

Xerox MRP Family
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP
Coax Command Reference

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Installation caution

Your Xerox 4220/MRP And 4230/MRP printers are not customer installable. Only a Xerox service representative should install the equipment.

Safety



CAUTION: This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the installation requirements, may cause interference to radio communications.

U.S.A.

Your printer has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. In such cases, the user at his or her own expense is required to correct the interference.

Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian department of communications.

Ce present appareil numerique n'emet pas de bruits radioelectriques dépassant les limites applicables aux appareils de Classe A prescrites dans le reglement sur le brouillage radioelectrique edicte par le ministre des communications du Canada.

Europe: 50 Hz, 220 - 240 V equipment

This equipment has been tested and certified in conformance with European commission directive 82/499/ECC and VDE 0871/0875, Class A, relating to radio frequency interference.



CAUTION: In order to allow this equipment to operate in proximity to Industrial, Scientific and Medical (ISM) equipment, the external radiation from ISM equipment may have to be limited or special mitigation measures taken.

Laser safety

Your printer complies with appropriate safety standards.

Specifically regarding lasers, the equipment complies with laser product performance standards set by governmental, international, and national agencies as a Class 1 laser product. It does not emit hazardous light; the beam is totally enclosed during all phases of customer operation and maintenance.



WARNING: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

VAROITUS: LAITTEEN KÄYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTÖHJEESSA MAINITULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1. YLITTÄVÄLLE LASERSÄTEILYLLE

WARNING: OM APPARATEN ANVÄNDS PÅ ANNAT SÄTT ÄN I DENNA BRUKSANSVISNING SPECIFICERADE, KAN ANVÄNDAREN UTSÄTTAS FÖR O SYNLIG LASERSTRÄLNING, SOM ÖVERSKRIDER GRÄNSEN FÖR LASERKLASS 1.

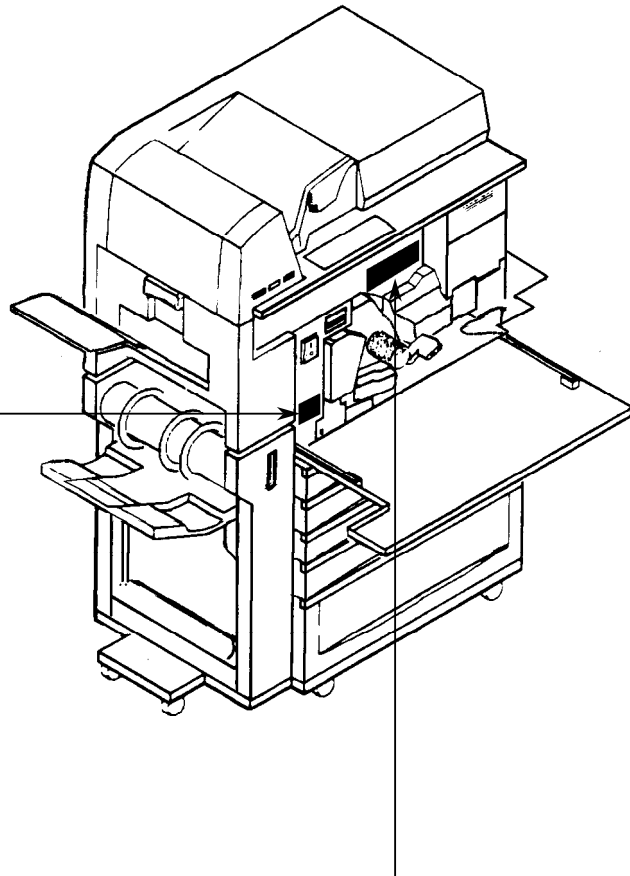
Warning labels

There are several user accessible Laser Safety Warning labels located on the printer. These are as shown on the next two pages.

DANGER-invisible laser radiation when open and interlock defeated for service.

AVOID DIRECT EXPOSURE TO BEAM.

Instructions for safe service are in **SERVICE MANUAL**.



DANGER

**INVISIBLE LASER RADIATION WHEN 'ROS COVER2' OPEN, AND WHEN 'ROS COVER1' OR 'ROS COVERS' OPEN.
AVOID DIRECT EXPOSURE TO BEAM.**

50hz.
Configuration

XEROX	XEROX CORPORATION
PRODUCT IDENTIFIER	1H7
VOLTS	220/240V
AMPERES	6.5A
HERTZ	50Hz
CLASSIFIED BY UNDERWRITERS LABORATORIES INC. IN ACCORDANCE WITH I. E. C. PUBLICATION 950. 82 499 EEC	
CLASS 1 LASER PRODUCT LASER KLASSE 1	

60hz.
Configuration

XEROX	XEROX CORPORATION EL SEGUNDO, CALIFORNIA 90245 MANUFACTURED IN JAPAN	CAUTION
PRODUCT IDENTIFICATION	1H5	*OPERATION OF ELECTRICAL EQUIPMENT WITHOUT PROPER ELECTRICAL SERVICE MAY BE DANGEROUS TO OPERATING PERSONNEL. IF THIS EQUIPMENT IS MOVED TO ANOTHER LOCATION, OPERATED FROM ANOTHER ELECTRICAL SOURCE, OR IF ALTERATIONS ARE PERFORMED ON THE PREMISES WHICH COULD AFFECT THE ELECTRICAL SERVICE AND/OR GROUND IN THE BUILDING, CONTACT A LICENSED ELECTRICIAN TO CHECK FOR PROPER ELECTRICAL SERVICE. COMPLIES WITH THE LIMITS FOR A CLASS A COMPUTING DEVICE PURSUANT TO SUBPART J OF PART 15 OF FCC RULES. This Digital Apparatus does not exceed the Class A Limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications. Cet appareil numérique est conforme aux limites d'émission de bruits radioélectriques pour les appareils de Classe A stipulées dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.
VOLTS	115V	
AMPERES	12A	
HERTZ	60Hz	
CERTIFIED ONLY TO CANADIAN ELECTRICAL CODES CERTIFIÉ UNiquement DU CODE CANADIEN DE L'ÉLECTRICITÉ SEULEMENT		
THIS PRODUCT COMPLIES WITH REGULATIONS, 21 CFR CHAPTER 1 SUB CHAPTER J SECTION 100, 1040 AT DATE OF MANUFACTURE MONTH OF MANUFACTURE FEBRUARY 1994 4B09		

These laser warning labels are placed on panels that cover areas that are not operator serviceable. These panels are not to be removed.

Operational safety

Your Xerox equipment and supplies are designed and tested to meet strict safety requirements. These requirements include safety agency examination, approval, and compliance with established environmental standards.

Follow these notes to ensure safe operation of your equipment.

Do this

Always connect equipment to a properly grounded power source receptacle. If in doubt, have the receptacle checked by a qualified electrician.



WARNING: Improper connection of the equipment grounding conductor can result in electrical shock.

Always place equipment on a floor with adequate strength for the weight of the machine.

Always have your Xerox service representative move or relocate the equipment.

Always use materials and supplies specifically designed for your Xerox equipment.



WARNING: Use of unsuitable materials may result in poor performance and can possibly create a hazardous condition.

Always use a Xerox specified cordset with the Equipment Leakage Circuit Interrupter/Residual Current Device (ELCI/RCD).

Do not do this

Never use an extension cord with the ELCI/RCD.

Never use the ELCI/RCD where water may enter the casing.

Never attempt any maintenance function that is not specifically described in your Xerox MRP family documentations.

Never remove any covers or guards that are fastened with screws unless otherwise instructed. There are no operator-serviceable areas within these covers.

Never override or "cheat" electrical or mechanical devices.

Never operate the equipment if you notice unusual noises or odors. Disconnect the power cord from the power source receptacle and call Xerox service to correct the problem.

U.S. only: If you need any additional safety information concerning the equipment or if you need Xerox supplied materials, call the following toll-free number: **1-800-828-6571**.

Approvals and certification

60 Hz, 115 V

Listed by Underwriters Laboratories (UL), UL1950. Meets CSA standards, C22.2 NO 950.

50 Hz, 220 - 240 V

UL classified to IEC 950



The CE marking applied to this product symbolises Rank Xerox Declaration of Conformity with the following applicable Directives of the European Union as of the dates indicated:

January 1, 1995: Council Directive 73/23/EEC amended by Council Directive 93/68/EEC, approximation of the laws of the member states related to low voltage equipment.

January 1, 1995: Council Directive 89/336/EEC, approximation of the laws of the member states related to electromagnetic compatibility.

A full declaration, defining the relevant Directives and referenced standards can be obtained from your Rank Xerox representative.

Safety feature

Your printer is equipped with an Equipment Leakage Circuit Interrupter/Residual Current Device (ELCI/RCD). This safety device protects you if an electric outlet supplying power to the printer is improperly wired.

U.S. configuration of ELCI/RCD

- 1 Window**
- 2 Reset button.**

International configuration of ELCI/RCD

- 1 Window**
- 2 Reset button.**

If power to the printer is interrupted, follow these steps:

1. Locate the safety device, using the U.S. or International Configuration (refer to the appropriate illustration).
2. Check to see if a red flag displays in the window of the safety device.
3. If the red flag does not display, press and release the black Reset button.

The red flag displays and power is restored to the system.

If power is not restored by this procedure or if the device interrupts power to the machine again, call your Xerox service representative.

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Glossary

GLOSSARY-1

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The *Xerox MRP Family Coax Command Reference*, intended as a learning tool and as a reference guide, provides the user, host system programmer, and the System Administrator with a comprehensive reference to printing on the Xerox MRP Family coax printers.

About this manual

The procedures presented in this manual assume that you have a basic knowledge and understanding of IBM computer systems, especially the IBM 3270 Information Display System in the coax environment.

Become familiar with the contents and conventions in this "Introduction" chapter before using this manual.

Conventions

This manual uses conventions in text and procedures to help you recognize different types of information.

Text conventions

This manual uses the following text conventions throughout.



CAUTION: Cautions are associated with equipment safety.



WARNING: Warnings are associated with the safety of people.

N

Notes are hints that help you perform a task or understand the text.

italics

Items are italicized for the following reasons:

- Document and library names (for example, the *Xerox MRP Family Printer Language Reference for PCL 5 and PostScript*)

	<ul style="list-style-type: none">• Variable information (for example, <i>password</i>)• For emphasis.
X	Represents hexadecimal (HEX) code. For example: X'05' or X'25'
MB	Megabyte.
KB	Kilobyte.
GSM	Grams per one square meter of paper.
type	When instructed to type information, do not press the Enter key.
enter	"Enter" is used to describe a two-step process of keying in data and pressing the Enter key (for example, enter print the README file requires typing the data, printing the README file, and pressing the Enter key).
bold	Bold text is used for characters you enter (for example, enter \psfax\install\la), and for command syntax.
asterisk (*)	Default menu options are followed by an asterisk.
<UPPERCASE>	Uppercase in angle brackets is used for keys that do not have icons (for example, press <ESC>).
menus, modes, options, and commands	These have downstyle capitalization (for example, Configuration menu, Duplex mode, Symbol Set option, and Set Attribute command).
index notations	The use of lowercase letters f, i, and t in the index section denote figure, illustration, and table, respectively (for example, 6-1f, 7-2i, 2-2t).
screen representations	Illustrations and screen representations contained within this manual may differ slightly from what actually appears on your screen.

Procedure conventions

This guide uses the following conventions within printer control panel procedures.

A function key, when referred to in the main text of this manual, is identified by its name followed by the icon representing the key.

Clear/**C**
Last Page/**L**
Main Menu/**M**
Off-Line/**O**
Pause/**P**
Reset/**R**
Scroll Next/**2**
Scroll Previous/**1**
Test Mode/**T**

A function key, specified in a numbered step-by-step example, is identified by the icon in the left margin and the associated key name in the text of the numbered step. For example:

- R** 1. Press the **Reset** key.

222 Indicates that this key must be pressed three times.

Window messages Reference to messages displayed at the control panel appear in text like this:

PLEASE WAIT...
FINISHING CURRENT JOB

Procedure conventions—personal computer (PC)

Keyboard key A keyboard key name is boldface with downstyle capitalization. For example: Press the **Tab** key.

Key+key A plus sign used between two key names indicates that these keys must be pressed at the same time. For example: Press the **Alt+A** means that you should press and hold down the **Alt** key while you press the **A** key.

FILENAMES Names of files are displayed in uppercase italics.

Type When instructed to type information, do not press the **Enter** key.

Enter When instructed to enter information, type the information and press the **Enter** key.

1. Overview and printer setup

This chapter describes the operation of the Xerox MRP Family printers internal interfaces in a coax environment.

Refer to the "Overview" chapter in your *Xerox MRP Printer Operator Guide* for detailed descriptions of the features, operating environment, hardware and software requirements of your MRP Family printer.

Emulated printers

Your Xerox printer coax interface provides compatibility with several IBM printers. Its internal coax connectivity provides superior performance and support for the vast majority of data processing and office automation applications running on IBM mid-range systems.

Your Xerox coax printer emulates existing IBM printers with no changes to your present applications or procedures. The internal coax connectivity allows you to enable the data streams of the Data Stream Compatibility (DSC), Systems Network Architecture (SNA) Character String (SCS), or Intelligent Printer Data Stream (IPDS) while still processing Printer Control Language (PCL) 5 or PostScript Level 2 concurrently through serial or parallel ports.

Table 1-1. Xerox printer coax emulations

Printer (Model)	Type	Speed	CPI	LPI	Character sets
3287 (1,2)	Dot-matrix	80/120 cps (models1/2)	10	3, 4, 6, 8	Various
3268 (2, 2C)	Dot-matrix	Up to 340 cps	10, 16.7	3, 4, 6, 8	Various
3262 (3, 13)	Band printer	Up to 650 lpm	10	3, 4, 6, 8	Depends on band mounted: 48—128 characters
3812/3816 (1, 2) Model 2-IPDS	Laser (240 dpi)	Up to 12/24 ppm	10, 12, 15, 17	3, 4, 6, 8	User selectable with 61 standard fonts
4028 (NS1)	Laser (300 dpi)	Up to 10 ppm	n/a	n/a	Various fixed pitch and typographic with 32 resident
4214 (1)	Dot-matrix	Up to 200 cps	5, 10, 12, 15, 16.7	3, 4, 6, 8	Various
4245 (D12, D20)	Band printer	1,200/2,000 lpm (D12/D20)	10	3, 4, 6, 8	Depends on band mounted: 48—142 characters
6262 (D12, D14, D22)	Band printer	1,200/1,400/ 2200 lpm (D12/D14/ D22)	10	3, 4, 6, 8	Depends on band mounted: 48—192 characters

The following functions are not supported by your Xerox MRP Family coax printers:

- Compression or compaction
- Color
- Full IBM A Programming Language (APL) character sets
- Function management headers (supported with IPDS)
- Katakana character set
- Graphical Data Display Manager (GDDM) (supported with IPDS).

Features and compatibilities

Your Xerox coax printers support the following features and compatibility, and have these capabilities:

- Control of coax setup using a set of Host Utilities. These utilities provide a high-level user interface to the set of Function Selection via Line (FSL) commands that properly customize the coax interfaces.
- Enables HP PCL 5 and PostScript Level 2 over all interfaces.
- Complete set of 3816 compatible fonts are provided with the printer on a 9-track tape.
- Emulates the IBM coax printers shown in Table 1-1.
- U.S. or European settings using dipswitches
- Backwards compatibility with Xerox 3270 HS interface
- Automatic input sharing between coax and all other printer interface ports
- Concurrent support of Systems Network Architecture (SNA) Character String (SCS), Data Stream Compatibility (DSC), 3270 data streams (LU1), Intelligent Printer Data Stream (IPDS), PCL 5, and PostScript Level 2
- Support for downloading new interface firmware.
- Hexadecimal (HEX) dump, ASCII HEX dump, and HEX dump Printer Communication Interface Area (PCIA) dump to aid in the debugging of coax interface problems.

The Xerox coax interface is designed to upgrade with an Intelligent Printer Data Stream (IPDS) module. The support for IPDS is done by plugging an IPDS-module on top of the interface.

MRP Family user interface interaction with coax interface

The MRP Family coax interface communicates to the printer controller in PCL. The following information clarifies printer setup and user interface changes.

Printer setup

Default "Input Tray" and "Output Destination" settings from the UI have no effect on the coax interface. For all jobs from the coax interface, PCL commands are sent specifying a paper tray, paper size, and output destination.

At installation, the default tray is #1 (PCL source 1), paper size is letter or A4 depending on the ST1 jumper setting on the interface card, and the output destination is PCL destination 1, which defaults to the top tray. You may change the default paper tray and destination by using an FSL Y11 command. Details on this command for the coax environment are included in this document. The other interfaces of the machine are unaffected. Any embedded language commands override the user interface settings.

If coax jobs are printed from Tray 5, set the "Tray 5 Size Setup" option to a size supported by the Xerox MRP Family PCL emulation only. This also applies to the manual settings of the other paper trays. The 11 standard size paper stocks and envelopes are documented in the "Print language setup menu" section of the System Administrator Guide.

Refer to the *Xerox MRP Family System Administrator Guide* for a description of the parameters in the printer setup.

Print Language Setup - HP LaserJet Emulation Mode

The "Font" selection does not determine the default font for coax printing. The interface cards send PCL font characteristics that best match the IBM fonts and select an internal PCL font or 3816 emulation font accordingly. The default font is changed using specific FSL commands described in this manual.

For the duplex capability and setup functions, refer to the *Xerox MRP Family System Administrator Guide*. If banner sheets are enabled, job data may print on the back of the banner sheets or vice versa.

There are three methods to change the input paper tray. Refer to the "Function Selection via Line (FSL) commands" chapter. The "Input Tray to Command Assignment" selection maps the PCL paper source command numbers (not tray numbers) to other trays. This allows you to map most of the PCL source commands sent by the interface cards to select a paper tray that is different than the default. An example is to change the default paper feed from Tray 1 to the high-capacity feeder Tray 4. However, you can no longer access input Tray 1 for jobs from coax interface or in PCL. In addition, the printer PCL5 driver does not appear to function correctly when you try to use it.

The preferred method is to utilize the Configuration and Resource Utilities for selecting a default tray.

Printing 132 characters by 66 lines landscape with Xerox 3816 font (FONT0204)

1. Download the Xerox 3816 font named "FONT0204".
2. Create a configuration description for a 132 character MPP and a 66 line MPL. Refer to Chapter 3 for more information on setting MPP and MPL.
3. Create a user-defined FSL file/member that contains one of the following:

For 8.5" x 11" paper use:

```
&&??@ @Y96,204@  
&&??@ @Y62, 104, 1B, 28, 32, 30, 32, 30, 34, 58, 1B, 26, 6C, 31, 6F, 35, 2E, 34 35, 43@  
&&??<space>
```

For A4 paper use:

```
&&??@ @Y96,204@  
&&??@ @Y62, 104, 1B, 28, 32, 30, 32, 30, 34, 58, 1B, 26, 6C, 31, 6F, 35, 2E, 33, 30, 43@  
&&??<space>
```

This FSL sequence defines the PCL code that selects FONT0204 as the default landscape font and set the vertical motion index to a value that will allow for 66 lines on the page.

There is no need to put any FSL into the user data stream.

Configuring the Coax interface card

Figure 1-1 illustrates the top view, and figure 1-2 illustrates the side view of the coax interface card. You should never attempt to remove the interface card from the printer motherboard. Your service representative configures the coax interface card to your specifications at installation. This illustration and subsequent jumper setting descriptions are provided only for your information.

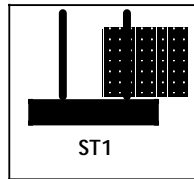
Figure 1-1. **Coax interface card (top view)**

- ST1 sets the default paper size
- ST2 sets the default print language

Figure 1-2. **Coax interface card (side view)**

- 1 Test button
- 2 CU LED (if light is not on, printer is not connected)
- 3 Parallel share port (reserved for Xerox use)
- 4 Coax connector

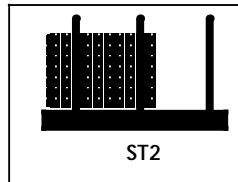
Page size



The default page size is set with a 2-pin jumper (**ST1**). The jumper is turned OFF by placing the jumper shunt over only 1 pin, as shown in the illustration at left. The jumper is turned ON by covering both pins. Turning the jumper OFF sets the page size default to U. S. (8.5x11). Turning the jumper ON sets the page size default to European A4 (8.27x11.69).

This figure shows the location of the page size jumper on the coax interface card. **DO NOT** move the jumper shunt. The jumper should be changed only by your service representative.

Print language



The default print language is determined by the placement of a shunt over a 3-pin jumper (**ST2**). The illustration at left shows the jumper configuration. The printer will work properly only with the jumper in the standard configuration. The shunt should always be placed over the two pins closest to the edge of the interface card. **DO NOT** move the jumper shunt. The jumper should be changed only by your service representative. This figure shows the location of the print language jumper on the coax interface card

Printer address and emulation

Coaxial default settings for the printer emulation can only be set through the FSL Function. Refer to Chapter 3 for instructions and a complete list of coax printers the interface can emulate.

Checking the interface configuration

You can check the configuration of your interface by using one of the following methods:

- Printing the Interface Configuration Report from the Utilities Menu of the User Interface. (Refer to that section in the "Utilities menu" chapter of the *Xerox MRP Family System Administration Guide*.)
- Using the Function Selection via Line (FSL) command T4—Printout Settings (in non-IPDS only)
- Pressing the test button on the interface card (refer to Figure 1-2).

Refer to the "T2—Online Hex Dump" and "T4—Printout Settings" sections in the "Function Selection via Line (FSL) commands" chapter for information on how to use these FSL function commands.

For a description of the procedures for printing the coax Interface Configuration Report from the control panel through the Utilities menu, refer to "Interface Configuration Report"

section of the "Utilities menu" chapter of the *Xerox MRP Family System Administration Guide* (refer to Figure 1-3 example).

Figure 1-3. **Sample of a Coax Interface Configuration Report**

FSL cross reference for the coax configuration page

The default settings on the coax configuration page are printed using references to the FSL (Function Select via Line) command numbers. A list of the items that are printed on the configuration page is shown in table 1-2. Next to each item is an abbreviated configuration command name in parentheses.

Table 1-2. Command numbers and names

Func # 1 set to 4	(IBM buffer size)	Func # 32 set to 0	(Non-SCS valid FF)
Func # 2 set to 6	(Lines per inch)	Func # 33 set to 0	(Non-SCS A.F, at end of job)
Func # 3 set to 10	(Characters per inch)	Func # 34 set to 1	(Last LF as FF)
Func # 5 set to 62	(Max page length)	Func # 36 set to 0	(Suppress IBM ctrl code)
Func # 6 set to 132	(Max print line)	Func # 37 set to 1	(Printer Emulation)
Func # 7 set to 1	(Set case)	Func # 38 set to 1	(Communication feature)
Func # 8 set to 0	(Set LU1 language)	Func # 44 set to 1	(Suppress CR & SP)
Func # 10 set to 0	(Set page format)	Func # 46 set to 12	(Set IRQ timer)
Func # 11 set to 2	(Default paper path)	Func # 47 set to 1	(ESC mode selection)
Func # 12 set to 3	(Default paper size)	Func # 49 set to 0	(Restrict access)
Func # 13 set to 1	(Set wrap/Cut option)	Func # 50 set to 0	(FF after timeout)
Func # 14 set to 1	(Enable graphic option)	Func # 73 set to 0	(Select translate table)
Func # 19 set to 0	(Set simplex/duplex)	Func # 78 set to 1	(Select APL translate table)
Func # 25 set to 0	(FF before local copy)	Func # 79 set to 0	(not used)
Func # 26 set to 1	(FF after local copy)	Func # 89 set to 0	(Enable page offset)
Func # 27 set to 0	(Non-SCS print image)	Func # 98 set to 1	(Enable APO)
Func # 28 set to 0	(Non-SCS CR at MPP+1)	Func # 110 set to 1	(not used)
Func # 29 set to 0	(Non-SCS NL at MPP+1)	Func # 111 set to 0	(not used)
Func # 30 set to 1	(Non-SCS valid FF+data)	Func # 112 set to 0	(not used)
Func # 31 set to 1	(Non-SCS valid FF at end)	Func # 113 set to 1	(not used)
		Func # 119 set to 2	(Enable Auto paper size configuration)
		Func # 120 set to 1	(settings at power up)

FSL Y4, Set Default Line Spacing (Line Spacing - Single, Double), can be changed, but does not show up on the configuration report.

FSL Y9, Active GFID, appears on the bottom half of the configuration page.

For more information on these FSL commands, refer to the "Function Select via Line commands" chapter. This chapter includes detailed information on the definition and use of the FSL commands.

For more information on the use of the Coax Configuration and Resource Utility, refer to the "Coax Utility" chapter in this manual.

Printing of blank pages after downloading configuration and font data

Your MRP Family usually prints a blank page after a configuration description or a font is downloaded from the Configuration and Resource Utility.

This blank page is required to properly invoke the commands that reconfigure the printer or store the fonts.

MRP Family delete current job capability

If you want to return to the main menu while a job is printing, the user interface provides you with the capability of deleting the current job before doing so (refer to the *Xerox MRP Family System Administrator's Guide*). By responding yes, you only delete that portion of the job that was received by the printer. Any outstanding pages at the host are not deleted and may be sent by the host to the printer once you place the printer back into print mode. In the coax and twinax interfaces in particular, you do not have the capability of deleting a job from the host that is currently being sent to the printer.

2.

DSC and SCS data stream commands

The emulated IBM printers support a range of data stream commands. Some commands are ignored by certain models, while others are implemented within the feature restrictions imposed by the particular printer.

The data stream commands described in this chapter control the formatting of the printed data. Your Xerox MRP Family coax printers support the following types of commands:

- Data Stream Compatibility (DSC)
- SNA (Systems Network Architecture) Character String (SCS).

At the beginning of each section is a table summarizing the commands in hexadecimal order and a comparison table showing how the commands are supported for each emulation. The descriptions of the commands are presented alphabetically.

Remember

PCL 5 emulation and PostScript Level 2 are supported using transparencies. Refer to the "Transparent (TRN)" command section for detailed information on using this command.

DSC control codes

DSC control codes have different meanings in unformatted and formatted modes:

- In unformatted mode, the line length and carriage movement is controlled by New Line (NL), Carriage Return (CR), and End of Message (EM) control codes. EM terminates buffers.
- In formatted mode, the control codes NL, CR, and EM are ignored. Lines are filled to the maximum print position (MPP) or maximum line print; then an implicit new line is performed.

Form Feed (FF) is valid in DSC mode provided its position is valid. The positional attributes of FF apply to both formatted and unformatted modes of operation.

Command summary and comparison

Table 2-1 is a summary of DSC commands that the Xerox coax printer handles for the various printers emulated. Refer to the "Function Selection via Line (FSL) commands" chapter to check the commands corresponding to the DSC options.

• = Supported as described in this manual.

Blank = Not supported

Table 2-1. DSC command summary and comparison

DSC Command	3262	3268	3287	3812/3816	4028	4245	6262
00 Null (NUL)	•	•	•	•	•	•	•
01 End of Message (EM)	•	•	•	•	•	•	•
02 Form Feed (FF)	•	•	•	•	•	•	•
03 New Line (NL)	•	•	•	•	•	•	•
04 Reserved							
05 Carriage Return (CR)	•	•	•	•	•	•	•
06 Reserved							
07 Reserved							

Remember End of Message (EM) terminates buffers.

DSC command descriptions

The descriptions of the DSC commands, shown in hexadecimal, are listed alphabetically.

Carriage Return (CR)

05

Moves the print position to the left margin of the current line in an unformatted print field. In a formatted print field or unformatted nonprint field, this control code is printed as a space character. In a formatted nonprint field, it is printed as a null character.

05	Control sequence of a Carriage Return command
-----------	---

End of Message (EM)

01

In an unformatted print field, this control code terminates the buffer. In a formatted print field or unformatted nonprint field, this control code is printed as a space character. In a formatted nonprint field, it is printed as a null character.

01	Control sequence of an End Of Message command
-----------	---

Form Feed (FF)

02

Moves the print position to the top margin of the next form. This movement occurs in both print and nonprint fields, and formatted or unformatted modes.

02	Control sequence of a Form Feed command
-----------	---

New Line (NL)

03

Moves the print position to the first position of the next line in an unformatted print field. In a formatted print field or unformatted nonprint field, this control code is printed as a space character. In a formatted nonprint field, it is printed as a null character.

03	Control sequence of a New Line command
-----------	--

Null (NUL)

00

This control code does not cause any printer function. In unformatted mode, the printer treats this code as a space for both print and nonprint fields. In formatted print or nonprinted fields, a null character is printed.

00	Control sequence of a Null command
-----------	------------------------------------

Reserved codes

04**06****07**

These control codes in an unformatted print field, unformatted non-print field or a formatted print field are printed as a space character. In a formatted nonprint field, they are printed as a null character.

04	Control sequence of a Stop command
06 07	Control sequence of a Space or a Null command

SCS data stream structure

The SNA Character String (SCS) has a relatively simple structure consisting of a 1-byte hexadecimal control code followed by the data to be printed. Multiple control codes can be inserted into SCS by printing applications in a specific order to achieve certain types of output.

The SCS mode can also be referred to as SNA LU1 mode.

Command summary

Table 2-2 lists the hexadecimal SCS commands in alphanumeric order.

Table 2-2. **Coax commands**

Code	Name
04vv	Vertical Channel Select (VCS)
05	Horizontal Tab (HT)
08gg	Graphic Escape (GE)
0B	Vertical Tab (VT)
0C	Form Feed (FF)
0D	Carriage Return (CR)
14	Enable Print (ENP)
15	New Line (NL)
16	Back Space (BS)
1E	Interchange Record Separator (IRS)
24	Inhibit Print (INP)
25	Line Feed (LF)
28ttvv	Set Attribute (SA)
2BC1nnhhlmrmht1...tn	Set Horizontal Format (SHF)
2BC2nnvvvtmbmvt1..tn	Set Vertical Format (SVF)
2BC6nnld	Set Line Density (SLD)
2BD2nn2900cp	Set Print Density (SPD)
2BD2nn48xxxxxsddo ddxxxxxxxx	Page Presentation Media (PPM)
2F	Bell (BEL)
35nn	Transparent (TRN)

Supported SCS commands

Table 2-3 shows the commands in hexadecimal, and presented alphabetically, supported by the different emulations for Systems Network Architecture (SNA) Character String (SCS).

SCS command comparison

Table 2-3 shows how your Xerox coax printers handle the SCS commands for the IBM coax printer emulations shown.

- = supported as described in this manual
- Blank = not supported
- A = accepted but results in no operation, or ignored.

Table 2-3. **SCS coax commands**

SCS command	3262	3268	3287 4214	3812/16 4028	4245	6262	Comment
Back Space (BS) 16	•	•	•	•	•	•	
Bell (BEL) 2F	A	A	A	A	A	A	Ignored
Carriage Return (CR) 0D	•	•	•	•	•	•	
Enable Print (ENP) 14	A	A	A	A	•	A	No operation
Form Feed (FF) 0C	•	•	•	•	•	•	
Graphic Escape (GE) 08gg	•	•	•	•	•	•	3262 and 6262 are for APL printing
Horizontal Tab (HT) 05	•	•	•	•	•	•	Adjust with spaces
Inhibit Print (INP) 24	A	A	A	A	•	A	No operation
Interchange Record Separator (IRS) 1E	•	•	•	•	•	•	NL will be performed.
Line Feed (LF) 25	•	•	•	•	•	•	
New Line (NL) 15	•	•	•	•	•	•	
Null (NUL) 00	•	•	•	•	•	•	

Table 2-3. SCS coax commands (continued)

SCS command	3262	3268	3287 4214	3812/16 4028	4245	6262	Comment
Page Presentation Media (PPM) 2BD2nn48xxxxxsddoddxsxxxxxx				•			
Set Attribute (SA) 28ttvv		•	•	•		•	For APL, color and underline
Set Graphic Error Action (SGEA) 2BC803grop					•		
Set Horizontal Format (SHF) 2BC1nnhhlmrmht1....tn	•	•	•	•	•	•	
Set Line Density (SLD) 2BC6nnld	•	•	•	•	•	•	
Set Print Density (SPD) 2BD2nn2900cp		•		•		•	
Set Vertical Format (SVF) 2BC2nnvvvtmbmvt1.....tn	•	•	•	•	•	•	
Transparent (TRN) 35nn	•	•	•	•	•	•	Data is sent according to FSL Y37.
Vertical Channel Select (VCS) 04vv	•	•	•	•	•	•	Supported, but adjust with LFs in 3287.
Vertical Tab (VT) 0B	•	•	•	•	•	•	Adjust with LFs.

Command descriptions

The section provides an alphabetical listing of the data stream commands.

Back Space (BS)

16

Moves the print position left by the current character width, ignoring the left margin, unless this movement exceeds the left edge of the physical page. In this case, the print position moves to column one on the left edge.

16	Control sequence of a Back Space command
-----------	--

Bell (BEL)

2F

Turns on the attention indicator to show that operator action is required and sounds the alarm if it is not disabled. The printer stops and waits for operator attention. (This command is currently accepted but ignored.)

2F	Control sequence of a Bell command
-----------	------------------------------------

Carriage Return (CR)

0D

Moves the print position to the first position on the same line. If already at the first position, this command is ignored. The print position is moved to the effective left margin of those printers which support the Set Horizontal Margin command.

0D	Control sequence of a Carriage Return command
-----------	---

Enable Print (ENP)

14

This command is used in conjunction with the Inhibit Print (INP) command. Any printable characters between INP and Enable Print (ENP) commands are translated to spaces. SCS control codes between INP and ENP can cause unpredictable results.

Note: Only the 4245 emulation carries out the actions described above; all other emulations ignore this command.

14	Control sequence of an Enable Print command
-----------	---

Form Feed (FF)

0C

Moves the print position to the top line and left margin of the next form as specified by the Set Vertical Format (SVF) command. If this is not specified by the SVF command, the maximum print line is assumed to be one and the print position moves to the left margin of the next line.

0C	Hexadecimal (HEX) value of a Form Feed command
-----------	--

- Remember**
- For the 3812 emulation, if the maximum page length is set to 1, the Form Feed command causes a new line to occur. Any other page length causes the printer to eject the current page on receipt of a form feed.
 - You should not use the New Line command when moving the print position from one form to the next.

Graphic Escape (GE)

08gg

Allows A Programming Language (APL) characters to be sent in a SCS data stream. Each APL character in the data stream is preceded by a GE.

08	Control sequence of a Graphic Escape command
gg	Single-byte character between X'40' and X'FE' that defines the APL code point for the character.

When GE is supported and is followed by another control code (X'00' through X'3F' and X'FF'), the two bytes (08gg) are treated as one invalid SCS command and cause a single "function not supported" response to the application program. X'00' through X'3F' are unprintable.

Horizontal Tab (HT)

05

Moves the print position to the right one tab stop setting. If no tab stop is detected or the last tab stop is to the *left* of the current print position, a movement to the right by one space is executed, and an error code 2 appears. If an HT is requested after passing the right margin, a new line is created and a space is printed at the left margin.

05	Control sequence of a Horizontal Tab command
-----------	--

Inhibit Print (INP)

24

This command is used in conjunction with the Enable Print (EP) command. Printable characters between INP and ENP are translated to blanks. SCS control codes between INP and ENP can cause unpredictable results.

- Note:** Only the 4245 emulation carries out the actions described above. All other emulations ignore this command.

24	Control sequence of an Inhibit Print command
-----------	--

Interchange Record Separator (IRS)

1E

Moves the print position to the first position on the next line. If the current position is at the end of a page, the print position moves to the first line of the next page.

The print position moves to the effective left margin of those printers that support the Set Horizontal Margin command (all coax emulations). A new line is performed using this command.

1E	Control sequence of an Interchange Record Separator command
----	---

The IRS command has the same function as the New Line (NL) command.

Line Feed (LF)

25

Moves the print position to the same horizontal position on the next line. If the print position is the last line of the page, LF moves it to the first line of the next page.

25	Control sequence of a Line Feed command
----	---

New Line (NL)

15

Moves the print position to the first position on the next line. If the current position is at the end of a page, the print position moves to the first line of the next page.

The print position moves to the effective left margin of those printers that support the Set Horizontal Margin command (all coax emulations).

15	Control sequence of a New Line command
----	--

The NL command has the same function as the Interchange Record Separator (IRS) command.

Since the Set Horizontal Margin (SHM) command is not actually supported in coax, a default is used to set the right and left margins.

Page Presentation Media (PPM)

2BD2nn48xxxxxsddoddxxxxxxx

Specifies the presentation media device settings of the printer. PPM specifies the source paper tray, the output tray offset, and the output tray.

2B	Control sequence prefix of a Page Presentation Media command
D2	Command class for a Page Presentation Media command
nn	Number of bytes in the command string including the byte count Valid values are X'04'—X'0C.' Other values cause an error code 3. The default is X'02.'
48	Control type for a Page Presentation Media command
xxxxxx	Three-byte number that is not used and reserved for future use.
sd	One-byte number that selects input trays used for paper or envelopes. Valid values for this parameter are: X'00' = uses current form setting, and causes no change of paper tray. X'01' = Selects paper tray 1. X'02' = Selects envelope (bypass tray). Attempts to feed from non-installed paper tray cause an error type 1.
do	One-byte number that specifies the output tray offset. Valid parameter is X'00' = No offset. Any other value causes the output tray to offset.
dd	One-byte number specifying the output tray. As there is only one output tray, <i>dd</i> is also used to specify whether to offset the output tray. The output tray is offset if the parameter is changed from its value in the last PPM. If two or more indications to offset the output tray are received, only the first is used.
xxxxxxxx	Four-byte number that is not used.

Remember

If any of the above parameters are invalid, an error code 4 occurs. Refer also to the FSL command "Y9—Set Default Print Quality" section in the Function Selection via Line (FSL) commands chapter.

Set Attribute (SA)

28ttvv

SA specifies an attribute associated with subsequent characters in the data stream. The codes remain valid until a new SNA chain begins or a new SA code changes the value of the character attribute. This command is used for APL, color, and underline.

28	Control sequence prefix of a Set Attribute command
tt	<p>One-byte number that defines the command as follows:</p> <ul style="list-style-type: none"> X'00' = Reset X'41' = Extended highlighting X'42' = Color X'43' = Character Set <p>X'00' = Reset enables attributes to reset to defaults.</p>
vv	<p>One-byte number which clarifies <i>tt</i> as follows:</p> <p>Extended highlighting definitions:</p> <ul style="list-style-type: none"> X'00' = Normal (default) X'F1' = Blink (accept) X'F2' = Reverse Video (accept) X'F4' = Underline (supported) <p>The receipt of Blink and Reverse Video parameters cause underlining to be disabled on all emulations other than the coax 3812 emulation.</p> <p>Color definitions:</p> <ul style="list-style-type: none"> X'00' = Black (default) X'F1' = Blue (prints black) X'F2' = Red (prints black) X'F3' = Pink (prints black) X'F4' = Green (prints black) X'F5' = Turquoise (prints black) X'F6' = Yellow (prints black) X'F7' = Black (supported) <p>Character Set definitions:</p> <ul style="list-style-type: none"> X'00' = Default character set X'F1' = APL character set (supported) X'40'—X'FE' = Local character set identifier (ignored except for X'F1.')

Remember Any invalid sequence is reported to the host as an invalid SCS command.

Set Graphic Error Action (SGEA)

2BC803grop

Defines the action to be taken when a character in the data stream is not in the currently selected character set and cannot be printed (an unprintable graphic character).

2B	Control sequence prefix of a Set Graphic Error Action command
C8	Command class for a Set Graphic Error Action command
03	Number of bytes in the command string including the byte count
gr	One-byte number specifying the graphic to be substituted. If the code is not printable, it is substituted by a space (40) and no error is reported.
op	A one-byte number specifying the unprintable character error option. This can only be X'01' meaning no stop, no status. Any other value causes an invalid parameter error.

Remember

- This command, although not currently supported by the 4220/MRP or 4230/MRP, is supported only by the 4245 coax emulation.
- If the SGEA function is not used, then unprintable graphic characters are replaced with a hyphen (X'60') or, for the 4245 emulation, a space (X'40'). An invalid SGEA setting does not change the current setting.

Set Horizontal Format (SHF)

2BC1nnhhlmrmht...tn

Defines the maximum number of characters per line, left margin, right margin, and horizontal tabs. It activates the auto new line function.

2B	Control sequence prefix of a Set Horizontal Format command
C1	Command class for a Set Horizontal Format command
nn	<p>Number of bytes in a command including <i>nn</i>. Valid values are 01 to FF.</p> <p>If <i>nn</i> equals 01, the maximum print position defaults to the user selected value, the left margin defaults to column 1, the right margin defaults to MPP, and the tab values are cleared. These settings represent the printer default state.</p> <p>A value of X'00' causes a SCS parameter check and default values to be installed.</p>
hh	<p>A one-byte number specifying the maximum horizontal print position in characters per line. Valid values for <i>hh</i> are printer dependent.</p> <p>The 3812 emulation accepts a maximum value of:</p> <ul style="list-style-type: none"> X'8C' (140 decimal) - when the CPI is 10 X'A8' (168 decimal) - when the CPI is 12 X'D2' (210 decimal) - when the CPI is 15 X'DF' (223 decimal) - when the CPI is 17 <p>The 3268 emulation accepts maximum values of X'84' (132) when 10 character per inch (CPI) is selected and X'DC' (220) when 16 CPI is selected.</p> <p>For all other emulations, the maximum value of <i>hh</i> is X'84' (132) as these emulations support only 10 cpi.</p> <p>A value of X'00' causes the default value to be used.</p> <p>If the <i>hh</i> value is not valid, defaults for this and all other parameters are selected and a SCS parameter check occurs.</p> <p>The default value for MPP (<i>hh</i>) is set at the printer.</p>

Continuing on next page

<p>lm (continued)</p>	<p>A one-byte number that specifies the column value of the left most print position.</p> <p>If <i>lm</i> is a positive number but less than the maximum print position (MPP), the value is adopted as the left margin setting.</p> <p>If <i>lm</i> is X'00' or <i>nn</i> is less than X'03,' defaults are used for the left margin.</p> <p>If <i>lm</i> is greater than MPP, defaults are used for the left margin and horizontal tabs and a SCS parameter check occurs.</p> <p><i>LM</i> defaults to column 1 if not given, so default = X'01.'</p>
<p>rm</p>	<p>A one-byte number that specifies the column value of the right most print position.</p> <p>If <i>rm</i> is a positive number greater than or equal to <i>lm</i>, but less than the maximum print position (MPP), the value is accepted but not used.</p> <p>If <i>rm</i> is less than <i>lm</i> or greater than MPP, defaults are used for the right margin and horizontal tabs and a SCS parameter check occurs.</p> <p><i>RM</i> defaults to MPP if not given, so default = maximum print position.</p>
<p>ht1...tn</p>	<p>One-byte number that sets the column number for horizontal tabs.</p> <p>Tab values are valid if they are less than the maximum print position (MPP) and greater than or equal to <i>lm</i>.</p> <p>If this is not the case, no tabs are set and a SCS parameter check occurs.</p> <p>If a tab value is zero it is not set.</p> <p>The first tab value is <i>lm</i> and the default is a tab at each character space from the left margin.</p>

Remember

- This command must be initialized by a new line or a carriage return or the old values are used.
- The maximum number of tabs is 251.
- If the command is received on a page boundary, the page dimensions are recalculated, possibly changing the page orientation.

Set Line Density (SLD)

2BC6nnld

Defines the vertical space required for one print line (Lines Per Inch or LPI) overriding those set at the control panel.

2B	Control sequence prefix of a Set Line Density command										
C6	Command class for a Set Line Density command										
nn	<p>Number of bytes in the command string including the byte count</p> <p>Valid values are 01 and 02.</p> <p>If <i>nn</i> equals 01, <i>ld</i> defaults to the value set at the printer, except for the 3287 emulation, which defaults to 6 LPI.</p> <p>If <i>nn</i> equals 02, the <i>ld</i> parameter is used.</p>										
ld	<p>Line density or the distance moved for a single line of vertical spacing.</p> <p>Valid values for this parameter for each emulation and the correlation between LPI and the <i>ld</i> values are:</p> <table> <tr> <td>00 = 6 LPI</td> <td>3262, 3268, 3287, 3812, 4245, 6262</td> </tr> <tr> <td>09 = 8 LPI</td> <td>3262, 3268, 3287, 3812, 4245, 6262</td> </tr> <tr> <td>0C = 6 LPI</td> <td>3262, 3268, 3287, 3812, 4245, 6262</td> </tr> <tr> <td>12 = 4 LPI</td> <td>3262, 3268, 3287, 3812, 6262</td> </tr> <tr> <td>18 = 3 LPI</td> <td>3262, 3268, 3287, 3812, 6262</td> </tr> </table>	00 = 6 LPI	3262, 3268, 3287, 3812, 4245, 6262	09 = 8 LPI	3262, 3268, 3287, 3812, 4245, 6262	0C = 6 LPI	3262, 3268, 3287, 3812, 4245, 6262	12 = 4 LPI	3262, 3268, 3287, 3812, 6262	18 = 3 LPI	3262, 3268, 3287, 3812, 6262
00 = 6 LPI	3262, 3268, 3287, 3812, 4245, 6262										
09 = 8 LPI	3262, 3268, 3287, 3812, 4245, 6262										
0C = 6 LPI	3262, 3268, 3287, 3812, 4245, 6262										
12 = 4 LPI	3262, 3268, 3287, 3812, 6262										
18 = 3 LPI	3262, 3268, 3287, 3812, 6262										

Remember

An invalid value for *nn* or *ld* causes all emulations to use a default of 6 LPI and an invalid SCS parameter check to occur. The exceptions to this are the 3262, 4245, and 6262 emulations, which use the previously defined LPI value.

Set Print Density (SPD)

2BD2nn2900cp

Defines the number of characters to print per horizontal inch (CPI) or characters per line (CPL).

2B	Control sequence prefix of a Set Print Density command												
D2	Command class for Set Print Density												
nn	Number of bytes in a command string including the byte count Valid <i>nn</i> are: 02 = default value for CPI applies. 04 = CPI is defined by <i>cp</i> . Any other values cause the default value of CPI, that is set at the printer, to be used and an invalid SCS parameter check occurs.												
29	Control type for Set Print Density command												
00	One-byte number which must be X'00.'												
cp	One-byte number expressed in hexadecimal that specifies a CPI value for the emulations as follows: <table> <tr> <td>00 = 10 CPI</td> <td>3812, 3268, 6262</td> </tr> <tr> <td>0A = 10 CPI</td> <td>3812, 3268, 6262</td> </tr> <tr> <td>0C = 12 CPI</td> <td>3812</td> </tr> <tr> <td>0F = 15 CPI</td> <td>3812</td> </tr> <tr> <td>10 = 16.6 CPI</td> <td>3812, 3268</td> </tr> <tr> <td>11 = 17.1 CPI</td> <td>3812, 3268</td> </tr> </table> Default = X'00.' An invalid <i>cp</i> parameter causes the CPI default to be set at the printer, and results in an invalid SCS parameter check. Font Titan 17M is equal to 16.67 characters per inch. The value of 16.67 is used when calculating orientation.	00 = 10 CPI	3812, 3268, 6262	0A = 10 CPI	3812, 3268, 6262	0C = 12 CPI	3812	0F = 15 CPI	3812	10 = 16.6 CPI	3812, 3268	11 = 17.1 CPI	3812, 3268
00 = 10 CPI	3812, 3268, 6262												
0A = 10 CPI	3812, 3268, 6262												
0C = 12 CPI	3812												
0F = 15 CPI	3812												
10 = 16.6 CPI	3812, 3268												
11 = 17.1 CPI	3812, 3268												

Refer to the "Y3—Set Default CPI" section of the "Function Selection via Line (FSL) commands" chapter for the FSL command that impacts this SCS command.

Set Vertical Format (SVF)

2BC2nnvvvtmbmvt1...tn

Specifies the maximum number of lines per page, top margin, bottom margin, and vertical tabs. The first 12 tabs specify the Vertical Channel Select stops. On processing this command, the current line becomes logical line one, except on the 3812 emulation where it causes a form feed.

2B	Control sequence prefix of a Set Vertical Format command
C2	Command class for a Set Vertical Format command
nn	<p>Number of bytes in the command string including the byte count</p> <p>Valid values are 01—FF.</p> <p>If <i>nn</i> equals 01, the defaults used are the page length and bottom margin set at the printer, 1 for top margin, and no tabs set.</p> <p>A value of 00 causes a SCS parameter check and default values to be used.</p>
vv	<p>One-byte number that specifies the maximum number of lines per page or maximum print length (MPL).</p> <p>Valid maximum values for <i>vv</i>, shown in hexadecimal (decimal), are emulation dependent as follows:</p> <p>3262 = 7F (127 decimal) 3268 = 7F (127 decimal) 3287 = 66 (102) 3812 = 2A (42) at 3 lpi, 38 (56) at 4 lpi, 54 (84) at 6 lpi, 70 (112) at 8 lpi 4245 = 7F (127 decimal) 6262 = 7F (127 decimal)</p> <p>A value of 00 causes the default values set at the printer to be used.</p> <p>If the <i>vv</i> value is not in range, a SCS parameter check results and default value set at the printer is used.</p>

Continuing on next page

<p>tm (continued)</p>	<p>A one-byte number that specifies the first print line of the page</p> <p>If <i>tm</i> is a positive number, but less than or equal to the maximum page length (MPL), the value is adopted as the top margin setting.</p> <p>If <i>tm</i> is X'00' or <i>nn</i> is less than 3, defaults are used for the top margin.</p> <p>If <i>tm</i> is greater than MPL, defaults are used for the top margin, bottom margin, and vertical tabs, and a SCS parameter check results.</p> <p>Default = 1</p>
<p>bm</p>	<p>A one-byte number that specifies the last print line of the page.</p> <p>If <i>bm</i> is a positive number greater than or equal to <i>tm</i>, but less than or equal to the maximum page length (MPL), the value is adopted as the bottom margin.</p> <p>If <i>bm</i> is X'00' or <i>nn</i> is less than 4, the bottom margin defaults to MPL.</p> <p>If <i>bm</i> is less than <i>tm</i> or greater than MPL, defaults are used for the bottom margin and vertical tabs. An SCS parameter check results.</p> <p>Default = maximum lines per page.</p>
<p>vt1...tn</p>	<p>One-byte value that sets line number values for both Vertical Tabs (VT) and Vertical Channel Select (VCS) functions.</p> <p>Tab values are valid if they are less than <i>bm</i> and greater than or equal to <i>tm</i>; if this is not the case, a SCS parameter check occurs.</p> <p>If an error is found, tab processing stops and the tab values last set remain unchanged.</p> <p>If a tab value is zero, it sets no tab or channel value.</p> <p><i>tm</i> is always the first tab value.</p> <p>Default = each line from the top margin.</p>

Remember

- If this command is received at a page boundary, and only when the Automatic Page Orientation (APO) is enabled, the page dimensions are recalculated, possibly changing the page orientation.
- The maximum number of tabs that can be set is 251.

Transparent (TRN)

35nn

Indicates the start of a transparent data stream. Since you define the data within a transparent stream, the printer does not scan the SCS data for control codes. A hyphen is substituted, however, for all codes below X'40.'

35	Control sequence prefix of a Transparent command
nn	Number of bytes following this command <i>not</i> to be checked for printed data stream commands Valid values for <i>nn</i> range from 0—FF.

Remember

Data is sent according to Function Selection via Line (FSL) Y37—IBM Printer Emulation Select command. Refer to the “Y37—IBM Printer Emulation Select” section in the “Function Selection via Line (FSL) commands” chapter for more information on this FSL command.

Vertical Channel Select (VCS)

04vv

Allows the movement of the paper to a specific line number. This is achieved by using the top margin and the first 11 tab settings from the Set Vertical Format command to specify 12 vertical channels. The first channel is always the top margin, even if no tabs have been set.

04	Control sequence prefix of a Vertical Channel Select command
vv	Byte that selects the channel where you want to move the print position. The correlations between valid values and the channel selection are: 7A = 10 7B = 11 7C = 12 81 = 1 82 = 2 83 = 3 84 = 4 85 = 5 86 = 6 87 = 7 88 = 8 89 = 9

A Vertical Channel Select (VCS) command is interpreted as a one Line Feed (LF) command. This means that if you want to print

starting in line 4, you must enter four VCS commands. Unprintable characters appear on the paper as spaces.

There are two different 3268 and 4214 emulations. When using the first 3268 and 4214 emulations, the system sends the number of Line Feed Commands required by the selected Vertical Format command. This means you can instruct the printer to start printing in line 4 with only one VCS command.

When using the second 3268 and 4214 emulations, you send the commands below the interface. You can do this by transmitting a file to the printer, or by entering the commands on your screen and making a local copy (print screen). You can also do it using shareport on the interface.

- Remember**
- This command adjusts with line feeds (LFs).
 - This command is not supported for the 3287 emulation and causes a line feed.
 - All values, except channel one, must be specified before use; otherwise, the VCS command is treated as a Line feed. If the channel selected is less than or equal to the current page position, the print position moves to the correct line on the next page.
 - Channel 1 is always top-of-form, while the other eleven channels are taken as the first eleven tab stops from the Set Vertical Format (SVF) command.

Vertical Tab (VT)

OB

Moves the print position vertically down to the next tab stop setting, which is set by the Set Vertical Format command. If no vertical tab stops are below the current print position, a vertical tab results in a line feed. If a vertical tab is requested with the print position below the bottom margin, it results in a move to the top margin of the next page.

OB	Control sequence of a Vertical Tab command
-----------	--

- Remember** This command adjusts with line feeds (LFs).

3. Function Selection via Line (FSL) commands

This chapter describes the Function Selection via Line (FSL) commands. FSL sequences are special escape sequences which download settings to the printer. The command allows you to set up default interfaces or change default settings. FSL commands access the value-added features (like duplex emulation, paper tray selections, etc.) of the Xerox MRP Family coax printers.

When your settings are downloaded to the temporary memory area by means of the FSL functions, you can save the settings for future use. This is done by saving the contents of the temporary memory in the permanent memory. Once they are saved, the interface will read the settings each time power is turned on, or when a special command in the data stream requests it. This chapter shows you how.

Setting levels

FSL parameter values are stored in nonvolatile memory (NVM). Once set, the parameters can also be saved in permanent memory by using FSL commands.

Three levels of hierarchies exist in the coax interface at any time:

- The factory default area
- The permanent memory area
- The temporary memory area.

The settings stored in the temporary memory are the highest priority. When the coax interface operates, it always checks the temporary memory to determine the appropriate values.

When settings are restored to factory default, the permanent memory and the temporary memory are cleared and the permanent memory is set to factory defaults.

Storing and reading settings

Table 3-1 shows the commands that allow you to store new settings, override the temporarily defined settings by clearing temporary memory, or restore the settings to factory defaults.

Table 3-1. Memory Exchange Settings

Syntax	Function
<Esc>X1	Saves the temporarily defined settings in the permanent memory.
<Esc>X2	Restores the settings from permanent storage.
<Esc>X3	Restores the settings to factory default settings.
<Esc>X4	Restores the settings to power up defaults, and reads the permanent memory.

Actions at power up

When data is sent to the coax interface, the following happens:

- The permanent memory area is checked to determine whether it contains data. If the data is valid, normal operation is started using the settings just read.
- If the permanent memory area is unreadable, it is cleared. The factory defaults are loaded, and an error message is sent to the printer explaining the action taken in a printer error message. (Refer to the "Error handling" chapter.) Operation then starts on the basis of the factory default settings.
- The interface checks the printer. If the printer is malfunctioning, the coax interface will try to print a message.

Function Selection via Line (FSL)

Function Selection via Line (FSL) sequences are special escape sequences that download settings to the printer.

The FSL structure has been designed for use in connection with printer emulations that do not provide direct access to the facilities. You should avoid using the FSL functions completely, if the host system and the selected printer emulation give you direct access to the facilities. In such cases, the parameters are selected through printer files overriding the FSL values.

If you use the FSL functions to change printer settings, remember to reset the printer so you always start using and changing the printer on the same basis.

The FSL function has the following feature:

- Convenient short functions
- Portable applications
- Emulates IBM front panel settings
- Setup for IBM application support
- Macro functions.

FSL escape character

The coax interface for the Xerox MRP Family is managed by special escape sequences sent to the printer using the FSL commands. FSL escape sequences are command sequences preceded by a user-defined escape character. When an FSL escape character appears in the data stream, the printer interprets the characters following it as a command string and not as characters to be printed.

When you have defined an escape character, you can configure the interface according to your needs.

When a character has been defined as an escape character, you cannot use it as a normal character and print it. However, you do not need to have an escape character defined permanently. When it has served its purpose, it can be removed.

The escape character described in this chapter is different from the printer escape character and the IBM escape character and cannot be used for sending native printer commands or system commands.

This section describes how to configure and manage the coax interface controller for the 4220/MRP and 4230/MRP by the use of escape sequences.

The factory defaults of the printer suffice for most uses, and in most cases, system software controls the facilities described in this chapter.

Types of FSL escape character

FSL escape characters are either temporary or permanent. Their functionalities are as follows:

Temporary (&&??n)

- Changes the interface set-up.
- Activates any FSL function.
- Sends transparent data.
- Stores and retrieves interface settings.

The syntax, **&&??@**, for instance, defines **@** as the temporary escape character. The five-character syntax is sent to the printer from the host system. This escape character is not defined permanently, and is lost when the printer is powered off.

Permanent

- Has the same functionalities as a temporary escape character.
- Remains active at power on.

Use FSL function Y48 to select a permanent escape character that immediately saves the settings in the permanent memory. Refer to the “Y48—Permanent Escape” section for further description.

Using FSL escape character

You may define this character by sending the following character sequence from the host:

&&??@

Where @ is the single character used as the interface escape character and must be in the range X'40' to X'FF.' If a value of X'40' (space character) is used, then the current interface escape character is reset and no interface escape character is defined. For example, to define the interface escape character as '@', the following sequence must be sent:

&&??@

- Remember**
- The interface escape character for the remainder of this chapter is '@'.
 - You should reset the interface escape character when you are not using the Special Features of the 4220/MRP or 4230/MRP coax interface by sending **&&?? <blank>** or **&&?? <space>**.
 - The 4220/MRP or 4230/MRP coax interface does not pass the interface escape character. Therefore, both the interface and the printer escape character must be different. Only the interface escape character is covered in this document.

Format of FSL escape sequences

Valid escape sequences must be in one of the following formats:

format 1	@Y48, n1@	Selects the permanent escape character.
format 2	@W1,string1234@	Sends user strings defined using FSL Y59.
format 3	@T3	Selects Online ASCII hexadecimal (Hex) dump.
format 4	@Z1	Sends user string 1 to printer where encountered.

- Remember**
- Do not use the following as escape characters as they have special functions assigned:
- Comma (,)
 - Semicolon (;)
 - Colon (:)
 - Apostrophe (')
 - Hex numbers (0-9, A-F, a-f)
 - Signs (+ -)
 - FSL function identifiers (L, S, T, W, X, Y, Z, &, ?)

Removing FSL escape character

Follow these steps to remove an escape character:

- Temporary** Use the following syntax, **&&?? <blank>** or **&&?? <space>**.
- Permanent**
1. Set Function Y48 to "00" (no escape character).
 2. Define a new temporary escape character (**&&??n**).

3. Save the setting using the command **<ESC> <X1>**.

FSL types

All FSL commands begin with a leading escape character:

- **T**—Test functions
- **W**—Bar Code printing
- **X**—Memory exchange
- **Y**—Setup functions
- **Z**—Sending of user strings.

Only FSL command types W and Y end with a trailing escape character.

General syntax of an FSL command

The general syntax of an FSL command is as follows:

<ESC> <FSL type> <function no.>, <parameter> <ESC>

Between the leading and the trailing escape characters, all blanks and IBM control codes are ignored. Thus, you could insert blanks to make the strings easier to read. The escape sequence specifies the function you wish to activate and the value that should be attached to the function.

FSL commands

Table 3-2. **FSL Commands**

FSL	Command name
ESC	Special Transparent Feature (Single Paired Hex Transparent)
ESC-ESC	Special Transparent Feature (Multiple Paired Hex Transparent)
T1	Offline Hex Dump (PCIA Dump)
T2	Online Hex Dump
T3	Online ASCII Hex Dump
T4	Printout Settings
T5	Printout Character Set
T6	Cancel Online ASCII Hex Dump
W	Print Bar Code
X0	Set Printer in Hold Mode
X1	Store Settings in Permanent Storage
X2	Restore Settings from Permanent Storage
X3	Restore Factory Default Settings

Table 3-2. **FSL Commands** (continued)

FSL	Command name
X4	Restore Settings from Permanent Storage
Y1	Set IBM Buffer Size
Y2	Set Default LPI
Y3	Set Default CPI
Y4	Set Default Line Spacing (single/double)
Y5	Set Default Maximum Page Length (MPL)
Y6	Set Default Maximum Print Position (MPP)
Y7	Set Case (mono, dual)
Y8	Set LU1 Language
Y9	Set Default Print Quality
Y10	Set Page Format
Y11	Set Default Paper Path
Y12	Set Default Paper Size
Y13	Set Wrap/Cut Option at Physical Paper Size
Y14	Enable Graphic Option
Y19	Set Simplex / Duplex
Y25	FF Before Local Copy
Y26	FF After Local Copy
Y27	Non-SCS Print Image
Y28	Non-SCS, CR at MPP + 1
Y29	Non-SCS, NL at MPP + 1
Y30	Non-SCS, Valid FF Followed by Data
Y31	Non-SCS, Valid FF at End of Print Buffer
Y32	Non-SCS, FF Valid
Y33	Non-SCS, Automatic Function at End of Job
Y34	Last LF on Page Sent as FF
Y36	Suppress IBM Control Code
Y37	IBM Printer Emulation Select
Y38	IBM Communication Feature, (Query, EAB)

Table 3-2. **FSL Commands** (continued)

FSL	Command name
Y44	Suppress CR and SP to Same Position
Y46	Set IRQ Timer
Y47	ESC-Mode Selection
Y48	Set Permanent Escape
Y49	Restrict Access of Temporary and Permanent Settings
Y50	FF After Time Elapse
Y51	User Strings at Power Up (PWO)
Y57	User-defined String Before Local Copy
Y58	User-defined String After Local Copy
Y59	Bar Code Definition
Y60	Font Link for GFIDs
Y61	Setup for User-defined Strings
Y62	Setup for IBM-defined Strings
Y71	Create Translate Table
Y72	Reset Translate Table
Y73	Select Translate Table
Y74	Define Symbol Set String
Y75	Overwrite Translate Table
Y76	Create APL Translate Table
Y77	Reset APL Translate Table
Y78	Select APL Translate Table
Y80	Overwrite APL Translate Table
Y88	Define Page Offset
Y89	Enable Page Offset
Y90	Define User Escape String
Y91	GFID/Font Select Setup
Y92	Point Size Strings
Y93	Attribute Strings

Table 3-2. **FSL Commands** (continued)

FSL	Command name
Y94	Typeface Strings
Y96	GFID Select
Y98	Enable Automatic Page Orientation (APO) Support
Y100	Printer Share String and Timer
Y119	Enable Auto Paper Size Configuration
Y120	Setting Printout at Power Up
Y249	Enter Engineering Mode
Y253	Allow Passwords
Z	Send User-defined String

Command descriptions

This section provides an alphanumeric listing of FSL commands.

Each command shows syntax, usage, and data information. Only data information that gives you values and descriptions is explained, isolated from the rest of the text, and put in a box for easy reading. Examples are given only when further clarification of a command is needed.

Common command features

@	Leading escape character
,	Comma is used as a command delimiter. (A blank can also be used.)
< >	Brackets represent required parameter.
[]	Square brackets are used for optional command characters.
{ }	Curly brackets are used for required characters.
:	Colon is used as a separator (marks end of string).
;	Semi-colon is used as a separator (marks next consecutive position)
*	Factory default
@	Trailing escape character

All command functions start with a defined leading escape character. Command functions, W and Y, also end with a

defined trailing escape character. Commas are used as delimiters, and are not expressly explained for each command.

ESC—Single Paired Hex Transparent

@<HEX>@<HEX> . . . @<HEX>

Sends hexadecimal (HEX) codes transparently to the printer. This function is also used to execute user-defined macros (refer to FSL Y90).

<HEX>	Pair of hexadecimal values Valid values are: 0—9 A—F a—f.
--------------------	---

Example @1B&11H

The leading escape character of this string command tells the interface that the following characters should be treated as a pair of hexadecimal codes.

ESC-ESC—Multiple Paired Hex Transparent

@@<HEX> <HEX> . . . <HEX>@

Sends hexadecimal (HEX) codes transparently to the printer.

<HEX>	Pair of hexadecimal values Valid values are: 0—9 A—F a—f. Between the two leading and the trailing escape characters, all spaces, 3270 control codes, and commas are ignored. They may be inserted in the data stream to make it more readable. Only the characters 0—9, A—F, and a—f are allowed. Any other characters may give unpredictable results. The last hex character is ignored if an uneven number of hex-characters is received.
ascii	Data in plain text

Depending on the values you select when using FSL function Y47—ESC Mode Selection, do the following:

- If FSL Y47 = 1 or 2, use @@<HEX> <HEX> . . . <HEX>@ or @@<HEX>' apostrophe ascii'@
- If FSL Y47 = 3, use @@<HEX> <HEX> . . . <HEX>@@ or @@ ! ascii ascii@@.

When using the @@ ! ascii ascii @@ syntax, an escape character (X'1B') substitutes the character "!".

Example **@@1B 5C 31 32@**

The two leading escape characters of this command string tells the interface that the following characters should be treated in pairs as hexadecimal codes, until the next escape character in the data stream is registered.

T1—Offline Hex Dump (PCIA Dump)

@T1

Selects Offline Hexadecimal Dump, Printer Communications Interface Area (PCIA) Dump, on the coax interface.

This function will only dump the buffer containing the command sequence.

T2—Online Hex Dump

@T2

Selects Online Hexadecimal Dump on the coax interface.

The current buffer contents are printed, and the next buffer contents will be dumped.

The Online Hex Dump can also be activated using the test button on the rear panel of the printer. Pressing the button results in a settings printout and the configuration utility LED indicator will start flashing approximately 10 seconds. The dump is terminated by pressing the button again. (Refer also to the T4—Printout Settings command.)

T3—Online ASCII Hex Dump

@T3

Selects Online ASCII Hexadecimal Dump.

Test 3 will be cancelled if you apply test 6 (T6).

T4—Printout Settings

@T4

Prints the current settings, and selects Test 4 print out.

Although you should readily use this FSL command to print the current settings of your printer, you may also activate a settings printout by pressing the test key on the rear panel of your printer. Refer to the "Setting the printer emulation" section in the "Configuring the coax interface card" chapter in this manual for detailed procedure.

Since pressing the button while the LED is flashing brings the interface to Online Hex Dump mode (T2), refer also to the T2—Online Hex Dump command.

The settings printout is also available as a power up feature by using the FSL Y120—Setting Printout at Power Up command.

T5—Printout Character Set

@T5

Prints the character sets.

T6—Cancel Online ASCII Hex Dump

@T6

Stops Online ASCII Hexadecimal Dump.

Applying test 6 will cancel test 3 (T3).

W—Print Bar Code

@Wn,data@

Converts data to bar code.

<i>n</i>	Number from 1 to 8 indicating the bar code number
data	Data must not exceed one line. Each character must be valid for actual type, and the number of characters must be required for the specific code. The upper left corner of the bar code will be in the position of the leading escape character. When the bar code has been printed, the printer cursor will be located after the trailing escape character, and printing will continue from this point.

Example **@W1,string 1234@** prints "string 1234" as a bar code, if the bar code definition 1 has been defined previously with function Y59.

X0—Set Printer in Hold Mode

@X0 [display_data]@

Sets the coax interface in Hold mode by command sent using the line.

Remember

X2—Restore Settings from Permanent Storage

@X2

Restores nonvolatile memory (NVM) to random access memory (RAM). The printer will be updated with the escape strings, according to these settings. This command saves all current settings in NVM including the interface escape character.

X3—Restore Factory Default Settings

@X3

Restores factory default settings in Random Access Memory (RAM).

Function X3 overwrites the contents of RAM that results in a loss of settings contained in RAM. This function only affects the used port, and reads factory default into temporary memory. This function causes the saved software setup commands to be overwritten by the factory default commands, effectively resetting the RAM.

X4—Restore Settings from Permanent Storage

@X4

Restores NVM to RAM, and reads permanent memory into temporary memory. This function causes any unsaved settings to be overwritten by the currently saved commands. The printer is updated with the escape strings according to these settings. (@X2 equivalent @X4.)

Y1—Set IBM Buffer Size

@Y1, n@

Changes default buffer size. It selects the buffer size the printer uses to print the contents of a terminal screen in DSC mode. This type of operation is usually done when you want to copy the contents of a terminal screen, or the host computer sends data to the printer and the terminal at the same time. *This function also affects the buffer size if it is done in the SCS mode.* The factory default setting is 3440.

<i>n</i>	Valid parameters are: 1 for 960 characters 2 for 1920 characters 3 for 2560 characters 4* for 3440 characters 5 for 3564 characters.
----------	---

Remember

This function should not be set during normal operation. Once programmed, the new value should be stored with the X1 function. Be sure to switch the printer off for 10 seconds before you switch it on again.

For consistent operation, configure your 4220/MRP or 4230/MRP coax interface to match the buffer size required by your host system.

This command only takes effect the *next* time that the printing system is initialized and the settings have been saved in non-volatile memory (NVM).

Refer to the "Features" function of the Printer Output Area (table D-2) in the "Coax communications buffer" appendix.

Example @Y1, 5@ sets the buffer size to 3564 characters.

Y2—Set Default LPI

@Y2, n@

Selects current and default values for lines per inch (LPI) that are used at power up. LPI is used for calculating top margins.

<i>n</i>	Valid parameters are:
	0 for No LPI setup sent to printer
	3 for 3 LPI
	4 for 4 LPI
	6* for 6 LPI
	8 for 8 LPI.

The factory default setting is 6 lines per inch. If zero (0) is selected, calculation is performed on 6 LPI. LPI from the host overrides the default.

This function emulates a front panel switch on an IBM printer:

- 3 = 6 LPI and double space
- 4 = 8 LPI and double space.

However, if FSL function Y4 is set at 2 for double spacing, then LPI is as follows:

- 3 = 3 LPI
- 4 = 4 LPI
- 6 = 3 LPI
- 8 = 4 LPI.

If 3 or 4 is set by this command, FSL function Y4 is ignored (refer to the "Y4—Set Default Line Spacing" section).

This function has immediate effect on default LPI.

Example @Y2, 8@ sets the printer to 8 LPI.

Y3—Set Default CPI

@Y3, n@

Selects the default value for characters per inch (CPI) that is used at power up. The factory default setting is 10 characters per inch.

<i>n</i>	Valid parameters are: 10* for 10 CPI 12 for 12 CPI 15 for 15 CPI 16 for 16.7/17.1 CPI 20 for 20 CPI 27 for 27 CPI.
----------	--

Changes in the default value cause immediate changes in the current value. This function emulates a front panel switch on an IBM printer. In SCS mode, this function is read at power up, or when a system command to read the operator panel value is received.

The link between FSL Y3 and the strings to select a font is given by the Font Link for GFIDs—Y60. This function links the CPI selection to a GFID. The GFID can be modified by the use of FSL Y91 through Y94. You could also use FSL Y62, but you have to define all the CPI, LPI, and orientation strings. Refer to the individual FSL sections for detailed information.

Refer also to the “Set Print Density (SPD)” section of the “DSC and SCS data stream commands” chapter for the SCS command that impacts this FSL function.

This function has immediate effect on default CPI.

Example @Y3,15@ sets the printer to 15 CPI (the printer uses the GFID linked to 15 CPI).

Y4—Set Default Line Spacing (single/double)

@Y4, n@

Selects the default line spacing. This command controls the power up default value for the number of line feeds that are generated when a new line character is processed.

<i>n</i>	Valid parameters are: 1* for single space 2 for double space.
----------	---

Changes in the default values cause immediate changes in the current value. It has immediate effect. This function is only included for compatibility reasons. Refer to the “Y2—Set Default LPI” section because if you set FSL Y2 to 3 (for 3 LPI) or 4 (for 4 LPI), this Y4 function is ignored.

Example @Y4, 2@ sets the protocol converter to double space default.

Y5—Set Default Maximum Page Length (MPL)

@Y5, n@

Selects current and default form length. It selects the power up default value for the Maximum Page Length (MPL) in units of single line spaces.

<i>n</i>	Valid parameters are:
000—255	Indicates the maximum number of lines allowed on a page before a form feed is generated automatically.
62*	Factory default for US (letter)
66*	Factory default for EUR (A4)

This function emulates a front panel switch on an IBM printer. When set to 000, no vertical formatting is done, and no form feed is generated at bottom of form (BOF).

If MPL is not at top of form (TOF), then form feed (FF) is performed. The printer ejects paper, and printing is at TOF on the next page. If the page is empty, FF is suppressed, no paper ejects, and the printer prints at TOF on the current page. Refer to the "Form Feed (FF)" section in the "DSC and SCS data stream commands" chapter for additional information on the FF command.

Remember

When operating in the SCS mode, the form length or MPL can be downloaded from the host. FSL Y5 function has immediate effect on the printer, unless form length has been downloaded from the host, and the value is used when selecting default in SCS mode.

If the setting stored in RAM for Y5 is 255, the value of Y5 (Maximum Print Lines) will be computed for the user as part of the automatic configuration logic. The value for Y5 is computed based on information from Y10 (Portrait/Landscape) and Y11 (Active Tray). The automatic configuration logic computed value will be take effect if the user has stored a value other than 255 into RAM using FSL X1.

You may disable the Automatic Papersize Configuration logic by using FSL Y119 (See the FSL Y119 command for more information.)

Example @Y5, 50@ sets the page length to 50 lines.

Y6—Set Default Maximum Print Position (MPP)

@Y6, n@

Selects current and default maximum print position (MPP) in characters from the left margin. The factory default setting is 132.

<i>n</i>	Valid parameters are: 000—255 Set MPP in number of characters Default setting is 132.
-----------------	---

This function emulates a front panel switch on an IBM printer. It has an immediate effect.

MPP and the current position are not changed by changing characters per inch (CPI).

Remember

When set at 000, no horizontal formatting is done; no new line (NL) is generated by the interface at MPP even if MPP is defined by the data stream.

Refer to the "Set Print Density (SPD)" section of the "DSC and SCS data stream commands" chapter for additional information on this SCS command that impacts this FSL Y6 function.

Example

@Y6, 80@ sets MPP to 80 characters.

Y7—Set Case (mono, dual)

@Y7, n@

Selects mono case or dual case as the power-up default setting for the printer. The factory default setting is dual case.

<i>n</i>	Valid parameters are: 0 Mono case (left to right) 1* Dual case (left to right) 2 Right to left (Dual case) 3 Left to right (Dual case).
-----------------	---

In mono case, printing is in upper case characters only. Printing in dual case includes upper and lower case characters. This function can only be overridden from the system if you use value 0 or 1.

On the PCL/IPDS platform, values 2 and 3 are supported as Left to Right (dual case). Y7 is used only in DSC LU3 mode and ignored in SCS mode.

Y8—Set LU1 Language

@Y8, *n*@

Selects the LU1 language translate table at power up, and has effect as soon as it is received.

The factory default setting is 00. If the conversion table is not loaded, then 01 is used as default.

<i>n</i>	Valid parameters are:
00*	Download LU1 language from 3174 control unit or 3274 (configuration support C or D only)
1	English (U.S.) EBCDIC
3	Austria/Germany
4	Belgium
5	Brazilian
6	Canadian (French)
7	Danish/Norwegian
8	Danish/Norwegian (Alternate)
9	Finnish/Swedish
10	Finnish/Swedish (Alternate)
11	French
12	French (Use 11 French.)
13	Austrian/German (Alternate)
14	International
15	Italian
16	Japanese (English)
19	Spanish
20	Spanish (Alternate)
21	Spanish speaking
22	English (UK)
23	Norwegian (Use 7 Danish/Norwegian.)
24	Swedish (Use 9 Finnish/Swedish.)
25	EBCDIC WT (Use 1 English (U.S.) EBCDIC.)
26	Norwegian Alt (Use 8 Danish/Norwegian Alternate.)
27	Swedish Alt (Use 10 Finnish/Swedish Alternate.)
28	Portuguese
30	French 105-character
31	Swiss-German/Swiss-French
32	Swiss-French (Use 31 Swiss-German/Swiss French.)
40	Spanish Data Text/Extension

If the number is not defined in the printer, it is ignored. The code point for the FSL ESC character is not reset after using this function. This causes problems if the FSL ESC character is national dependent.

The codepoint for the FSL Single Paired Hex Transparent, ESC character, is not reset after using this FSL function Y8. This may cause problems if the FSL ESC character is national dependent.

If *n* is not defined in the printer, FSL Y8 is ignored.

Example @Y8, 30@ sets the printer language to French 105 character set.

Y9—Set Default Print Quality

@Y9, n@

Selects current and default font under the Page Presentation Media SCS command.

Refer to the “qq” parameter of the Page Presentation Media (PPM) command in the “Page Presentation Media (PPM)” section of the “DSC and SCS data stream commands” chapter for detailed information on this parameter that specifies the print quality.

n	<p>Valid values for this parameter are:</p> <ul style="list-style-type: none"> 0 No Print Quality command sent to printer 1* Draft quality 2 Near letter quality 3 Letter quality 4—65534 (See notes.) <p>Notes:</p> <ul style="list-style-type: none"> • Use 0 with Impact Printers only. 0 is ignored by all other printers. • Values 1 to 3 are passed to a GFID selection, that can also be defined using FSL Y91 through Y94.. If no parameters are defined in the Y62—Setup for IBM-defined Strings command, nothing is sent to the printer. (Refer to the Y62 command for additional information.) • Values greater than 3 are paired to FSL 96.
----------	--

Example @Y9, 2@ sets the printing at near letter quality.

Y10—Set Page Format

@Y10, <n1>, {n2}@

Selects an exact or scaled page format on page boundary.

If no value is entered for *n2*, the *n1* value is used for all trays.
Refer also to FSL Y62 command that affects this function.

<i>n1</i>	<p>Valid values are:</p> <ul style="list-style-type: none"> 0* Portrait (No compression or scaling) 1 Landscape (No compression or scaling) 2 COR (as IBM 3812). If the interface is in User mode, the <i>n</i> string = 24, defined in FSL Y62 command, is sent. 3 Use LPI and MPL to calculate the Vertical Motions Index (VMI). Also called fit to page in portrait. If the interface is in User mode, the <i>n</i> string = 25, defined in FSL Y62 command, is sent. 4 Compressed portrait format for 3287 compatible printing within an 8" x 11" page area 5 Compressed portrait for 3287 compatible printing within an 8" x 12" page area 6 Compressed landscape for 3287 compatible printing within an 13.2" x 8.5" page area 7 Compressed landscape for 3287 compatible printing using a page width of 13.2" with fixed line spacing (LPI) 8 Compressed portrait for 3287 compatible printing using a page length of 11" with fixed character spacing (CPI) 9 Compressed portrait for 3287 compatible printing using a page length of 12" with fixed character spacing (CPI)
<i>n2</i>	<p>Values for <i>n2</i> are:</p> <ul style="list-style-type: none"> 1 Ignored 2* Tray 1 3 Tray 3 4 Manual feeder 5 Tray 2 6 Tray 4 7-255 Reserved for optional feeder. (20) (Reserved)

If the code is placed as the first printable character on the page, the changed format is effective as soon as the printer receives the command. If the command is placed at any other position on the page, the change is effective on the next page.

Only *n1* = 0 or 1 is supported for envelope feeder. (Refer to related FSL function Y11.)

If *n1* is greater than 3 (*n1*>3), then FSL Y62—Setup for IBM-defined Strings command is not used.

Example @Y10, 1@ selects landscape format with no scaling.

Y11—Set Default Paper Path

@Y11, <*n1*>, {*n2*}@

Selects the default input paper tray, or links an input tray to an output paper tray.

Utility	FSL Y11, <i>n1</i>	PCL parameter to Esc&I#H	4220/MRP 4230/MRP
N/A	N/A	0 Current Tray	Not Supported
TRAY1	2	1 Paper Tray	Tray 1
TRAY2	5	3 Manual-Envelope	Tray 2
TRAY3	3	4 Lower Tray	Tray 3
TRAY4	6	5 Paper Deck	Tray 4
TRAY5	4	2 Manual-Paper	Tray 5**
N/A	N/A	6 Envelope Feeder	Tray 5**

Utility	FSL Y11, <i>n1</i>	PCL parameter to Esc&I#H	4215/MRP and 4219/MRP
N/A	N/A	0 Current Tray	Current Tray
UPPER	2	1 Paper Tray	Upper Tray
MIDDLE	1	7 Undefined	Middle Tray
LOWER	3	4 Lower Tray	Lower Tray
MAN-PAP	4	2 Manual-Paper	Manual Tray-Paper
MAN-ENV	5	3 Manual-Envelope	Manual Tray-Envelope
N/A	N/A	6 Envelope Feeder	Not Supported

** Cannot be changed. Other printer trays can be remapped at the user interface.

If the code is placed as the first printable character on the page, the changed format is effective as soon as the printer receives the command. If the command is placed at any other position on the page, the change is effective on the next page.

The *n1* parameter produces a PCL5 sequence that selects the proper input paper tray. The table provides a cross reference

that shows how to access the paper trays of all MRP family printers.

When selecting the *n2* parameter, linkage is set up between the input tray specified in *n1* and the output tray specified in *n2*. The only values supported for *n2* are 1 and 2.

When you select an output tray via the Y11 command, keep in mind that the coax interface uses PCL5 commands to make this selection. Therefore, an *n2* value of 1 produces a PCL5 command that selects output destination 1. You must use the MRP user interface to map the output destination to the command as described in the *Xerox MRP Family System Administrator Guide*. The diagram on page 3-2 shows you how to access this menu.

Use the menu to select any one of the three available output destinations: Top Tray, Face-Up Tray, or High-Capacity Stacker (if installed). Output destination 2 is fixed to the Face-Up Tray and cannot be changed. Therefore, an *n2* parameter of 2 always links to the Face-Up Tray.

The table below shows valid numbers for *n2* when using the 4220/MRP or 4230/MRP.

<i>n2</i>	Values for <i>n2</i> are:
0	Default destination selected from UI
1	Top tray or High-Capacity Stacker, depending on mapping
2*	Face-up tray

Example 1 @Y11,3@ selects paper from the lower tray (Tray 2).

Example 2 @Y11, 2, 2@ results in paper from input tray 1 ejecting in output tray 2.

Remember The utilities only support the *n1* Input Tray Selection parameter. They do not support the *n2* Output Tray Selection parameter at this time.

Remember Since the SCS Page Presentation Media (PPM) command impacts this FSL function, refer to the "Page Presentation Media (PPM)" section in the "DSC and SCS data stream commands" chapter for detailed information.

Y12—Set Default Paper Size

@Y12, n1 [,n2]@

Selects paper size. As with FSL Y11, a PCL5 command selects the proper paper size. The table lists the supported paper sizes and illustrates how they map to PCL5 for the MRP family of printers. Also, the table identifies whether the AS/400 Utility provides access to the paper size or whether the user-created FSL must be used.

Utility	FSL parameter	PCL parameter to Esc&I#A	4215/MRP and 4219/MRP	4220/MRP 4230/MRP
Yes	1 A4	26	A4 Tray, Manual	Tray 1-5
Yes	2 Legal	3	Legal Tray, Manual	Tray 1-5
Yes	3 Letter	2	Letter Tray, Manual	Tray 1-5
Yes	4 Executive	1	Manual	Tray 1-3, 5
Yes	5 Monarch Envelope	80	Manual	Tray 5
Yes	6 Business 10 Envelope	81	Manual	Tray 5
Yes	7 DL Envelope	90	Manual	Tray 5
Yes	8 C5 Envelope	91	Manual	Tray 5
Yes	10 A3	27	A3 Tray, Manual	Tray 1-3, 5
Yes	11 Ledger	6	Ledger Tray, Manual	Tray 1-3, 5
N/A	16 B5 Envelope	100	Not Supported	Not Supported

Example @Y12, 2@ sets the page size to legal.

Remember The setting for Y12 is not necessary. It is overwritten if Y119 is enabled. The Automatic Papersize Configuration logic enabled by Y119 overwrites any setting you provide to Y12.

Remember On the 4215/MRP and 4219/MRP, the size of the manual feed is set to the default paper size. When the manual feed tray is used for other sizes:

1. Disable Y119
2. Use the Y12 command to define the paper size for the manual feed tray.

Remember If paper trays are not installed in the 4215/MRP or 4219/MRP, the sizes defined for the missing trays are either letter or A4.

Remember For firmware release S11 116.010 and beyond, the values for Y12 (paper size) will be computed automatically for the user. You no longer need to include a Y12 command to inform the interface of the size of paper that is loaded in a tray. Previous versions of the interface card would format data according to the paper size

defined in Y12, which could be different from what actually was loaded. In the new releases, the system detects the actual size loaded in the tray and automatically formats for that size paper.

Y13—Set Wrap/Cut Option at Physical Paper Size

@Y13, <n1> [, n2]@

Sets print line overflow action. If no value is entered for *n2*, the *n1* setting values are valid for all supported trays.

<i>n1</i>	<p>Values for <i>n1</i> are:</p> <p>0 Lines exceeding the available print area are wrapped at the paper edge. Overflow data prints on the next line, and not count as lines, when the printer calculates the maximum print lines or length (MPL).</p> <p>1* Lines are truncated at paper edge. Overflow data is not printed.</p> <p>No guarantee for vertical formatting is given if <i>n1</i> = 0. If <i>n1</i> = 1 is selected, data exceeding the maximum print position is lost.</p>
<i>n2</i>	<p>Values for <i>n2</i> are:</p> <p>1 Ignored</p> <p>2* Input tray 1</p> <p>3 Input tray 3</p> <p>4 Manual feeder</p> <p>5 Input tray 2</p> <p>6 Input tray 4</p> <p>7—255 Optional feeder</p> <p>The default is selected for all trays.</p>

This function wraps and cuts on the physical paper (A4, letter, etc.) and NOT on the logical paper (MPL x MPP). If *n2* is not set, default is selected for all trays.

Example **@Y13, 1@** selects lines exceeding maximum print position to be truncated, or cut off.

Remember When using FSL Y13 Set Wrap/Cut Option on the 4219/MRP or the 4215/MRP, first enable the Line Wrap option from the PCL5 Setup User Interface menu. Refer to the Printer Setup Menu in chapter 2 of the *Xerox 4219/MRP 4215/MRP Operator Guide* for instructions on how to access this menu.

Y14—Enable Graphic Option

@Y14, n@

Enables connection of IBM 3812 Page Printer using the ida 3812 software. It also enables the use of ida 820 Advanced Funtion Printing (AFP) software package.

n1	<p>Values for <i>n1</i> are:</p> <p>0 Disable Graphics</p> <p>1* Enable Graphics</p> <p>No guarantee for vertical formatting is given if <i>n1</i> = 0. If <i>n1</i> = 1 is selected, data exceeding the maximum print position is lost.</p>
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Refer to the "Helpful hints" appendix for recommended settings to obtain a specific IBM printer emulation.

Refer also to the "Printer Type and Character Set," "Features," and "PS Characteristics" functions in table D-2 of the "Printer Output Area" section in the "Coax communications buffer" appendix.

Remember

It is important not to set this function during normal operation. Once programmed, the new value should be stored.

Y19—Set Simplex / Duplex

@Y19, n@

Selects duplex printing.

Printing on both sides of a paper is enabled with long-edge binding or short-edge binding (tumble).

n	<p>Values for <i>n</i> are:</p> <p>0 Simplex printing (printing on one side of the paper)</p> <p>1 Long-edge binding duplex</p> <p>2 Short-edge binding duplex</p> <p>Long-edge and short-edge bindings are printed in both portrait and landscape.</p>
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Orientation of the printing (landscape or portrait) should be selected in the software controlling the printing, for example, word processing programs.

Do not use a different page format on the front and the back side of a paper or the binding edge might have an unpredictable result.

To make sure that all pages have been ejected while printing in duplex, set FSL function Y19 to "0" simplex printing at the end of

the document you wish to print in duplex. This is especially important if the document has an uneven number of pages.

Note: The duplex setting cannot be saved in Permanent Storage with the X1 command.

If you share a printer with other users, it is important that you remember to set function 19 to simplex printing again. If you forget this, the documents of the other users will also be printed in duplex, and a page may contain your print job on one side and the print job of another user on the other side.

Example **&&??@ @Y19, 1@ @Y10,1@** prints a document in long-edge landscape.

&&??@ defines "@" as the escape character.

@Y19, 1@ sets long-edge binding, duplex printing.

@Y10,1@ sets orientation to landscape.

Y25—FF Before Local Copy

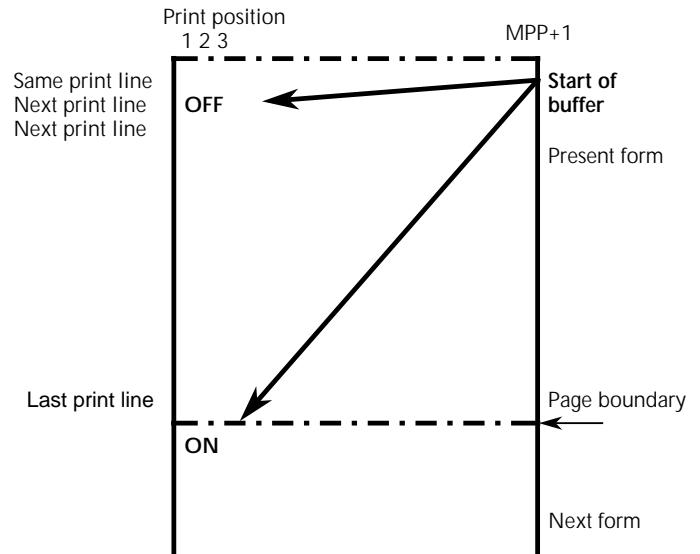
@Y25, n@

Selects a form feed (FF) to be performed before local copy. This function determines the print position before an Operator Initiated Local Copy (print screen function).

<i>n</i>	Values for <i>n</i> are:
0*	No Form Feed Before Local Copy
1	Form Feed Before Local Copy is performed.

If $n = 0$ is selected, no automatic form feed is performed (default). If $n = 1$ is selected, an automatic form feed is performed unless a Form Feed command was the last command received, which means the printer is set to print at position 1 of the first line of the next page. Refer to the illustration given in the example.

Example @Y25, 1@ sets Form Feed Before Local Copy.



Y26—FF After Local Copy

@Y26, n@

Selects a form feed to be performed after local copy. It determines the print position after a Local Copy (print screen function).

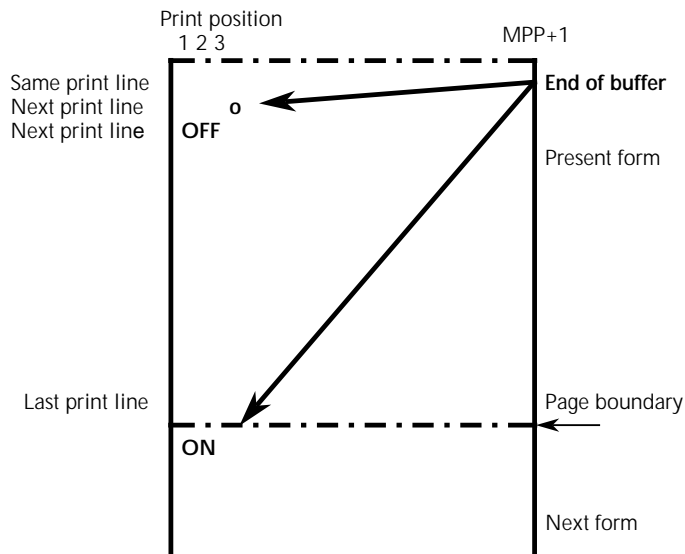
The default is 0 for non-page printers, and 1 for page printers.

<i>n</i>	Values for <i>n</i> are: 0 No Form Feed Before Local Copy 1 Form Feed Before Local Copy is performed.
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If $n = 0$ is selected, the printer defaults to Automatic Form Feed at the end of the print buffer setting, or FSL Y33—Non SCS, Automatic Function at End of Job command. If $n = 1$ is selected, an automatic form feed is performed unless a Form Feed command was the last command received, which means the printer is set to print at position 1 of the first line of the next page. Refer to the illustration given in the example.

Remember This option corresponds with the IBM 3268 RPO SC9508 and the IBM 3287 RPO MC3750.

Example @Y26, 1@ sets Form Feed After Local Copy.



Y27—Non-SCS Print Image

@Y27, n@

Implements an IBM Request for Price Quotation (RPO), and Compatibility modes for other converters. This function specifies how nulls are handled. The factory default is always for Null Line Suppression.

<i>n</i>	<p>Values for <i>n</i> are:</p> <p>0* Sets:</p> <ul style="list-style-type: none"> • Null line suppression in Local Copy • Null line suppression in NON SCS print • Formatted print in Local Copy • Formatted print in NON SCS print. <p>1 Sets:</p> <ul style="list-style-type: none"> • Null line suppression in Local Copy • Null line suppression in NON SCS print • Formatted print in Local Copy • Formatted print in NON SCS print. <p>2 Sets:</p> <ul style="list-style-type: none"> • Null line suppression in Local Copy • True Screen image in NON SCS print • Formatted print in Local Copy • Un-Formatted print in NON SCS print. <p>3 Sets:</p> <ul style="list-style-type: none"> • True Screen image in Local Copy • True Screen image in NON SCS print • Un-Formatted print in Local Copy • Un-Formatted print in NON SCS print. <p>4 Sets:</p> <ul style="list-style-type: none"> • Null line suppression in Local Copy • Null line suppression in NON SCS print • Formatted print in Local Copy • Formatted print in NON SCS print. <p>5 Sets:</p> <ul style="list-style-type: none"> • Null line suppression in Local Copy • Null line suppression in NON SCS print • Un-Formatted print in Local Copy • Formatted print in NON SCS print. <p>6 Sets:</p> <ul style="list-style-type: none"> • Null line suppression in Local Copy • Null line suppression in NON SCS print • Formatted print in Local Copy • Un-Formatted print in NON SCS print. <p>7 Sets:</p> <ul style="list-style-type: none"> • Null line suppression in Local Copy • Null line suppression in NON SCS print • Un-Formatted print in Local Copy • Un-Formatted print in NON SCS print.
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This option corresponds with the IBM 3268 RPO SC9505, the IBM 3287 RPO SC3741, and the IBM 4214 OPT 18=2.

The n values 0 and 3 correspond to IBM parameters. The values 4 through 7 are implemented for compatibility purposes with other protocol converters.

This function is available in DSC LU3 mode, a non-SCS operation.

Y28—Non-SCS, CR at MPP + 1

@Y28, n@

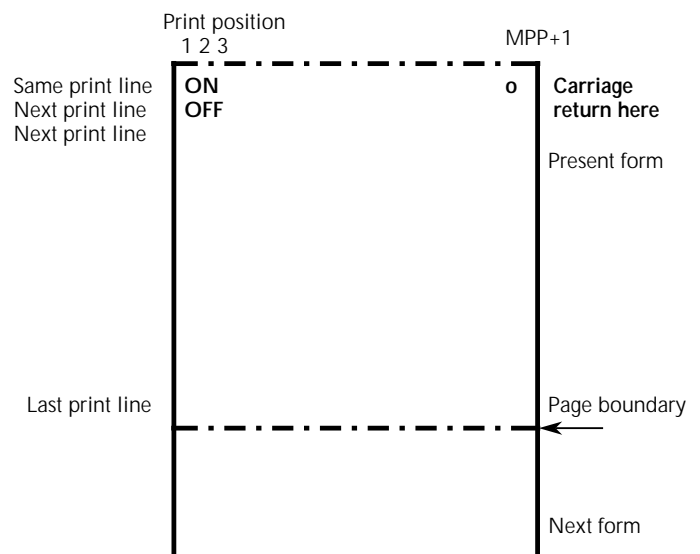
Implements an IBM RPQ and takes effect as soon as the command is received. This function controls the printer action when a carriage return (CR) occurs at the MPP+1.

n	Values for n are:
0*	Next character position is 1st Print Position on next line, when a Carriage Return (CR) is registered at MPP+1.
1	Next character position is 1st Print Position on current line, when a Carriage Return (CR) is registered at MPP+1.

This option only affects NON SCS printing, and corresponds with the following:

- IBM 3268 RPQ SC9501
- IBM 3287 RPQ S30219
- IBM 4214 OPT 15=1.

Example @Y28, 1@ sets the printer to stay on current line when a Carriage Return (CR) is received at MPP+1.



Y29—Non-SCS, NL at MPP + 1

@Y29, n@

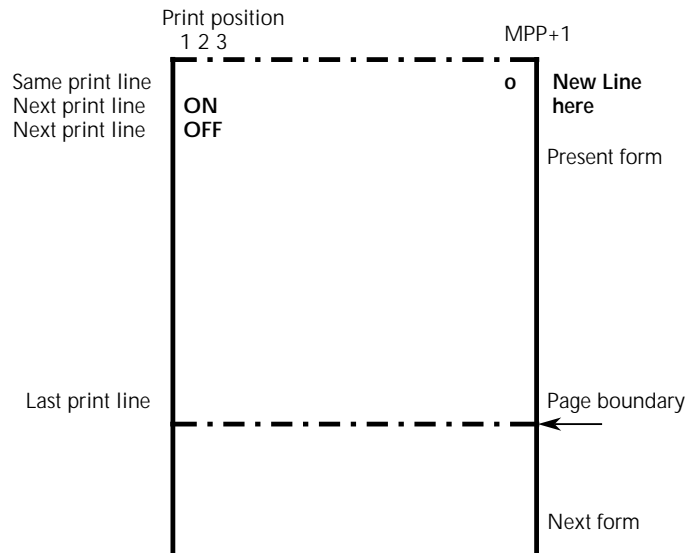
Implements an IBM RPO and takes effect as soon as the command is received. This function controls how many lines are skipped when a New Line (NL) occurs at MPP+1.

n	Values for <i>n</i> are: 0* Next character position is 1st Print Position two lines down, when a New Line (NL) is received at MPP+1. 1 Next character position is 1st Print Position on next line, when a New Line (NL) is received at MPP+1.
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This option only affects DSC LU3 mode, a NON SCS printing, and corresponds with the following:

- IBM 3268 RPO SC9502
- IBM 3287 RPO S30219
- IBM 4214 OPT 15=1.

Example @Y29, 0@ sets the printer to advance two lines when a NL is received at MPP+1.



Y30—Non-SCS, Valid FF Followed by Data

@Y30, n@

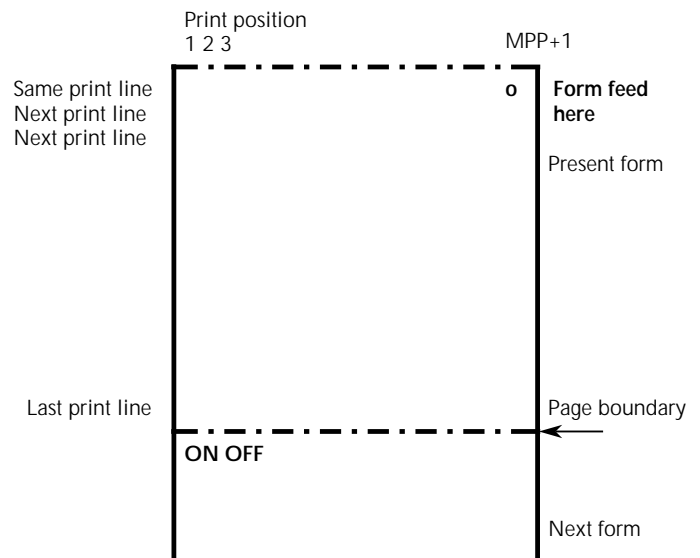
Implements an IBM RPQ and takes effect as soon as the command is received. This function determines the first print position after the Form Feed (FF) command has been executed.

<i>n</i>	Values for <i>n</i> are:
0*	Next print position is the 2nd Print Position (PP) on the next form, when a valid FF, which is not positioned at the end of the IBM print buffer, is received.
1*	Next character position is the 1st Print Position on the next form, when a valid FF, which is not positioned at the end of the IBM print buffer, is received.

The default is product dependent. PCL platform has a default of 1. If $n = 0$ is selected, the printer is set to print at position 2 of the first print line of the next page. If $n = 1$ is selected, the printer is set to print at position 1 of the first print line of the next page.

This option only affects DSC LU3 mode, a NON SCS printing, and corresponds with the IBM 3268 RPQ SC9503 and the IBM 3287 RPQ N/A.

Example @Y30, 1@ sets the printer to advance to 1st Print Position (PP) on the next form.



Y31—Non-SCS, Valid FF at End of Print Buffer

@Y31, n@

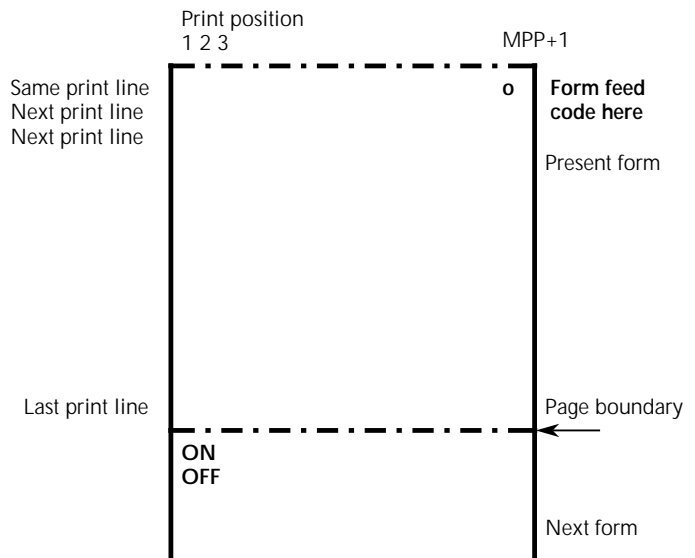
Implements an IBM RPO and takes effect as soon as the command is received. This function determines the print line position when a Form Feed command is the last command in the print buffer, or is immediately followed by an end of message code.

n	Values for <i>n</i> are: 0* Next character position is the 1st Print Position (PP) on the 2nd line on the next form, when a valid FF positioned at the end of the IBM print buffer, is received. 1* Next character position is the 1st Print Position on the next form, when a valid FF, which is not positioned at the end of the IBM print buffer, is received.
----------	---

The default is product dependent. PCL platform has a default of 1. If *n* = 0, (default) is selected, it automatically adds a new line to a Form Feed command at the end of the print data. The printer is set to print at position 1 of the second line of the next page. If *n* = 1 is selected, it executes only a Form Feed command. The printer is set to print at position 1 of the first print line of the next form. This option is ignored if Automatic Form Feed at End of Buffer (Y33) is ENABLED or Form Feed After Local Copy (Y26) is ENABLED.

This option corresponds with the IBM 3268 RPO SC9504 and the IBM 3287 RPO SC3749.

Example @Y31, 1@ sets the printer to advance to 1st PP and 1st line on the next form.



Y32—Non-SCS, FF Valid

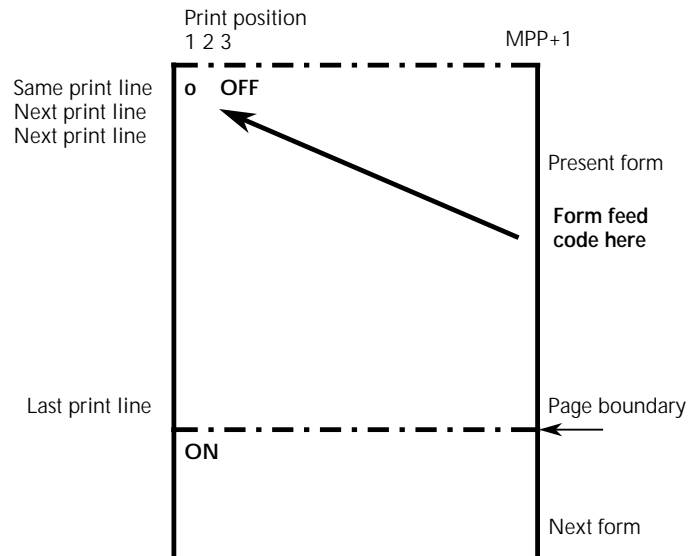
@Y32, n@

Implements an IBM RPQ. This function determines when the position of the Form Feed command affects its execution.

<i>n</i>	Values for <i>n</i> are:
0*	FF valid only at 1st Print Position in line or at Position MPP+1.
1	FF valid anywhere it occurs.

This option only affects DSC LU3 mode, a NON SCS printing, and corresponds with the IBM 3268 RPQ SC9506, IBM 3287 RPQ N/A, and the 4214 OPT 19=1.

Example @Y32, 1@ selects FF to be valid anywhere it occurs.



Y33—Non-SCS, Automatic Function at End of Job

@Y33, n@

Implements an IBM RPO and takes effect as soon as the command is received. This function determines the print position after the print buffer is completed or after an end of message is received. Settings different from the factory default is NOT recommended.

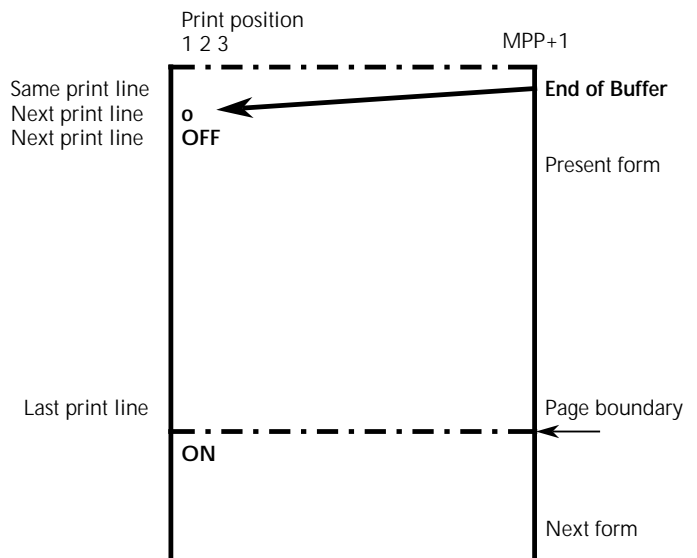
n	Values for <i>n</i> are: 0* A New Line (NL) is automatically executed when the printing of a buffer is completed unless the last command executed was a Form Feed (FF), New Line (NL), or a Carriage Return (CR). 1 A Form Feed is automatically executed when the printing of a buffer is completed, unless the last command executed was a FF.
----------	--

If *n* = 0, (default) is selected, on completion of the print buffer, an Automatic New Line is performed unless the last command executed was a Form Feed, or the last print position is at position 1. If Form Feed is the last character in the buffer, the end of printer buffer options (Y31) is checked.

If *n* = 1 is selected, on completion of the print buffer, an Automatic Form Feed is performed unless Form Feed was the last command in the buffer. The printer is set at print position 1 of the first line of the next page.

This option only affects NON SCS printing, and corresponds with the IBM 3268 RPO SC9507, and the IBM 3287 RPO SC3740.

Example @Y33, 1@ sets the printer to automatically issue a FF at the end of a print buffer.



Y34—Last LF on Page Sent as FF

@Y34, n@

Decides whether the last line feed on a page should be sent as a Form Feed or a line feed. This option, when enabled, counts the number of lines and generates a form feed when the line count equals the page length. Calculations are based on the page length, which can be set at the printer and overridden by the appropriate IBM command when operating in the SCS mode.

<i>n</i>	Values for <i>n</i> are:
0*	No (option disabled)
1*	Yes (option enabled), counts the lines when you use Function Y5—Set Default Page Length (MPL); and SCS Set Vertical Format (SVF) command.

The default is product dependent. Use 0 as the default for non page printers. Use 1 as the default for page printers, and when printing in duplex, and in conjunction with pending page layout (page boundary) select. All Line Feeds preceding this Form Feed command are suppressed.

Example @Y34, 1@ sends last LF as FF.

Y36—Suppress IBM Control Code

@Y36, n@

Suppresses all or some IBM control codes sent from the host system.

<i>n</i>	Values for <i>n</i> are:
0*	Respect all IBM control codes
1	Suppress all IBM control codes.
2	Suppress SCS pitch and line density commands (CPI and LPI). This value is reserved and is used only because of compatibility with old products.

If you decide to select $n = 1$, Suppress IBM control codes, you need to format documents by the sending of transparent control codes.

Y37—IBM Printer Emulation Select

@Y37, n@

Selects IBM printer emulation.

<i>n</i>	Values for <i>n</i> are:
	0 3287/4214 emulation
	1* 3268 emulation
	2 3268 emulation. All values X'00'—X'3F' are sent transparently with the exception of valid SCS codes (refer to Table 2-3).
	4 Transparent mode

Table 4-3. **Valid SCS codes**

Code	Command name	EBCDIC (Hex)
VCS	Vertical Channel Select ¹	04
HT	Horizontal Tab	05
GE	Graphic Escape	08
VT	Vertical Tab	0B
FF	Form Feed	0C
CR	Carriage Return	0D
ENP	Enable Print	14
NL	New Line	15
BS	Back Space	16
IRS	Interchange Record Separator	1E
INP	Inhibit Print	24
LF	Line Feed ²	25
SA	Set Attribute	28
ESC	SCS escape character (SHF, SVF, SLD, SCD)	2B
BEL	Bell	2F
TRN	Transparent	35

¹ In 3287 emulation, VCS commands are sent as Line Feeds. Unprintable characters appear as spaces.

² In 3268 emulation, as many LFs as required by the Select Vertical Format (SVF) command in use are sent. Unprintable characters appear as hyphens (-).

Example @Y37, 0@ sets 3287 VCS emulation.

Refer to the "Helpful hints" appendix for recommended settings to obtain a specific IBM printer emulation.

Y38—IBM Communication Feature (Query, EAB)

@Y38, *n*@

Enables query reply.

<i>n</i>	Values for <i>n</i> are:
0	Extended Attribute Buffer (EAB) but No Query Reply
1*	EAB and Query Reply enabled
2	No Query Reply and No EAB support

This function is only read at power up.

Example @Y38, 0@ disables query reply.

Refer to the "Helpful hints" appendix for recommended settings to obtain a specific IBM printer emulation.

Refer also to the "Query replies" appendix that explains in detail the available Query Replies available on the interface.

For this FSL Y38 function, refer to the "Printer Features," "Features," and "Extended ID" functions of the Printer Output Area (table D-2) in the "Coax communications buffer" appendix.

Y44—Suppress CR and SP to Same Position

@Y44, *n*@

Selects suppression of Carriage Returns (CRs) and Spaces (SPs).

<i>n</i>	Values for <i>n</i> are:
0	No suppression
1*	Suppression.

This function should be set to 1 if font downloading or escape sequences are being sent without the Special Transparent Feature, Multiple Paired Hex Transparent (ESC ESC) notation.

This function is used when transparent data to the printer is needed (font-download, overlays, etc.).

Example @Y44, 1@ selects suppression of CRs and Spaces to the same position.

Y46—Set IRQ Timer

@Y46, *n1* [, *n2*] [, *n3*]

Sets Intervention Required (IRQ) time, Hold Time Out, and Busy Time Out. This function takes effect as soon as the command is received.

<i>n1</i>	Values for <i>n1</i> are: 000 Never send IRQ 001 to 255 Send IRQ after <i>n1</i> x 5 seconds if printer error 12* Send IRQ after 1 minute
<i>n2</i>	Values for <i>n2</i> are: 000 Never send Hold Time Out 001 to 255 Send Hold Time Out after <i>n2</i> x 5 seconds if printer is in Stop mode. 120* Send hold time out after 10 minutes.
<i>n3</i>	Values for <i>n3</i> are: 000 Never send Busy Time Out 001 to 255 Send Busy Time Out after <i>n3</i> x 5 seconds if printer is busy. 120* Default, send busy time out after 20 minutes.

This function allows you to define the period of time between an event that has occurred requiring operator intervention and the sending of an IRQ timeout response to the host. The factory default is 12, which is one minute.

If the printer is put into a not ready state for more than 10 minutes, an IRQ occurs independent of this setting except when 'no IRQ' is selected.

The IRQ timeout is rounded up to the nearest minute.

Example @Y46, 036@ sets IRQ time for printer errors to 3 minutes.

Y47—ESC-Mode Selection

@Y47, n

or

@@!ascii ascii@

Sends hexadecimal (HEX) codes transparent to the printer, and selects Tel-a-graf support. This function takes effect as soon as it is received.

ASCII mode is definition PCL 5 and PostScript Level 2 commands sent directly to the printer.

n	<p>Valid values are:</p> <p>1* '@'XX' sent as 'XX' @@'XX' sent as 'XX' @@!ascii ascii@ sent as ascii.</p> <p>2 Tel-a-graf support @@'XX' sent as 'XX' @@!ascii ascii@ sent as ascii.</p> <p>3 '@'XX' sent as 'XX' @@'XX' sent as 'XX' @@!ascii ascii@ sent as ascii. @, @-@, @ sets Filter mode On @, @=@, @ sets Partial Filter mode On @,@+@,@ sets Filter mode Off</p> <p>In Tel-a-graf mode, the first two decimal digits after the escape character are used to determine the length of the string used.</p> <p>Filter mode is a special compatible feature for replacing protocol converters. The filter-modes suppress control codes or text.</p>
ASCII	Data in plain text

Example 1 @Y47,2@ selects a Tel-a-graf support.

Example 2 @02 41 42 sends HEX codes 41 42 to the printer.

Example 3 @@'1B'&11H@

This is another example of a command string. An apostrophe (') is used to enter ASCII mode.

Between the two leading and the trailing escape characters, all spaces, 3270 control codes, and the apostrophe character is ignored. They may be inserted in the data stream to make it more readable.

Y48—Set Permanent Escape

@Y48, 'n1'@ or **@Y48, <xx>@**

Selects the permanent escape character.

n1 or <xx>	Character for permanent escape character selected from the LU3 character table
xx = 0*	No escape character

Example 1 **@Y48, '>'@** sets the character > as permanent escape character. Subsequent FSL escape strings will then require > as escape character.

Example 2 **@Y48, ' '@, @Y48, 00@** clears the permanent escape character. No permanent escape character is used.

Y49—Restrict Access of Temporary and Permanent Settings

@Y49, n1 'password'@

Locks the settings stored in the temporary and permanent memory areas by disabling Function Selection via Line (FSL).

n	Values for <i>n</i> are: 0* Unlock FSL functions. 1 Lock the settings in temporary and permanent memory areas. 2 Lock the settings in permanent memory only.
----------	---

When *n* = 1 is selected, use *n* = 0 to enable FSL again. Refer to examples 1 and 2. Various levels (0, 1, and 2) are available, depending on your needs.

Note This FSL must be used with the Y249 and Y253 functions. Y249 is needed to enter engineering mode, and Y253 is needed to allow passwords.

Example 1 **@Y249, FOREST@**
@Y253, 1@
@Y49, 1, JET@ locks both the temporary and permanent memory areas with the password "JET" (if it has been installed).

Example 2 **@Y249, FOREST@**
@Y253, 1@
@Y49, 0, JET@ unlocks the memory areas again.

Y50—FF After Time Elapse

@Y50, *n*@

Flushes the page if unprinted data remains in the print buffer for a specified elapsed time. This function has effect as soon as the command is received.

<i>n</i>	Values for <i>n</i> are: 0* Do not flush page 1 to 255 Flush page after x seconds.
-----------------	--

Make sure that this function is set to a value longer than is required for the system to generate and send the next buffer. In general, the host application generates a termination form feed and you need not change this function.

In Duplex mode, a command for select next page will be issued.

Example @Y50, 10@ sends Form Feed after 10 seconds if data remains in print buffer.

Y51—User Strings at Power Up

@Y51, <string number>@

Specifies the user strings that should be sent at power up.

0 to 7	One or more strings stated in the form (<i>n1</i>), (<i>n2</i>), . . . (<i>nx</i>) in ascending order.
---------------	--

- Remember**
- The string has to be defined in function Y61—Setup for User-defined Strings before it is sent by function Y51.
 - The interface may overwrite some of the settings set in the user string at power up.
 - The user string should not conflict with the IBM setup string defined in function Y62
 - The strings are sent in ascending order.

Example @Y51, 2, 5@ sends user strings 2 and 5 to the printer after FSL Y61 defines the string.

Y57—User-defined String Before Local Copy

@Y57, <string number>@

Sets up the printer before local copy.

0 to 7	One or more strings indicated on the form (n1), (n2), . . . (nx) in ascending sequence.
---------------	---

This function only affects operator initiated local copy, and not host initiated copy. This function only affects local copy from CUT screen terminals, and not from DFT terminals.

CUT screens are screen dumps in non-SCS, while Distributed Function Terminal (DFT) screens are new screen dump in SCS.

This function is only used due to compatibility with older products.

Example **@Y57, 3, 5@** sends user strings 3 and 5 to the printer before local copy.

Y58—User-defined String After Local Copy

@Y58, <string number>@

Sets up the printer after local copy.

0 to 7	One or more strings indicated on the form (n1), (n2), . . . (nx) in ascending sequence.
---------------	---

This function only affects operator initiated local copy, and not host initiated copy. This function only affects local copy from CUT screen terminals, and not from DFT terminals. These strings are defined by Y61—Setup for User-defined Strings.

This function is only used due to compatibility with older products.

Example **@Y58, 2, 4@** sends user strings 2 and 4 to the printer after local copy.

Y59—Bar Code Definition

**@Y59, <Def. no.>, <Bar code type>, <Height>
{,<Expansion>}@**

Defines the bar code generated by function *Wn*. Up to eight bar codes are defined and selected for use with function *W*—Print Bar Code.

<Def. no.>	Numeric value from 1 to 8 specifying the bar code number
<Bar Code type>	<p>Bar Code type is a 2-digit number. The valid values for the first digit are:</p> <p>3X Bar code with no alphanumeric characters printed under the bar code</p> <p>2X Bar code with alphanumeric characters printed under the bar code. Text will be printed with the resident font in 10 CPI.</p> <p>The valid values for the second digit are:</p> <p>X2 EAN 89, EAN13 & UPC-A 7 data: check digit 8 is included. EAN8 8 data: check digit 8 is check digit. EAN8 11 data: check digit 12 is included. UPC-A 12 data: check digit 13 is included. EAN13 13 data: check digit 13 is checked. EAN13</p> <p>X3 2 of 5 interleaved</p> <p>X4 2 of 5 industrial</p> <p>X5 Codabar</p> <p>X6 MSI, check digit must be supplied by the system.</p> <p>X8 Plessey, check digit must be supplied by the system.</p> <p>X9 3 of 9, Both fine and medium are supported depending on expansion.</p>
<Height>	Bar code height in lines, value from 1—255 (using 9 LPI).
<Expansion>	<p>Horizontal expansion factor that selects values from 1 to 32. This value is optional. Default is 1.</p> <p>The expansion resolution is enhanced where the integer expansion factor can be added by a fraction of 1 to 7. (Example, expansion = 2.3)</p>

Remember

- The bar code definition must be sent BEFORE the W—Bar Code Printout command is used.
- Many bar codes include checkdigits.
- Text under the bar code is printed with the resident font.
- As soon as the bar code is defined, it can be activated.
- Start, stop, and center codes are generated automatically.

Bar code types (second digit) explained

UPC and EAN (X2)

- If 7 characters are received, an EAN8 checkdigit is calculated and generated.
- If 8 characters are received, an EAN8 checkdigit is calculated and compared to the 8th digit.
-

- You must insert the checkdigit for this code as it is not uniquely specified.
- Start, stop, and center codes are generated automatically.

3 of 9 (X9)

- Have alphanumeric characters, automatic checking, and variable length with no checkdigits.
- You may insert the start and stop codes, but if you choose not to do the insertion of the start and stop codes, these codes are generated automatically. Both the start code and the stop code are represented by an asterisk (*).

Example @Y59, 1, 29, 9, 2@ @W1, LaserJet@

This example defines bar code 1 to be a 3 of 9 bar code, numeric, and alphanumeric characters with text printed under the bar code, followed by the W command that sends data to the printer.

The bar code height is 9 lines in 9 lpi = 1"

Expansion is set to 2.

Y60—Font Link for GFIDs

@Y60, n1, n2@

Assigns a font, specified by its Global Font Identifier (GFID), to the pitch value selection in Function Y3—Set Default CPI, or from the system.

<i>n1</i> <i>n2</i>	Values for <i>n1</i> = Pitch, and <i>n2</i> = GFID are:	
	<i>n1</i> = Pitch	<i>n2</i> = GFID
	0 CPI	Nothing is defined.
	5 CPI	244
	10 CPI	11
	12 CPI	80
	15 CPI	223
	17.1 (16.1) CPI	253
	PROPORTIONAL	1412
	13.3 CPI	204
	20 CPI	281
	27 CPI	290

If the pitch is also defined in function Y62—Setup for IBM-defined Strings, then function Y3 refers to the value in function Y62 and ignores function Y60. The link between the pitch and GFID exists as soon as function Y60 is received.

Default is dependent on the type of printer.

Refer to the GFID Table 3-3 for the equivalent Pitch.

Refer also to the FSL "Y3—Set Default CPI" section.

Table 3-3. **GFID = Pitch equivalence**

GFID	Pitch
1—65	10 CPI
66—153	12 CPI
154—200	Proportional Spaced Mode (PSM)
201—210	13.3 CPI
211—239	15 CPI
240—246	5 CPI
247—257	17.1 CPI (16.7 CPI)
258—259	18 CPI
260—273	8.55 CPI
274—279	17.1 CPI
280—284	20 CPI
285—289	25 CPI
290—299	27 CPI
400—65535	Typographic

You must specify a GFID when you specify a pitch or the protocol converter selects one of the printer GFID defaults.

Special fonts are selected in Computer Output Reduction (COR), depending on the current CPI and font width.

Table 3-4 shows original pitch and selected pitch.

Table 3-4. Pitch choices

Original pitch	Selected pitch
< / = 8.55 CPI	10 CPI
> 8.55—10 CPI	13.3 CPI
> 10—13.3 CPI	15 CPI
> 13.3—17.1 CPI	20 CPI
> 17.1 CPI	27 CPI
Typographic	15 CPI

Example 1 @Y60, 10, 18@ sets a link so 10 CPI selection using FSL Y3 or SCS are mapped to GFID 18.

Example 2 @Y60, 16, 253@ sets a link so 16.7/17.1 CPI selections using FSL Y3 or SCS are mapped to GFID 253.

Y61—Setup for User-defined Strings

@Y61, *n*, <string>@

Allows you to define up to eight user strings.

< <i>n</i> >	User-string ID number (0—7) The ID 6 is reserved for begin Advanced Function Presentation (AFP) print job. The ID 7 is reserved for terminate Advanced Function Presentation (AFP) print job.
<string>	User string contents in Hexadecimal (HEX) or characters with apostrophe notation

- Remember**
- If the strings selected under function Y51 are not programmed, no data is sent.
 - The apostrophe escape notation or HEX can be used in the programming of this function.
 - The separator must be a comma except for HEX data.
 - The length of a user string is limited by the size of the free user area in the nonvolatile memory. The actual size of the free user area is specified in the test print out.
 - When using Advance Function Printing (AFP), user string 6 and 7 are reserved.

Example 1 @Y61, 1, 1B, 34@ defines the user string 1 as 1B 34 HEX.

Example 2 **@Y61, 5, '1B'*c300A*c30B'1B'*c0P@**

In example 2, a user string with the ID of 5 is defined. The user string specifies a rule, 300 dots wide and 30 dots high, and prints it.

Example 3 **@Y61, n@** deletes a user string.

Example 4 Sending a user string is done with a Z function as follows:

@Zn where *n* is the string ID number from 0—8.

Y62—Setup for IBM-defined Strings

@Y62, n, <string>@)

defines the strings sent to the printer when a SNA Character String (SCS) or a Function Selection via Line (FSL) command is received. The parameter *n* has two alternative values for some strings, and are included for backwards compatibility with current interface boxes available from the Xerox Connection. The string entered should be a PCL string that performs the function associated with the particular SCS command.

<n>	User-string ID number (00—FF)																				
<p><string></p>	User string contents in Hexadecimal (HEX) or characters with apostrophe notation																				
	<table border="0"> <thead> <tr> <th># String:</th> <th>Choice for:</th> <th>PCL String:</th> </tr> </thead> <tbody> <tr> <td>*24</td> <td></td> <td>Format for Y10=2 optional</td> </tr> <tr> <td>*25</td> <td></td> <td>Format for Y10=3 optional</td> </tr> <tr> <td>LPI</td> <td> *101 3 LPI *102 4 LPI *103 (1) 6 LPI *104 (2) 8 LPI *105 9 LPI *106 72 LPI *107 8.83 LPI *108 11.80 LPI *109 Reserved (Variable LPI) </td> <td></td> </tr> <tr> <td>CPI</td> <td> *110 Proportional Spacing *111 (28) 5 CPI *112 (3) 10 CPI *113 (4) 12 CPI *114 (5) 15 CPI *115 13.3 CPI *116 (6) 16.7/17.1 CPI *117 20 CPI *118 27 CPI *119 8.55 CPI </td> <td></td> </tr> <tr> <td>Paper Feed</td> <td> 120 (19) Tractor Feed +121 (26) Envelope +123 (27) Manual Cut-Sheet Feeder 124 Jog +125 (20) Drawer 1 +126 (21) Drawer 2 127 (29) Drawer 3 128 Load paper 129 Eject paper </td> <td></td> </tr> <tr> <td>Attributes</td> <td> +130 (22) Bold On +131 (23) Bold Off +132 (7) Underscore On +133 (8) Underscore Off 134 Italics On 135 Italics Off 138 Bold Offset On 139 Bold Offset Off </td> <td></td> </tr> </tbody> </table>	# String:	Choice for:	PCL String:	*24		Format for Y10=2 optional	*25		Format for Y10=3 optional	LPI	*101 3 LPI *102 4 LPI *103 (1) 6 LPI *104 (2) 8 LPI *105 9 LPI *106 72 LPI *107 8.83 LPI *108 11.80 LPI *109 Reserved (Variable LPI)		CPI	*110 Proportional Spacing *111 (28) 5 CPI *112 (3) 10 CPI *113 (4) 12 CPI *114 (5) 15 CPI *115 13.3 CPI *116 (6) 16.7/17.1 CPI *117 20 CPI *118 27 CPI *119 8.55 CPI		Paper Feed	120 (19) Tractor Feed +121 (26) Envelope +123 (27) Manual Cut-Sheet Feeder 124 Jog +125 (20) Drawer 1 +126 (21) Drawer 2 127 (29) Drawer 3 128 Load paper 129 Eject paper		Attributes	+130 (22) Bold On +131 (23) Bold Off +132 (7) Underscore On +133 (8) Underscore Off 134 Italics On 135 Italics Off 138 Bold Offset On 139 Bold Offset Off
# String:	Choice for:	PCL String:																			
*24		Format for Y10=2 optional																			
*25		Format for Y10=3 optional																			
LPI	*101 3 LPI *102 4 LPI *103 (1) 6 LPI *104 (2) 8 LPI *105 9 LPI *106 72 LPI *107 8.83 LPI *108 11.80 LPI *109 Reserved (Variable LPI)																				
CPI	*110 Proportional Spacing *111 (28) 5 CPI *112 (3) 10 CPI *113 (4) 12 CPI *114 (5) 15 CPI *115 13.3 CPI *116 (6) 16.7/17.1 CPI *117 20 CPI *118 27 CPI *119 8.55 CPI																				
Paper Feed	120 (19) Tractor Feed +121 (26) Envelope +123 (27) Manual Cut-Sheet Feeder 124 Jog +125 (20) Drawer 1 +126 (21) Drawer 2 127 (29) Drawer 3 128 Load paper 129 Eject paper																				
Attributes	+130 (22) Bold On +131 (23) Bold Off +132 (7) Underscore On +133 (8) Underscore Off 134 Italics On 135 Italics Off 138 Bold Offset On 139 Bold Offset Off																				

<n>	User-string ID number (00—FF)
<string>	User string contents in Hexadecimal (HEX) or characters with apostrophe notation
Quality	*140 (17) Draft *141 (18) Near Letter Quality *142 Correspondence
Character	146 0 degree (Portrait) 147 90 degree (Landscape)
Orientation	148 180 degree (Portrait) 149 270 degree (Landscape)
Page orientation	*150 0 degree (Portrait) *151 90 degree (Landscape) *152 180 degree (Portrait) *153 270 degree (Landscape)
Color	160 Color default 161 (10) Blue 162 (11) Red 163 (12) Pink 164 (13) Green 165 (14) Turquoise 166 (15) Yellow 167 White 168 (9) Black 169 Dark Blue 170 Orange 171 Purple 172 Dark Green 173 Dark Turquoise 174 Mustard 175 Grey 176 Brown 177 Neutral 178 (16) Multicolor
Page strings	180 (Variable form length) 181 (Executive, 7.25" x 10.5") 183 (Letter, 8.5" x 11") 187 (Legal, 8.5" x 14") 189 (A4, 210mm x 297mm) Default for Europe 191 (Letter, Monarch, 7 3/4, Envelope 3 7/8" x 7 1/2") 193 (Business, Com 10, Envelope 4 1/8" x 9 1/2") 195 International DL, Envelope 110mm x 220mm)

<n>	User-string ID number (00—FF)	
Page strings cont'd.	197	(International C5, Envelope 162mm x 229mm)
	198	(Comm Envelope 98.4mm x 257mm)
	199	(B5, Envelope 176mm x 250mm)
	200	(B5, 182mm x 257mm)
	201	(A3, 297mm x 420mm)
	202	(U.S. Ledger 11" x 17")
	203	(A5, 136mm x 209mm)
	204	(B4, 257mm x 364mm)
	205	(Half Letter 5.5" x 8.5")
	206	(U.S. Legal 13" - 8.5" x 13")
Cursor position	207	(215 x 315)
	210	Reserved (Relative horizontal)
	211	Reserved (Absolute horizontal)
	212	Reserved (Relative vertical)
213	Reserved (Absolute vertical)	
Graphic strings	220	LAC 10 CPI
	221	LAC 15 CPI
Font handling	230	Reserved (Variable Point Size)
	240	Reserved (Set Pitch)
HMI	*241	HMI for 5 CPI
	*242	HMI for 10 CPI
	*243	HMI for 12 CPI
	*244	HMI for 15 CPI
	*245	HMI for 13.3 CPI
	*246	HMI for 16.7 CPI
	*247	HMI for 20 CPI
	*248	HMI for 27 CPI
	260	Reserved (Variable typeface)
Page presentation	+270	Simplex printing
	+271	Duplex short edge printing
	+272	Duplex long edge printing
	+273	Duplex print page shift
	+280	Line wrap
	+281	Line cut
Related	Function 02, Default LPI	
	Function 03, Default CPI	
	Function 09, Font Select	
	Function 10, Default orientation	
	Function 11, Paper Path	
	Function 22, Printer Driver select	
	Function 91, GFID Font definition	
	Function 97, User GFID/Font select	

The maximum length of a string is 255 characters. You must define the strings, if needed.

Use the apostrophe escape notation to program this function if you do not need the Escape character.

Programming a string where the ID number is marked with an '*' causes the I/F to change to USER mode and all default strings are disabled except where marked with a '+'.
 To return to AUTO mode for a particular USER mode string (marked *) the string is defined with no parameters.

Example 1

@Y62, 103, 1B'&1#C'@	Defines 6 LPI
@Y62, 104, 1B'&1#C'@	Defines 8 LPI
@Y62, 102, 1B'&1#C'@	Defines 4 LPI
@Y62, 112, 1B'&k#H'@	Defines 10 CPI
@Y62, 113, 1B'&k#H'@	Defines 12 CPI
@Y62, 114, 1B'&k#H'@	Defines 15 CPI
@Y62, 130, 1B'(s3B'@	Begin Bold
@Y62, 131, 1B'(s0B'@	End Bold
@Y62, 132, 1B'&d0D'@	Begin Underscore
@Y62, 133, 1B'&d'@	End Underscore

To disable a string, end the FSL after the string number. Refer to example 2.

Example 2 @Y62, 130@ disables string number 130.

Y71—Create Translate Table

@Y71,<table number>@

Although all translate tables are created at power up, this function is only included due to compatibility with older products and is ignored.

Y72—Reset Translate Table

@Y72,<table number>@

Clears translate table changes, deletes a specified translate table, and resets translate tables to default.

<table number>	Number that clears the indicated translate table change to preserve memory in ranges 1 to 8
-----------------------------	---

Example @Y72, 2@ resets Table 2.

Y73—Select Translate Table

@Y73,<table number>@

Causes the specified translate table to become active. To modify a table, it must be active. The translate tables are illustrated in tables A-1 through A-8 in the appendix.

The modification done by function Y75 (modify translate table) is performed on the translate table that is selected with Y73.

Example @Y73, 2@ selects the Codepage 500 to PC 8 translate table.

<table number>	Number that identifies the translate table in ranges 1 to 8. 1 Codepage 500 to Roman 8. 2 Codepage 500 to PC 8. 3 Codepage 500 to ECMA. 4 Codepage 259 to PC 8 (Box characters for drawing only). 5 Codepage 500 to ASCII 7 Bit. 6 Codepage 500 to OCR A (Equivalent to PCL translate table 1) 7 Codepage 500 to OCR B (Equivalent to PCL translate table 1) 8 Codepage 500 to PC 850.
-----------------------------	--

Y74—Define Symbol Set String

@Y74,<string no.>,<HEXdata>@

Selects symbol sets in the printer in association with function Y75, Overwrite Translate Table.

<user-defined>	Setup for symbol set select string on the form: <string no.>, <HEXdata> Number that identifies the symbol set string in ranges 1 to 8.
-----------------------------	--

Remember Zero (0) does not change symbol set.

Example **@Y74, 01, 1B283855@** defines symbol set 00 to be Roman 8 on a Hewlett-Packard PCL Level 4 printer.

Y75—Overwrite Translate Table

@Y75, n1, n2, <data> {:n1,n2, <data>}@

Matches the printers character table. Changes are made in the currently selected translate table.

Modifies entries in the active customized translate table. The modifications become active immediately and are stored directly in nonvolatile memory (NVM). Up to eight characters may be defined for each code point.

n1	Position of the character to be translated with valid values of X'00'—X'BF'
n2	Selected Symbol Set with valid values of 1—8
<data>	Data is the hexadecimal value required to print the character.

You need to select the translate table first before you can use this FSL Y75 command. Therefore, use FSL Y73 or FSL Y91 before you use this FSL function Y75.

The preferred method of selecting the translate table is to use FSL Y91 as this function not only specifies the translate table, but gives vital information on the font selection such as point size, typeface, symbol set, and attribute.

Overwrite methods available

- Change a single character.
- Change a series of characters.
- Make a multistrike character.

More than one code point may be defined at the same time with the semicolon (;) and colon (:) delimiters as follows:

- A semicolon denotes that the next number is an ASCII HEX value that is placed in the next consecutive address in the table.
- A colon separates successive code point translations. It denotes that the next number in a series of numbers is an address in the table.

Example 1 **@Y75,BC, 9C@** defines the character A in address BC to be ASCII value 9C.

Example 2 **@Y75, BB, 4F, 08, 2F@** defines the address BB to be a multistrike character made up of the ASCII values 4F 08 2F (O, backspace, /).

Example 3 **@Y75, A0, 90; 91; 92@** defines the addresses A0 A1 A2 to be the ASCII values 90 91 92 respectively.

Example 4 **@Y75, 1C, 9C : 2B, 15@** defines the address 1C to be ASCII value 9C and the address 2B to be the ASCII value 15.

Example 5 **@Y75, 17, 7D; 3F; 21; 53, 08, 7C : 3B. F7@** defines the address 17 to be the ASCII value 7D, the address 18 to be the ASCII value 3F, and the address 19 to be the ASCII value 21 - followed by the address 1A defined as a multistrike character made up of ASCII values 53 08 7C. Finally, the address 3B is defined to be the ASCII value F7

Y76—Create APL Translate Table

@Y76,<table number>@

Although all translate tables are created at power up, this function is only included due to compatibility with old products.

Y77—Reset APL Translate Table

@Y77,<table number>@

Clears all APL translate table changes, deletes a specified APL translate table, and resets APL translate tables to default.

<table number>	Number that deletes the indicated APL translate table change to preserve memory in ranges 1 to 8.
-----------------------------	---

Example @Y77, 2@ resets Table 2.

Y78—Select APL Translate Table

@Y78,<table number>@

Selects the APL translate table, and causes the specified APL translate table to become the *active* translate table. Before modifying a table, it must be selected as the active translate table.

<table number>	Number that selects the APL translate table in use in ranges 1 to 8.
-----------------------------	--

The modification done by function Y80 is performed on the selected APL translate table.

Example @Y78, 2@ selects APL table 2.

Y80—Overwrite APL Translate Table

@Y80, n1, n2, <data> [: n1, n2, <data>]@

Matches the APL character table of the printer. Changes are made in the current selected translate table. The function modifies entries in the active customized translate table. The modifications become active immediately and are stored directly in nonvolatile memory (NVM). Up to eight characters may be defined for each code point.

n1	Position of the character to be translated with valid values of X'30'—X'BF'
n2	Selected Symbol Set with valid values of 1—8
<data>	Data is the hexadecimal value required to print the character.

Overwrite methods available

- Change a single character.
- Change a series of characters.
- Make a multistrike character.

More than one code point may be defined at the same time with the semicolon (;) and colon (:) delimiters as follows:

- A semicolon denotes that the next number is an ASCII hexadecimal value that is placed in the next consecutive address in the table.
- A colon separates successive code point translations. It denotes that the next number in a series of numbers is an address in the table.

Example 1 **@Y80,BC, 9C@** defines the character A in address BC to be ASCII value 9C.

Example 2 **@Y80, BB, 4F, 08, 2F@** defines the address BB to be a multistrike character made up of the ASCII values 4F 08 2F (O, backspace, /).

Example 3 **@Y80, A0, 90; 91; 92@** defines the addresses A0 A1 A2 to be the ASCII values 90 91 92 respectively.

Example 4 **@Y80, 1C, 9C : 2B, 15@** defines the address 1C to be ASCII value 9C and the address 2B to be the ASCII value 15.

Example 5 **@Y80, 17, 7D; 3F; 21; 53, 08, 7C : 3B. F7@** defines the address 17 to be the ASCII value 7D, the address 18 to be the ASCII value 3F, and the address 19 to be the ASCII value 21 - followed by the address 1A defined as a multistrike character made up of ASCII values 53 08 7C. Finally, the address 3B is defined to be the ASCII value F7.

Y88—Define Page Offset

@Y88 <n1>, <n2> {,n3}@

Positions the logical page on the physical page. (Refer to the "Page Orientation algorithm" section in this chapter.)

n1	0 to +/- 32000 horizontal margin compensation in 1/1440 inch. Default value is 0.
n2	0 to +/- 32000 vertical margin compensation in 1/1440 inch. Default value is 0.
n3	Orientation as specified in FSL Y10—Set Page Format. Valid values are 0 to 9. The valid value for Advanced Function Printing (AFP) is 20.

Remember

- If n3 is not specified, the n1 and n2 values apply to all orientations.
- If Y88 is placed as the first printable data on the page, it has immediate effect. If the command is placed at any other position on the page, the function has effect on the next page.
- This function must be enabled using Y89.

Example 1

@Y88, -144, -240, 1@ selects the left margin to be negatively offset 144/1440" (=1 character to the left in 10 CPI), top margin to be negatively offset 240/1440" (=1 line towards the top in 6 LPI) with orientation as specified in FSL Y10: n1 = 1.

Example 2

@Y88, 576, 480, 0@ selects left margin to be offset 576/1440" (=4 characters to the right in 10 CPI), top margin to be offset 480/1440" (=2 lines down in 6 LPI) with orientation as specified in FSL 10: n1 = 0 (Portrait, no compression).

Y89—Enable Page Offset

@Y89, n1 {,n2}@

Compensates the physical left margin offset on laser printers that have physical left margin limits.

If this function is deactivated, you may experience some data loss in the left margin.

All characters between the left and the physical left margin will be printed on the first position of the physical left margin.

<i>n1</i>	<p>0* Function is deactivated from next page boundary. Positioning is physical left margin 2/10".</p> <p>1 Function is activated from next page boundary. Positioning is equal to IBM printers. Compensation for the physical left margin is always on.</p>														
<i>n2</i>	<p>Valid values are:</p> <table style="margin-left: 20px;"> <tr><td>1</td><td>Ignored</td></tr> <tr><td>2</td><td>Tray 1</td></tr> <tr><td>3</td><td>Tray 3</td></tr> <tr><td>4</td><td>Manual feed</td></tr> <tr><td>5</td><td>Tray 2</td></tr> <tr><td>6</td><td>Tray 4</td></tr> <tr><td>7-255</td><td>Reserved (optional feeder).</td></tr> </table> <p>Data <i>n2</i> is optional. If no <i>n2</i> is defined, all trays are selected.</p>	1	Ignored	2	Tray 1	3	Tray 3	4	Manual feed	5	Tray 2	6	Tray 4	7-255	Reserved (optional feeder).
1	Ignored														
2	Tray 1														
3	Tray 3														
4	Manual feed														
5	Tray 2														
6	Tray 4														
7-255	Reserved (optional feeder).														

Y90—Define User Escape String

@Y90, <n1>, <n2>@

Defines a number of escape sequences (ESC) followed by a HEX number from (X'01' to X'FF'), 1 to 255 (in decimals) to be substituted by a string. It is in effect as soon as it is received.

<i>n1</i>	<p>User escape string number with valid values as follows:</p> <table style="margin-left: 20px;"> <tr><td>00</td><td>Erases strings.</td></tr> <tr><td>01 to FF</td><td>Hexadecimal user escape string number in this format: ESC Y90, <No. in HEX>, {string}: . . . : <No. in Hex>, {string} ESC</td></tr> </table>	00	Erases strings.	01 to FF	Hexadecimal user escape string number in this format: ESC Y90, <No. in HEX>, {string}: . . . : <No. in Hex>, {string} ESC
00	Erases strings.				
01 to FF	Hexadecimal user escape string number in this format: ESC Y90, <No. in HEX>, {string}: . . . : <No. in Hex>, {string} ESC				
<i>n2</i>	User escape string or text string in apostrophe notation				

The maximum length of the ESC string is 255 bytes.

The escape sequence number must be stated in hexadecimal. The strings substituting the short escape sequence are treated as if sent using the Function Selection via Line.

The user escape strings may be used for several purposes:

- A short escape sequence (consisting of the escape character and a number) may be substituted by a string. This string can be made up of one or more escape sequences. These escape sequence strings may then be used to change the setup of the printer.
- The short escape sequence may also be substituted by a text string to be inserted in the text. However, this method is not recommended, as the result is not always predictable.

Any result achievable by the use of other functions may also be carried out by the use of this function.

A colon denotes that the next number is the HEX code number applied to the following escape sequence.

You can have two levels of macros.

Example @Y90, 1A, 'ABCD' :8F, '@Y8, 4@' @ exchanges future occurrences of @1A with ABCD. The rest of the sequence :8F, @Y8, 4@ exchanges future occurrences of @8F with @Y8, 4@ which sets default code pages.

Y91—GFID/Font Select Setup

@Y91, n1, n2, n3, n4, n5 {,n6}@

Specifies the relationship between IBM Global Font Identifiers (GFIDs) and the internally defined fonts. It sets the parameters for Attributes (that is, bold and italics), Symbol Set, and Point Size. It is possible to define up to 16 GFID/font specifications this way.

Note: (Y91, Y92, Y93, Y94) are not required unless you want to change the GFIDs and/or internally defined fonts provided as default with this interface. More information is in the "Font selection via FSL in Coax" section in Chapter 4.

n1	IBM GFID Number with valid values from 1—65535
n2	Typeface with valid values from 0—255. The possible typefaces 0—255 are used as part of the preprogrammed typeface command for the relevant printer driver.
n3	Attributes with valid values from 0—255. The possible Attribute values are: <ul style="list-style-type: none"> 0 Remove all current attributes 1 Bold 2 Italics 3 Bold and Italics 4 Proportional Font 5 Proportional Font Bold 6 Proportional Font Italics 7 Proportional Font Bold and Italics 16 Reserved (Shaded) 32 Reserved (Inverse)

When a Y91 specified GFID is received, the following is verified: If Y92 Point Size String is defined, this is sent. If Y92 is not defined, the point size defined in Y91 is sent. (Refer to "Y92—Point Size Strings" section.)

If you use the compatibility font set, the relationship between font and the Global Font ID (GFID) is provided, hence, the appropriate font is selected in GFID. Refer to "Font support and selection" chapter for detailed information on GFIDs, and a description of the interaction of Y91, Y92, Y93 and Y94.

Refer also to the "IBM GFID to PCL fonts attribute" appendix for PCL fonts and their equivalent IBM GFIDs.

<i>n4</i>	Symbol set can be 0—7 depending on the printer.																								
<i>n5</i>	<p>Point size is the GFID number in decimal between 1 to 65535.</p> <p>If a GFID over 399 is defined with a non-proportional attribute, then the horizontal spacing (HMI) is calculated by dividing GFID with 100 (GFID/100). The following gives the GFID/Pitch relationship:</p> <table style="margin-left: 40px;"> <thead> <tr> <th style="text-align: left;">GFID</th> <th style="text-align: left;">PITCH</th> </tr> </thead> <tbody> <tr><td>01— 65</td><td>10 CPI</td></tr> <tr><td>66—153</td><td>12 CPI</td></tr> <tr><td>154—200</td><td>PROPORTIONAL</td></tr> <tr><td>201—204</td><td>13.3 CPI</td></tr> <tr><td>211—239</td><td>15 CPI</td></tr> <tr><td>240—249</td><td>5 CPI</td></tr> <tr><td>250—259</td><td>17.1 CPI</td></tr> <tr><td>260—279</td><td>8.55 CPI</td></tr> <tr><td>281</td><td>20 CPI</td></tr> <tr><td>290</td><td>27 CPI</td></tr> <tr><td>400—65535</td><td>TYPOGRAPHIC</td></tr> </tbody> </table> <p>GFIDs 1—399: The point size is generally dependent on the pitch of the specific font.</p> <p>GFIDs 400—65535: The value <i>n5</i> is optional as the point size of the requested font is calculated from GFID divided by 100, rounded down to the nearest whole decimal.</p> <p>Under the specific circumstances where a monospaced type font is requested, the <i>n5</i> value is used to define the horizontal motion index (HMI) with which the font is printed.</p> <p>Typographic fonts, by definition, cannot be justified. If a specific font is selected in a pitch which is available on the installed cartridge, the printer uses another font in the selected pitch. Deleting a GFID definition is done by defining the GFID without any associated parameters, as shown.</p>	GFID	PITCH	01— 65	10 CPI	66—153	12 CPI	154—200	PROPORTIONAL	201—204	13.3 CPI	211—239	15 CPI	240—249	5 CPI	250—259	17.1 CPI	260—279	8.55 CPI	281	20 CPI	290	27 CPI	400—65535	TYPOGRAPHIC
GFID	PITCH																								
01— 65	10 CPI																								
66—153	12 CPI																								
154—200	PROPORTIONAL																								
201—204	13.3 CPI																								
211—239	15 CPI																								
240—249	5 CPI																								
250—259	17.1 CPI																								
260—279	8.55 CPI																								
281	20 CPI																								
290	27 CPI																								
400—65535	TYPOGRAPHIC																								
<i>n6</i>	Translate table with valid values from 1—8.																								

The user-defined string is a PCL sequence that selects point size (Y92), font attribute (Y93), and font typeface (Y94).

Example 1 @Y91, *n1*@ deletes a GFID definition.

Example 2 @Y91, 512, 4, 5, 5, 18@ is a syntax example in HP mode with the following settings:

IBM GFID No.:	IBM GFID 512
Typeface:	Typeface No. 4
Attributes:	Proportional Bold
Symbol Set:	Symbolset 5
Point Size:	Point Size 18

Example 3 `@Y91, 18, 0, 2, 1, 10@` is a syntax example in IBM Proprinter mode with the following settings:

IBM GFID No.:	IBM GFID 18
Typeface:	Typeface No. 0
Attributes:	Italic
Symbol Set:	Symbolset 1
Point Size:	Point Size 10

Y92—Point Size Strings

`@Y92, n1@`

Sets font point size in association with Function Y91, GFID/Font Select Setup.

<i>n1</i>	User-defined setup for point size select strings on the form <String No.>, <HEXdata>. The valid string values are 1 to 8.
------------------	---

Example `@Y92, 01, 1B2873313056@` sets the point size to 10.

Refer to the “IBM GFID to PCL fonts attribute” appendix to determine the point sizes for individual font names.

Y93—Attribute Strings

`@Y93, n1@`

Sets font attributes in association with Function Y91, GFID/Font Select Setup.

<i>n1</i>	User-defined setup for attribute select strings on the form <String No.>, <HEXdata>. The valid string values are 1 to 8.
------------------	--

Example `@Y93, 01, 1B28733342@` requests the bold attribute.

Refer to the “IBM GFID to PCL fonts attribute” appendix to determine the symbol sets for individual font names.

Y94—Typeface Strings

`@Y94 n1@`

Sets font typeface in association with Function Y91—GFID/Font Select Setup.

<i>n1</i>	User-defined setup for symbol set select strings on the form <String No.>, <HEXdata>. The valid string values are 1 to 8.
------------------	---

Refer also to the “IBM GFID to PCL fonts attribute” appendix for typefaces given for individual font names.

Example **@Y94, 01, 1B28733354@** selects the Courier typeface.

Remember You do not actually need FSL Y92 through Y94 in order to support FSL Y91—GFID/Font Select Setup since the PCL strings for point size, attribute, symbol set, and typeface are generated by algorithm.

Y96—GFID Select

@Y96, <GFID>@

Allows you to change fonts in application software without a font change facility. Thus you access all fonts available in the attached printer.

The host system processes the data as normal printable characters, whereas the command string is interpreted by the printer as a font change request.

<GFID>	Global Font Identifier expressed in decimal in the range of 1 to 65535.
---------------------	---

This function cannot be saved in nonvolatile memory.

Refer to the “Configuration and Resource Utility” and “Font support and selection” chapters for more information on fonts.

Example **@Y96, 255@** selects a 17-pitch Letter Gothic font.

Y98—Enable Automatic Page Orientation (APO) Support

@Y98, n1, [n2]@

activates or deactivates the automatic page orientation function for the trays. This function allows you to choose between tray orientations based upon the commands received from the host or based upon the orientation set by the default tray orientation. The factory default is disabled.

There are two parameters in this function.

<i>n1</i>	<p>Valid values are:</p> <p>0* Enable APO 1 Disable APO.</p> <p>For all <i>n1</i> values > 0, disable is selected. The default for coax interface is <i>n1</i> = 1.</p>
<i>n2</i>	<p>Valid values are:</p> <p>1 Ignored 2 Tray 1 3 Tray 3 4 Manual feed 5 Tray 2 6 Tray 4 7-255 Reserved (optional feeder).</p> <p>Factory default for <i>n2</i> is all trays selected except <i>n2</i> = 5 is for tray 2.</p>

Example @Y98, 0, 2@ enables Automatic Page Orientation for tray 1.

Y100—Printer Share String and Timer

@Y100, *n1* {, *n2*}@

Selects timeout for the actual input, and defines the user string to be sent to the printer before data transmission.

<i>n1</i> timeout	<p>This is the timeout with numeric value between 0 and 255. Increments are, approximately, in steps of 1 second duration.</p> <p>Your Xerox MRP Family printer has a default of 20 (approximately 20 seconds). The <i>n1</i> = 0 enables i/f to always send the share string when entering Centronics mode.</p>
<i>n2</i> string	<p>If this optional parameter is defined, the string is sent to the printer before data transmission, when selected by the share unit.</p> <p>Factory default is no string (optional).</p>

This function has immediate effect. It is saved using function X1—Store Settings in Permanent Storage.

Y119—Enable/disable automatic paper size configuration

@Y119, n@

Enables or disables Automatic Papersize Configuration logic.

n	The valid values are: 0 Disables the Automatic Papersize Configuration logic. 1 Reserved for future use 2 Enables the Automatic Papersize Configuration logic.
----------	---

Remember: Do not disable Automatic Papersize Configuration if you have the IPDS option installed.

Example @Y119, 2@ enables Automatic Papersize Configuration logic.

Y120—Setting Printout at Power Up

@Y120, n1@

Prints out the current settings when the printer is powered up.

n1	The valid values are: 0 No printout requested 1* Printout requested
-----------	---

Refer also to FSL commands T2—Online Hex Dump, and T4—Printout Settings that print out current settings on your printer.

Refer also to FSL commands T2—Online Hex Dump, and T4—Printout Settings that print out current settings on your printer.

Y249—Enter Engineering Mode

@Y249, n@

Enables the rest of the engineering functions and FSL setup using Centronic/RS 232 input.

n	Represents the password FOREST.
----------	---------------------------------

The engineering switch function will be enabled after receiving the password using this FSL Y249 command.

Remember This is strictly an engineering function.

Y253—Allow passwords

@Y253, n1, [n2]@

allows the use of passwords to be used in conjunction with FSL Y49. This FSL is only enabled in engineering mode (see Y249).

<i>n</i>	Values for <i>n</i> are:
	0 Disable the use of passwords
	1 Allow passwords

Example Refer to the example used for Y49 in this document.

Z—Send User-defined Strings

@Zn

Sends user-defined strings. This function sends a user-defined PCL command directly to the printer.

<i>n</i>	Number from 1 to 8 indicating the user-defined string.
----------	--

Page layout functions

In PCL, various FSL functions influence page layout and the functions for all tray configurations. The settings of these functions interrelate to a wide extent which is why you must consider them together when using the FSL commands.

These FSL functions are as follows:

- Y10—Set Page Format
- Y11—Set Default Paper Path
- Y12—Set Default Paper Size
- Y13—Set Wrap/Cut Option at Physical Page Size
- Y19—Set Simplex / Duplex
- Y88—Define Page Offset
- Y89—Enable Page Offset
- Y98—Enable Automatic Page Orientation (APO) Support.

For a more detailed description of these FSL functions, refer to the "Command descriptions" section.

Placing commands in the data stream

If you put the function code as the first printable character on a page or as the very last character on the previous page, the changed layout is in effect as soon as the printer receives the command, that is, on the next page to be printed.

If you put the function code at any other position on the page, the change takes effect on the next page. This means that on a font change, for instance, a font change cannot be executed on

a page if a page format change code has been placed before the font change.

Blanks, margin settings, and SCS commands are not treated as printable characters.

Remember Discrepancies between the logical page commands (MPP, MPL) and the physical page size (A4, orientation, etc.) may result in printing problems.

Page Orientation algorithm

Page orientation commands define the orientation of the printed pages. The final orientation of the output depends on the factors listed by priority below:

- If a Host Orientation command was received
- If Auto Tray Orientation was selected
- The default orientation of the current tray
- If the page size parameters are valid
- If draft or letter quality was selected.

For all coax printer emulations, the print quality is always draft. Draft is the default at power up.

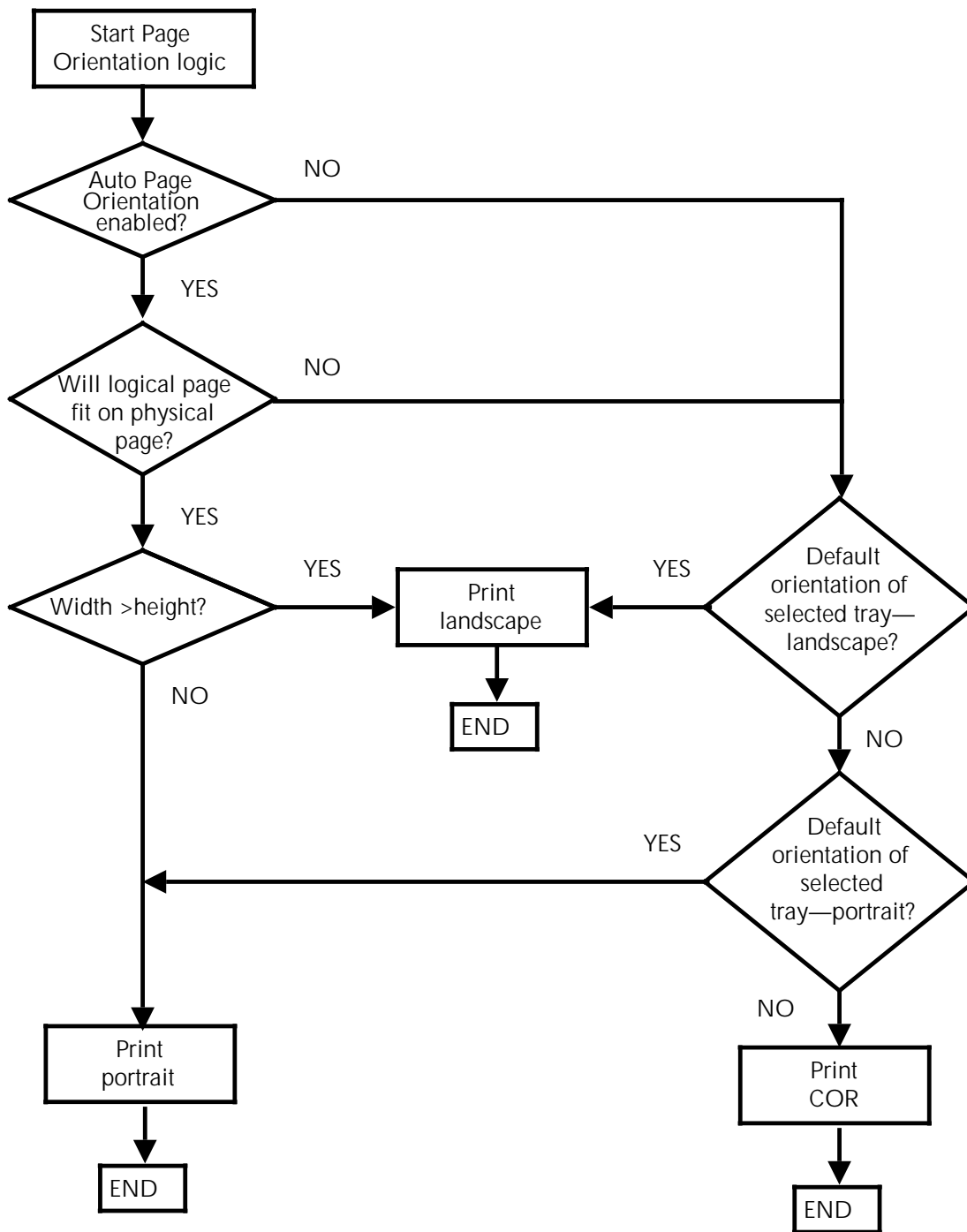
Tray orientation can be portrait, landscape, and Computer Output Reduction (COR). COR is a reduced size copy of the printed output.

The characteristics of COR are as follows:

- Landscape orientation
- A 70% reduction in the size of the logical page that is accomplished by:
 - Substituting smaller fonts:
 - 14 pitch for 10 pitch fonts
 - 15 pitch for 12 pitch fonts
 - 20 pitch for 15 pitch fonts
 - 27 pitch for 17 pitch fonts
 - Reducing vertical line spacing to 70% of full size
 - 0.5-inch top and left margins.

The COR fonts may be cross referenced with the full sized fonts listed in the Font and Character Set tables in the “Font support and selection” chapter.

Figure 3-1. Page orientation algorithm—1



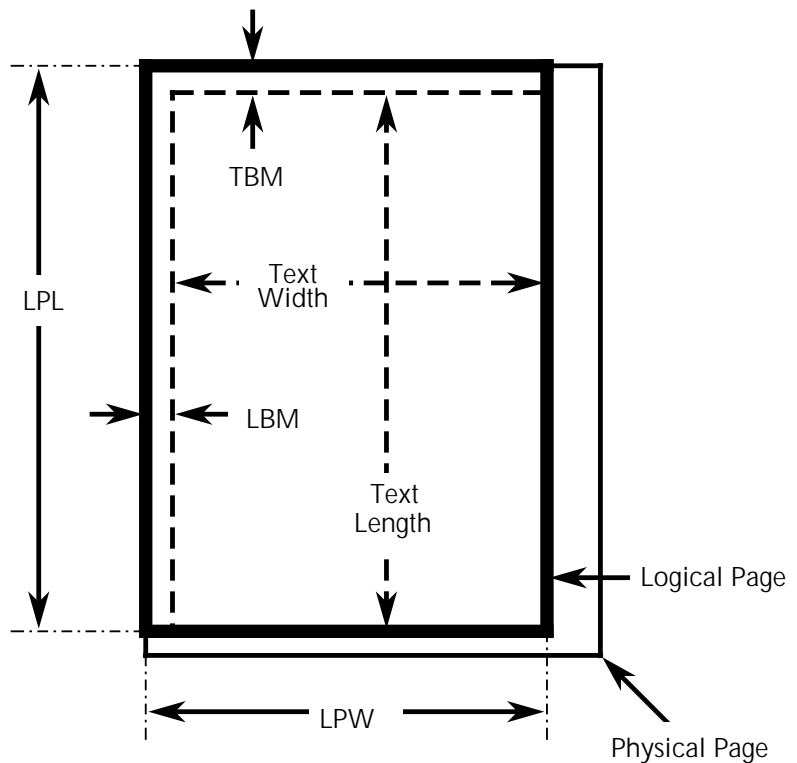
Logical Page Size

The logical page size is used in Auto Page Orientation. Logical page length (LPL) and logical page width (LPW) determine the logical page size. Refer to Figure 3-2.

LPL is governed by the top binding margin (TBM) and the length of the printable text. The text length is determined by the number of lines per inch (LPI) and the maximum page length (MPL). The mathematical relationship is: $LPL = TBM + MPL / LPI$.

LPW is governed by the left binding margin (LBM) and the width of the printable text. The text width is determined by the number of characters per inch (CPI) and the maximum print position (MPP). The mathematical relationship is: $LPW = LBM + MPP / CPI$.

Figure 3-2. **Logical page size**



Default values for TBM, LBM, CPI, LPI, MPL, and MPP are modified from their factory defaults by using FSL commands set by the LPI, CPI, Page Length, and Page Width parameters.

Remember

When operating in the SCS mode, the Set Horizontal Format commands override the MPP defaults.

- Set Vertical Format command overrides MPL defaults.
- Set Character Density command overrides CPI defaults.
- Set Line Density command overrides LPI defaults.
- SCS command overrides with the last command received at a page boundary being used for page size calculations.
- The differences in the available printable area are controlled by the following FSL functions.
 - Y10—Set Page Format
 - Y13—Set Wrap/Cut Option at Physical Paper Size
 - Y88—Define Page Offset
 - Y89—Enable Page Offset.

4. Font support and selection

This chapter describes font support and the relationships between IBM and Xerox fonts.

The ability to install customized translate tables and cross reference tables between IBM and Xerox fonts provides you with flexibility for utilizing fonts to suit your individual requirements.

Tables showing the character sets and the supported IBM code pages are found in the “Font and code set tables” appendix.

Supported fonts

Your Xerox MRP Family coax printer provides font support for most of the printers it emulates. Support is provided for three categories of fonts:

- Fixed pitch fonts—Your printer supports fixed pitch fonts matching the fixed pitch capabilities of all the IBM printers emulated.
- Proportionally spaced (PS) fonts—Your printer provides support for proportionally-spaced fonts using the same PS width values as those used by IBM, thus ensuring a match with IBM PS fonts.
- Typographic fonts—Your printer provides support for typographic fonts using the same width values as those used by IBM, thus ensuring a match with the respective IBM fonts.

The supported fonts are the PCL fonts and the 3816 emulation fonts. In the event the 3816 emulation fonts are not resident on your Xerox MRP Family coax printer, the interface card will use an appropriate PCL resident font. Refer to the “IBM GFID to PCL fonts attribute” appendix for the appropriate PCL resident font to use.

While the PCL font closest to the requested font is used by the printer, this algorithm may not choose a font with the exact characteristics for the desired output. To have your output exactly match that of a 3816, download the compatibility font set. Otherwise, differences may be observed in margins, justification, and data running off the page.

Included fonts

Your MRP printer equipped with an internal coax interface is shipped with a set of fifty five 3816 emulation fonts. These fonts are supplied on 9-track tapes shipped with the printer. Table 4-1 is a list of the font names that uses the corresponding GFID number shown as the last four digits.

Table 4-1. **3816 emulation fonts and their corresponding GFIDs**

Font name	GFID	Font name	GFID
FONT0003	0003	FONT0112	0112
FONT0005	0005	FONT0155	0155
FONT0011	0011	FONT0159	0159
FONT0012	0012	FONT0160	0160
FONT0018	0018	FONT0162	0162
FONT0019	0019	FONT0163	0163
FONT0038	0038	FONT0173	0173
FONT0039	0039	FONT0175	0175
FONT0040	0040	FONT0204	0204
FONT0041	0041	FONT0229	0229
FONT0042	0042	FONT0230	0230
FONT0043	0043	FONT0244	0244
FONT0044	0044	FONT0245	0245
FONT0046	0046	FONT0252	0252
FONT0060	0060	FONT0253	0253
FONT0066	0066	FONT0254	0254
FONT0068	0068	FONT0281	0281
FONT0069	0069	FONT0290	0290
FONT0070	0070	FONT0751	0751
FONT0071	0071	FONT1051	1051
FONT0072	0072	FONT1053	1053
FONT0084	0084	FONT1056	1056
FONT0085	0085	FONT1351	1351
FONT0086	0086	FONT1653	1653
FONT0087	0087	FONT2103	2103
FONT0108	0108	FONT4555	4555
FONT0110	0110	FONT000A	No GFID ¹
FONT0111	0111		

¹This is a fixed pitch font at 16.7 cpi for use with line printer emulation to print at 132 x 66 in landscape.

Global Font Identifiers (GFIDs)

To provide automatic font selection within your Xerox MRP Family coax printer, Xerox fonts correlate to IBM font parameters. This correlation considers the IBM method of selecting fonts using Global Font Identifiers (GFIDs) as follows:

- Data Processing (DP) mode
- Word Processing (WP) mode.

The DP mode selects font through the printer file font parameter. The WP mode selects font through type style.

GFIDs are numbers that reference fonts in the IBM data stream. A Xerox font may be identified by an associated GFID.

A GFID defines the tpestyle, font type, and the pitch but not the orientation. For example, GFID 0011 refers to a Courier 10 pitch font in both portrait and landscape orientations. The font orientation on the printed page is taken from the orientation selected through the emulation commands sent from the host computer system unless automatic orientation is enabled.

GFID cross reference is automatically modified each time a font is downloaded.

All the font names correspond to GFID and both orientations, landscape and portrait, are included in the font. If you do not load all the fonts, refer to the "IBM GFID to PCL fonts attribute" appendix.

GFID to PCL font mapping

The default GFID to PCL font mapping is not active when the Xerox 3812/3816 compatibility fonts are used. The character and line spacing of the compatibility fonts are designed to match the equivalent IBM GFID font. The fixed GFID interval ranges from 1 to 399 and is divided into groups with different pitch. Refer to Table 4-2. GFIDs from 400 and up are typographical fonts. If the printer resident PCL fonts are used in lieu of the Xerox 3812/3816 compatibility fonts, character and line spacing is controlled by the interface, not the font.

Proportional spaced (PS) fonts are fixed spaced fonts. The spacing is controlled by the interface, and not the font.

Print density to GFID mapping

A pitch to GFID mapping occurs if the SCS Set Print Density (SPD) command specifies the pitch parameter. Since the 3812 emulates a 5219 printer, the pitch to GFID mapping is implemented according to the mapping shown in Table 4-3.

Table 4-2. **GFID interval and related pitch**

GFID	Pitch
1—65	10
6—153	12
154—200	Proportional Spaced Mode (PSM)
201—210	13.3
211—239	15
240—246	5
247—257	17.1
258—259	18
260—273	8.55
274—279	17.1
280—284	20
285—289	25
290—299	27
300—399	12

Table 4-3. **GFID interval and related pitch**

Print Density/ character per inch (CPI)	GFID
5	245
10	11
12	85
15	223
16.7	254
PS	158

Font selection via FSL in coax

There are two methods to select fonts via FSL in coax: the Printer Resident Fonts or the 3812/3816 Compatibility Font Set.

Font selection using printer resident PCL fonts

The printer defaults to GFID 0011 unless otherwise defined. This GFID is mapped to a 12 point, Courier typeface 3, Roman-8 symbol set.

To change the mapping of GFID 0011, or any other GFID, use FSL Y91. These FSL parameters are used in a PCL font selection command. Refer to a PCL command reference manual to input all the paramethe43.0683 fto 2 -1

set to match pitch, if spacing is set to fixed, and font selection occurs.

- The predefined table (refer to the “PCL font and IBM GFID” appendix) is examined and a selection occurs when a match is made. Horizontal Motion Index (HMI) is set to match pitch, if spacing is set to fixed, and font selection occurs.
- To make sure correct code point mapping is selected, Symbol Set is matched to the active translate table, as follows:
 - If the GFID is below 400, fixed spacing is selected. A font pitch, style, and stroke weight are specified (refer to Table 4-12). The Horizontal Motion Index (HMI) is set to match pitch, and font selection is made.

Specifically, the mapping involves the following steps before font selection is completed:

- Pitch is selected.
- Style is set to upright.
- Stroke Weight is set to medium.
- HMI is set to match pitch.
- If the GFID is above 400, a typographic font is selected. The point size and typeface are taken from the GFID, divided in parts, using the following algorithm:

GFID number	=	XXXYY
XXX	=	Point Size
YY	=	Typeface ID.

Selecting COR fonts

The font width for the GFID is mapped to a related COR width according to the COR font mapping (refer to Table 4-4). The mapping involves the following steps before font selection is completed:

- Pitch is selected.
- Lineprinter font is selected.
- Style is set to upright.
- Stroke Weight is set to medium.
- HMI is set to match pitch.

Table 4-4. COR font mapping

Characters per inch (CPI)	Selection
10 CPI - > 13.3 CPI	
12 CPI - > 15 CPI	
PS - > 15 CPI	PS fonts is treated as 12 CPI fixed spaced fonts in COR.
13.33 CPI - > 15 CPI	
15 CPI - > 16.6 CPI	
5 CPI - > 10 CPI	
17.1 CPI - > 16.6 CPI	HMI is set to 20
18 CPI - > 16.6 CPI	HMI is set to 20
8.5 CPI - > 10 CPI	
17.1 CPI - > 16.6 CPI	HMI is set to 20
20 CPI - > 20 CPI	
25 CPI - > 25 CPI	
27 CPI - > 27 CPI	
TYPO - > 15 CPI	Typographic fonts is treated as 12 CPI fixed spaced fonts in COR.

Character sets

The default coax character set is defined at power up by the user-defined default selection stored in nonvolatile memory (NVM). This can be changed by SCS or FSL data stream command that selects the character set by a language identifier. The default character set can also be selected using special feature translation table commands. Refer to the FSL Translate Table commands in the "Function Selection via Line (FSL) commands" chapter in this manual. Up to eight customized tables can be downloaded and stored in NVM.

The Xerox MRP Family coax printers support IBM error types, IBM error code actions, and initialization errors. The printers recognize the following error categories:

- IBM data stream error type 1
- IBM data stream error type 2
- IBM data stream error type 3 or invalid SCS parameter
- IBM data stream error type 4 or invalid SCS command
- Initialization error
- FSL error.

Errors are logged internally by the coax interface.

Note: Error handling in the Xerox MRP Family printers is different from the IBM printers emulated. Output may differ from that seen under similar circumstances on the IBM printer.

IBM error types

IBM error types are reported back to the host through the coax protocol.

IBM error types fall into the four categories described in Table 5-1. An error action for each error category is defined by the system using an IBM data stream command.

These errors and their appropriate responses are handled by the system automatically and do not require user action.

Table 5-1. **Error code descriptions**

Error type	Description
1	Condition detected that causes loss of text information
2	Condition detected that alters the appearance of the printed output
3	Multibyte command detected that contains an unsupported type or class code
4	Multibyte command detected that contains an unsupported parameter or parameter value

SCS parameter and command errors are reported through the coax protocols.

Although IBM errors are reported, they may not necessarily match the errors reported by the emulated printers under certain conditions.

Recoverable printer errors

Although the Xerox Family MRP coax printer does not support print out of error codes and error codes are not shown in the display, the printer stops during a print operation, for instance, if the paper tray is empty. In such a case, a front panel message appears. Printing stops as soon as this kind of error is detected. Once the appropriate action is taken, the printer automatically starts printing again. If the print buffer contains data, printing starts with the page being printed when the error occurred.

FSL error messages

FSL errors do not result in a displayed error message but a message, containing an error code and error type, is printed.

Recoverable errors

Follow the instructions of the error messages to recover.

Table 5-2. **Recoverable errors**

Code	Error type	Code description
1001	NVRAM error	NVRAM is locked.
1002	NVRAM error	NVRAM cannot be locked before programming.
2301	Escape error	Numerical overflow
2302	Escape error	Terminator is not accepted.
2303	Escape error	Function is not supported.
2304	Escape error	Parameter is out of range.
2305	Escape error	Multi-strike string is too long.
2307	Escape error	Function is disabled.
2309	Escape error	Illegal separator
2311	Escape error	Syntax error
2500	Escape error	No translate table number
3001	Escape error	The dynamic area is locked.
3002	Escape error	No space is left in dynamic area
4001	Password error	Password is wrong.
4002	Password error	Password is not active.

Continuing next page

Table 5-2. **Recoverable errors** (continued)

Code	Error	Code Description
4003	Password error	NVRAM is already locked, password is ignored.
5003	NVRAM error	Checksum in NVRAM is wrong.
5004	NVRAM error	Validation value in NVRAM is wrong.
5006	NVRAM error	Values are now overwritten with factory defaults.

Nonrecoverable hardware errors

A recovery attempt in connection with nonrecoverable hardware errors is made as follows:

Turn switch off for 10 seconds and then on again. If the problem persists, contact your Xerox service representative.

Table 5-3. **Nonrecoverable hardware errors**

Code	Error	Code Description
5002	Hardware error	Hardware error in NVRAM
5005	NVRAM error	NVRAM verification error in cell
6001	Hardware error	NVRAM checksum error
7001	Hardware error	Main processor RAM error
8001	Hardware error	Line interface RAM error
8002	Hardware error	Wrong data in self-test
8003	Hardware error	Wrong word in self-test
8004	Hardware error	Response missing from coax interface
8005	Hardware error	Wrong interrupt from coax interface
8006	Hardware error	No test response from coax interface
8007	Hardware error	Invalid test response from coax interface
8010	Hardware error	Nothing received in self-test

6.

Configuration and sysgen samples

This chapter provides you with examples of configurations for connecting your Xerox 4220/MRP or 4230/MRP coax printer to an IBM host.

Coax printers line configurations

Four of the possible line configurations are shown in this section. They are followed by sample sysgen programs.

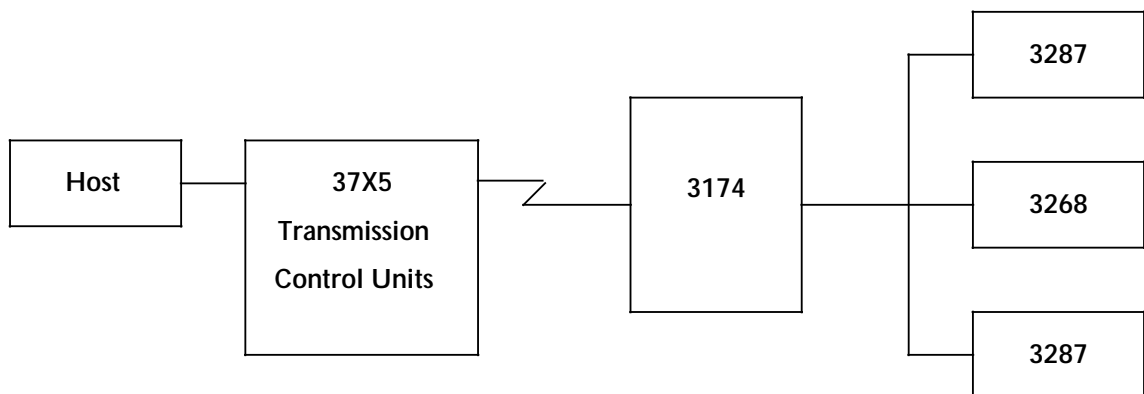
Your 4220/MRP or 4230/MRP coax printer supports two types of coax environments:

- SCS in Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC)—SNA LU1
- DSC in non-SNA—Binary Synchronous Communication (BSC)—LU3.

The four illustrations in this chapter show possible configurations for both environments using IBM 3262/4214/3816 attachments.

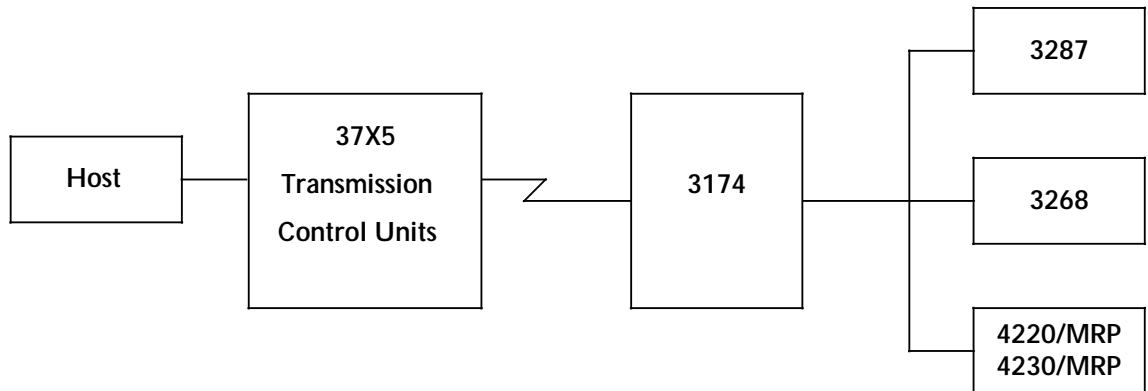
Configuration 1 shows only an IBM 3287. See Figure 6-1.

Figure 6-1. **Configuration 1**



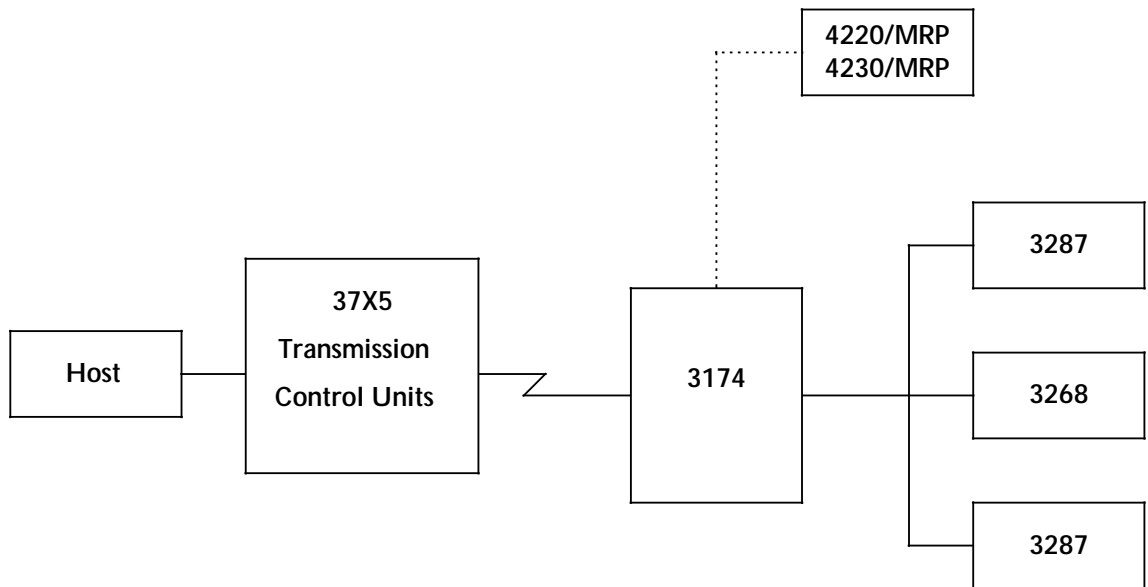
Configuration 2 shows the 4220/MRP or 4230/MRP replacing the IBM 3287 on the same port. See Figure 6-2.

Figure 6-2. **Configuration 2**



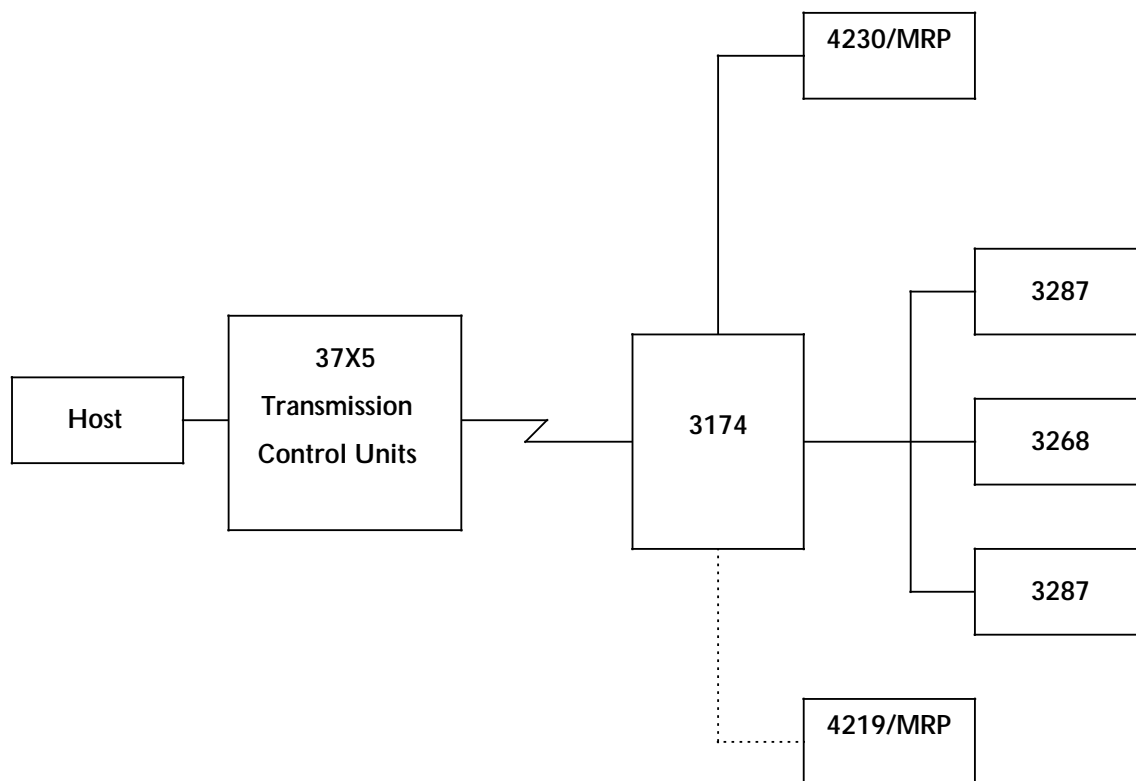
Configuration 3 shows the 4220/MRP or 4230/MRP attached to a previously unused port and the IBM 3287 attached to its previous port. See Figure 6-3.

Figure 6-3. **Configuration 3**



Configuration 4 shows a 4230/MRP attached to a previously unused port, a 4219/MRP attached to a previously unused port through a communications module, and the IBM 3287 attached to its previous port. See Figure 6-4.

Figure 6-4. **Configuration 4**



Sysgen samples

The sample sysgens in this section represent parameters to enter when using IBM copyright programs to perform the following:

- Sample IO Gen for the 3274—non-SNA controller
- Sample VTAM parameter for local non-SNA 3270 terminal and printer
- Sample VTAM parameter for local SNA 3270 terminal and printer
- Sample NCP Gen—Group, Line, Physical Unit (PU), and Logical Unit (LU) Definitions—3274-61C
- Sample NCP Gen—Group, Line, PU, and LU Definitions—3276C
- JES/328X Print Facility parameters
- Sample mode table entries for 3278-2 terminals (by control unit type).
- Sample mode table entries for 3278 printers (all control units).

Sample IO Gen for the 3174/3274—non-SNA controller

```

DEVO20      IODEVICE UNIT=3287,ADDRESS=020,MODEL=2,
              FEATURE=(DOCHAR,EBKY3277,KB78KEY,NUMLOCK,AUDALRM)
DEVO21      IODEVICE UNIT=3279,ADDRESS=021,MODEL=2A,
              FEATURE=(DOCHAR,EBKY3277,KB78KEY,NUMLOCK,AUDALRM)
DEVO22      IODEVICE UNIT=3279,ADDRESS=022,MODEL=2A,
              FEATURE=(DOCHAR,EBKY3277,KB78KEY,NUMLOCK,AUDALRM)
    
```

Sample VTAM parameter for local non-SNA 3270 terminal and printer

```

                                LBUILD
*
LP920T00    LOCAL      CUADDR=920,          3278-2 TERMINAL
              TERM=3277,
              FEATUR2=(MODEL2),
              ISTATUS=ACTIVE,
              USSTAB=USSVTAM,
              MODETAB=MODE3270,
              DLOGMOD=S3270
*
LP921P01    LOCAL      CUADDR=921,          3287 PRINTER
              TERM=3286,
              FEATUR2=(MODEL2),
              ISTATUS=ACTIVE,
              USSTAB=USSVTAM,
              MODETAB=MODE3270,
              DLOGMOD=DSC2K
    
```

Sample VTAM parameter for local SNA 3270 terminal and printer

```

                                VBUILD      TYPE=LOCAL
*
X10PUA0D    PU          CUADDR=A0D,
              MAXBFRU=9,
              PUTYPE=2,
              USSTAB=USSVTAM,
              MODETAB=MODE3270,
              ISTATUS=ACTIVE
*
LPA0DT00    LOCAL      LOCADDR=2,          3278-2 TERMINAL
              DLOGMOD=T3278M2,
              ISTATUS=ACTIVE
*
LPA0DP01    LOCAL      LOCADDR=3,          3287 PRINTER
              DLOGMOD=DSC2K,
              ISTATUS=ACTIVE
    
```

Sample NCP Gen—Group, Line, PU, and LU definitions—3274-61C

```

SNAGP01      GROUP      LNCTL=SDLC ,
                CLOCKING=EXT ,
                DIAL=NO ,
                DUPLEX=FULL ,
                NEWSYNC=NO ,
                NRZI=NO ,
                REPLYTO=1 ,
                RETRIES=(1 , 1 , 2) ,
                TYPE=NCP
*
N05LN039     LINE      ADDRESS=(039) ,
                ANS=CONTINUE ,
                DUPLEX=(FULL) ,
                ETRATIO=30 ,
                PAUSE=.2 ,
                SERVLIM=4 ,
                SPEED=9600 ,
                VPACING=2
                SPACE 3
SOTL039      SERVICE ORDER=(N05039P0)
                SPACE 3
*
N05039P0     PU        ADDR=C1 ,
                DISCNT=(NO) ,
                IRETRY=NO ,
                ISTATUS=ACTIVE ,
                MAXDATA=265 ,
                MAXOUT=7 ,
                MODETAB=MODE3270 ,
                PASSLIM=10 ,
                PUDR=NO ,
                PUTYPE=2 ,
                RETRIES=( , 10 , 3) ,
                SRT=(32768 , 10) ,
                SSCPFM=USSSCS ,
                USSTAB=USSVTAM
*
LAX39L00     LU        LOCADDR=2 ,                3278-2 TERMINAL
                BATCH=NO ,
                DLOGMOD=M3278M2 ,
                ISTATUS=ACTIVE
*
LAX39L01     LU        LOCADDR=3 ,                3287 PRINTER
                BATCH=NO ,
                PACING=0 ,
                VPACING=0 ,
                DLOGMOD=DSC2K ,
                ISTATUS=ACTIVE

```

Sample NCP Gen—Group, Line, PU, and LU definitions—3276-C

```

SNAGP02      GROUP      LNCTL=SDLC,
                  CLOCKING=EXT,
                  DIAL=NO,
                  DUPLEX=FULL,
                  ISTATUS=ACTIVE,
                  NEWSYNC=NO,
                  NRZI=NO,
                  PAUSE=.2,
                  RETRIES=(7, 1, 3),
                  SSCPFM=USSSCS,
                  SPEED=9600,
                  TYPE=NCP,
                  USSTAB=USSVTAM
*
N05LN03B     LINE      ADDRESS=(3B),
                  SPEED=9600
*
SOTL039      SERVICE ORDER=(N0503BP0)
*
N0503BP0     PU        ADDR=C1,
                  IRETRY=YES,
                  ISTATUS=ACTIVE,
                  MAXDATA=265,
                  MAXOUT=7,
                  PASSLIM=12,
                  PUTYPE=2,
                  MODETAB=MODE3270,
                  SSCPFM=USSSCS,
*
LAX3BL00     LU        LOCADDR=2,          3278-2 TERMINAL
                  DLOGMOD=DT3278M2,
                  ISTATUS=ACTIVE
*
LAX3BL01     LU        LOCADDR=3,          3287 PRINTER
                  DLOGMOD=DSC2K,
                  ISTATUS=ACTIVE
    
```

JES/328X print facility parameters

```

*
*           'RMT 14 LP921P01' IS A LOCAL, NON-SNA PRINTER
*           'RMT 15 LPA0DP01' IS A LOCAL, SNA PRINTER
*           'RMT 16 LAX39L01' IS A REMOTE, 3274 SNA PRINTER
*           'RMT 17 LAX3BL01' IS A REMOTE, 3276 SNA PRINTER
*
PLU=NJEWCO3,
SLU=RMT 14,TLU=LP921P01,LUTYPE=1,LOGMODE=DLOGMOD
PLU=NJEWCO3,
SLU=RMT 15,TLU=LPA0DP01,LUTYPE=1,BUFSIZE=1520,LOGMODE=SCS,IMMRESP=N
PLU=NJEWCO3,
SLU=RMT 16,TLU=LAX39L01,LUTYPE=1,BUFSIZE=1520,LOGMODE=SCS,IMMRESP=N
PLU=NJEWCO3,
SLU=RMT 17,TLU=LAX3BL01,LUTYPE=1,BUFSIZE=1520,LOGMODE=SCS,IMMRESP=N
    
```

Sample mode table entries for 3278-2 terminals (by control unit type)

```

MODE3270      MODETAB
*
MODEEENT LOGMODE=S3270,          LOCAL NON-SNA 3274 CONTROL UNIT
                FMPROF=X'02',          3278-2 TERMINAL
                TSPROF=X'02',
                PRIPROT=X'71',
                COS=HICOS,
                SECPROT=X'40',
                COMFPROT=X'2000',
                RUSIZES=X'0000',
                PSERVIC=X'000000000000185018500200'
*
MODEEENT LOGMODE=T3278M2,        LOCAL SNA 3274 CONTROL UNIT
                FMPROF=X'03',          3278- 2 TERMINAL
                TSPROF=X'03',
                PRIPROT=X'B1',
                SECPROT=X'90',
                COMPROT=X'3080',
                RUSIZES=X'87C7',
                PSERVIC=X'020000000000185018507F00'
*
MODEEENT LOGMODE=M3278M2,        REMOTE SNA 3274 CONTROL UNIT
                FMPROF=X'03',          3278 - TERMINAL
                TSPROF=X'03',
                PRIPROT=X'B1',
                SECPROT=X'90',
                COMPROT=X'3080',
                RUSIZES=X'88F8',
                PSERVIC=X'020000000000185000007E00'

```

Sample mode table entries for 3287 printers (all control units)

```

*
MODEEENT LOGMODE=DSC2K,          3287 PRINTER
                FMPROF=X'03',
                TSPROF=X'03',
                PRIPROT=X'B1',
                SECPROT=X'90',
                COMPROT=X'3080',
                RUSIZES=X'8787',
                PSERVIC=X'030000000000185018507F00'
*
MODEEENT LOGMODE=SCS,            SNA CHARACTER STRING PRINTER
                FMPROF=X'03',
                TSPROF=X'03',
                PRIPROT=X'B1',
                SECPROT=X'90',
                COMPROT=X'3080',
                RUSIZES=X'87C6',
                PSNDPAC=X'01',
                SRCVPAC=X'01',
                PSERVIC=X'01000000E100000000000000'

```

7. Configuration and Resource Utility (MVS)

The Xerox Configuration and Resource Utility manages printer resources (fonts, forms, and the internal interface controller configuration descriptions) on a Multiple Virtual Storage (MVS) host. The utility is distributed on a 9-track tape 6250 BPI and 3480 cartridge. A set of Job Control Language (JCL) statements is provided to install the Xerox Configuration and Resource Utility (MVS).

All resources are stored as members of host partitioned data sets (PDS).

The Xerox MRP Family printers have a set of resident PCL5 fonts. A set of IBM 3816 emulations fonts and a utility to download them are provided with the Resource and Configuration Utilities. Utilities to create, modify, and download alternate printer configuration defaults are included.

The Configuration and Resource Utility has been developed and tested in the following MVS environments:

- MVS/ESA Version 4.3
- ISPF Version 2.3
- ISPF/PDF Version 3.4
- TSO/E Version 2.3.

The Configuration and Resource Utility creates the following ISPF libraries:

- XMRP.V1R2M1.CLIST
- XMRP.V1R2M1.LOAD
- XMRP.V1R2M1.CFGDLIB
- XMRP.V1R2M1.FNTLIB
- XMRP.V1R2M1.LINKLIB
- XMRP.V1R2M1.INSTALL
- XMRP.V1R2M1.UCRTLIB
- XMRP.V1R2M1.FRMLIB
- XMRP.V1R2M1.LSTLIB.

All CLISTs provided with the utility are located in the library, XMRP.V1R2M1.CLIST. You can modify the CLISTs to fit your particular environment. However, the logic of the CLIST must be maintained for the program to run correctly.

Installing your Configuration and Resource Utility

The Host Resource Utility Version V1R2M1 for Coax running under MVS/ESA. Added features in the new Utility include Tray selection, Paper size and a Form Library. The instructions in this section assume that you understand the MVS environment.

Requirements: MVS/ESA

If you have created or modified the configuration descriptions or user-created FSL members in a previous version of the Host Utility, make sure you save the changes by copying the members from your current CFGDLIB and from XMRPV.4220.UCRTLIB to XMRP.V1R2M1.UCRTLIB after installing the new version of the utility.

After the utility is updated, use the ISPF/TSO move or copy option to restore the saved PDSs to the newly restored XMRP.V1R2M1.CFGDLIB or XMRP.V1R2M1.UCRTLIB. The previous versions of the PDS files may be deleted at the user's discretion.

To start the installation of the Resource Utility:

1. Create a IEBCOPY JCL Job to load the JCL "LOADINST" from your tape/cartridge to your DASD. The LOADINST JCL is the first file on the tape/cart.

The IEBCOPY JCL to load the XMRP.V1R2M1.INSTALL PDS is as follows:

```
000001 //XXXXXXXX JOB (UUUU),
000002 // 'UTILITY LOAD',CLASS=A,MSGCLASS=X,
000003 // MSGLEVEL=(1,1),NOTIFY=XXXXXXXX
000004 //*
000005 //LOD1 EXEC PGM=IEBCOPY,REGION=2048K
000006 //SYSPRINT DD SYSOUT=*
000007 //CART DD DISP=SHR,DSN=XMRP.V1R2M1.INSTAL,
000008 // UNIT=CART,LABEL=(1,SL,,,EXPDT=98000),
000009 // VOL=(,RETAIN,,,SER=XR001)
000010 //TARGET DD DSN=XMRP.V1R2M1.INSTALL,
000011 // DISP=(,CATLG,DELETE),UNIT=3380,
000012 // SPACE=(3200,(14,2,5)),
000013 // DCB=(RECFM=FB,BLKSIZE=3200,LRECL=80),
000014 // VOL=SER=dddddd
000015 //SYSIN DD *
000016 COPY INDD=CART,OUTDD=TARGET
000017 /*
/*
```

- Change JOB statement as required to match your installation standards (such as change XXXXXXXX to your TSO High Level Qualifier and UUUU to your Account Number).
- Change **CART** to **TAPE** if you are installing the Utility from a tape.
- Change the **dddddd** to the VOLSER of the DASD unit on which the UTILITY data sets are allocated.
- Change **3380** to the unit type of the DASD unit on which the UTILITY data sets are allocated.

You can change the Target XMRP to your High Level Qualifier or anything else, but remember to change the CLISTs accordingly.

2. The XMRP.V1R2M1. Install data set contains a job (LOADINST) to load the Resource Utility to DASD.
 - Tailor and submit for execution the LOADINST job from the XMRP.V1R2M1.INSTALL dataset.
 - Follow the same steps as above on this JCL. The following JCL is the LOADINST JCL that is provided on the Cart/Tape.

The following IEBCOPY JCL is in your XMRP.V1R2M1.INSTALL DataSet:

```

000001 //XXXXXXXXX JOB (UUUU),
000002 //   'LOADINST',CLASS=A,MSGCLASS=X,
000003 //     MSGLEVEL=(1,1),NOTIFY=XXXXXXXX
000004 //*
000005//* IEBCOPY TO INSTALL AND ALLOCATE THE
000006//* THE XEROX RESOURCE UTILITY V1R2M1
000007//*     RELEASE 1.2.1
000008//*
000009 //LOD1  EXEC PGM=IEBCOPY,REGION=2084K
000010 //SYSPRINT DD SYSOUT=*
000011 //CART  DD DISP=SHR,DSN=XMRP.V1R2M1.CFDLB,
000012 //     UNIT=CART,LABEL=(2,SL,,,EXPDT=98000),
000013 //     VOL=(,RETAIN,,,SER=XR001)
000014 //TARGET DD DSN=XMRP.V1R2M1.CFGDLIB,
000015 //     DISP=(,CATLG,DELETE),UNIT=3380,
000016 //     SPACE=(27984,(78,28,10)),
000017 //     DCB=(RECFM=FB,BLKSIZE=27984,LRECL=132),
000018 //     VOL=SER=dddddd
000019 //SYSIN  DD *
000020 COPY INDD=CART,OUTDD=TARGET
000021 /*
000022 //LOD2  EXEC PGM=IEBCOPY,REGION=2048K
000023 //SYSPRINT DD SYSOUT=*
000024 //CART  DD DISP=SHR,DSN=XMRP.V1R2M1.CLIST,
000025 //     UNIT=CART,LABEL=(3,SL,,,EXPDT=98000),
000026 //     VOL=(,RETAIN,,,REF=*.LOD1.CART)
000027 //TARGET DD DSN=XMRP.V1R2M1.CLIST,
000028 //     DISP=(,CATLG,DELETE),UNIT=3380,
000029 //     SPACE=(27920,(32,16,5)),
000030 //     DCB=(RECFM=FB,BLKSIZE=1600,LRECL=80),
000031 //     VOL=SER=dddddd
000032 //SYSIN  DD *
000033 COPY INDD=CART,OUTDD=TARGET
000034 /*
000035 //LOD3  EXEC PGM=IEBCOPY,REGION=2048K
000036 //SYSPRINT DD SYSOUT=*
000037 //CART  DD DISP=SHR,DSN=XMRP.V1R2M1.FNTLB,
000038 //     UNIT=CART,LABEL=(4,SL,,,EXPDT=98000),
000039 //     VOL=(,RETAIN,,,REF=*.LOD1.CART)
000040 //TARGET DD DSN=XMRP.V1R2M1.FNTLIB,
000041 //     DISP=(,CATLG,DELETE),UNIT=3380,
000042 //     SPACE=(660,(4560,60,20)),
000043 //     DCB=(RECFM=FB,BLKSIZE=660,LRECL=132),
000044 //     VOL=SER=dddddd
000045 //SYSIN  DD *
000046 COPY INDD=CART,OUTDD=TARGET
000047 /*
000048 //LOD4  EXEC PGM=IEBCOPY,REGION=2048K
000049 //SYSPRINT DD SYSOUT=*
000050 //CART  DD DISP=SHR,DSN=XMRP.V1R2M1.LNKLB,
000051 //     UNIT=CART,LABEL=(5,SL,,,EXPDT=98000),
000052 //     VOL=(RETAIN,,,REF=*.LOD1.CART),

```

```

000053//TARGET DD DSN=XMRP.V1R2M1.LINKLIB,
000054 // DISP=(,CATLG,DELETE),UNIT=3380,
000055 // SPACE=(6144,(539,63,25)),
000056 // DCB=(RECFM=U,BLKSIZE=6144),
000057 // VOL=SER=ddddd
000058 //SYSIN DD *
000059 COPY INDD=CART,OUTDD=TARGET
000060 /*
000061 //LOD5 EXEC PGM=IEBCOPY,REGION=2048K
000062 //SYSPRINT DD SYSOUT=*
000063 //CART DD DISP=SHR,DSN=XMRP.V1R2M1.LOAD,
000064 // UNIT=CART,LABEL=(6,SL,,,EXPDT=98000),
000065 // VOL=(,RETAIN,,,REF=*.LOD1.CART)
000066 //TARGET DD DSN=XMRP.V1R2M1.LOAD,
000067 // DISP=(,CATLG,DELETE),UNIT=3380,
000068 // SPACE=(3200,(260,15,10)),
000069 // DCB=(RECFM=U,BLKSIZE=3200),
000070 // VOL=SER=ddddd
000071 //SYSIN DD *
000072 COPY INDD=CART,OUTDD=TARGET
000073 /*
000074 //LOD6 EXEC PGM=IEBCOPY,REGION=2048K
000075 //SYSPRINT DD SYSOUT=*
000076 //CART DD DISP=SHR,DSN=XMRP.V1R2M1.UCRTLB,
000077 // UNIT=CART,LABEL=(7,SL,,,EXPDT=98000),
000078 // VOL=(,RETAIN,,,REF=*.LOD1.CART)
000079 //TARGET DD DSN=XMRP.V1R2M1.UCRTLIB,
000080 // DISP=(,CATLG,DELETE),UNIT=3380,
000081 // SPACE=(27984,(78,28,10)),
000082 // DCB=(RECFM=FB,BLKSIZE=27984,LRECL=132),
000083 // VOL=SER=ddddd
000084 //SYSIN DD *
000085 COPY INDD=CART,OUTDD=TARGET
000086 /*
000087 /*
000088 //LOD7 EXEC PGM=IEBCOPY,REGION=2048K
000089 //SYSPRINT DD SYSOUT=*
000090 //CART DD DISP=SHR,DSN=XMRP.V1R2M1.FRMLB,
000091 // UNIT=CART,LABEL=(8,SL,,,EXPDT=98000),
000092 // VOL=(,RETAIN,,,REF=*.LOD1.CART)
000093 //TARGET DD DSN=XMRP.V1R2M1.FRMLIB,
000094 // DISP=(,CATLG,DELETE),UNIT=3380,
000095 // SPACE=(27984,(78,28,10)),
000096 // DCB=(RECFM=FB,BLKSIZE=27984,LRECL=132),
000097 // VOL=SER=ddddd
000098 //SYSIN DD *
000099 COPY INDD=CART,OUTDD=TARGET
000100 /*
000101 //LOD8 EXEC PGM=IEBCOPY,REGION=2048K
000102 //SYSPRINT DD SYSOUT=*
000103 //CART DD DISP=SHR,DSN=XMRP.V1R2M1.LSTLB,
000104 // UNIT=CART,LABEL=(9,SL,,,EXPDT=98000),

```

```

000105 //      VOL=(,RETAIN,,,REF=*.LOD1.CART)
000106 //TARGET DD DSN=XMRP.V1R2M1.LSTLIB,
000107 //      DISP=(,CATLG,DELETE),UNIT=3380,
000108 //      SPACE=(27984,(28,18,10)),
000109 //      DCB=(RECFM=FB,BLKSIZE=27984,LRECL=132),
000110 //      VOL=SER=dddddd
000111 //SYSIN DD *
000112 COPY INDD=CART,OUTDD=TARGET
000113 /*
000114 /*
000115//LOD9 EXEC PGM=IEBCOPY,REGION=2048K
000116//SYSPRINT DD SYSOUT=*
000117//CART DD DISP=SHR,DSN=XMRP.V1R2M1.CNTJL,
000118//      NIT=CARTLA,LABEL=(10MAK,,,EXPDT=98000),
000119//      VOL=(,RETAIN,,,REF=*.LOD1.CART
000120//TARGET DD DSN=XMRP.V1R2M1.CNTJCL
000121//      DISP=(,CATLG,DELETE),UNIT=3380
000122//      SPACE=(6160,(8,8,15))
000123//      DCB=(REGFM=FB,BLKSIZE=6160,LRECL=80)
000124/* VOL=SER=dddddd
000125//SYSIN DD *
0000126 COPY INDD=CART,OUTDD=TARGET
0000127/*
0000128 /*

***** BOTTOM OF DATA *****

```

Managing fonts

The Xerox Resource Utility supports a predefined set of 3816 emulation fonts to the printer. These 55 fonts are provided on the Xerox supplied tape or cartridge in the XMRPV1R2M1FNTLIB.

The 3816 emulation fonts located in the XMRP.V1R2M1.FNTLIB ISPF library have the following naming convention:

FONT####

The value of the four # symbols corresponds to the GFID number a job must specify to request the font.

You use the Xerox Resource Utility Font List program to manage the IBM 3816 Emulation Fonts on the host. The functions provided are browse, copy, delete, and download. The members listed are fonts residing in XMRP.V1R2M1.FNTLIB.

The fonts only include the landscape orientation; however, the FSLs generated allow the interface card to properly select a font in either rotation because the printer automatically rotates fonts to the current orientation. This means the 4215/MRP and 4219/MRP can accept all fonts in the FNTLIB with the minimum memory configuration.

Refer to Table 7-1 for a complete list of fonts.

Table 7-1. 3816 emulation fonts

Font name	Font name	Font name	Font name
FONT0003	FONT0060	FONT0112	FONT0253
FONT0005	FONT0066	FONT0155	FONT0254
FONT0011	FONT0068	FONT0159	FONT0281
FONT0012	FONT0069	FONT0160	FONT0290
FONT0018	FONT0070	FONT0162	FONT0751
FONT0019	FONT0071	FONT0163	FONT1051
FONT0038	FONT0072	FONT0173	FONT1053
FONT0039	FONT0084	FONT0175	FONT1056
FONT0040	FONT0085	FONT0204	FONT1351
FONT0041	FONT0086	FONT0229	FONT1653
FONT0042	FONT0087	FONT0230	FONT2103
FONT0043	FONT0108	FONT0244	FONT4555
FONT0044	FONT0110	FONT0245	FONT000A
FONT0046	FONT0111	FONT0252	

Loading fonts

Load one font at a time, by entering the following command:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXFNT)' '<font name> <printer
destination>'
```

Replace ** with the name of the font to load. The valid names are listed in Table 7-1. Replace *<printer destination>* with the JES remote id set up for the Xerox printer.

The following is an example for loading font FONT0003 to remote 221:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXFNT)' 'FONT0003 RMT221'
```



CAUTION: If you are sending a Restore Factory Default (RSTFCT) via the Configuration Utility or using the FSL X3 command and have downloaded fonts to the printer, the mapping tables to the GFIDs are lost. You must download the fonts again.

In order to load multiple fonts you can create a CLIST that repeats the download command for each font that you wish to download. The following example shows a CLIST named ALLFONTS that you can create to download any number of the 55 fonts. It was created in the XMRP.V1R2M1.CLIST Library.

```
TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXFNT)' 'FONT0003 RMT221'
TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXFNT)' 'FONT0005 RMT221'
TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXFNT)' 'FONT0011 RMT221'
      .
      .
      .
TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXFNT)' 'FONT4555 RMT221'
```



CAUTION: Loading all 55 fonts on a 4215/MRP or 4219/MRP configured with 8 MB of RAM reduces printer performance significantly and causes most jobs to abort due to insufficient memory.

To execute the CLIST and download the fonts, enter the following command:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(ALLFONTS)'
```

Accessing the Font List screen

To access the Font List screen, enter the following on the selection line or command line and press <Enter>:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(XLSTFNT)'
```

The Font List screen is displayed, which lists all members residing in the XMRP.V1R2M1.FNTLIB library.

The following options are available:

- Option B** Browse font data. This allows you to look at the contents of the selected member.
- Option C** Copy font data. Observe TSO naming conventions:
 - alpha or @, \$, # only for first character
 - alpha or numeric @, # \$ for remaining characters
 - 8 character limit.
- Option D** Delete font data allows you to delete a member from the library.
- Option L** Download font data allows to you to send the font to a printer.

Managing forms

You use the Xerox Resource Utility Form List to manage the forms that you have uploaded to the host. The functions provided are browse, copy, delete, and download. The members listed are forms residing in XMRP.V1R2M1.FRMLIB.

Loading Xerox forms

A program to download one form at a time is supplied with the utility. First store the form to be downloaded in the XMRP.V1R2M1.FRMLIB library. To download the form to the printer, enter the following command on the primary command line:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXFRM)' '<form name> <printer
destination>'
```

Accessing the Form List screen

To access the Form List screen, enter the following on the selection line or command line and press <Enter>:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(XLSTFRM)'
```

The Form List screen displays all the members in the XMRP.V1R2M1.FRMLIB library.

The Form List screen displays showing these options:

- | | |
|-----------------|--|
| Option B | Browse the form data will allow you to display the contents of a member on the screen. |
| Option C | Copy form data allows you to copy a member. Note that you MUST observe the following TSO naming conventions: <ul style="list-style-type: none"> • alpha or @, \$, # only for first character • alpha or numeric @, # \$ for remaining characters • 8 character limit. |
| Option D | Delete form data allows you to delete a member from the library. |
| Option L | Download form data allows you to send a form to a printer. |

Managing lists of resources

You use the Xerox Resource Utility to manage lists of resources. The members listed are lists of resources (fonts, forms, and configuration descriptions) residing in XMRP.V1R2M1.LSTLIB. The functions provided are browse, copy, delete, and download. A function key (PF12) is provided to create a list. The entries in a list must be in the following format:

FONT=Fontname

FORM=Formname

CFGD=Configuration Description name

Spaces are not allowed between the keyword and the "=", and the font, form, or configuration description name. The keywords Font, Form and CFGD are not case sensitive.

For example, you may want to set up a list file to download several fonts, followed by a configuration description. To do this, you would hit the PF12 key, which will prompt you for a member

name. Enter a name for this list followed by the enter key. This will put you into a standard TSO edit session.

The following list would load two fonts and a configuration description:

```
FONT=0204
FONT=0206
CFGD=YOURCFGD
```

Press the PF3 key to save and exit. You may now perform the functions on the list that are described on the following page.

Loading lists of resources

This program downloads lists of resources. You can use this program rather than the XLSTLST program to download a list of resources if you already know the name of the list and do not need to modify the list. The list to be downloaded MUST be in the XMRP.V1R2M1.LSTLIB library. To execute, enter the following on the primary command line:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXLIST)' '<list name> <printer
destination>'
```

Accessing the List Manager screen

To access the List Manager screen, enter the following on the selection line or command line and press <Enter>:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXLIST)' '<list name> <printer
destination>'
```

The List Manager screen is displayed and shows the following options:

- | | |
|-----------------|--|
| Option B | Browse list data. |
| Option C | Copy list data. Observe TSO naming conventions as follows: <ul style="list-style-type: none"> • alpha or @, \$, # only for first character • alpha or numeric @, # \$ for remaining characters • 8 character limit. |
| Option D | Delete a list from the library. |
| Option M | Modify a list. |
| Option L | Download to a printer the resources contained in the list. |

Downloading ASCII files

- | | |
|-----------------|--|
| LDXRXASC | This command works like Font Download CLIST (LDXRXFNT) and is used to Double Byte (Hex Transparency Mode) an application or user-created ASCII PostScript or PCL5 file. For example, there are PostScript ASCII files on your host system, such as the one used for jam recovery on the desktop. You can modify the CLIST to point to the data set and download your ASCII PostScript file via LDXRXASC: |
|-----------------|--|

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXASC)' '<file name> <printer
destination>'
```

VPS 6.2 transparency

VPS 6.2 supports a transparency option. If this option is used, a sysout class is enabled to support this feature, and you must make two modifications to the LDXRXFNT and LDXRXFRM clists, as follows:

1. Modify the clists to make use of this transparency feature by changing the sysout class in the allocate statement for sysout printer to reflect the class assigned to VPS transparency. This value is site dependent; ask your site system programmer for this information.
2. The parameter in the call statement must be changed from DBLBYT to NODBLBYT.

Configuration Description List

You use the Xerox Resource Utility Configuration Description List to manage the Configuration Descriptions on the host. The functions provided are browse, copy, delete, modify, and download. The members listed are configuration descriptions residing in XMRP.V1R2M1.CFGDLIB.

Accessing the Configuration Description List screen

To access the Configuration Description List screen, enter the following on the selection or command line and press <Enter>:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(XLSTCFG)'
```

The Configuration Description List screen displays showing these options:

- Option B** Browse Configuration Description.
- Option C** Copy Configuration Description. Observe TSO naming conventions:
 - alpha or @, \$, # only for first character
 - alpha or numeric @, # \$ for remaining characters
 - 8 character limit.
- Option D** Delete Configuration Description.
- Option M** Modify Configuration Description.
- Option L** Download Configuration Description.

A PF12 key is provided to create a Configuration Description.

The NONE parameter has been added to disable the creation of that FSL.

The following Configuration Descriptions are provided with the utility and are located in the XMRP.V1R2M1.CFGDLIB library. To send one of these configuration descriptions, such as the

DUPLEX configuration, to the printer enter the following on the command line:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(LDXRXCFG)' 'DUPLEX <printer destination>'
```

- | | |
|-----------------|---|
| DUPLEX | Configures the 4220/MRP printer for Duplex, long. |
| INTL3262 | Configures the 42XX/MRP printer as an international IBM 3262 band printer, witQON IĒ-Ū4.ufĪĒ18 113F3, ¼fĪĒ1 |

Creating a configuration file

Enter the following command to invoke the create configuration screen:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(CRTCFGD)'
```

To create a configuration file, enter the values or use the default for each option shown on the screen. The value typed for NAME OF CONFIG DESCRIPTION becomes the member name of the configuration file when it is saved in the XMRP.V1R2M1.CFGDLIB ISPF library.

The NON-SCS PRINT IMAGE options, NLSBOTH, NLS, TSI, and TSIBOTH, correspond to the following FSL Y27 of 0, 1, 2, 3, respectively.

You can specify FSL commands not shown on the screen in a user-created FSL file. User-created FSLs should reside in a library separate from the configuration descriptions. However, the library attributes should be identical to the library, XMRP.V1R2M1.CFGDLIB ISPF. The utility provides a library, XMRP.V1R2M1.UCRTLIB, to store user created FSLs. Use the EDIT option of the ISPF primary option menu to perform the create and edit functions.

The value typed for NAME OF USER-CREATED FSL corresponds to the location of the user-created FSL file. When the configuration file is saved, the user-created FSL is appended to it. If an invalid "User Created FSL" member is entered, an MVS Utility message is displayed:

```
"LSCX504 WARNING ERRNO = ENFOUND GENERATED IN
FOPEN CALLED FROM LINE XXX OF UCRTOPEN (MAIN), OFFSET
00005A      PDS MEMBER NOT FOUND: XXXXXXXX
INTERRUPTED WHILE: OPENING FILE "dsn:UCRT"
```

Press the <Enter> key to return to the MVS utility screen, which displays the message:

```
". . . . data set not available"
```

Key in a valid data set and member name. Press <Enter> to save the configuration description.



CAUTION: If the user-created FSL needs to be modified after creating the configuration file, the configuration file does not reflect the changes made in the user-created FSL until you modify the configuration file. See the section in this chapter, "Modifying and loading a configuration file."

In the next example, the member MYFSL is located in the library XMRP.V1R2M1.UCRTLIB.

If you are not logged on to the account that owns the member, enter the FSL location as follows with single apostrophes:

```
NAME OF USER-CREATED FSL == => 'XMRP.V1R2M1.UCRTLIB(MYFSL)'
```



CAUTION: If the name entered is invalid and the correct syntax for the FSL name is not known, type NONE in uppercase letters, press <Enter>, then <PF3> to exit.

Note

You can change FSL Y4 - Set Default Line Spacing (Line Spacing - Single, Double) with the utility but the change does not appear on the configuration report.

Creating the User-created FSL

It is mandatory that you create this FSL before using it on the Create Configuration Description screen. This FSL is appended to the configuration description name member created from this screen.

The Name of User-created FSL is an 8-character name created using any edit function. The user-created FSL must have a record length of 132. Each record must begin with the sequence to the FSL escape character (for example, &&??%). Each FSL command should not span two records.

The Name of User-created FSL field must be any partitioned data set (PDS) or any physical sequential file with apostrophes. Do not use apostrophes if the highest level qualifier is the person who is logged on.

Modifying and loading a configuration file

Enter the following command to invoke the configuration description list screen and display all configurations in the XMRP.V1R2M1.CFGDLIB ISPF library:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(XLSTCFG)'
```

Position the cursor in the command column opposite the member you want to modify or download. In the command column, type **M** to modify the file or **L** to load the file. Then press <Enter>.



CAUTION: If the Edit option in ISPF/TSO is used to build a user-created FSL in the XMRP.V1R2M1.CFGDLIB, the user-created FSL is listed on the screen and unpredictable results occur when the L or M option is used.

Modifying a configuration file

After completing modifications, use <PF8> or <Enter> to advance to the next screen. Remember to press the <Enter> key when the next screen displays. This saves the changes entered.

Exiting the Create Configuration Description screen with <F3> does not automatically save the Configuration Description. If an invalid "User Created FSL" member is entered, an MVS Utility message displays:

```
- "LSCX504 WARNING ERRNO = ENFOUND GENERATED IN
FOPEN CALLED FROM LINE XXX OF UCRTOPEN (MAIN), OFFSET
00005A      PDS MEMBER NOT FOUND: XXXXXXXX
INTERRUPTED WHILE: OPENING FILE "ddn:UCRT"
```

Press the <Enter> key to return to the MVS utility screen, which displays the message:

". . . . data set not available"

Loading a configuration file

After typing **L**, press <Enter>. The host responds by displaying this message:

PLEASE ENTER PRINTER DESTINATION.

Type the remote id for the printer and press <Enter>. The host responds with the following:

Press <Enter> to return to the configuration description list screen.

Deleting or copying a configuration file

All configuration setups created using the utility reside in the XMRP.V1R2M1.CFGDLIB ISPF library. The utility does not provide functions to delete or copy configurations. Delete operations can be performed by using the ISPF/TSO Delete function. The same is true for copying.

Note There is a name field inside all configuration descriptions. When a copy operation is performed, the new configuration description contains the same name field as the original configuration description. The utility does not allow this field to be changed. Therefore, the ISPF Edit function must be used to change this name field. If the modify option is taken from XLSTCFG, the old name field appears, if it has not been changed via ISPF Edit. The member name is used for reference by the utility for subsequent operations, not the name contained in the name field.

Configuration in the VM environment

Currently, there is no utility to configure the 42XX/MRP Family of printers in the VM environment. It is recommended that the user create a file member with all the necessary FSLs to configure the printer and then send that file to the printer. By creating a file with all of these FSLs, you can configure the printer without the aid of a utility. The following example shows what the file should contain to configure the printer.

```
&&??@ @Y2,6@ @Y3,10@ @Y4,1@ @Y5,62@ @Y6,132@ @Y7,1@
@Y10,0@ @Y11,2@ @Y12,3@ @Y13,1@ @Y19,0@ @Y25,0@
@Y26,1@ @Y27,0@ @Y28,0@ @Y29,0@ @Y30,1@ Y34,1@
@Y50,0@&&??<space>
```

The file must be terminated with a space character in order to properly turn off the FSL escape character ('@' in this example). Also, since the example has the 'NONE' option for I/F MEMORY

CONTROL, there is no FSL for this command. If you wish to store the settings into memory, change the last line to:

@Y50,0@ @X1&&??<space>

Configuration and Resource Utility components

The following is a list of entities included in your utility:

- XMRPV1R2M1CLIST—invokes create or change configuration description, load fonts, load configuration description, and list configuration description.
- XMRPV1R2M1LOAD—contains the create configuration description, change configuration description, list configuration description, load fonts, and load configuration description 'C' object code.
- XMRPV1R2M1CFGDLIB—contains configuration description members. XFACT is the factory defaults.
- XMRPV1R2M1FNTLIB—contains the downloadable 3816 emulation fonts. Refer to Table 7-11 for the various downloadable fonts.
- XMRPV1R2M1LINKLIB—contains executable subroutines called by the Xerox utility programs.

Selecting functions

Table 7-2. **Function keys**

Keys	Name	Description
F3	END	Exits or returns you to the previous screen—no save. Exits the prompt display and associated display without running the command.
F7	BACKWARD	Displays prior screen. If on top screen, displays "TOP" on the lower right hand corner of the screen.
F8	FORWARD	Displays the next screen. If at the end of the screens, displays "BOTTOM" on the lower right hand corner of the screen.

Accessing the MVS ISPF Primary Option Menu

After logging on, the MVS ISPF Primary Option Menu screen displays:

```

                                ISPF Primary Option Menu
OPTION  = = =>
0  ISPF PARMS      - Specify terminal and user parameters
1  BROWSE          - Display source data or output listings
2  EDIT            - Create or change source data
3  UTILITIES       - Perform utility functions
4  FOREGROUND      - Invoke language processors in foreground
5  BATCH           - Submit job for language processing
6  COMMAND         - Enter TSO command or CLIST
7  DIALOG TEST     - Perform dialog testing
8  LM UTILITIES    - Perform library management utility
                    functions
C  CHANGES        - Display summary of changes for this
                    release
I  ISPF CUST.      - Customer developed ISPF applications
N  NETWORK         - Network and Communications
P  PRINT           - Printing Programs
S  SYSTEMS         - System's Facilities
T  TUTORIAL        - Display Information about ISPF/PDF
X  EXIT            - Terminate ISPF using log and list
                    defaults

Enter END command to terminate ISPF.

```

Enter **6** (Option 6) on the option line.

Remember

To create a user-created FSL, use an editor (for instance, TSO option **2**). User-created FSL is a term used to describe a repository for FSL only. In contrast with configuration description created using the Resource Utility Configuration Description Create or Change program, the configuration description is a repository for text and FSL.

Invoking the Configuration and Resource Utility

You can invoke the Configuration and Resource Utility main menu from the ISPF command line by entering the following onto the primary command line:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(XRSCMNU)'
```

The main menu for the utility then appears and you can enter one of four options: Work with Xerox Fonts; Work with Xerox Forms; Work with Xerox Lists; and Work with Xerox CFGDS (configuration descriptions). This menu gives you access to individual utilities that provide a variety of functions such as downloading fonts and forms, creating and modifying configurations, and downloading lists of resources. These individual utilities are in the form of CLISTS that are stored in the XMRP.V1R2M1.CLIST library.

You can also run each of the utility functions on a standalone basis by entering the following command on the primary command line:

```
==> TSO EXEC 'XMRP.V1R2M1.CLIST(XXXX)'
```

where XXXX is the CLIST you want to invoke.

The following CLISTS are provided:

- Enter the LDXRXASC CLIST to download ASCII files.
- Enter the LDXRXFNT CLIST to download fonts.
- Enter the LDXRXCFCG CLIST to download configuration files.
- Enter the LDXRXFRM CLIST to download forms.
- Enter the LDXRXLST CLIST to download a list of resources.
- Enter the CRTCFGD CLIST to create configuration files.
- Enter the CHGCFGD CLIST to change configuration files.
- Enter the XLSTCFG CLIST to modify, copy, delete, and download configuration files.
- Enter the XLSTFRM CLIST to browse, copy, delete, and download form files.
- Enter the XLSTLST CLIST create, modify, browse, copy, and download lists of resources.
- Enter the XLSTFNT CLIST to browse, copy, delete, and download font files.

Remember

When instructed to enter a command, type the direct command preceded by **TSO EXEC 'XMRP.V1R2M1.CLIST(*direct command*)'**, and press the **Enter** key.

Create Configuration Description

The Xerox Resource Utility, Create Configuration Description screen allows you to create configuration descriptions for the internal interface card on the host.

The configuration description object or file converts the values selected from the screen to the appropriate Function Selection via Line (FSL). The Function Selection via Line (FSL) is created when the Create Configuration Description screen is exited and stored in XMRPV1R2M1CFGDLIB partitioned data set (PDS).

Each time the Create Configuration Description command is executed, the FSL is recreated. There is an option from the Create Configuration Screen to download the description to the printer.

To create this Configuration Description screen, enter on the selection line or command line:

TSO EXEC 'XMRPV1R2M1CLIST(CRTCFGD)'

Press the **Enter** key.

Refer to the "Clist Code Listings" section in this chapter for additional information.

1st screen The Create Configuration Description first screen displays:

```

-----XEROX RESOURCE UTILITY  Ver
1.2.1-----
-----CREATE CONFIGURATION
DESCRIPTION-----
----- (Value 'NONE' does not create FSL for the
CFGD-----
NAME OF CONFIG DESCRIPTION  = = =>          NAME
LINES PER INCH              = = => 6         NONE,0,3,4,6,8
CHARACTERS PER INCH         = = => 10        NONE,10,12,15,16,20,27
LINE SPACING                = = => SINGLE    NONE,SINGLE,DOUBLE
FORM LENGTH                 = = => 62        NONE,0 to 255
MAXIMUM PRINT POSITION       = = => 132       NONE,0 to 255
CASE                       = = => DUAL      NONE,MONO,DUAL
PAGE FORMAT                 = = => PORT      NONE,PORT,LAND,COR
PAPER PATH                  = = => TRAY 1
NONE,TRAY1,TRAY2,TRAY3,TRAY4,TRAY5,
MIDDLE,UPPER,LOWER,MAN-
PAP,MAN-ENV
PAPER SIZE                  = = => LETTER
NONE,LETTER,LEGAL,A4,EXEC,MON,
BUS,DL,C5,A3,LEDGER
LINE OVERFLOW OPTION        = = => TRUNCATE  NONE,WRAP,TRUNCATE
DUPLEX PRINTING             = = => SIMPLEX   NONE,SIMPLEX,LONG,SHORT
FORM FEED BEFORE LOCAL CPY = = => NO       NONE,YES,N

```

The screen has three columns. Column 1 shows the various FSL commands. Column 2 is where you enter your choice of parameter values found in column 3. Default values are displayed in column 2.

Note: Although the screen displays 16 in the Characters Per Inch field, the printer uses 16.7.

Remember You enter your options in the Default parameter fields (column 2) and press the **Enter** key to execute the command.

There are two validated fields in the Create Configuration Description screen:

- Name of Configuration Description

- Name of user-created FSL.

The Name of Configuration Description field must be any 8-character name starting with an alpha character.

Press F8 to go to the second screen.

2nd screen The Create Configuration Description second screen displays:

```

-----XEROX RESOURCE UTILITY
-----
-----CREATE CONFIGURATION DESCRIPTION-----
LAST LF ON PAGE SENT AS FF = = => YES      NONE,YES,NO
FF AFTER TIME ELAPSE      = = => 0         NONE,0 TO 255
USER HORIZONTAL MARGINS   = = => NONE      NONE,NUMBER IN 1440ths
INCH
USER VERTICAL MARGINS    = = => NONE      NONE,NUMBER IN 1440ths
INCH
NON-SCS PRINT IMAGE      = = => NSLBOTH
NONE,NLSBOTH,NLS,TSI,TSIBOTH
I/F MEMORY CONTROL      = = => NONE
NONE,RSTUSR,RSTFCT,SAVUSR
    
```

Refer to Table 7-2 for a description of the function keys.

Table 7-3 provides additional information on the FSL commands generated through the use of the User Horizontal Margins and User Vertical Margins.

Table 7-3.

For FSL Y60—Font Link for GFIDs, you need to refer to table 3-4 in the “Function Selection via Line (FSL) commands” chapter for the correct GFID pitch equivalent.

Refer also to the “FSL escape character” section in the “Function Selection via Line (FSL) commands” chapter for additional information on format, using, and removing FSL escape character.

Saving a Create Configuration Description

To save a configuration description, do the following:

1. Press F8 or the **Enter** key to go to the second screen.
2. Press the **Enter** key.

The information on both screens will be saved.

Change Configuration Description

The Xerox Resource Utility, Change Configuration Description screen allows you to change configuration descriptions for the internal interface card on the host.

The configuration description object or file converts the values selected from the screen to the appropriate Function Selection via Line (FSL). The Function Selection via Line (FSL) is changed when the Change Configuration Description screen is exited and stored in XMRPV1R2M1CFGDLIB partitioned data set (PDS).

Each time the Change Configuration Description command is executed, the FSL is recreated. There is an option from the Change Configuration Screen to download the description to the printer.

To change this Configuration Description screen, enter on the selection line or command line:

```
TSO EXEC 'XMRPV1R2M1CLIST(CHGCFGD)'<member name>'
```

Press the **Enter** key.

Any member name in XMRPV1R2M1CFGLIB is valid.

Refer to the “Clist Code Listings” section in this chapter for additional information.

1st screen The Change Configuration Description first screen displays:

The screen has three columns. Column 1 shows the various FSL commands. Column 2 is where you enter your choice of parameter values found in column 3. Default values are displayed in column 2.

N **Note:** Although the screen displays 16 in the Characters Per Inch field, the printer uses 16.7.

Remember

```

-----XEROX RESOURCE UTILITY   Ver  1.2.1
-----
-----CHANGE CONFIGURATION
DESCRIPTION-----
------(Value 'NONE' does not create FSL for the
CPGD)-----
NAME OF CONFIG DESCRIPTION = =>          NAME
LINES PER INCH            = => 6          NONE,0,3,4,6,8
CHARACTERS PER INCH       = => 10         NONE,10,12,15,16,20,27
LINE SPACING              = => SINGLE     NONE,SINGLE, DOUBLE
FORM LENGTH               = => 62         NONE,0 to 255
MAXIMUM PRINT POSITION     = => 132        NONE,0 to 255
CASE                      = => DUAL       NONE,MONO,DUAL
PAGE FORMAT               = => PORT       NONE,PORT,LAND,COR
PAPER PATH                = => TRAY 1
NONE,TRAY1,TRAY2,TRAY3,TRAY4,TRAY5
MIDDLE,UPPER,LOWER,MAN-
PAP,MAN-ENV
PAPER SIZE                = => LETTER
NONE,LETTER,LEGAL,A4,EXEC,MON,
BUS,DL,C5,A3,LEDGER
LINE OVERFLOW OPTION     = => TRUNCATE    NONE,WRAP,TRUNCATE
DUPLEX PRINTING          = => SIMPLEX     NONE,SIMPLEX,LONG SHORT
FORM FEED BEFORE LOCAL CPY = => NO        NONE,YES,NO
    
```

In the Name of Configuration Description field, enter any 8-alphanumeric name starting with an alpha character.

In the Name of User-created FSL field, enter any PDS data set name or any physical sequential file. If the highest level qualifier is the person who is logged on, do not use apostrophes. If the XMRP PDS is used, include apostrophes.

Press F8 to go to the second screen.

2nd screen The Change Configuration Description second screen displays:

```

-----XEROX RESOURCE UTILITY
-----
-----CHANGE CONFIGURATION
DESCRIPTION-----
LAST LF ON PAGE SENT AS FF = => YES      NONE,NO,YES
FF AFTER TIME ELAPSE      = => 0         NONE,0 TO 255
USER HORIZONTAL MARGINS   = => NONE      NONE,NUMBER IN 1440ths
INCH
USER VERTICAL MARGINS    = => NONE      NONE,NUMBER IN 1440ths
INCH
NON-SCS PRINT IMAGE       = => NONE
NONE,NLSBOTH,NLS,TSI,TSIBOTH
I/F MEMORY CONTROL       = . . => NONE      NONE,RSTUSR,RSTFCT,SAVUSR
    
```

Refer to Table 7-2 for a description of the function keys.

Saving a Change Configuration Description

To save a Change Configuration Description, do the following:

1. Press F8 or the **Enter** key to go to the second screen.
2. Press the **Enter** key.

The information on both screens will be saved.

Handling error messages

You may encounter the following error messages when working on the Change Configuration Description screen:

Error message	"Configuration Description Name Field Blank - Reenter or Exit" means you did not enter a configuration description name and had pressed the Enter key.
Error message	"Name - Invalid Config Desc Name - Reenter or Exit" means you have keyed in a space in the configuration description name.
Error message	"Name - Invalid User-created FSL Name - Reenter or Exit" means you have keyed in a space in the user-created FSL name.
Error message	"User-created FSL Data Set Not Available" means the user-created FSL is not changed.

Clist code listings

The following listings of Clist codes are provided by Xerox Utility Program. Any of the Clists can be invoked on any TSO command line. TSO provides prompting for the required parameters. Any of the Clists can be modified to meet site requirements.

Listing configuration descriptions

Command	XMRPV1R2M1CLIST(XLSTCFG)
	PROC 0
	ALLOC DA('XMRPV1R2M1LINKLIB') REUSE F(CTRANS) SHR
	ALLOC DA('XMRPV1R2M1CFGDLIB') REUSE F(CFG1) SHR
	CALL 'XMRPV1R2M1LOAD(XLSTCFG)' "'XMRPV1R2M1CLIST'"
	FREE F(CTRANS)
	FREE F(CFG1)

Creating configuration descriptions

Command **XMRPV1R2M1CLIST(CRTCFGD)**

```
PROC 0
ALLOC DA('XMRPV1R2M1LINKLIB') REUSE F(CTRANS) SHR
ALLOC DA('XMRPV1R2M1CFGDLIB') REUSE F(CFGD) SHR

CALL'XMRPV1R2M1LOAD(CRTCFGD)'
FREE F(CTRANS)
FREE F(CFGD)
```

Changing configuration descriptions

Command **XMRPV1R2M1CLIST(CHGCFGD)**

```
PROC 1 CFGD NOALLOC
ALLOC DA('XMRPV1R2M1CFGDLIB(&CFGD)') F(CFGD) REUSE
SHR
IF &NOALLOC = NOALLOC THEN
ELSE ALLOC DA('XMRPV1R2M1LINKLIB')REUSE F(CTRANS) SHR

CALL'XMRPV1R2M1LOAD(CHGCFGD)'
```

```
IF &NOALLOC = NOALLOC THEN
ELSE FREE F(CTRANS)

FREE F(CFGD)
```

Loading configuration descriptions

Command **XMRPV1R2M1CLIST(LDXRXCFCG)**

```
PROC 2 CFGD DEST NOALLOC

IF &DEST = NO ALLOC THEN DO
  SET &NOALLOC = &DEST
  WRITE PLEASE ENTER PRINTER DESTINATION.
  READ &DEST
END

IF &NOALLOC = NOALLOC THEN
ELSE ALLOC DA('XMRPV1R2M1LINKLIB') REUSE F(CTRANS) SHR

ALLOC DA('XMRPV1R2M1CFGDLIB'(&CFGD)') F(CFGD) REUSE
SHR
ALLOC SYSOUT(A) DEST(&DEST) F(PRTR)

CALL'XMRPV1R2M1LOAD(LDXRXCFCG)'
```

```
IF &NOALLOC = NOALLOC THEN
ELSE FREE F(CTRANS)

FREE F(CFGD)
FREE F(PRTR)
```

Loading fonts

Command **XMRPV1R2M1CLIST(LDXRXFNT)PROC 2 FNTNAME DEST**
ALLOCC DA('XMRPV1R2M1LINKLIB') REUSE F(CTRANS) SHR
ALLOCC DA('XMRPV1R2M1FNTLIB'(&FNTNAME)) F(FONT) REUSE
SHR
ALLOCC SYSOUT(A) DEST(&DEST) F(PRTR)
CALL 'XMRPV1R2M1LOAD(LDXRXFNT)'
FREE F(CTRANS)
FREE F(FONT)
FREE F(PRTR)

A. Font and code set tables

This appendix shows PCL Translate Tables 1 through 8 applicable to the MRP Family coax interface printers. These tables are valid when the printer-resident fonts are used. If the compatibility fonts are used, a unique table is loaded automatically to access the full Code Page 500 character set that is supported. Table 7 is selected, modified, and used as the active translate table. The appendix also contains IBM code set tables applicable to the MRP Family coax interface printers.

Table A-1. PCL Translate Table 1: Codepage 500 to Roman 8

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	20	26	2D	D6	D2	B3	F3	BF	7B	7D	5C	30
x1	20	C5	2F	DC	61	6A	AC	BB	41	4A	20	31
x2	C0	C1	A2	A4	62	6B	73	BC	42	4B	53	32
x3	CC	CD	D8	A5	63	6C	74	F2	43	4C	54	33
x4	C8	C9	A1	A3	64	6D	75	BE	44	4D	55	34
x5	C4	D5	E0	E5	65	6E	76	BD	45	4E	56	35
x6	E2	D1	E1	A6	66	6F	77	F4	46	4F	57	36
x7	D4	DD	D0	A7	67	70	78	F7	47	50	58	37
x8	B5	D9	B4	E6	68	71	79	F8	48	51	59	38
x9	B7	DE	B6	A9	69	72	7A	F5	49	52	5A	39
xA	5B	5D	7C	3A	FB	F9	B8		2D			
xB	2E	24	2C	23	FD	FA	B9	7C	C2	C3	DF	AE
xC	3C	2A	25	40	E4	D7	E3	B0	CE	CF	DA	DB
xD	28	29	5F	27	B2		B1	AB	CA	CB	E8	AD
xE	2B	3B	3E	3D	F1	D3	F0	A8	C6	C7	E7	ED
xF	21	5E	3F	22	FE	BA			EA	EF	E9	

Table A-2. PCL Translate Table 2: Codepage 500 to PC 8

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	20	26	2D			F8	E6	9B	7B	7D	5C	30
x1	20	82	2F	90	61	6A	7E	9C	41	4A	20	31
x2	83	88			62	6B	73	9D	42	4B	53	32
x3	84	89	8E		63	6C	74	9E	43	4C	54	33
x4	85	8A			64	6D	75	9F	44	4D	55	34
x5	A0	A1			65	6E	76	15	45	4E	56	35
x6		8C			66	6F	77	14	46	4F	57	36
x7	86	8B	8F		67	70	78	AC	47	50	58	37
x8	87	8D	80		68	71	79	AB	48	51	59	38
x9	A4	E1	A5	A5	69	72	7A		49	52	5A	39
xA	5B	5D			AE	A6	AD	AA	2D		FD	
xB	2E	24	2C	2C	AF	A7	A8	B3	93	96		
xC	3C	2A	25	25		91			94	81	99	9A
xD	28	29	5F	5F					95	97		
xE	2B	3B	3E	3E		92			A2	A3		
xF	21	5E	3F	3F	F1					98		

Table A-3. PCL Translate Table 3: Codepage 500 to ECMA

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	20	26	2D	F8	D8	B0	B5	A2	7B	7D	5C	30
x1	20	E9	2F	C9	61	6A		A3	41	4A	20	31
x2	E2	EA	C2	CA	62	6B	73	A5	42	4B	53	32
x3	E4	EB	C4	CB	63	6C	74	B7	43	4C	54	33
x4	E0	E8	C0	C8	64	6D	75		44	4D	55	34
x5	E1	ED	C1	CD	65	6E	76	A7	45	4E	56	35
x6	E3	EE	C3	CE	66	6F	77	B6	46	4F	57	36
x7	E5	EF	C5	CF	67	70	78	BC	47	50	58	37
x8	E7	EC	C7	CC	68	71	79	BD	48	51	59	38
x9	F1	DF	D1		69	72	7A	BE	49	52	5A	39
xA	5B	5D	A6	3A	AB	AA	A1	AC	2D	B9	B2	B3
xB	2E	24	2C	23	BB	BA	BF	7C	F4	FB	D4	DB
xC	3C	2A	25	40	F0	E6	D0	AF	F6	FC	D6	DC
xD	28	29	5F	27	FD	B8	DD	A8	F2	F9	D2	D9
xE	2B	3B	3E	3D	FE	C6	DE	B4	F3	FA	D3	DA
xF	21	5E	3F	22	B1	A4	AE		F5		D5	

Table A-4. PCL Translate Table 4: Codepage 259 to PC-8
(Only Box Characters for drawing)

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	20											
x1	20										20	
x2												
x3												
x4												
x5												
x6												
x7												
x8												
x9												
xA					DA	C2	BF					
xB					C3	C5	B4					
xC					C0	C1	D9					
xD					B3		C4					
xE												
xF												

Table A-5. PCL Translate Table 5: Codepage 500 to ASCII 7-Bit

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	20	26	2D									30
x1	20		2F		61	6A			41	4A	20	31
x2					62	6B	73		42	4B	53	32
x3					63	6C	74		43	4C	54	33
x4					64	6D	75		44	4D	55	34
x5					65	6E	76		45	4E	56	35
x6					66	6F	77		46	4F	57	36
x7					67	70	78		47	50	58	37
x8					68	71	79		48	51	59	38
x9					69	72	7A		49	52	5A	39
xA	5B	5D		3A					2D			
xB	2E	24	2C	23				7C				
xC	3C	2A	25	40								
xD	28	29	5F	27								
xE	2B	3B	3E	3D								
xF	21	5E	3F	22								

Table A-6. PCL Translate Table 6: Codepage 500 to OCR A
(Equivalent to PCL translate table 1)

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	20	26	2D	D6	D2	B3	F3	BF	7B	7D	5C	30
x1	20	C5	2F	DC	61	6A	AC	BB	41	4A	20	31
x2	C0	C1	A2	A4	62	6B	73	BC	42	4B	53	32
x3	CC	CD	D8	A5	63	6C	74	F2	43	4C	54	33
x4	C8	C9	A1	A3	64	6D	75	BE	44	4D	55	34
x5	C4	D5	E0	E5	65	6E	76	BD	45	4E	56	35
x6	E2	D1	E1	A6	66	6F	77	F4	46	4F	57	36
x7	D4	DD	D0	A7	67	70	78	F7	47	50	58	37
x8	B5	D9	B4	E6	68	71	79	F8	48	51	59	38
x9	B7	DE	B6	A9	69	72	7A	F5	49	52	5A	39
xA	5B	5D	7C	3A	FB	F9	B8		2D			
xB	2E	24	2C	23	FD	FA	B9	7C	C2	C3	DF	AE
xC	3C	2A	25	40	E4	D7	E3	B0	CE	CF	DA	DB
xD	28	29	5F	27	B2		B1	AB	CA	CB	E8	AD
xE	2B	3B	3E	3D	F1	D3	F0	A8	C6	C7	E7	ED
xF	21	5E	3F	22	FE	BA			EA	EF	E9	

Table A-7. PCL Translate Table 7: Codepage 500 to OCR B
(Equivalent to PCL translate table 1)

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	20	26	2D	D6	D2	B3	F3	BF	7B	7D	5C	30
x1	20	C5	2F	DC	61	6A	AC	BB	41	4A	20	31
x2	C0	C1	A2	A4	62	6B	73	BC	42	4B	53	32
x3	CC	CD	D8	A5	63	6C	74	F2	43	4C	54	33
x4	C8	C9	A1	A3	64	6D	75	BE	44	4D	55	34
x5	C4	D5	E0	E5	65	6E	76	BD	45	4E	56	35
x6	E2	D1	E1	A6	66	6F	77	F4	46	4F	57	36
x7	D4	DD	D0	A7	67	70	78	F7	47	50	58	37
x8	B5	D9	B4	E6	68	71	79	F8	48	51	59	38
x9	B7	DE	B6	A9	69	72	7A	F5	49	52	5A	39
xA	5B	5D	7C	3A	FB	F9	B8		2D			
xB	2E	24	2C	23	FD	FA	B9	7C	C2	C3	DF	AE
xC	3C	2A	25	40	E4	D7	E3	B0	CE	CF	DA	DB
xD	28	29	5F	27	B2		B1	AB	CA	CB	E8	AD
xE	2B	3B	3E	3D	F1	D3	F0	A8	C6	C7	E7	ED
xF	21	5E	3F	22	FE	BA			EA	EF	E9	

Table A-8. PCL Translate Table 8: Codepage 500 to PC-850

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	20	26	2D	9B	9D	F8	E6	BD	7B	7D	5C	30
x1	20	82	2F	90	61	6A	7E	9C	41	4A	20	31
x2	83	88	B6	D2	62	6B	73	BE	42	4B	53	32
x3	84	89	8E	D3	63	6C	74	FA	43	4C	54	33
x4	85	8A	B7	D4	64	6D	75	9F	44	4D	55	34
x5	A0	A1	B5	D6	65	6E	76	F5	45	4E	56	35
x6	C6	8C	C7	D7	66	6F	77	F4	46	4F	57	36
x7	86	8B	8F	D8	67	70	78	AC	47	50	58	37
x8	87	8D	80	DE	68	71	79	AB	48	51	59	38
x9	A4	E1	A5	60	69	72	7A	F3	49	52	5A	39
xA	5B	5D	7C	3A	AE	A6	AD	AA	2D	D5	FD	FC
xB	2E	24	2C	23	AF	A7	A8	B3	93	96	E2	EA
xC	3C	2A	25	40	D0	91	D1	EE	94	81	99	9A
xD	28	29	5F	27	EC	F7	ED	F9	95	97	E3	EB
xE	2B	3B	3E	3D	E7	92	E8	EF	A2	A3	E0	E9
xF	21	5E	3F	22	F1	CF	A9	F2	E4	98	E5	

Table A-9. Code Page 037—U.S. English

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	^	{	}	\	0
x1	(RSP)	é	/	É	a	j	~	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	â	ï	Å	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	`	i	r	z		I	R	Z	9
xA	ø	!	¡	:	«	ª	ı	[	–	ı	2	3
xB	.	\$	,	#	»	º	ı	]	ô	û	Ô	Û
xC	<	*	%	@	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	´	¸	´	”	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	Ɔ	’	ó	ú	Ó	Ú
xF	|	¬	?	”	±		®	≡	õ	ÿ	Õ	(EO)

Table A-10. Code Page 273—Austrian/German

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	ϕ	ä	ü	Ö	0
x1	(RSP)	é	/	É	a	j	ß	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	{	ë	[	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	@	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	å	ï	Å	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	~	Ñ	`	i	r	z		I	R	Z	9
xA	Ä	Ü	ö	:	«	ª	ı	¬	–	ı	2	3
xB	.	\$	,	#	»	º	ı	|	ô	û	Ô	Û
xC	<	*	%	§	ð	æ	Ð	-	ı	}	\]
xD	(	)	_	'	´	¸	´	¨	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	þ	´	ó	ú	Ó	Ú
xF	!	^	?	”	±		®	≡	õ	ÿ	Õ	(EO)

Table A-11. Code Page 274—Belgian

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	¢	é	è	ç	0
x1	(RSP)	{	/	É	a	j	¨	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	@	}	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	å	ï	Å	Ï	g	p	x		G	P	X	7
x8	\	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	`	i	r	z		I	R	Z	9
xA	[	]	ù	:	«	ª	ı	¬	–	ı	2	3
xB	.	\$	,	#	»	º	ı	|	ô	û	Ô	Û
xC	<	*	%	à	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	´	¸	´	~	ò	ı	Ò	Ù
xE	+	;	>	=	þ	Æ	þ	'	ó	ú	Ó	Ú
xF	!	^	?	”	±		®	==	õ	ÿ	Õ	(EO)

Table A-12. Code Page 275—Brazilian

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	¢	õ	é	\	0
x1	(RSP)	}	/	[	a	j	~	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	`	î	@	Î	f	o	w	¶	F	O	W	6
x7	å	ï	Å	Ï	g	p	x		G	P	X	7
x8	ı	ì	]ı	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	ã	i	r	z		I	R	Z	9
xA	É	\$	ç	:	«	ª	ı	¬	—	ı	2	3
xB	.	Ç	,	Õ	»	º	ı	|	ô	û	Ô	Û
xC	<	*	%	Ã	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	´	¸	´	¨	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	þ	´	ó	ú	Ó	Ú
xF	!	^	?	”	±		®	≡	{	¨	y	# (EO)

Table A-13. Code Page 276—French Canadian

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	ϕ	é	è	,	0
x1	(RSP)	{	/	É	a	j	¨	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	[	}	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	å	ï	Å	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	`	i	r	z		I	R	Z	9
xA	à	´	ù	:	«	ª	ı	¬	–	ı	2	3
xB	.	\$	,	#	»	º	ı	|	ô	û	Ô	Û
xC	<	*	%	@	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	´	\	´	~	ò	ı	Ò	Ù
xE	+	;	>	=	þ	Æ	Þ	]	ó	ú	Ó	Ú
xF	!	^	?	”	±		®	≡	õ	ÿ	Õ	(EO)

Table A-14. Code Page 277—Danish/Norwegian

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	|	@	°	μ	ϕ	æ	å	\	0
x1	(RSP)	é	/	É	a	j	ü	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	}	ï	\$	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	`	i	r	z		I	R	Z	9
xA	#		ø	:	«	ª	ı	¬	–	ı	2	3
xB	.	Å	,	Æ	»	º	ı	|	ô	û	Ô	Û
xC	<	*	%	Ø	ð	{	Ð	-	ö	~	Ö	Ü
xD	(	)	_	'	´	¸	´	¨	ò	ù	Ò	Ù
xE	+	;	>	=	þ	[	Þ	´	ó	ú	Ó	Ú
xF	!	^	?	”	±	]	®	≡	õ	ÿ	Õ	(EO)

Table A-15. Code Page 278—Finnish/Swedish

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	ϕ	ä	å	É	0
x1	(RSP)	`	/	\	a	j	ü	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	{	ë	#	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	[	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	}	ï	\$	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	é	i	r	z		I	R	Z	9
xA	§		ö	:	«	ª	ı	¬	–	ı	²	³
xB	.	Å	,	Ä	»	º	ç	|	ô	û	Ô	Û
xC	<	*	%	Ö	ð	æ	Ð	ˉ	ı	˜	@	Ü
xD	(	)	_	'	´	¸	´	¨	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	þ	´	ó	ú	Ó	Ú
xF	!	^	?	”	±	]	®	≡	õ	ÿ	Õ	(EO)

Table A-16. Code Page 280—Italian

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	[	μ	¢	à	è	ç	0
x1	(RSP)	]	/	É	a	j	ì	#	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	{	}	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	@	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	â	ï	Å	Ï	g	p	x		G	P	X	7
x8	\	~	Ç	ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	ù	i	r	z		I	R	Z	9
xA	°	é	ò	:	«	ª	ı	¬	—	ı	2	3
xB	.	\$	,	£	»	º	ı	|	ô	û	Ô	Û
xC	<	*	%	§	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	´	¸	´	¨	ı	`	Ò	Ù
xE	+	;	>	=	þ	Æ	þ	´	ó	ú	Ó	Ú
xF	!	^	?	”	±		®	≡	õ	ÿ	Õ	(EO)

Table A-17. Code Page 281—Japanese (Latin characters)

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	¢	{	}	\$	0
x1	(RSP)	é	/	É	a	j	-	[	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	\	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	å	ï	Å	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	`	i	r	z		I	R	Z	9
xA	£	!	!	:	«	ª	¡	^	-	|	2	3
xB	.	¥	,	#	»	º	¿	]	ô	û	Ô	Û
xC	<	*	%	@	ð	æ	Ð	~	ö	ü	Ö	Ü
xD	(	)	_	'	´	¸	´	¨	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
xF	|	-	?	"	±		®	≡	õ	ÿ	Õ	(EO)

Table A-18. Code Page 282—Portuguese

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	¢	ã	´	Ç	0
x1	(RSP)	é	/	É	a	j	ç	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	{	î	#	Î	f	o	w	¶	F	O	W	6
x7	å	ï	Å	Ï	g	p	x		G	P	X	7
x8	~	ì	\	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	`	i	r	z		I	R	Z	9
xA	[	]	õ	:	«	ª	ı	¬	–	|	2	3
xB	.	\$	,	Ã	»	º	ı	|	ô	û	Ô	Û
xC	<	*	%	Õ	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	ý	¸	Ý	¨	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	Þ	}	ó	ú	Ó	Ú
xF	!	^	?	”	±		®	≡	ı	ÿ	@	(EO)

Table A-19. Code Page 284—Spanish/Spanish speaking

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	¢	{	}	\	0
x1	(RSP)	é	/	É	a	j	¨	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	â	ï	Å	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ı	ß	#	`	i	r	z		I	R	Z	9
xA	[	]	ñ	:	«	ª	ı	^	–	ı	2	3
xB	.	\$	,	Ñ	»	º	¿	!	ô	û	Ô	Û
xC	<	*	%	@	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	ý	¸	Ý	~	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	Þ	'	ó	ú	Ó	Ú
xF	|	-	?	”	±		®	≡	õ	ÿ	Õ	(EO)

Table A-20. Code Page 285—U.K. English

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	¢	{	}	\	0
x1	(RSP)	é	/	É	a	j	-	[	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	å	ï	Å	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	`	i	r	z		I	R	Z	9
xA	\$	!	¡	:	«	ª	ı	^	-	|	2	3
xB	.	£	,	#	»	º	ı	]	ô	û	Ô	Û
xC	<	*	%	@	ð	æ	Ð	~	ö	ü	Ö	Ü
xD	(	)	_	'	´	¸	´	¨	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	Þ	´	ó	ú	Ó	Ú
xF	|	¬	?	”	±		®	≡	õ	ÿ	Õ	(EO)

Table A-21. Code Page 297—French

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	[	`	ç	é	è	ç	0
x1	(RSP)	{	/	É	a	j	¨	#	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	@	}	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	]	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	â	ï	Å	Ï	g	p	x		G	P	X	7
x8	\	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	µ	i	r	z		I	R	Z	9
xA	°	§	ù	:	«	ª	ı	¬	—	ı	2	3
xB	.	\$	,	£	»	º	¿	|	ô	û	Ô	Û
xC	<	*	%	à	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	´	¸	´	~	ò	ı	Ò	Ù
xE	+	;	>	=	þ	Æ	þ	´	ó	ú	Ó	Ú
xF	!	^	?	”	±		®	≡	õ	ÿ	Õ	(EO)

Table A-22. Code Page 500—Multinational

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0	(SP)	&	-	ø	Ø	°	μ	¢	{	}	\	0
x1	(RSP)	é	/	É	a	j	~	£	A	J	(NSP)	1
x2	â	ê	Â	Ê	b	k	s	¥	B	K	S	2
x3	ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
x4	à	è	À	È	d	m	u	f	D	M	U	4
x5	á	í	Á	Í	e	n	v	§	E	N	V	5
x6	ã	î	Ã	Î	f	o	w	¶	F	O	W	6
x7	å	ï	Å	Ï	g	p	x		G	P	X	7
x8	ç	ì	Ç	Ì	h	q	y		H	Q	Y	8
x9	ñ	ß	Ñ	`	i	r	z		I	R	Z	9
xA	[	]	;	:	«	ª	ı	¬	–	|	2	3
xB	.	\$	,	#	»	º	ı	|	ô	û	Ô	Û
xC	<	*	%	@	ð	æ	Ð	-	ö	ü	Ö	Ü
xD	(	)	_	'	´	¸	´	¨	ò	ù	Ò	Ù
xE	+	;	>	=	þ	Æ	þ	´	ó	ú	Ó	Ú
xF	!	^	?	”	±		®	≡	õ	ÿ	Õ	(EO)

Table A-23. APL character assignment in EBCDIC-SNA mode

	4x	5x	6x	7x	8x	9x	Ax	Bx	Cx	Dx	Ex	Fx
x0		&	-	o	~	□	—	α	{	}	\	0
x1	<u>A</u>	<u>J</u>	/	^	a	j	~	ε	A	J	≡	1
x2	<u>B</u>	<u>K</u>	<u>S</u>	..	b	k	s	ι	B	K	S	2
x3	<u>C</u>	<u>L</u>	<u>I</u>	⊠	c	l	t	ρ	C	L	T	3
x4	<u>D</u>	<u>M</u>	<u>U</u>	ι	d	m	u	ω	D	M	U	4
x5	<u>E</u>	<u>N</u>	<u>V</u>	ε	e	n	v		E	N	V	5
x6	<u>F</u>	<u>O</u>	<u>W</u>	⊢	f	o	w	x	F	O	W	6
x7	<u>G</u>	<u>P</u>	<u>X</u>	⊣	g	p	x	\	G	P	X	7
x8	<u>H</u>	<u>Q</u>	<u>Y</u>	v	h	q	y	÷	H	Q	Y	8
x9	<u>I</u>	<u>R</u>	<u>Z</u>	'	i	r	z	̄	I	R	Z	9
xA	¢	!	|	:	↑	⊃	∩	∇	★	∩	∕	
xB	.	\$	,	#	↓	⊂	∪	Δ	∨	!	∕	∇
xC	<	*	%	@	≤	ö	⊥	⊤	∩	∨	∴	Δ
xD	(	)	—	'	┌	○	[	]	Φ	⊠	⊖	⊗
xE	+	;	>	=	└	∴	≥	≠	∩	∩	⊠	⊥
xF	|	—	?	"	→	←	◦	|	∅	∩	∇	

Table A-24. DSC code page EBCDIC-DSC modes

	0x	1x	2x	3x	4x	5x	6x	7x	8x	9x	Ax	Bx
x0	NUL	(SP)	0	&	à	ä	À	Ä	a	q	A	Q
x1	EM	=	1	-	è	ë	È	Ë	b	r	B	R
x2	FF	'	2	.	ì	ï	Ì	Ï	c	s	C	S
x3	NL	"	3	,	ò	ö	Ò	Ö	d	t	D	T
x4		/	4	:	ù	ü	Ù	Ü	e	u	E	U
x5	CR	\	5	+	ã	â	Ã	Â	f	v	F	V
x6		|	6	-	õ	ê	Õ	Ê	g	w	G	W
x7		|	7	-	ÿ	î	Ÿ	Î	h	x	H	X
x8	<	?	8	.	à	ô	A	Ô	i	y	I	Y
x9	>	!	9	˘	è	û	E	Û	j	z	J	Z
xA	[	\$	ß	^	é	á	E	Á	k	æ	K	Æ
xB	]	¢	§	~	ì	é	I	É	l	ø	L	Ø
xC	)	£	#	¨	ò	í	O	Í	m	å	M	Å
xD	(	¥	@	´	ù	ó	U	Ó	n	ç	N	Ç
xE	}	Pts	%	`	ü	ú	Y	Ú	o	¯	O	;
xF	{		-	¸	ç	ñ	C	Ñ	p	˘	P	*

Code point X'75' print as a **Â** when operating in the EBCDIC-DSC mode.

Table A-25. DSC APL character assignment

	0x	1x	2x	3x	4x	5x	6x	7x	8x	9x	Ax	Bx
x0			-		-	≥	}	{	Δ	0	-	-
x1		-	-	-	↑	◦	<u>A</u>	<u>J</u>	◦	1		-
x2		-	-		≤	α	<u>B</u>	<u>K</u>	<u>S</u>	2	↓	I
x3		-	-		┌	ε	<u>C</u>	<u>L</u>	<u>T</u>	3	⋯	!
x4		-	-		└	ι	<u>D</u>	<u>M</u>	<u>U</u>	4	⊖	-
x5		-	-		→	ρ	<u>E</u>	<u>N</u>	<u>V</u>	5	⊞	-
x6		-	-		□	ω	<u>F</u>	<u>O</u>	<u>W</u>	6	▽	▽
x7		-	-		⊃	x	<u>G</u>	<u>P</u>	<u>X</u>	7	⊕	Δ
x8	-	-	-		⊂	\	<u>H</u>	<u>Q</u>	<u>Y</u>	8	⋄	
x9	-	-	-		○	÷	<u>I</u>	<u>R</u>	<u>Z</u>	9	⊥	-
xA	-	-	-		←	∇					⋈	⊞
xB	-	-	-	-	-	Δ	-				⋄	⊞
xC	-	-	-		∩	∟)				∧	
xD	-	-	-	-	∪]	()			∨	~
xE	-	-	-	-	⊥	≠	+			;	⊕	≠
xF	-	-	-	-	┌	|				*	⊖	⋈

An unsupported character prints as a white plus sign in a black box (reverse video effect).

Table A-26. APL character assignment EBCDIC-DSC

	0x	1x	2x	3x	4x	5x	6x	7x	8x	9x	Ax	Bx
x0			0	&	<u>P</u>	<u>€</u>	ö	\	a	q	A	Q
x1		=	1	-	<u>Q</u>	†	←	÷	b	r	B	R
x2		'	2	.	<u>R</u>	‡	—	̄	c	s	C	S
x3		"	3	,	<u>S</u>	v	n	∇	d	t	D	T
x4		/	4	:	<u>T</u>	~	u	Δ	e	u	E	U
x5		\	5	+	<u>U</u>	↑	⊥	τ	f	v	F	V
x6		|	6	-	<u>V</u>	↓	<u>A</u>	<u>B</u>	g	w	G	W
x7		|	7	!	<u>W</u>	≤	Y	≠	h	x	H	X
x8	>	?	8	<u>J</u>	<u>X</u>	∫	°	|	i	y	I	Y
x9	<	!	9	<u>K</u>	<u>Y</u>	∫	α	↖	j	z	J	Z
xA	[	\$	<u>G</u>	<u>L</u>	<u>Z</u>	→	€	↘	k	≡	K	
xB	]	¢	<u>H</u>	˘	o	□	ι	∩	l	∕	L	∇
xC	(	<u>C</u>	#	<u>M</u>	<u>S</u>	⊃	ρ	Φ	m	↖	M	<u>Δ</u>
xD	)	<u>D</u>	@	˘	<u>T</u>	⊂	ω	Α	n	∩	N	⊕
xE	}	<u>E</u>	%	<u>N</u>	~	ö		!	o	∇	O	;
xF	{	<u>F</u>	_	<u>O</u>	∩	o	x	∇	p	⊕	P	*

An unsupported character prints as a white plus sign in a black box (reverse video effect).

B.

DSC option defaults

This appendix contains a table showing the default DSC options for the IBM printers emulated and also for the Xerox MRP Family coax printers.

For full details of each command, refer to the "DSC and SCS data stream commands" chapter in this manual.

Refer to the "IBM publications" section in the "Introduction" chapter for manuals used to provide the information in this appendix.

Table B-1. IBM printer DSC option defaults

DSC option	3262 default setting	3268/ default setting	3287/ 4214 default setting	3812/16 4028 default setting	4245 default setting	6262 default setting	4220/4219/ 4215/MRP coax default settings
CR @ MPP + 1					personalized		
First print position next line		*	*	*	on		
First print position, current line	*				shipment	*	*
NL @ MPP + 1					personalized		
First print position next line	*				on	*	
First print position + 2 lines		*	*	*	shipment		*
FF WITHIN A PRINT BUFFER					personalized		
2nd print position, first line (next 1st print position, first line form)	*	*	*	*	on	*	*
					shipment		
FF @ END OF PRINT BUFFER					personalized		
First print position, Line 2 (next First print position, Line 1 form)		*	*	*	on		
	*				shipment	*	*
NULL SUPPRESSION					personalized		
Suppression of Null lines	*	*	*	*	on	*	*
Print Nulls as spaces					shipment	(chars)	
'FF' VALID					personalized		
At print position 1 and MPP+1	*	*	*	*	on	*	*
Whenever encountered					shipment		
AUTO FF @ END OF PRINT BUFFER					personalized		
Print position 1 next line	*	*	*	*	on	*	*
Print position 1 next form					shipment		
FF AFTER LOCAL COPY							
Print position 1 next line	*	*	*		not	*	
Print position 1 next form				*	available		*
FF BEFORE LOCAL COPY							
Print position unchanged	not	not	not	not	not	not	*
Print position 1 next form	available	available	available	available	available	available	
GENERATE NL ON RECEIPT OF EM							
No	not	not	not	not	not	not	
Yes	available	available	available	available	available	available	*

* denotes the setting.

C.

Command summary

This appendix contains tables of the special feature commands and a table of the IBM data stream commands available with your Xerox MRP Family coax printers.

For full details of each command, see the "DSC and SCS data stream commands" chapter in this manual.

Table C-1. **DSC Commands**

Name	Code
Carriage Return (CR)	05
End of Message (EM)	01
Form Feed (FF)	02
New Line (NL)	03
Null (NUL)	00
Reserved	04
Reserved	06
Reserved	07

Table C-2. SCS commands

Name	Code
Backspace (BS)	16
Bell (BEL)	2F
Carriage Return (CR)	0D
Enable Print (ENP)	14
Form Feed (FF)	0C
Graphic Escape (GE)	08gg
Horizontal Tab (HT)	05
Inhibit Print (INP)	24
Interchange Record Separator (IRS)	1E
Line Feed (LF)	25
New Line (NL)	15
Null (NUL)	00
Page Presentation Media (PPM)	2BD2nn48xxxxxsddoddxxxxxxx
Set Attribute (SA)	28ttvv
Set Graphic Error Action (SGEA)	2BC803grop
Set Horizontal Format (SHF)	2BC1nnhhlmrmht1....tn
Set Line Density (SLD)	2BC6nnld
Set Print Density (SPD)	2BD2nn2900cp
Set Vertical Format (SVF)	2BC2nnvvvtmbmvt1.....tn
Transparent (TRN)	35nn
Vertical Channel Select (VCS)	04vv
Vertical Tab (VT)	0B

Table C-3. FSL commands

Description of feature	Command	Default
ESC—Special Paired Hex Transparent	@<Hex>@<Hex> . . .<Hex>	None
ESC-ESC—Multiple Paired Hex Transparent	@@<Hex><Hex> . . .<Hex>@	None
T1—Offline Hex Dump (PCIA Dump)	@T1	None
T2—Online Hex Dump	@T2	None
T3—Online ASCII Hex Dump	@T3	None
T4—Printout Settings	@T4	None
T5—Printout Character Set	@T5	None
T6—Cancel Online ASCII Hex Dump	@T6	None
W—Print Bar Code	@Wn,data@	None
X0—Set Printer in Hold Mode	@X0 [display_data]@	None
X1—Store Settings in Permanent Storage	@X1	None
X2—Restore Settings from Permanent Storage	@X2	None
X3—Restore Factory Default Settings	@X3	None
X4—Restore Settings from Permanent Storage	@X4	None
Y1—Set IBM Buffer Size	@Y1,n@	3440
Y2—Set Default LPI	@Y2,n@	6
Y3—Set Default CPI	@Y3,n@	10
Y4—Set Default Line Spacing (single/double)	@Y4,n@	1
Y5—Set Default Maximum Page Length (MPL)	@Y5,n@	62 US, letter 66 EUR, A4
Y6—Set Default Maximum Print Position (MPP)	@Y6,n@	132
Y7—Set Case (mono, dual)	@Y7,n@	1
Y8—Set LU1 Language	@Y8,n@	00
Y9—Set Default Print Quality	@Y9,n@	1

For full details on these commands, see the “Function Selection via Line (FSL) commands” chapter in this manual.

Table C-3. FSL commands (continued)

Description of feature	Command	Default
Y10—Set Page Format	@Y10, <n1>, {n2}@	n1=0 n2 = 2
Y11—Set Default Paper Path	@Y11, <n1>, {n2}@	n1=1 n2 = 2
Y12—Set Default Paper Size	@Y12, n1 [, n2]@	n1=3 (U.S.) n1=1 (EUR) n2 = all trays
Y13—Set Wrap/Cut Option at Physical Paper Size	@Y13, <n1> [, n2]@	n1=1 n2 = 2
Y14—Enable Graphic Option	@Y14, n@	1
Y19—Set Simplex / Duplex	@Y19, <n1>, {n2}@	None
Y25—FF Before Local Copy	@Y25, n@	0
Y26—FF After Local Copy	@Y26, n@	n = 0 for nonpage printers n = 1 for page printers
Y27—Non-SCS Print Image	@Y27, n@	0
Y28—Non-SCS, CR at MPP + 1	@Y28, n@	0
Y29—Non-SCS, NL at MPP + 1	@Y29, n@	0
Y30—Non-SCS, Valid FF Followed by Data	@Y30, n@	Product dependent, n=0 or 1
Y31—Non-SCS, Valid FF at End of Print Buffer	@Y31, n@	Product dependent, n=0 or 1
Y32—Non-SCS, FF Valid	@Y32, n@	0
Y33—Non-SCS, Automatic Function at End of Job	@Y33, n@	0
Y34—Last LF on Page Sent as FF	@Y34, n@	Product dependent, n=0 or 1
Y36—Suppress IBM Control Code	@Y36, n@	0
Y37—IBM Printer Emulation Select	@Y37, n@	1
Y38—IBM Communication Feature (Query, EAB)	@Y38, n@	1
Y44—Suppress CR and SP to Same Position	@Y44, n@	1

Table C-3. FSL commands (continued)

Description of feature	Command	Default
Y46—Set IRQ Timer	@Y46, <i>n1</i> [, <i>n2</i>] [, <i>n3</i>]@	<i>n1</i> = 12 (1 minute) <i>n2</i> = 120 (10 minutes) <i>n3</i> = 120 (10 minutes)
Y47—ESC-Mode Selection	@Y47, <i>n</i> @ or @@!asciiscii@	<i>n</i> = 1
Y48—Set Permanent Escape	@Y48, ' <i>n1</i> '@ or @Y48, < <i>xx</i> >@	<i>xx</i> = 0
Y49—Restrict Access of Temporary and Permanent Settings	@Y49, <i>n1</i> 'password'@	<i>n1</i> = 0
Y50—FF After Time Elapse	@Y50, <i>n</i> @	0
Y51—User Strings at Power Up	@Y51, <string number>@	None
Y57—User-defined String Before Local Copy	@Y57, <string number>@	None
Y58—User-defined String After Local Copy	@Y58, <string number>@	None
Y59—Bar Code Definition	@Y59 <Def. no.>, <Bar code type>, <Height> {,<Expansion>}@	Expansion = 1
Y60—Font Link For GFIDs	@Y60, <i>n1</i> , <i>n2</i> @	Product dependent
Y61—Setup for User-defined Strings	@Y61, <i>n</i> , <string>@	None
Y62—Setup for IBM-defined String	@Y62, <i>n</i> <string>@	None
Y71—Create Translate Table	@Y71, <table number>@	None
Y72—Reset Translate Table	@Y72, <table number>@	None
Y73—Select Translate Table	@Y73, <table number>@	None
Y74—Define Symbol Set String	@Y74, <String no.>, <HEXdata>@	None
Y75—Overwrite Translate Table	@Y75, <i>n1</i> , <i>n2</i> , <data> {: <i>n1</i> , <i>n2</i> , <data>}@	None
Y76—Create APL Translate Table	@Y76, <table number>@	None
Y77—Reset APL Translate Table	@Y77, <table number>@	None
Y78—Select APL Translate Table	@Y78, <table number>@	None
Y80—Overwrite APL Translate Table	@Y80, <i>n1</i> , <i>n2</i> , <data>[: <i>n1</i> , <i>n2</i> , <data>]@	None

Table C-3. FSL commands (continued)

Description of feature	Command	Default
Y88—Define Page Offset	@Y88 <n1>, <n2> {,n3}@	n1 = 0 n2 = 0 n3 = None
Y89—Enable Page Offset	@Y89, n1 {,n2}@	n1 = 0
Y90—Define User Escape String	@Y90, <n1>, <n2>@	None
Y91—GFID/Font Select Setup	@Y91, n1, n2, n3, n4, n5 {n6}@	None
Y92—Point Size Strings	@Y92, n1@	None
Y93—Attribute Strings	@Y93, n1@	None
Y94—Typeface Strings	@Y94, n1@	None
Y96—GFID Select	@Y96, <GFID>@	None
Y98—Enable Automatic Page Orientation (APO) Support	@Y98, n1 {,n2}@	n1 = 1
Y100—Printer Share String and Timer	@Y100, n1 {,n2}@	n1 = 10 seconds
Y119—Enable/disable automatic paper size configuration	@Y119, n@	None
Y120—Setting Printout at Power Up	@Y120, n1@	n1 = 1
Y249—Enter Engineering Mode	@Y249, n@	None
Y253—Allow passwords	@Y253, n1, [n2]@	None
Z—Send User-defined Strings	@Zn	None

D. Coax communications buffer

This appendix describes a memory area known as the communications buffer that is used by all coax emulations.

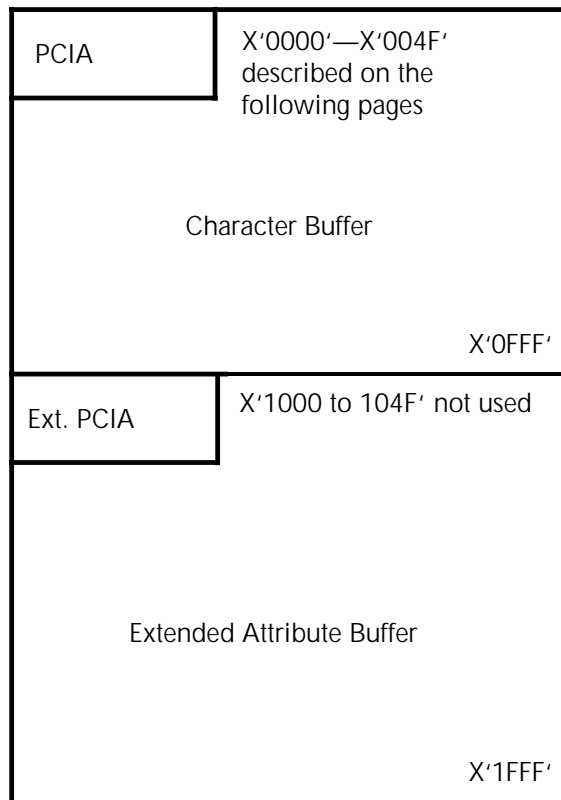
Communications buffer

The communications buffer (figure D-1) contains a character buffer and an extended attribute buffer. Each of these buffers contains 4KB of storage.

The first 80 bytes of the character buffer contains the printer control information area (PCIA). The first 80 bytes of the attribute buffer contains the extended PCIA.

The remainder of the character buffer is a message area which contains data and commands necessary for printing. The attribute buffer can contain additional information about how each character prints.

Figure D-1. **Communications buffer**



Printer Output Area

The Printer Output Area (POA) that occupies locations X'0000' to X'000F' of the Printer Communications Interface Area (PCIA) contains information regarding printer status and configuration. The POA is written by the printer and read by the cluster controller.

Table D-2. **Printer output area**

Address	Function		Description
X'0000'	Status Register	Bit 0 Bit 1 Bit 2 Bit 3 Bit 4 Bit 5 Bit 6 Bit 7	0—Address 0006 is reserved Data check Order complete Equipment check (hardware or PCIA error) Operator intervention required Sense data available (see byte 3) Input code (see byte 2) available (PA key pressed) Valid switch transition (see byte 1)
X'0001'	Key Status	Bit 0—2 Bit 3 Bit 4 Bit 5 Bit 6 Bit 7	Reserved 0—Disable base color switch off 0—Monochrome output only 0—Mono/Dual switch in mono state 1—Mono/Dual switch in dual state 0—Single/Double space switch in single state 1—Single/Double space switch in double state 0—6/8 LPI switch in 6 LPI state 1—6/8 LPI switch in 8 LPI state
X'0002'	Key Input Code	Code X'50' Code X'5F' Code X'5E' Code X'5D' Code X'6B' Code X'6F'	Attention (Program Attention) PA, key pressed while in receive state PA1 key pressed PA2 key pressed No PA key pressed Inbound data available LU1 mode inbound data without FM header
X'0003'	Sense Data	Code X'01' Code X'02' Code X'03' Code X'04'	Cancel key pressed (in SCS mode) Invalid control code parameter Invalid SCS control code Order reject
X'0004' X'0005'	Inbound Data Length		
X'0006'	Extended Status	Bit 0—7	Reserved
X'0007 to X'0009'	Reserved		

Continuing next page

Table D-2. **Printer output area** (continued)

Address	Function		Description
X'000A'	Printer Features	Bit 0 Bit 1 Bit 2 Bit 3 Bit 4 Bit 5 Bit 6 Bit 7	1—Highlight supported. (Dependent on FSL Y38) 1—Reverse video supported (not implemented) 1—Blink supported (not implemented) 0—Translate table required. (Dependent on FSL Y38) Reserved 0—Format header subset 4 supported (IPDS only) 0—SCS Save/restore and query (Dependent on FSL Y38) 0—Non-SCS DSC query support (Dependent on FSL Y38) If IPDS module is mounted = X'97.' For non-IPDS = X'93.'
X'000B'	Printer Type and Character Set	Bit 0—3 Bit 4—7	Printer type: If FSL Y14 = 1, Printer type = 0100 otherwise Printer type = 0 Character set = 0 (EBCDIC and APL supported)
X'000C'	Features	Bit 0 Bit 1 Bit 2 Bit 3 Bit 4—6 Bit 7	1—EAB (Extended Attribute Buffer) installed (Dependent on FSL Y38) 1—APL/Text feature installed (requires EAB) (Dependent on FSL Y38) PS feature installed. (Dependent on FSL Y14) SCS feature installed = 1 Display screen size. (Dependent on FSL Y1) 001 = 960 byte screen size 010 = 1920 byte screen size 011 = 2560 byte screen size 110 = 3564 byte screen size 111 = 3440 byte screen size Unit ID = 1
X'000D'	Character Buffer Size	Code X'10'	4KB basic buffer (does not include EAB)
X'000E'	Extended ID	Bit 0—1 Bit 2 Bit 3 Bit 4 Bit 5 Bit 6—7	0—Reserved 0—Color support. (Dependent on FSL Y38) 1—SCS FMH Support LU-1 FM header data stream support. (Dependent on FSL Y38) 0—DSC load structure field order supported (IPDS) Reserved Reserved
X'000F'	PS Characteristics	Bit 0—1	PS Installed. (If FSL Y14 = 1 then PS installed = 01, otherwise, PS installed type = 00)

Refer to the "Query replies" appendix for additional information on query reply contents.

Control Unit Output Area

The Control Unit Output Area (CUOA) that occupies locations X'0010' to X'004F' of the PCIA contains information regarding orders from the control unit and configuration information. The CUOA is written by the cluster controller and read by the printer.

Table D-3. Control unit output area

Address	Function		Description
X'0010'	Mode	Bit 0—4 Bit 5 Bit 6—7	Reserved Enable Set Attribute control code (SCS only) Ignored
X'00011	Mode	Bit 0—2 Bit 3—4 Bit 5—7	Reserved 00 — Host-directed copy 01 — Host-initiated local copy 10 — Operator-Initiated Local Copy 11 — Reserved 000 — No mode 001 — Data Stream Compatible mode (DSC) - BSC 101 — Data Stream Emulation mode (DSE) - SNA 110 — LU-1 mode 111 — Reserved
X'0012' to X'0013'	Message Starting Address (MSA)		These two bytes define the point in the message area where the current message begins.
X'0014' to X'0015'	Message Length		These bytes define the length of the current message. If the length is zero, nothing is printed. In SCS mode, data wraps from the end of the character buffer to address X'0050.' In non-SCS mode, data is loaded to the end of the character buffer only.
X'0016'	Order	Code X'01' Code X'02' Code X'03' Code X'05' Code X'06' Code X'07'	Abort System status available Print processing Load translate tables (ignored) DSC (ignored) DSC load structured field (ignored)

Continuing next page

Table D-3. Control unit output area (continued)

Address	Function		Description
X'0017'	Order Parameters		The bits of this byte have different meanings for different orders:
	Abort	Bit 0—7	Reserved
	System Status Available	Code X'00' Code X'02' Code X'03'	Mode change Enter send state (LU1 mode only) Enter receive state (LU1 mode only)
	SCS Mode Print Processing	Bit 0	0—Extended order parameter not used 1—Extended order parameter valid (byte 0022)
		Bit 1	0—Not first segment of first-in-chain 1—First segment of first-in-chain
		Bit 2	0—Not last segment of last-in-chain 1—Last segment of last-in-chain
		Bit 3	0—SCS EBCDIC data code (Reserved)
		Bit 4—6 Bit 7	Reserved Ignored - SCS data stream processing only
	Order Parameters		The bits of this byte have different meanings for different orders:
	Non-LU1 Mode Print	Bit 0	Reserved
		Bit 1	0—Reserved 1—Reserved
		Bit 2	Reserved
		Bit 3	0—Character buffer control codes X'01' through X'07' are control codes in Base and APL 1—Character buffer control codes X'01' through X'07' are control codes only if the attribute buffer byte equals xxxxx001 (APL). Otherwise, control codes 01—07 are translated to graphics.
		Bit 4	0—Print without the attribute buffer 1—Print with the attribute buffer
Bit 5—6		00—Use machine default for Dual/Mono Case 01—Mono Case 10—Dual Case	
Bit 7			

Table D-3. Control unit output area (continued)

Address	Function		Description
X'0017' (cont.)	DSC Query	bits 0—7	Ignored
	Load Translate Table	Bits 0—7	Ignored
	Load Structured Field	Bits 0—7	Ignored
X'0018'	Maximum Print Position		This byte specifies the maximum print position for 3270 DSC mode. If zero, the value defined at the printer control panel is used.
X'0019' to X'0021'	Reserved		
X'0022'	Extended Order	Bit 0	Reserved
		Bit 1	0—Continue on error. Any SCS control code not supported prints a hyphen, but does not return an error response. 1—Stop on error. Any SCS control code not supported returns a "function not supported" response to the control unit and printing stops.
		Bit 2	Ignored
		Bit 3—7	Reserved
X'0023' to X'0049'	Reserved		
X'004A' to X'004D'	Test Message		Test message from control unit: AA 32 87 AA (for 3274/3287) AA 32 62 AA (for 3276/3262)
X'004E' X'004F'	Reserved		

Orders

Orders accepted by the Xerox MRP Family coax printers are operations that control printing and mode changing. The PCIA bytes X'0016'—X'0017' specify the type of order the printer is required to perform. The first byte (X'0016') contains the order and the second byte (X'0017') contains any applicable parameters for that order. The following are valid orders:

- 01 Abort
- 02 SSA—System Status Available
- 03 Print processing
- 05 Load translate tables (ignored)
- 06 DSC query (ignored)
- 07 DSC load structured field (IPDS) (ignored)

For any other orders, the 4220/MRP or 4230/MRP coax printer returns the 'Order Reject' and 'Order Complete' responses to the host system.

Abort

On receipt of an abort order, the Xerox Family MRP coax printers terminate the current order and then respond with an 'Order Complete' in the status byte (byte 'X0000').

This order has no parameters, so the abort order does not use PCIA byte X'0017.'

System Status Available (SSA)

The SSA order allows the host control unit to change the Print mode. If the printer is in SCS mode, this order also allows a request for either PA1 or PA2 action by the host.

Refer to table D-3 for the parameter byte (PCIA byte X'0017') codes accepted for this order. If these parameters are incorrect, an 'Order Reject' response is returned to the host system.

Print order processing

This order causes printing of the message buffer while taking the following into account: the Print mode (PCIA byte X'0017'), the message starting address (MSA), and the message length (ML) bytes in the PCIA.

The MSA (PCIA bytes X'0012'—X'0013') identifies the position of the first byte of data in the print buffer. If the MSA value is outside print buffer limits, the Xerox MRP Family coax printers immediately return 'Order Reject' and 'Order Complete' responses to the host system.

The ML (PCIA bytes X'0014'—X'0015') plus MSA-1 defines the position of the last byte of data in the buffer. If ML is zero, the Xerox MRP Family coax printers return an 'Order Complete' response to the host system without an error condition and without printing anything.

In the SCS mode, if ML defines a position beyond the end of the buffer, data wraps from the end of the buffer back to address (X'0050') which is the beginning of the data area.

In the DSC mode, if ML extends beyond the end of the buffer, printing stops at the end of the buffer. An End of Message (EM) control code in the buffer overrides the ML, terminating the print process at that point in the buffer.

When set correctly, the printer processes characters from the message buffer, starting at the MSA and continuing in a sequential manner for the length of the message. This processing prints the printable characters in the buffer, using any commands also in the buffer to format the printed page as required.

When a print order has been completed, the Xerox MRP Family coax printers return an 'Order Complete' in the PCIA byte X'0000' and posts the response 'Printer Status Available.'

DSC print order processing

In DSC mode, the message buffer contains DSC codes for printable characters and control functions.

Following the printing of the last line of data in the buffer, an automatic new line is performed *unless* the print position is already in column one or the DSC options of the 4220/MRP or 4230/MRP coax printer have been set to inhibit this action.

The maximum print position (MPP) from PCIA byte X'0018' specifies the maximum print position for each line of print. If MPP is zero, the print line width is determined by the value set at the printer control panel.

If an entire print line does not contain any printable characters (all are nulls, attributes, or in a nonprint field), it may not be printed depending on how the Null Suppression option is set in the 4220/MRP or 4230/MRP coax printer. To print a blank line, at least one character in the line must be a space character within a print field, or the Null Suppression option must be disabled.

Invalid control codes are treated as nulls.

In addition to the printer control codes, the data may contain screen-field attribute characters because the printer can be used as local copy printer (copy screen image to printer). A field starts with a field attribute (FA) character and ends with the next FA character. Fields that cannot be printed (for example, input fields) are treated as blank fields and are called nonprint fields. The FA is normally the first character in a print order. It is defined in table D-4.

Table D-4. **Field attribute (FA) character definitions**

Bit	Value	Description
0,1	11	Field attribute identifier
2,3,4,5	XX11	Nonprint field
	XX10	Print field
	XX01	Print field
	XX00	Print field
6,7	00	Reserved

If the first character in a print order is not an attribute character, the attribute of the first field is determined as follows:

- The print data is searched backwards for a field attribute from MSA + ML-1 to MSA ignoring EM control codes. The first FA found is then treated as if it had occurred at the MSA.
- If no FA is in the data, printing defaults to the normal unprotected attribute X'C0' (print field).

Some of the print data requires special attributes, such as highlighting, color, and the APL character set. For data requiring such specification, the host system places the data byte in the base buffer and the appropriate place in the extended attribute buffer (EAB).

If bit 4 in the PCIA order byte X'0017' is on, the printer uses the attribute data contained in the EAB to determine the appearance of the printed output.

Usually the extended field attribute (EFA) is at the beginning of the EAB. If it is not there, a similar search procedure is executed to find the first FA.

If the EAB modifies an FA byte in the base buffer, it is an EFA. See table D-5.

Table D-5. **Extended field attribute (EFA)**

Bit	Value	Description
0—1	00 01 10 11	Normal mode Blink character (ignored) Reverse video character (ignored) Underline character (including spaces and nulls)
2—4	xxx	Black
5—7	000 001	Base DSC character set APL DSC character set

If the EAB modifies a character byte in the base buffer, it is a character attribute (CA). See table D-6.

Table D-6. **Character attribute (CA)**

E. IBM GFID to PCL fonts attribute

Table E-1 shows PCL fonts and their corresponding IBM GFIDs. Refer to the "Font support and selection" chapter in this manual for detailed explanation of fonts, character sets, and Global Font Identifiers (GFIDs).

Table E-1. PCL fonts and equivalent IBM GFIDs

Font name	IBM GFID	Typeface	Symbol Set	Point Size
OCR B	3	0	OCR B	12
Courier	11	3	Roman 8	12
Prestige	12	8	Roman 8	10
Courier Italic	18	3	Roman 8	12
OCR A	19	0	OCR A	12
Presentation Bold	38	11	ASCII	14
Letter Gothic Bold	39	6	Roman 8	14
Letter Gothic	40	6	Roman 8	14
Courier Bold	46	3	Roman 8	12
Courier Medium	51	3	ASCII	12
Courier Bold	52	3	ASCII	12
Courier Italic	53	3	ASCII	12
Letter Gothic Medium	60	6	ASCII	14
Letter Gothic	66	6	Roman 8	12
Letter Gothic Italic	68	6	Roman 8	12
Letter Gothic Bold	69	6	Roman 8	12
Prestige	80	8	Roman 8	10
Courier	85	3	Roman 8	10
Prestige	86	8	Roman 8	10
Letter Gothic	87	6	Roman 8	12
Letter Gothic Italic	91	6	Roman 8	12

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Table E-1. PCL fonts and equivalent IBM GFIDs (continued)

Font name	IBM GFID	Typeface	Symbol Set	Point Size
Courier Italic	95	3	Roman 8	10
Letter Gothic Italic	109	6	Roman 8	12
Letter Gothic Bold	110	6	Roman 8	12
Prestige Bold	111	8	Roman 8	10
Prestige Italic	112	8	Roman 8	10
Courier Bold	115	3	Roman 8	10
Courier Italic	116	3	Roman 8	10
Prestige Medium	117	8	ASCII	10
Prestige Bold	118	8	ASCII	10
Prestige Italic	119	8	ASCII	10
Letter Gothic	204	6	Roman 8	12
Prestige	221	8	Roman 8	7
Line Printer Medium	253	0	Roman 8	8.5
Letter Gothic Medium	255	6	Roman 8	9.5
Prestige Elite Medium	256	8	ASCII	7
Bar Code EAN/UPC Medium	501	0	EAN/UPC	12
Bar Code EAN/UPC Bold	502	0	EAN/UPC	12
Dutch 601 Medium	601	5	Roman 8	6
Dutch 601 Bold	602	5	Roman 8	6
Dutch 601 Italic	603	5	Roman 8	6
Swiss 721 Medium	611	4	Roman 8	6
Swiss 721 Bold	612	4	Roman 8	6
Swiss 721 Italic	613	4	Roman 8	6
Swiss 721 Medium	614	4	ASCII	6
Dutch 601 Medium	801	5	Roman 8	8
Dutch 601 Bold	802	5	Roman 8	8
Dutch 601 Italic	803	5	Roman 8	8
Dutch 601 Medium	804	5	ASCII	8
Swiss 721 Medium	811	4	Roman 8	8
Swiss 721 Bold	812	4	Roman 8	8

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equivalent IBM GFIDs

Font name	IBM GFID	Typeface	Symbol Set	Point Size
Swiss 721 Italic	813	4	Roman 8	8
Swiss 721 Medium	814	4	ASCII	8
Swiss 721 Bold	815	4	ASCII	8
Dutch 601 Medium	1001	5	Roman 8	10
Dutch 601 Bold	1002	5	Roman 8	10
Dutch 601 Italic	1003	5	Roman 8	10
Dutch 601 Medium	1004	5	ASCII	10
Dutch 601 Bold	1005	5	ASCII	10
Dutch 601 Italic	1006	5	ASCII	10
Swiss 721 Medium	1011	4	Roman 8	10
Swiss 721 Bold	1012	4	Roman 8	10
Swiss 721 Italic	1013	4	Roman 8	10
Swiss 721 Medium	1014	4	ASCII	10
Swiss 721 Bold	1015	4	ASCII	10
Swiss 721 Italic	1016	4	ASCII	10
Dutch 601 Medium	1201	5	Roman 8	12
Dutch 601 Bold	1202	5	Roman 8	12
Dutch 601 Italic	1203	5	Roman 8	12
Dutch 601 Medium	1204	5	ASCII	12
Dutch 601 Bold	1205	5	ASCII	12
Dutch 601 Italic	1206	5	ASCII	12
Swiss 721 Medium	1211	4	Roman 8	12
Swiss 721 Bold	1212	4	Roman 8	12
Swiss 721 Italic	1213	4	Roman 8	12
Swiss 721 Medium	1214	4	ASCII	12
Swiss 721 Bold	1215	4	ASCII	12
Swiss 721 Italic	1216	4	ASCII	12
Dutch 601 Medium	1401	5	Roman 8	14
Dutch 601 Bold	1402	5	Roman 8	14
Dutch 601 Italic	1403	5	Roman 8	14

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Table E-1. PCL fonts and equivalent IBM GFIDs

Font name	IBM GFID	Typeface	Symbol Set	Point Size
Dutch 601 Bold	1405	5	ASCII	14
Swiss 721 Medium	1411	4	Roman 8	14
Swiss 721 Bold	1412	4	Roman 8	14
Swiss 721 Italic	1413	4	Roman 8	14
Swiss 721 Bold	1415	4	ASCII	14
Dutch 601 Bold	1801	5	Roman 8	18
Swiss 721 Bold	1811	4	Roman 8	18
Dutch 601 Bold	2401	5	Roman 8	24
Swiss 721 Bold	2411	4	Roman 8	24
Dutch 601 Bold	3001	5	Roman 8	30
Swiss 721 Bold	3011	4	Roman 8	30
Presentation Bold	6500	11	ASCII	18
Presentation Bold	8100	11	ASCII	16

Setting Function Selection via Line (FSL) to match emulated IBM printers

Some of the IBM printers the coax interface is emulating are subsets of other IBM printers. It is recommended, therefore, to set the Function Selection via line (FSL) functions to restrict the support on the interface to match the emulated IBM printers.

Table F-1 indicates the recommended settings to obtain a specific IBM printer emulation.

Table F-1. **Recommended settings**

IBM printers	FSL Y14	FSL Y37	FSL Y38
3262	Set to 0	Set to 1	Set to 2
3268	User dependent	Set to 1	Set to 1
3287	User dependent	Set to 0	Set to 1
3812/3816	User dependent	Set to 0	Set to 1
4028	User dependent	Set to 0	Set to 1
4214	User dependent	Set to 0	Set to 1
4245	Set to 0	Set to 1	Set to 2
6262	Set to 0	Set to 1	Set to 2

MRP Family Font Formats

Summary

The 4220/MRP, 4230/MRP, 4215/MRP, and 4219/MRP support the use of PCL fonts for printing IBM SCS data streams. The 3816 compatible font set that is shipped with the twinax or coax interface is provided in PCL format.

Answer

The fonts in the 3816 compatible font set are accessed using IBM standard GFIDs (Global Font Identifiers) in the same way that these fonts are accessed on an IBM 3816.

If other fonts, signatures, or logos are used by the customer, they should be obtained from the Xerox Font Center in PCL format. For use on the MRP Family printers, the custom fonts must be mapped to IBM GFIDs using FSL (Function Select via Line) commands. The use of FSL commands is discussed in chapter 3.

These PCL fonts can be downloaded to the printer by the Configuration and Resource Utility.

Additional notes There is no equivalent of the XES <ESC>+1fontname<CR><LF> functionality when printing IBM data streams. Access to fonts must be made by mapping IBM font calls to the new PCL fonts.

Printing a separator page between jobs

Summary How can I cause the interface to print a separator page between jobs?

Answer You can print a separator page between jobs in coax by using the Y100 function which sets the timeout on the coax line as well as defining an ASCII string which will be sent to the printer before each job.

Send the following FSL command to the printer:

```
&&??@Y100,20,OD200C
&&??<SPACE>
```

This command causes the coax interface to send the PCL commands necessary to print a blank page in front of every job.

Additional notes Be aware that there is nothing in the coax protocol that indicates to the interface that a new job is being sent. Once the interface becomes active, it sees everything sent as 1 job. The first parameter of the Y100 command (20 in the example) is the timeout on the coax line. By making this value shorter, you will cut down on the chances of 2 jobs being placed back to back without a separator page. Care should be taken, however, not to make the timeout too short, as this may cause jobs to end in the middle of a page of data if you are running on a slow line, or if the printer is a long distance from the host. Some experimentation may be necessary in order to come up with the optimal timeout value for your particular site.

Sending data to multiple ports

Summary The printer utilizes multiple ports to receive data (eg. parallel and coax/twinax), and occasionally hangs.

Answer When a job is received from the coax or twinax interface, a short PostScript job is sent to the controller to lock the printer into PCL mode for the duration of the job. The interface then sends the print job. However, if the Communications Priority Scheme is set to Sequential, the controller looks for the next job on another interface (not the coax/twinax interface). If that job is not PCL or if the job is not terminated with an <Esc> E PCL command, the printer will remain locked to that port and hang.

To resolve the problem, set the Communications Priority Scheme for the twinax/coax interface on the printer to anything other than Sequential (which is the default). Other valid options are Priority, SequentialLock, or PriorityLock. Any of these settings will ensure that the printer will not look at the next port until after the coax or twinax job has completed. This prevents the printer from locking up.

On the 4215/MRP and 4219/MRP control panel, the twinax/coax interface is referred to as 'Other I/O.' On the 4220/MRP, the interface is referred to as '4220/MRP Interface.' And on the 4230/MRP, the interface is referred to as '4230/MRP Interface.'

G.

Query replies

The tables in this appendix describe the query replies available on the interface. These replies are the same for all printer emulations. Differences are restricted only in the support of the Printer Communication Interface Area (PCIA). The restrictions are setup using FSL Y1—Set IBM Buffer Size, FSL Y14—Enable Graphic Option (idaAFP), and FSL Y38—IBM Communication Feature (Query, EAB). Refer to the “Coax communications buffer” appendix for detailed description of the PCIA.

Table G-1 indicates SNA Character Set (SCS) query reply summary without IPDS module.

Table G-1. **Summary query reply (SCS without IPDS)**

Byte	Value (Hex)	Description
00—01	000C	Length of structured field
02	81	Type = Query reply
03	80	Summary query reply
04	80	Summary query supported
05	81	Useable area query supported
06	85	Character Sets query supported
07	86	Color query supported
08	87	Highlight query supported
09	8F	OEM query supported (idata specified)
0A	92	Save/Restore formats supported
0B	A0	Device characteristics supported

Table G-2 shows non-SCS query reply summary without IPDS module.

Table G-2. **Summary query reply (Non-SCS without IPDS)**

Byte	Value (Hex)	Description
00—01	000A	Length of structured field
02	81	Type = Query reply
03	80	Summary query reply
04	80	Summary query supported
05	81	Useable area query supported
06	85	Character Sets query supported
07	86	Color query supported
08	87	Highlight query supported
09	8F	OEM query supported (idata specified)

Tables 3, 4, 5, 6, and 7 expand on the values summarized in table G-2.

Refer to table G-3 for the useable area query reply.

Table G-3. **Useable area query reply**

Byte	Value (Hex)	Description
00—01	00 17	Length of structured field (00 15 in SCS mode)
02	81	Type = Query reply
03	81	Useable area indicator
04	1F	Extended structure field supported Hard copy device No explicit partition addressing
05	00	Variable cell size not supported. Matrix characters
06—07	00 XX	Useable area width 10 CPI 84 MPP = 132 12 CPI 9E MPP = 158 15 CPI C6 MPP = 198 16.6 CPI DC MPP = 220 Other FF MPP = 255
08—09	00 FF	Useable area height: MPL = 255
0A	00	Units of measure = inches
0B—0E	00 01 00 64	Horizontal dot distance: 1/100 dot
0F—12	00 01 00 40	Vertical dot distance: 1/64 dot
13	0A	Horizontal units per cell: 10
14	08	Vertical units per cell: 8
15—16	0F B0	Buffer size: 4096 for non-SCS mode

Refer to table G-4 for the supported character sets reply.

Table G-4. **Supported Character Sets reply**

Byte	Value (Hex)	Description
00—01	00 13	Length of structured field
02	81	Type = Query reply
03	85	Character Sets supported
04	80	Flag
05	00	Reserved
06	0A	Default matrix width (10 slices)
07	08	Default matrix height (8 rows)
08—0B	06 00 00 00	Format types 5 and 6
0C	03	Character Set descriptor length, bytes
0D	00	Character Set ID: ROS '00'
0E	10	<ul style="list-style-type: none"> • On-loadable Character Set • Single plane • 1-Byte coded Character Set • No LCID compare allowed.
0F	00	LCID = None
10	01	Character Set ID: ROS '01'
11	00	<ul style="list-style-type: none"> • On-loadable Character Set • Single plane • 1-Byte coded Character Set • LCID compare allowed.
12	F1	LCID = APL

Refer to table G-5 for color reply.

Table G-5. **Color reply**

Byte	Value (Hex)	Description
00—01	00 16	Length of structured field
02	81	Type = Query reply
03	86	Color indicator supported
04	40	Monochrome ribbon is loaded.
05	08	Length of color attribute List
06—07	00 F7	First color: Attribute value (Default) Color printed = Neutral (Black)
08—09	F1 00	Second color: Attribute value (Blue) Color printed = Black
0A—0B	F2 00	Third color: Attribute value (Red) Color printed = Black
0C—0D	F3 00	Fourth color: Attribute value (Pink) Color printed = Black
0E—0F	F4 00	Fifth color: Attribute value (Green) Color printed = Black
10—11	F5 00	Sixth color: Attribute value (Turquoise) Color printed = Black
12—13	F6 00	Seventh color: Attribute value (Yellow) Color printed = Black
14—15	F7 F7	Eighth color: Attribute value (Multi color) Color printed = Black

Refer to table G-6 for highlight reply.

Table G-6. **Highlight reply**

Byte	Value (Hex)	Description
00—01	00 0D	Length of structured field
02	81	Type = Query reply
03	87	Highlight indicator
04	04	Number of highlight options
05—06	00 F0	First highlight option: Attribute value (Default) Highlight option = Normal
07—08	F1 00	Second highlight option: Attribute value (Blink) Highlight option = Normal
09—0A	F2 00	Third highlight option: Attribute value (Reverse video) Highlight option = Normal
0B—0C	F4 00	Fourth highlight option: Attribute value (Underline) Highlight option = Normal

Refer to table G-7 for Original Equipment Manufacturer (OEM) reply.

Table G-7. **OEM reply**

Byte	Value (Hex)	Description
00—01	00 16	Length of structured field
02	81	Type = Query reply
03	8F	OEM indicator
04—05	00 10	Number of parameters
06—15	xx xx xx xx xx xx	I-data confidential, used for idaAFP/idaPSS only

Refer to table G-8 for save restore reply.

Table G-8. **Save restore Reply**

Byte	Value (Hex)	Description
00—01	00 06	Length of structured field
02	81	Type = Query reply
03	92	Save/Restore indicator
04—05	00 4C	FPCB length

Refer to table G-9 for data chaining reply.

Table G-9. **Data chaining reply**

Byte	Value (Hex)	Description
00—01	00 06	Length of structured field
02	81	Type = Query reply
03	98	Data chaining indicator
04	80	Direction supported (To printer only)
05	00	Flags (Reserved, must be zero)

Refer to table G-10 for data streams reply.

Table G-10. **Data streams reply**

Refer to table G-11 for device characteristics reply.

Table G-11. **Device characteristics reply**

Byte	Value (Hex)	Description
00—01	00 1E	Length of structured field
02	81	Type = Query reply
03	A0	Data characteristics indicator
04—05	00 0D	Horizontal dimensional parameter structure length
06—07	FF 01	Horizontal dimensional parameter identifier
08	80	SPD supported
09—0A	0A 84	10 CPI, MPP = 132
0B—0C	0C 9E	12 CPI, MPP = 158
0D—0E	0F C6	15 CPI, MPP = 198
0F—10	10 DC	16.6 CPI, MPP = 220
11—12	00 0D	Vertical dimensional parameter structure length
13—14	FF 02	Vertical dimensional parameter identifier
15	80	SLD supported
16—17	0C FF	6 LPI, MPL = 255
18—19	09 FF	8 LPI, MPL = 255
1A—1B	18 FF	3 LPI, MPL = 255
1C—1D	12 FF	4 LPI, MPL = 255

H.

Related publications

Related publications

The following publications, as well as this manual, are available through the Xerox Documentation and Software Services (XDSS) (U.S. only). For additional details, see "XDSS ordering information" at the back of this manual.

- N **Note:** Xerox Canada, Ltd. publications are available through your local sales representative or analyst.

Xerox MRP Family publications

The Xerox 4230/MRP and 4220/MRP library sets includes the following manuals.

Publication	U.S. Number	International	
		Language	Number
4220/MRP, 4230/MRP Operator Guide	720P13941	French Spanish German Italian	
4220/MRP, 4230/MRP System Administrator Guide	720P13951	French	
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Twinax Command Reference*	720P12751		
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Coax Command Reference*	720P12761		
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Intelligent Printer Data Stream (IPDS) Configuration and Reference Guide*	720P12771		
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP PCL 5 and PostScript Printer Language Reference**	721P81071		

* Manuals are shipped with the options.

** In the U.S., the Printer Language Reference for PCL 5 and PostScript is not shipped with the printer. To order this document, fill out and mail the Printer Language Reference Order Card found at the back of the *System Administrator Guide*. The manual is shipped at no charge to you.

In RX, this manual is shipped with the printer.

Publication	U.S. Number	International	
		Language	Number
4220/MRP, 4230/MRP Installation Planning Guide	720P12701		
4219/MRP and 4215/MRP Installation Planning Guide	720P13290		
4219/MRP and 4215/MRP Quick Start	720P13070		
4219/MRP and 4215/MRP Operator Guide	720P13060	French Spanish German Italian	
4220/MRP, 4230/MRP Network Interface for Novell Operator Guide*	720P12302		
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Fax Modem for Macintosh Operator Guide*	720P12321		
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Fax Modem for MS-DOS Operator Guide*	720P12331		
4220/MRP, 4230/MRP AppleTalk Interface Operator Guide*	720P12312		
4220/MRP, 4230/MRP TCP/IP Operator Guide*	720P13721		
4220/MRP, 4230/MRP EtherTalk Operator Guide*	720P13731		
4220/MRP, 4230/MRP LAN Manager/LAN Server Operator Guide*	720P13701		
4220/MRP, 4230/MRP Windows NT Operator Guide*	720P13711		

* Manuals are shipped with the options.

For information about current Xerox training classes and workshops, refer to the *Xerox Customer Education: Printing Systems Catalog*, 610P30238 (U.S. only). In other locations, see your local representative for details.

IBM publications

The following IBM manuals were used for references:

Publication	Number
<i>IBM 3262 Printer Models 3413 Component Description</i>	GA24-3741
<i>IBM 3268 Printer Models 2 & 2c Description</i>	GA27-3268
<i>IBM 3816 Page Printer Setup Instructions</i>	GA34-2074
<i>IBM 4245 Printer, Models D12 and D20, Information Manual</i>	GA33-1586
<i>IBM 6262 Printer, Models D12 and D14, Product Description</i>	GA24-3988

Other publications

This section lists the IBM publications that provide greater detail about the IPDS system architecture and related architectures.

Publication	Number
<i>IBM Advanced Function Printing Data Stream Reference</i>	S544-3202-2
<i>IBM Data Stream and Object Architectures IBM Intelligent Printer Data Stream Reference</i>	S544-3417-3
<i>IBM Data Stream and Object Architectures Font Object Content Architecture (FOCA) Reference</i>	S544-3285-1
<i>IBM Data Stream and Object Architectures Bar Code Object Architecture (BCOA) Reference</i>	S544-3766-0
<i>IBM Data Stream and Object Architectures Presentation Text Object Content Architecture (PTOCA) Reference</i>	SC31-6803-0
<i>IBM Data Stream and Object Architectures Graphics Object Content Architecture (GOCA) Reference</i>	SC31-6804-0
<i>IBM Data Stream and Object Architectures Image Object Content Architecture (IOCA) Reference</i>	SC31-6805-1
<i>IBM Print Services Facility/MVS System Programming Guide (version 2.1.0)</i>	S544-3672-00
<i>IBM Page Printer Formatting Aid/370 Users Guide and Reference</i>	S544-3700-02

Rank Xerox documentation numbers

Publication	U.S number	Rank Xerox documentaion numbers	
		Language	Number
4220/MRP, 4230/MRP Operator Guide	720P13941	English French Spanish German Italian Portuguese	as U.S. number 708P10660 708P10680 708P10670 708P10700 708P10690
4220/MRP, 4230/MRP System Administrator Guide	720P13951	English French	as U.S. number 708P10710
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Twinax Command Reference	720P12751	English	as U.S. number
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Coax Command Reference	720P12761	English	as U.S. number
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Intelligent Printer Data Stream (IPDS) Configuration and Reference Guide	720P12771	English	as U.S. number
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP PCL 5 and PostScript Printer Language Reference	721P81071	English	as U.S. number
4220/MRP, 4230/MRP Network Interface for Novell Operator Guide	720P12302	English	as U.S. number
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Fax Modem for Macintosh Operator Guide (US only)	720P12321	English	as U.S. number
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Fax Modem for MS-DOS Operator Guide (US only)	720P12331	English	as U.S. number
4220/MRP, 4230/MRP AppleTalk Interface Operator Guide	720P12312	English	as U.S. number
4220/MRP, 4230/MRP TCP/IP Operator Guide	720P13721	English	as U.S. number
4220/MRP, 4230/MRP EtherTalk Operator Guide	720P13731	English	as U.S. number
4220/MRP, 4230/MRP LAN Manager/LAN Server Operator Guide	720P13701	English	as U.S. number
4220/MRP, 4230/MRP Windows NT Operator Guide	720P13711	English	as U.S. number

I. Forms Utility for the coax environment

The MRP family of printers has the capability to accept PCL5, Adobe PostScript Level 2, and SCS data stream via coax direct connection. This appendix focuses on merging variable data residing on an IBM Host with PCL forms (macros) using coax connection. The VTAM Printer Support System (VPS - Release 6.1) transparency must be used in order to successfully download PCL forms (macros) to the MRP printer.

Overview of VPS

The VTAM Printer Support System (VPS) is a logical extension of JES that fills a void in JES output-delivery facilities. VPS routes JES spooled output to any VTAM LU-0 (non-SNA), LU-1 (SNA/SCS) or LU-3 (SNA/DSC) device for all 3270-type printers as well as any other printer that attaches to a 3174/3274/3276 control unit (such as the Xerox laser printers).

After the sysout has been retrieved from JES, VPS builds print buffers with appropriate print control orders and, using standard VTAM facilities, then sends it to the appropriate VPS printer. VPS can insert special transparency codes into an output to accommodate special requirements of printers, printer emulation packages, or protocol converters. For more details on VPS, refer to the *VPS Installation and Operation Manual Release 6.1*.

VPS remote configuration

The VPS remote configuration necessary to enable transparency requires you add or modify the following command for your particular remote under VPS.R61.CNTL.

```
TRNCLASS=(A,C,35)
```

This command specifies when transparency should be used for a specific printer. For example, the above command was added to the configuration file VPS.R61.CNTL(VPSR156). VPS remote printer 156 will signify sysout class A to start each line with the transparency character hexadecimal 35 followed by a one-byte length field. The transparency character and length will be inserted multiple times by VPS if the data line is longer than 255 bytes.

There are other values that can be placed in each of the parameter fields. For other values or specific detail, refer to the *VPS Installation and Operation Manual Release 6.1*.

Below is an example of a VPS Remote Configuration file.

```

*****
* LPA0DT20 - REMOTE 156 FOR XEROX CENTRE *
*****
* _____ *
* VTAM DEFINITIONS *
* _____ *
LUNAME = LPA0DT20,    PRINTER LUNAME
ALOGMODE = SCS,      DEFAULT LOGMODE ENTRY
SEPINFO = USEREX01,
* _____ *
* JES SYSOUT SELECTION CRITERIA *
* _____ *
TRACE = (Y,05),
TRNCLASS = (A,C,35),
DEST = R156,          DEST ID
CLASS = ABCJ,         OUTPUT CLASSES
CHNSIZE = 0,          SCS PRINTER
COMPRESS = N,         NO COMPRESSION
MERGE = Y,
RUSIZE = 1536,        PRINTER BUFFER SIZE
SEPAR = N,            SEPARATOR = BOTH
AUTOEJECT = Y,        AUTOMATIC EJECT = YES
FCB = N,              FCB SUPPORT = NO
* _____ *
* GROUP DEFINITIONS *
* _____ *
GRPNAME = USMG

```

42XX/MRP transparency

In order for transparency data (hexadecimal 35) to be recognized by the 42xx/MRP, the printer must be placed in transparency mode. The Function Selection via Line (FSL) command, Y37, allows a user to select an IBM printer emulation. By sending Y37 with a value of 4 via FSL command, the printer will be placed in transparent mode. Follow the steps below:

1. Create a file containing the following command:

```
&&??%Y37,4%&&??<SPACE>
```

This sets the printer in transparent mode and resets the escape character to NONE.

Note: To save the settings in permanent memory on the printer, FSL X1 must be added to above command. For example, this command sets the printer in transparent mode:

```
&&??%Y37,4%
```

The following command saves the settings in permanent memory and resets the escape character to NONE:

```
&&??%X1&&??<SPACE>
```

2. Send the file containing the FSL commands by using a JCL file. For example:

```
//JK12345 JOB (XXXX),'FSLY37',MSGLEVEL = (1,1),CLASS = A,
//  MSGLASS = X,NOTIFY = JK34334
/*JOBPARM LINECT = 0, ROOM = 3231
/*ROUTE PRINT RMT156
// EXEC PGM = IEBGENER
//SYSPRINT DD SYSOUT = X
//SYSIN DD DUMMY
//SYSUT2 DD SYSOUT = J
//SYSUT1 DD DSN = JK12345.FSLFILE.Y37,DISP = SHR
```

Note: SYSOUT=J instead of SYSOUT=A must be used to send the FSL Y37. Sysout class A enables transparency and other sysout classes (B,C,J) do not send hexadecimal 35 with the data.

After the printer has been set to transparent mode via FSL Y37, the user can now send a PCL file through a JCL file.

Note: This example uses SYSOUT=A as a sysout class for transparencies. Most DP users will probably assign another sysout class for their transparency application since SYSOUT=A is normally the default selection used to provide generic output.

PCL forms overview

The Hewlett-Packard PCL language allows one or multiple forms (named macros in PCL terminology) to be stored in the printer's memory. This feature allows forms to be used repeatedly without the necessity of downloading the form for each page printed. A unique macro ID number can be assigned to each form through some forms creation packages (such as Lytrod's Proform III, Delrina FormFlow in MS Windows) or by using the FormFix Utility, which is on a diskette provided with the printer.

To invoke form merging, a different method is suggested depending on single page forms, or multiple page forms:

- For single page forms, the macro should be overlaid (Escape&f4X). Once the overlay is enabled, every page will automatically print the form along with the variable data.
- For multiple page forms, a macro should be called (Escape&f3X) for each page. A macro call will merge the form with the variable data only a page at a time. The variable data stream will control which form to invoke for each page.

For more details, refer to the *Hewlett Packard PCL Technical Reference Manual*.

There are PCL commands that cause a conditional page eject. That is, a page is ejected if there is any printable data in the print buffer. A PCL macro will be affected by the following conditional page eject commands:

- Reset (EscE)
- UEL (Universal Exit Language) (Esc%-12345X)
- Flush All Pages (Esc&r#F)
- Page Length (Esc&l#P)
- Page Size (Esc&l#A)
- Orientation (Esc &l#O)
- Paper Source (Esc&l#H)
- Form Feed (Hexadecimal value: 0C)
- Output Bin Selection (Esc&l#G)

Using FormFixC to create macros

If a PCL form is designed from a PC-based application package (Lytrud, Elixir, Delrina FormFlow, etc.) and is not yet a macro, it can be created into a macro by using the FormFixC Utility, which does the following:

- It encapsulates a PCL form with a macro ID# (Esc&f#Y) selected by the user and a start macro definition (Esc&f0X) at the beginning of the form.
- It places a stop macro definition (Esc&f1X) and makes the macro permanent (Esc&f10X) at the end of the form.
- And finally, FormFixC searches for the conditional page eject commands and deletes them from the form.

Installing FormFixC

Insert the diskette titled Xerox 42xx/MRP Forms Utility - Coax into the disk drive (this procedure assumes you are using the 'B' drive.) Its contents should include:

- FORMFIXC.EXE
- FORMFIXC.SYS
- READMECX.DOC

Installing FormFixC

1. Create a directory under the C: drive called FORMFIXC:
C:>md formfixc
2. Change to the FormFixC directory:
C:>cd formfixc
3. Copy the three files from the FormFixC package to the newly created directory:
C:\FORMFIXC>copy B:*.*

Implementing FormFixC

Entering FormFixC Screen

From the FormFixC directory, type:

```
C:\FORMFIXC>formfixc
```

The FormFixC Utility Menu will appear with these two items:

- 1) Run FormFixC Utility
- 2) Change FormFixC Defaults

Before running the utility, you need to first change the defaults.

Change FormFixC Defaults

If this is the first time you have run FormFixC, or if you want to change the output location of the converted files, you should verify the default settings. (If you have already set the defaults, this step can be skipped.)

1. Press 2 to move to the Change FormFixC Defaults screen.
2. In order to modify any of the defaults, press F2 to enter Change Mode. (When in Change Mode, the modifiable settings will appear green.)
3. There are only two defaults to be specified: the PC Drive and Directory where you wish to store the converted forms (.FIX files).
 - PC Drive: This should be specified as C.
 - Directory: Specify the (existing) subdirectory in the C drive. If the directory is left blank, the forms will be stored in the current directory .

Note: You must end the directory setting with a backslash (\). If not, you will later get an error message when you attempt to fix a form.

4. When finished setting the defaults, press Enter to exit Change Mode and to set the defaults. At the bottom of the screen, this message will appear:

```
Default Update Successful
```

5. Press End to return to the FormFixC Utility Menu.

Running FormFixC

Follow these steps to run FormFixC:

1. From the FormFixC Utility Menu, press 1 to enter the FormFixC Utility screen.
2. From this screen, enter the following three settings:

```
FORM DIRECTORY:  <Drive>:\<Directory>\
```

```
FORM NAME:      <formname>.<ext>
```

```
MACRO ID:       <ID#>
```

- FORM DIRECTORY is the location (drive and directory) of the form you want to convert. (Be sure to end with a '\', as noted on screen.)
- FORM NAME is the name of the form you want to convert. Be sure to include the extension (such as .PRN).
- MACRO ID should be entered only if needed. If a single digit ID, be sure to insert a 0 first.

3. Press Enter to run the utility on the form listed on the screen. The original file will remain; it will not be deleted.

This message will appear on the bottom of the screen:

Conversion Complete; Form Name is <form_name>.FIX.
Macro ID is <ID#>.

4. Once you have converted all the forms in this same manner, press End to return to the FormFix Utility Menu.
5. Press End again to exit to the DOS prompt.

The FormFix step has been completed.

FormFixC troubleshooting

If an error occurs, check the following common oversights:

- Not including the final backslash (\) at the end of the directory of either the output directory (Change FormFixC Defaults screen) or the form directory (FormFixC Utility screen).
- Not including the Form Name extension (FormFixC Utility screen).

Transferring a macro to the IBM host

If the user chooses to upload the macro from the PC to the IBM Host, IRMA Workstation for Windows EMU 2.1.2 (3270 Terminal) by Digital Communications Associates, Inc. (DCA) can be used to achieve this operation.

Sending a PCL macro to the printer

An ASCII PCL macro residing on the IBM Host can be sent to the printer using a JCL with SYSOUT class A. Below is an example of a JCL file that sends a PCL (ASCII) file/macro named INVOICE to VPS Remote 156.

```
//JK12345 JOB (XXXX),'SENDPCL',MSGLEVEL = (1,1),CLASS = A,  
//  MSGCLASS = X,NOTIFY = JK34334  
/*JOBPARM LINECT = 0, ROOM = 3231  
/*ROUTE PRINT RMT156  
// EXEC PGM = IEBGENER  
//SYSPRINT DD SYSOUT = X  
//SYSIN DD DUMMY  
//SYSUT2 DD SYSOUT = A  
//SYSUT1 DD DSN = JK12345.PCLFILE.INVOICE,DISP = SHR
```

SYSOUT=A instead of SYSOUT=J must be used to send a PCL file in transparent mode. Use other sysout classes (B,C,J) if transparency is not required.

Also, an ASCII PCL macro can directly be sent to the printer if there is a parallel connection from a PC to the printer. A DOS copy command can be issued. For example:

```
C:\>COPY /B INVOICE.PCL LPT1
```

Merging variable data with a single form (macro)

Before instructing the printer to start merging variable data with a macro that is already residing in the printer's memory, some setup commands must be sent.

The printer must be instructed about the page orientation, page size and paper source if the user does not want to use the default settings of the printer. These commands cannot be embedded into the macro definition because the printer will not allow them. Also, they cannot be embedded into the form preceding the macro definition because of the possibility of multiple page forms, or downloading of a macro for later use causing a change in printer operation.

Note: The form (macro) to be used must be downloaded to the printer prior to invoking that form.

Overlay command

The automatic overlay command will enable every page to have the same form until the end of the variable data is reached or when the overlay command is disabled. The following PCL commands must be placed in hexadecimal value at the beginning of the variable data file. For example, a macro with an ID #1 and an enable overlay command will have the following escape sequence:

Esc&f1Y 1B26663159 (hexadecimal value)

Esc&f4X 1B26663458 (hexadecimal value)

This is an example of a variable data file (VARDATA2) on the IBM Host. It sends to the printer the PCL macro ID #1 and the overlay command prior to the data. After the last line of data, the macro ID #1 (Esc&f1Y) and disable macro overlay command (Esc&f5X) is issued. &&??<SPACE> resets the Escape character to NONE.

&&??%1B266631591B26663458%&&??<SPACE>

This is variable data, LINE 1.

LINE 2.

LINE 3.

LINE 4.

•

•

•

LINE N.

&&??%1B266631591B26663558%&&??<SPACE>

Once this job is submitted using a JCL, it will merge this variable data with the macro ID #1 that is already residing on the printer. Here is an example of a JCL used to submit the job (VARDATA2) to VPS Remote 156.

```
//JK12345 JOB (XXX),'SEND DAT',MSGLEVEL = (1,1),CLASS =  
A,  
//  MSGLASS = X,NOTIFY = JK34334  
/*JOBPARM LINECT = 0, ROOM = 3231  
/*ROUTE PRINT RMT156  
// EXEC PGM = IEBGENER  
//SYSPRINT DD SYSOUT = X  
//SYSIN DD DUMMY  
//SYSUT2 DD SYSOUT = J  
//SYSUT1 DD DSN = JK12345.EBCDIC.VARDATA2,DISP =  
SHR
```

Note: SYSOUT=J is used.

Call command

The macro call command will only invoke the form once and merge the variable data with it. Therefore, any variable data that exceeds the page length of the desired form will print separately on the next page without the form.

The following PCL commands must be placed in hexadecimal value at the beginning of the variable data file. For example, a macro with an ID #1 and a call macro command will have the following escape sequence:

```
Esc&f1Y 1B26663159 (hexadecimal value)  
Esc&f3X 1B26663358 (hexadecimal value)
```

This is an example of a variable data file (VARDATA2) on the IBM Host. It sends to the printer the PCL macro ID #1 and the call macro command prior to the data. &&??<SPACE> resets the Escape character to NONE.

```
&&??%1B266631591B26663358%&&??<SPACE>  
This is variable data, LINE 1.  
LINE 2.  
LINE 3.  
LINE 4.  
•  
•  
•  
LINE N.
```

Once this job is submitted using a JCL, it will merge this variable data with the macro ID #1 that is already residing on the printer. Here is an example of a JCL used to submit the job (VARDATA2) to VPS Remote 156.

```
//JK12345 JOB (XXX),'SEND DAT',MSGLEVEL = (1,1),CLASS =  
A,  
//  MSGLASS = X,NOTIFY = JK34334  
/*JOBPARM LINECT = 0, ROOM = 3231  
/*ROUTE PRINT RMT156  
// EXEC PGM = IEBGENER
```

```
//SYSPRINT DD SYSOUT = X
//SYSIN DD DUMMY
//SYSUT2 DD SYSOUT = J
//SYSUT1 DD DSN = JK12345.EBCDIC.VARDATA2,DISP =
SHR
```

Note: SYSOUT=J is used.

Merging variable data with different forms (macros)

To invoke different forms, the macro call command must be used. The macro call command can be placed anywhere within the variable data where a different form is required.

Note: The forms (macros) to be used must be downloaded to the printer prior to invoking the desired forms.

The following is an example of three different portrait forms being called out within the variable data.

- The first macro being called is macro ID #3 and it contains variable data starting from line 1 to line 48.
- The second macro being called is macro ID #2 and it contains variable data starting from line 49 to line 98.
- The third macro being called is macro ID #1 and it contains variable data starting from line 99 to line 130.

This job can be submitted by using a JCL like the one shown above.

```
&&??%1B266633591B26663358%&&??<SPACE>Variable
data, line 1.
```

```
LINE 2.
```

```
LINE 3.
```

```
LINE 4.
```

```
LINE 5.
```

```
LINE 6.
```

```
LINE 7.
```

-
-
-

```
&&??%1B266632591B26663358%&&??<SPACE>Variable
data, line 49.
```

```
LINE 50.
```

```
LINE 51.
```

```
LINE 52.
```

-
-
-

```
&&??%1B266631591B26663358%&&??<SPACE>Variable
data, line 99.
```

```
LINE 100.
```

```
LINE 101.
```

```
LINE 102.
```

-
-

•
LINE 130.

Switching form orientation

As previously mentioned, there are setup commands that must be sent before instructing the printer to start merging variable data with a macro. If the LANDSCAPE orientation is required, the PCL landscape orientation must be issued in addition to the current page settings. To maintain the page settings as well as the cursor position (x,y) after a macro has been called, a PCL PUSH to the stack and POP from the stack must also be issued.

The following is an example of a LANDSCAPE form being called followed by a PORTRAIT form being called which is followed by another PORTRAIT form being called. The PCL Escape commands that are used are explained below.

Landscape	Esc&l1O	1B266C314F
Top Margin = Zero	Esc&l0E	1B266C3045
Push	Esc&f0S	1B26663053
Macro ID#4	Esc&f4Y	1B26663459
Call Macro	Esc&f3X	1B26663358
Pop	Esc&f1S	1B26663153
•		
•		
•		
Portrait	Esc&l0O	1B266C304F
Top Margin = Zero	Esc&l0E	1B266C3045
Push	Esc&f0S	1B26663053
Macro ID#3	Esc&f3Y	1B26663359
Call Macro	Esc&f3X	1B26663358
Pop	Esc&f1S	1B26663153
Vertical Position	Esc*p100Y	1B2A7031303059
Horizontal Position	Esc*p100X	1B2A7031303058
•		
•		
•		
Portrait	Esc&l0O	1B266C304F
Top Margin = Zero	Esc&l0E	1B266C3045
Push	Esc&f0S	1B26663053
Macro ID#1	Esc&f1Y	1B26663159
Call Macro	Esc&f3X	1B26663358
Pop	Esc&f1S	1B26663153
Vertical Position	Esc*p100Y	1B2A7031303059
Horizontal Position	Esc*p100X	1B2A7031303058

Note: The cursor position (100,100) is used as an example to place the variable data 1/3 inch down from the top margin plus any extra carriage return and line feeds generated (see "Limitations" section below).

&&??%1B266C314F1B266C30451B26663053%

&&??%1B266634591B266633581B26663153%&&??<SPACE
>Variable data, line 1.

LINE 2.

LINE 3.

LINE 4.

LINE 5.

LINE 6.

LINE 7.

•

•

•

&&??%1B266C304F1B266C30451B26663053%

&&??%1B266633591B266633581B26663153%&&??
<SPACE>

&&??%1B2A70313030591B2A7031303058%&&??
<SPACE>Variable data line 49.

LINE 50.

LINE 51.

LINE 52.

•

•

•

&&??%1B266C304F1B266C30451B26663053%

&&??%1B266631591B266633581B26663153%&&??
<SPACE>

&&??%1B2A70313030591B2A7031303058%&&??
<SPACE>Variable data line 99.

LINE 100.

LINE 101.

LINE 102.

•

•

•

LINE 130.

This job can be submitted by using a JCL like the one shown previously.

Limitations

There will be a blank line (carriage return and line feed) generated by each record or line before the variable data. For example:

&&??%1B266C314F1B266C30451B26663053%

will generate a carriage return and line feed prior to printing Variable data, line 1 in the example above. There will be two blank lines printed prior to Variable data line 49 in the example above.

abort	Command that prematurely terminates printing of a job or execution of a program.
AFP	Advanced Function Presentation. An IBM architecture that uses the all-points-addressable concept to print text and images on a printer.
algorithm	A prescribed set of well-defined, unambiguous rules or processes for the solution of a problem in a finite number of steps.
alignment	Relationship between the bottom edge of a character and the bottom edge of its adjacent right character.
ANSI	American National Standard Institute. ANSI-based commands are those that conform in format and definition to the standards set by the American National Standard Institute.
APL	A Programming Language. Also refers to a symbol set. Fonts for the APL symbol set can be found in the Xerox MRP Family coax printers.
ASCII	American Standard Code for Information Interchange. It is a 7-bit (or 8-bit) coding scheme used for the computer representation of letters, numbers, punctuation marks, and other symbols commonly found on a standard typewriter. It also represents special unprintable characters used by computer devices, that is, carriage return, line feed, form feed, escape, and so forth.
ASCII dump	Print language selection that produces a hardcopy of the actual ASCII codes being sent to the printer by its host.
asynchronous	Having a variable or random time interval between successive characters, or events. Transmission in which each character, word, or small block, is individually synchronized (timed), usually by the use of start and stop bits. It is referred to as character framed transmission.
binary	Base 2 number system written with the digits "0" or "1." See <i>bit</i> .

binding margin	Margin along which a page is to be bound. See <i>long-edge binding</i> and <i>short-edge binding</i> .
bit	Binary digit. A bit is the most fundamental unit of information a computer can accept. It has two states called "1" (one) and "0" (zero), or "on" and "off," that are used to represent a yes or no type statement. Groups of bits are used to represent more complex statements, such as a character. The most common grouping of bits is called a byte, consisting of eight bits. See <i>ASCII</i> or <i>EBCDIC</i> .
bitmap	Method of printing in which each dot of a character or graphics display is controlled by a bit of digitally coded information.
bitmapped fonts	Nonscalable fonts with predefined sizes (fixed point size and pitch attributes).
BSC	Binary Synchronous Communications. Data communications line protocol that uses a standard set of transmission control character sequences to send binary coded data over a communications line.
buffer	Memory where data is stored during transfer from one device to another. Useful for accumulating data into blocks before storage or processing, and for adjusting differences of speed between devices, or between a device and a communicating facility.
byte	Group of seven or eight bits. A kilobyte is equal to 1,024 bytes; a megabyte is equal to 1,024 kilobytes or 1,048,576 (1024 x 1024) bytes.
CA	Character Attribute. CAs, which appear in the Extension Attribute Buffer, modify printable characters in the Message Data Storage Area. CAs control underlining and use of the base and APL character set.
carriage return<CR>	Control character that (unless set to be interpreted as a line end) causes the printer to begin printing at the left margin of the current line. The ASCII or EBCDIC character <CR> is associated with this movement.
character	Single letter, number, symbol, space, or punctuation mark. Printable characters are those characters normally associated with a typewriter. Unprintable characters are special characters normally used by a computer to control a system, for example, line feed, backspace, carriage return, escape, bell, start of text, and so forth.

character set	Collection of characters contained in a font. Each character set has been designed for a special purpose. Some sets include all printable characters found on most standard computer keyboards, while others are intended for such applications as math, foreign language typesetting, and law.
CL	Command language. The set of all commands with which a user requests system functions, for instance, Job Control Language.
Clear command	The Clear command is never accompanied by a data stream command. It should always be the first command to a printer after the mode set. If the printer is ready, this ensures that the printer is operational before any data is sent to be printer. The Clear command to an SCS printer causes the following: 1. Clears the work station controller printer buffers and error counts. 2. Clears all printer receive buffers and formatting buffer. 3. Resets printer indicators to cause skip to old line on a start condition. 4. Resets the current print position to 1 (the left margin). 5. Resets any incomplete printer data stream (PDS) commands that were pending. 6. Resets invalid SCS command and parameter error indications in the printer. 7. Causes certain printer unit errors to be reported again even if they had or had not been reported. 8. Prints the residual buffered data.
coaxial cable	PVC or teflon shielded 50-ohm cable, used for Ethernet, and other protocols, such as coax. It is designed to accommodate transmission rate of 10 megabits per second.
configuration	Process of changing certain printer settings to allow your computer to communicate properly with the printer. The printer is configured using one of the configuration menus available from the printer control panel.
control panel	Pressure-sensitive panel on the front of the printer used to place the printer on and offline, access and change configuration settings, reset the printer, manage the printer, and perform diagnostics. It also has a window for displaying printer messages, four indicator lights, and a printer mimic for indicating locations in the printer that need user attention. See <i>error message</i> .
COR	Computer Output Reduction. COR, which is treated as a third page orientation, can be used to create a scaled-down version of computer output on a landscape letter-sized page. See also <i>draft quality</i> , <i>letter quality</i> .
cpi	characters per inch
CUOA	Control Unit Output Area. The CUOA, which occupies locations X'0010' to X'004F' of the PCIA, contains information regarding orders from the control unit as well as configuration information. The CUOA is written by the cluster controller and read by the printer.

data monitor	Data-analyzing tool that prints the hexadecimal value of all data received.
default	Preset value programmed into a printer that it uses unless you change the value with the control panel keys or print language commands. See also <i>factory defaults</i> , <i>power-up defaults</i> .
default font	Font in use whenever the printer is reset. Some font cartridges also contain a default font.
document	One or more recorded or printed pages forming a logical whole.
DOS	Disk Operating System. Specialized disk-oriented program that provides an easy-to-use link between the user and a disk drive of the computer.
dot	Smallest printable unit.
download	1. Send information from a computer (host) to a peripheral device (printer, terminal, and so forth). 2. It identifies something characterized by being sent from a computer to a peripheral device, for example, a downloaded font.
downloaded fonts	Fonts loaded from the host system into the dynamic memory of the printer. Downloaded fonts must be reloaded each time the system is powered up.
dpi	Dots per inch. A measure of the resolution of a printed image.
draft quality	Specified by the "conserve ribbon" parameter in the Page Presentation Media (PPM) SCS command. Used in the auto page orientation algorithm: when draft quality is requested, the page will be COR, if that is the default tray orientation. See also <i>COR</i> , <i>letter quality</i> .
DSC	Data Stream Compatibility. LU2 and LU3 data stream composed of controls, optionally intermixed with user data, which is carried with a request or response unit.
EAB	Extended Attribute Buffer. The elements in this buffer, which have a one-to-one correspondence with characters and attributes in the MDSA, and can be used to turn on underscoring or APL in the coax DSC environment.
EBCDIC	Extended Binary Coded Decimal Interchange Code. An 8-bit code, standard for most IBM systems providing 256 possible combinations of characters.
EEROM	Electrically Erasable Read Only Memory. Device that can be erased electrically and reprogrammed. See <i>NVM</i> .

EFA	Extended Field Attribute. EFAs, which appear in the Extension Attribute Buffer, modify Field Attributes in the Message Data Storage Area. EFAs control underlining and use of the base/APL character set.
embedded commands	Control codes within the text of a file.
emulate	The ability of a printer to be set up to behave like another printer in a non-native mode.
error message	Message that appears in the display window of the control panel, or is printed, indicating an error condition in the printer.
escape character \mathbb{E}	Control code or control character placed in front of a printer command. An \mathbb{E} tells the printer to execute the following character string rather than print it when in PCL mode.
escape sequence	Sequence of characters beginning with an escape code and comprising a printer command.
FA	Field Attribute. Field Attributes that control print or nonprint attributes in DSC systems.
factory default	Settings programmed into the printer before it is shipped. These settings are in use unless you override them using either the printer control panel or by sending printer commands.
fixed spacing	Font set in which every character cell has the same width. Also called fixed pitch.
font	Collection of characters with a consistent style. Different fonts can be selected for printing. Fonts can refer to the printer's internal fonts, or optional fonts stored on diskettes and downloaded to the printer.
font characteristics	Attributes that control the appearance of a font. These characteristics include orientation, character height, style, stroke weight, and typeface.
fontroot	Font name without the landscape or portrait (-P or -L) orientation suffix.
form feed (FF)	Control character that causes the print or display position to move to the next page; the EBCDIC character <FF> is associated with this character.
FSL	Function Selection via Line. Commands or functions that access the value-added features, like duplex, paper tray selection, etc., of a coax printer. It allows you to set up default interfaces or change default settings.

Graphical Data Display Manager (GDDM)	Function of the operating system that processes both text and graphics for output on a display, printer, or plotter.
GFID	Global Font Identifier, a number that references a font.
GSM	Grams per square meter. Universally accepted unit that expresses the weight in grams of one square meter of paper.
hexadecimal	Numbering system requiring sixteen number symbols (0 through 9 and A through F) to represent data.
hexadecimal dump	Print language selection that produces a hardcopy of the actual ASCII codes being sent to the printer by its host.
host computer	Computer transmitting data to a printer or other peripheral device. Also called a host for short.
HP-GL/2	Hewlett-Packard Graphics Language Level 2. Industry standard language for pen plotters that is integrated into the PCL 5 printer language. Allows drawing of vector (line) drawings, such as circles and rectangles.
HP PCL	Hewlett-Packard Printer Control Language.
image	Representation on the printed page of the data sent to the printer. It is formed of closely placed dots of dry ink, which are placed on the page electrostatically and fused.
interface	Connection between two devices. Interfaces are meant to carry electronic impulses from one place to another. Hardware interfaces, for example, link a host computer to a printer. Often refers to an electronic device that enables one kind of equipment to communicate with or control another.
interface cable	Connects the printer to the computer, or cluster controller, or other device so they can communicate.
Interface Escape Character	Character used in coax and twinax interface escape sequences.
internal fonts	Permanent landscape and portrait fonts that reside in the printer and are not affected when the printer is powered up or down.
I/O	Input/Output. Communication established between the printer and a host computer or two other devices (for example, disk drive I/O).

IPDS	Intelligent Printer Data Stream. IBM Systems Application Architecture host-to-printer data stream for advanced function printing subsystems. It provides an interface to all-points addressable (APA) printers that make possible the presentation of pages containing an architecturally unlimited mixture of different data types: high-quality text, raster image, vector graphics, and bar code.
IRQ	Intervention Required. When a printer fault occurs, the printer informs the host system of the need for operator intervention by setting bit 4 of location 0 of the PCIA.
job	Set of data, including programs, files, and instructions sent to a computer.
KB	Kilobyte. Unit of 1,024 bytes.
landscape	Page orientation in which output is printed parallel to the longer edge of the page. See also <i>portrait</i> .
letter quality	Specified by the "standard ribbon" parameter in the Page Presentation Media (PPM) DCA command. Used to determine orientation: when letter quality is requested, the page is printed portrait rather than in COR, if that is the default tray orientation. See also <i>COR</i> , <i>draft quality</i> .
line feed (LF)	Character that causes the print position to move to the corresponding position on the next line; the EBCDIC character <LF> is associated with this character.
logical page size	Size of printed text, plus top and left margins. Logical page size is used in the automatic page orientation algorithm. See also <i>LPL</i> , <i>LPW</i> .
long-edge binding	In this style of binding, the binding margin is along the long edge of the page, regardless of the orientation of the printed image. See also <i>binding margin</i> , <i>short-edge binding</i> .
LPI	Lines per inch. The printer control panel setting determines the default LPI, which can be overridden by SCS command from the host.
LPL	Logical Page Length. LPL is determined by the number of lines on the page (MPL), the lines per inch (LPI) and the top margin. See also <i>logical page size</i> , <i>LPW</i> .
LPW	Logical Page Width. LPW is determined by the number of characters on a line (MPP), the characters per inch (CPI), and the left margin. See also <i>logical page size</i> , <i>LPL</i> .
LU1	Logical Unit 1. An SCS device.

LU3	Logical Unit 3. A 3270 data stream (DSC or DSE) device.
MB	Megabyte. Unit of 1,048,576 bytes.
memory	Part of a computer system that stores data temporarily or permanently. See <i>NVM</i> .
mode	One of several alternative conditions or states of a device, such as Print mode and Configuration mode on the printer.
MPL	Maximum Print Length. Maximum number of lines on a page. The page length printer control panel setting determines the default MPL, which can be overridden by SCS command from the host.
MPP	Maximum Print Position. Maximum number of characters on a line. The page width printer control panel setting determines the default MPP, which can be overridden by PCIA location 0018 or by SCS or DCA commands from the host.
MSA	Message starting address. Printer control information area (PCIA) bytes X'0012—0013' that identifies the position of the first byte of data in the print buffer.
MVS	Multiple virtual storage. An alternate name for OS/VS2, release 2.
MVT	Multiprogramming with a variable number of tasks. The OS/360 control program that supervises the execution of a variable number of tasks in main storage, and allocates system resources among them.
network	Series of points connected by communication channels. A private network is a network of communications channels confined to the use of one customer.
NVM	Short for NVRAM, nonvolatile memory. That portion of memory in a device that remains unchanged when the device is turned off. It is sometimes referred to as EEROM or NovRam. It is used to store system defaults while the printer is powered off.
OCA	Object Content Architecture. A standard set of constructs to described the object data, the characteristics of that object, and the manipulation functions that may be performed on the object. OCA represents objects in device-independent format.
OCR	Optical Character Recognition. Information processing technology that converts human readable data into another medium for computer input. Light reflected from characters is recognized by optical character recognition equipment. It is also characters printed in a type style that can be read by both machines and people. Also refers to a symbol.

OEM	Original Equipment Manufacturer. A company or organization that purchases computer and peripheral equipment for use as components in products and equipment that they subsequently sell to their customers.
offline	State in which the printer is under the control of the user, not the host computer to which the printer is connected.
online	State in which the printer is under the control of the host computer.
option	One of the user-selectable printer features listed in a configuration menu. Each controls a different printer default condition.
OS/VS2	Operating system/virtual storage 2. A virtual storage operating system that is an extension of OS/MVT.
output tray	Place where printed material is delivered face down.
PA1	Program Attention 1. Key input code X'5F' is loaded into POA location 0002 during printer-host communications after the PA1 button is pressed. This is generally done as part of an applications program running on the host.
PA2	Program Attention 2. Key input code X'5E' is loaded into POA location 0002 during printer-host communications after the PA2 button is pressed. This is generally done as part of an applications program running on the host.
page description language (PDL)	1. Language used to describe printing jobs to a printing system. PDL describes the input (type, format, characteristics), performs the processing functions (logical processing), and describes the output (type format, font selection, accounting options). 2. Utility that puts new job descriptor libraries (JDLs) onto a system disk.
page orientation	Relationship of the printed data to the long or short edge of the page. See <i>landscape</i> , <i>portrait</i> .
parameter	As used in this manual, a user-selectable configuration option.
PCIA	Printer Communications Interface Area. The PCIA, which occupies the first 50 hexadecimal bytes in the input buffer of a coax-attached printer, contains control information. The POA, which occupies the first 10 hexadecimal locations, contains printer information that is read by the cluster controller. The CUOA, which occupies the next 40 hexadecimal locations, contains cluster controller information that is read by the printer.
PCL	Hewlett-Packard Printer Control Language.

PDL	Page Description Language. Language used to describe printing jobs to a Laser Printing System (LPS). PDL describes the input (type, format, characteristics), performs the processing functions (logical processing), and describes the output (type format, font selection, accounting options).
pitch	Number of characters to the inch. (10 pitch is 10 characters per inch; 12 pitch, 12 characters per inch, and so forth.)
POA	Printer Output Area. The POA, which occupies locations 0 to X'000F' of the PCIA, contains information regarding printer status and configuration. The POA is written by the printer and read by the cluster controller.
point	Traditionally type is measured in points. One point is equal to 1/72 inch. 12-point type is roughly equal in size to 10 pitch characters.
point size	Height (measured in points) of a character set from the top of an ascender, in uppercase character, to the bottom of a descender, in a lowercase character.
port	Communications connection from a computer to the printer, suitable for attaching a single line. That portion of a computer through which a peripheral device may communicate. connection between the CPU and a peripheral device. See also <i>parallel port</i> , <i>serial port</i> .
portrait	Page orientation in which the output is printed parallel to the shorter edge of the page. See also <i>landscape</i> .
power-up defaults	Values that are in effect when the printer is powered up.
print density	Relative darkness of print on the page. Very dense print appears totally black. Less dense print looks lighter, and solid filled areas may not be totally black.
printer commands	Instructions sent to the printer through application software programs, which change printing variables such as page orientation, margins, and fonts.
proportional spacing (PS)	Refers to a font in which each character cell is of a different width, according to the size and shape of the letter.
RAM	Random Access Memory. Memory used by a micro processor that has the ability to read as well as write. Storage that allows data (such as documents) to be stored and retrieved directly by address location without reading through any other data.
reset	To restore the printer to its default configurations. This may be performed at the control panel or by command.

resident fonts	Fonts resident in the printer when shipped. Also called internal fonts.
ROM	Read Only Memory. Memory used by a micro processor that can only be read. It cannot be rewritten.
scalable font	Font scaled within the printer to any point size.
scan line	Individual scan of the laser device across the width of the image. The line of video data printed in one pass of the laser beam across the length of the xerographic drum.
SCS	SNA Character String. One logical record that is physically sent to the printer in several parts, each of which is exactly 256 bytes long with the exception of the last part. The SCS data stream consists of a 1-byte printer control code followed by the data to be printed. SCS mode is also referred to as LU1 mode. The 4220/MRP accepts the EBCDIC data stream from an SCS cluster controller when the coax interface is installed.
short-edge binding	In this style of binding, the binding margin is along the short edge of the page, regardless of the orientation of the printed image. See <i>binding margin</i> , <i>long-edge binding</i> .
SNA	Systems Network Architecture. Defines message formats and protocols for IBM network communications.
software	Any word processing, programming, or special application package installed in your computer system.
source	Component of all communications systems, the originator of information.
Special Features	The features accessible when "Full Features" are selected under the "Special Features" printer control panel options of the Xerox MRP Family printers.
SSA	System Status Available. A valid order or operation accepted by a coax printer that controls printing and mode changing. In the control unit output area (cuoa), the SSA handles mode change using code X'00', enter send state, LU1 mode only using code X'02', and enter receive state, LU1 mode only using code X'03'.
stacker	Tray into which the printer ejects printed output. On the 4220/MRP or 4230/MRP, there are two standard output trays (the top output tray and face-up tray) and one optional output tray (the high-capacity stacker).
status sheet	Page produced by the printer when requested through a job command. Contains information about fonts used and errors detected in a job.

symbol set	Collection of characters contained in a font designed for a special purpose. Some sets include all printable characters found on most standard computer keyboards, while others are intended for such applications as math, foreign language typesetting, and law.
system reset	Reinitialization of the entire system. The system goes through a complete power-up, resetting all memory to the factory default configuration.
throughput	Amount of data that can be processed, transmitted, and printed, within a specified unit of time.
toggle	To switch or alternate the printer status between online (ready to accept data) and offline.
troubleshooting	Process of identifying the cause of a printer problem. The method used steps through a list of symptoms and suggested remedies until the solution is found.
typeface	Appearance of a set of characters, which gives it a unique identity. See <i>font</i> .
utility pages	Any page not generated from the data sent through an I/O port, including start-up pages, printer configuration reports, font reports, and error pages.
vertical spacing	Number of lines of characters per inch.
VM	Virtual machine. A functional simulation of a computer and its associated devices.
workstation	Input/output equipment at which an operator works; a station you can send data to or receive data from a computer for the purpose of performing a job.

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273—Austrian German, code page, A-11t

274—Belgian, code page, A-12t

275—Brazilian, code page, A-13t

276—French Canadian, code page, A-14t

277—Danish/Norwegian, code page, A-15t

278—Finnish/Swedish, code page, A-16t

280—Italian, code page, A-17t

281—Japanese (Latin characters), code page, A-18t

282—Portuguese, code page, A-19t

284—Spanish/Spanish speaking, code page, A-20t

285—U.K. English, code page, A-21t

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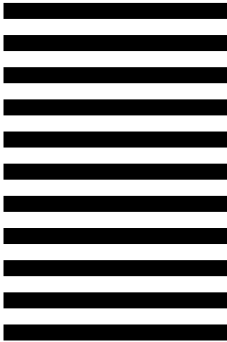
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