte 13, Application indicator for Industry FNC1

When the Industry FNC1 flag (Byte 12, Bit 1) is B'1', this parameter specifies an application indicator.

When the Industry FNC1 flag is B'0', this parameter is ignored and should be set to X'00'. Exception condition EC-0F12 exists if an invalid application-indicator value is specified.

E. Printing DBCS Characters

Several languages, such as Chinese, Korean, and Japanese, have fonts so large that it takes two bytes of information to represent each character. These fonts are referred to as Double Byte Character Set (DBCS) fonts. Depending on the language, the number of characters in the font can range from around 6,000 up to approximately 22,000 characters. Information on DBCS fonts can be found in the following technical references.

Technical Reference for AFP Font Collection Japanese Fonts	S544-5685-02
Technical Reference for AFP Font Collection Korean Fonts	S544-5686-00
Technical Reference for AFP Font Collection Simplified Chinese Fonts	S544-5687-00
Technical Reference for AFP Font Collection Traditional Chinese Fonts	S544-5688-01
Infoprint Fonts Japanese Font Library Technical Reference	S544-5849-01
Infoprint Fonts Japanese Font Library Technical Reference	S544-5850-00
Infoprint Fonts Simplified Chinese Font Library Technical Reference	S544-5851-00
Infoprint Fonts Traditional Chinese Font Library Technical Reference	S544-5852-00

DBCS resident fonts are not included in the Card for IPDS and SCS/TNe. DBCS fonts required to print a job must be downloaded with the job from the host. DBCS fonts that are marked eligible for capture on the host can be captured to disk or flash in the printer. Once captured, the fonts are treated as resident fonts and do not need to be downloaded with each job. This reduces network traffic and saves printing time when this font is requested for use in printing of future jobs. Capturing the fonts to disk is recommended. Due to the large size of the fonts, only a few fonts can be saved on user flash before the flash becomes full. See section 3.10.1 on page 49 for information on how to capture fonts.

Print the **Menu Settings** page (in the printer's **Reports** menu) to see how much memory is installed in the printer. If the memory installed is equal to or greater than the required minimum (shown below), select the following settings to enable DBCS characters to print:

1. IPDS Emulation – Select the **Resident** emulation. The **3812/3816** emulation does not support DBCS printing.
2. Host Resolution – Select Auto or the resolution that matches the raster fonts stored on the host. If you need to use 300 dpi and 240 dpi raster font resources in the same job, select Auto.

DBCS fonts require a large amount of printer memory for storage and printing during an IPDS session. Depending on the language, one font can require up to 15 MB of printer memory for temporary storage while printing a job. Because of the additional memory requirements to store and print DBCS fonts, additional memory is required in the printer. When an IPDS session is started between the host and printer, the printer reports resident resources and IPDS functions supported. The printer reports that it is capable of printing DBCS fonts when the printer contains a minimum of 128 MB memory. Attempts to print DBCS characters to a printer with less than the required memory will usually result in a message on the host indicating the printer does not support DBCS fonts.

F. Memory Requirements and Recommendations

Additional memory above the minimum recommended may be required for printing DBCS characters, TrueType fonts, complex mono or color IPDS jobs or if printer memory is used to save other emulation resources or hold other emulation jobs for later printing. A minimum of 128 MB of memory is required to activate DBCS printing.

TrueType fonts are downloaded to a different part of printer memory than other resources. Because TrueType fonts can be very large, the space allocated to them is a maximum of 50% of the total printer memory. Attempts to download additional fonts will result in a memory exception. True Type Font support is only available on selected products that support IPDS code release 3.01-01210 and higher. For some products this code may only be available as a field upgrade. Contact your point-of-purchase for information.

In the tables below, you will see that some values apply when ”saving of IPDS resources” is activated. Activation requires that the host timeout and printer **IPDS Timeout** values are properly set.
See IPDS Timeout on page 29 for further information.

Lexmark C770 and C772 recommended memory:

4800 Color Quality	Simplex/Duplex	256 MB
4800 Color Quality	Simplex and saving IPDS resources	384 MB
4800 Color Quality	Duplex and saving IPDS resources	384 MB
4800 Color Quality	DBCS Character Printing	512 MB
1200 dpi	Simplex/Duplex	384 MB
1200 dpi	Simplex and saving IPDS resources	512 MB
1200 dpi	Duplex and saving IPDS resources	512 MB
1200 dpi	DBCS Character Printing	512 MB

Lexmark C780 and C782 recommended memory:

4800 Color Quality	Simplex/Duplex	256 MB
4800 Color Quality	Simplex and saving IPDS resources	384 MB
4800 Color Quality	Duplex and saving IPDS resources	384 MB
4800 Color Quality	DBCS Character Printing	512 MB
1200 dpi	Simplex/Duplex	384 MB
1200 dpi	Simplex and saving IPDS resources	512 MB
1200 dpi	Duplex and saving IPDS resources	512 MB
1200 dpi	DBCS Character Printing	512 MB

Lexmark C920 recommended memory:

1200 dpi	Simplex/Duplex	256 MB
1200 dpi	Simplex and saving IPDS resources	384 MB
1200 dpi	Duplex and saving IPDS resources	384 MB
1200 dpi	DBCS Character Printing	384 MB

Lexmark C935 recommended memory:

2400 Image Q	Simplex/Duplex	512 MB
2400 Image Q	Simplex and saving IPDS resources	640 MB
2400 Image Q	Duplex and saving IPDS resources	640 MB
2400 Image Q	DBCS Character Printing	768 MB

Lexmark T640, T642, and T644 recommended memory:

600 dpi/1200 Image Q	Simplex/Duplex	64 MB
600 dpi/1200 Image Q	Simplex and saving IPDS resources	192 MB
600 dpi/1200 Image Q	Duplex and saving IPDS resources	192 MB
600 dpi/1200 Image Q	DBCS Character Printing	256 MB (128 MB required)
1200 dpi/2400 Image Q	Simplex/Duplex	128 MB
1200 dpi/2400 Image Q	Simplex and saving IPDS resources	192 MB
1200 dpi/2400 Image Q	Duplex and saving IPDS resources	192 MB
1200 dpi/2400 Image Q	DBCS Character Printing	256 MB (128 MB required)

Lexmark W840 recommended memory:

600 dpi	Simplex/Duplex	256 MB
600 dpi	Simplex and saving IPDS resources	384 MB
600 dpi	Duplex and saving IPDS resources	512 MB
600 dpi	DBCS character printing	384 MB
1200 dpi/2400 Image Q	Simplex/Duplex	384 MB
1200 dpi/2400 Image Q	Simplex and saving IPDS resources	512 MB
1200 dpi/2400 Image Q	Duplex and saving IPDS resources	512 MB
1200 dpi/2400 Image Q	DBCS character printing	512 MB

Lexmark X644e MFP and X646e MFP recommended memory:

600 dpi/1200 Image Q	Simplex/Duplex	128 MB
600 dpi/1200 Image Q	Simplex and saving IPDS resources	256 MB
600 dpi/1200 Image Q	Duplex and saving IPDS resources	256 MB
600 dpi/1200 Image Q	DBCS Character Printing	256 MB
1200 dpi/2400 Image Q	Simplex/Duplex	256 MB
1200 dpi/2400 Image Q	Simplex and saving IPDS resources	384 MB
1200 dpi/2400 Image Q	Duplex and saving IPDS resources	384 MB
1200 dpi/2400 Image Q	DBCS Character Printing	384 MB

Lexmark X646ef MFP recommended memory:

600 dpi/1200 Image Q	Simplex/Duplex	256 MB
600 dpi/1200 Image Q	Simplex and saving IPDS resources	384 MB
600 dpi/1200 Image Q	Duplex and saving IPDS resources	384 MB
600 dpi/1200 Image Q	DBCS Character Printing	512 MB
1200 dpi/2400 Image Q	Simplex/Duplex	384 MB
1200 dpi/2400 Image Q	Simplex and saving IPDS resources	512 MB
1200 dpi/2400 Image Q	Duplex and saving IPDS resources	512 MB
1200 dpi/2400 Image Q	DBCS Character Printing	640 MB

Lexmark X782e MFP recommended memory:

The Lexmark X782e MFP requires 768 MB of memory to support the copy and fax features. This is also the maximum amount of memory supported by this printer. Some IPDS jobs that print on other printers may not print in the memory provided. These jobs may have to be modified to print successfully.

Lexmark X850e MFP, X852e MFP, and X854e MFP recommended memory:

600 dpi	Simplex/Duplex	256 MB
600 dpi	Simplex and saving IPDS resources	384 MB
600 dpi	Duplex and saving IPDS resources	384 MB
600 dpi	DBCS character printing	384 MB
1200 dpi/2400 Image Q	Simplex/Duplex	384 MB
1200 dpi/2400 Image Q	Simplex and saving IPDS resources	512 MB
1200 dpi/2400 Image Q	Duplex and saving IPDS resources	512 MB
1200 dpi/2400 Image Q	DBCS Character Printing	512 MB

Lexmark X940e MFP and X945e MFP recommended memory:

2400 Image Q	Simplex/Duplex	512 MB
2400 Image Q	Simplex and saving IPDS resources	640 MB
2400 Image Q	Duplex and saving IPDS resources	640 MB
2400 Image Q	DBCS Character Printing	768 MB

G. Related Publications

Note: Ideally, you should always consult the latest edition of the publication. When a version number is shown, this indicates that earlier versions are not usable.

Print Services Facility/MVS: Update Guide G544-3984
Version 2, Release 2, Modification 0

Print Services Facility/MVS: System Programming Guide S544-3672
Version 2, Release 2, Modification 0

PSF V3R1 for OS/390: Customization S544-5622

PSF V3R1 for OS/390: Licensed Program Specifications G544-5626

PSF V3R1 for OS/390: Messages and Codes G544-5627

PSF V3R1 for OS/390: User's Guide S544-5630

IBM AIX PSF/6000: Print Administration Version 1.2.0 S544-3817

IBM AIX PSF/6000: Print Service Facilities for AIX Users G544-3814
Version 1.2.0

IBM AS/400 Printing V SG24-2160

IBM AS/400 Printing VI SG24-6250

PSF/2: Getting Started G544-3767

Intelligent Printer Data Stream Reference S544-3417

Image Object Content Architecture Reference (IOCA) SC31-6805-05

iSeries Printer Device Programming Version 5 SC41-5713-04

Bar Code Object Content Architecture (BCOCA) Reference S544-3766-05

Using OpenType Fonts in an AFP System G544-5876

H. Glossary

Abend	Verb which means to end a process abnormally.
AFP	Advanced Function Presentation or Printing.
AIX	IBM's implementation of the UNIX operating system. The RISC System/6000, among others, runs the AIX operating system.
BCOCA	Bar Code Object Content Architecture
BOOTP	BOOTstrap Protocol. A TCP/IP protocol that enables a workstation on a network to find its IP address.
Form Definition	Form definitions define, among other things, the aspects about how data is placed on the physical page, from which bin the paper is to be fed, the number of sides of the sheet to be printed (simplex/duplex), and the print direction and rotation of the data.
Gateway	The connecting device between the LAN and other equipment from minicomputers to main frames.
Host	The main computer on a network allowing the use of data files and programs to all workstations.
IP Address	A 32-bit address defined by the Internet Protocol RFC 791 usually represented in dotted decimal notation, e.g. 157.184.67.102.
IPDS	Intelligent Printer Data Stream.
MTU	Maximum Transmission Unit The largest possible unit of data that can be sent on a given physical medium in a single frame on a LAN.
Netmask	See Subnet mask.
OPC	IPDS command Obtain Printer Characteristics
PPR/PPD	Page Printer Requester/Page Printer Daemon. A non-standard bi-directional TCP/IP protocol allowing IPDS data to be transmitted over a TCP/IP network.

RFC	Request for Comments The document series that describes a part of the Internet suite of protocols and related experiments. All Internet standards are documented as RFCs.
SDF	Self Defining Field
Server	A network device that allows sharing of resources such as programs, storage and printers between multiple LAN workstations.
Subnet Mask	For Internet sub-networking, a 32-bit mask used to identify the sub-network address bits in the host portion of an IP address.
TCP/IP	Transmission Control Protocol/Internet Protocol.
XOA	IPDS command Execute Order Any State
XOH	IPDS command Execute Order Home State

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