XEROX

Xerox MRP Family
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP

PCL 5 and PostScript
Printer Language Reference

Notices

Installation caution

Your Xerox laser printer is not customer installable. Only a qualified 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 radio 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.

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

Europe: 50 Hz, 220 to 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.

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.

Be aware of all labels that warn you against removing panels or covers. See the example below of a label located behind the front cover, below the on/off switch.

> DANGER - Invisible laser radiation when open and interlock defeated for service.
>
> AVOID DIRECT EXPOSURE TO BEAM
>
> Instructions for safe service are in SERVICE MANUAL.

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 include safety agency examination, approval, and compliance with established environmental standards.

Attention to the following notes ensures the continued 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 qualified 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).

Use caution when installing or modifying telephone lines.

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 this document.

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.

Never install telephone wiring during a lightening storm.

Never install telephone jacks in a wet location unless specifically designated for wet locations.

Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightening.

Never use a telephone to report a gas leak in the vicinity of the leak.

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

Approvals and certification

60 Hz, 115 V   Listed by Underwriters Laboratories, UL1950 (UL). Meets CSA standards, C22.2 NO 950 (CSA).

50 Hz, 220 to 240 V   Meets the British Standards Institution, IEC950 (BSI).

Safety feature

Your printer 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 is interrupted to the printer, follow these steps:

1. Locate the safety device, using the U.S. or International Configuration (above).

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 service representative.

Table of contents

Introduction

The Printer Language Reference is intended as an aid to programmers using PostScript Page Description Language (PDL) or Hewlett-Packard (HP) Printer Control Language (PCL) 5 to write programs for a laser printer.

About this manual

This reference does not cover all aspects of HP PCL or PostScript PDL.

Before using this manual, become familiar with its contents and conventions.

Text conventions

The following text and procedure conventions are used throughout this guide.

italics	Italics are used for document and library names (for example, the *Xerox MRP Family 4220/MRP, 4230/MRP Operator Guide*).
	CAUTION: Cautions are associated with equipment safety.
	WARNING: Warnings are associated with the safety of people.
N	**Notes:** Hints that help you perform a task or understand the text.
MB	Megabyte.
K-byte	Kilobyte.
K-bit	Kilobit.
gsm	Grams per one square meter of paper.
menus, modes, options, and commands	These use downstyle capitalization (for example, Configuration menu, Duplex mode, and Raster Graphics command).

1.   PostScript mode

The Xerox laser printer supports Adobe PostScript Level 2 implementation. The operator set includes all Level 2 operators and a set of Level 1 compatibility operators unique to this printer. It does not include Display PostScript operators based on Level 1 or Level 2.

This chapter highlights certain language features specific to the Xerox implementation of the PostScript Page Description Language. It is intended for programmers who design host software for use on the printer or write their own programs in the PostScript PDL. This chapter does not cover standard operation and programming of PostScript printers. Refer to the references below for detailed information:

- *PostScript Language Reference Manual,* Second Edition, Adobe Systems Incorporated.

- *PostScript Language Supplement,* Adobe Systems Incorporated. Information supplied in this book is a necessity for designing software or writing PostScript Page Description Language programs. It can be obtained only from Adobe Systems Incorporated.

- *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP,* Adobe Systems Incorporated. This book is packaged and shipped with the *PostScript Language Reference Manual.*

N   **Note**: The *PostScript Language Supplement* and *PostScript Language Printer Addendum, Xerox 4220* referred to in this manual are Version 2015.

Device-dependent features

The PostScript language, although designed to be inherently device-independent, has provisions for some physical features that are not common across products. Your printer has PostScript language features and capabilities that might not be present in other PostScript output devices. Some of these features are described in the following pages.

Fonts available with the PostScript Language mode

A total of 65 fonts are included. The printer has 35 internal Adobe standard typefaces. ISO Latin1 Encoding and Standard Encoding are supported. The Adobe Type Manager pack supplied with the printer provides an additional 30 fonts. These fonts may be downloaded to Random Access Memory (RAM), the programmable font module, or hard disk, if they are present

as options. The Font Report shows typeface examples of internal and downloaded fonts.

Downloadable font types

The supported downloadable font types include:

- Adobe Type 0 (composite font)
- Adobe Type 1 (base font)
- Adobe Type 3 (user-defined font)

Internal fonts

The following is a list of font typefaces, arranged by family.

- New Century Schoolbook
  - NewCenturySchlbk-Roman
  - NewCenturySchlbk-Bold
  - NewCenturySchlbk-Italic
  - NewCenturySchlbk-BoldItalic

- Courier
  - Courier
  - Courier-Oblique
  - Courier-Bold
  - Courier-BoldOblique

- Palatino
  - Palatino-Roman
  - Palatino-Italic
  - Palatino-Bold
  - Palatino-BoldItalic

- Symbol

- Times
  - Times-Roman
  - Times-Italic
  - Times-Bold
  - Times-BoldItalic

- Helvetica
  - Helvetica
  - Helvetica-Oblique
  - Helvetica-Bold
  - Helvetica-BoldOblique

- Helvetica Narrow
  - Helvetica-Narrow
  - Helvetica-Narrow-Oblique
  - Helvetica-Narrow-Bold
  - Helvetica-Narrow-BoldOblique

- AvantGarde
  - AvantGarde-Book
  - AvantGarde-BookOblique
  - AvantGarde-Demi
  - AvantGarde-DemiOblique

- Bookman
  - Bookman-Demi
  - Bookman-DemiItalic
  - Bookman-Light
  - Bookman-LightItalic

- ZapfChancery-MediumItalic
- ZapfDingbats

Adobe Type Manager fonts

The 30 additional PostScript fonts included with the Adobe Type Manager are shown below.

- Adobe Caslon
  — ACaslon-Italic
  — ACaslon-Regular
  — ACaslon-Semibold
  — ACaslon-SemiboldItalic

- Adobe Garamond
  — AGaramond-Bold
  — AGaramond-BoldItalic
  — AGaramond-Italic
  — AGaramond-Regular

- Barmeno
  — Barmeno-Bold
  — Barmeno-ExtraBold
  — Barmeno-Medium
  — Barmeno-Regular

- Lithos
  — Lithos-Black
  — Lithos-Regular

- Tekton
  — Tekton
  — Tekton-Bold

- Americana
  — Americana
  — Americana-ExtraBold

- Formata
  — Formata-Italic
  — Formata-Medium
  — Formata-MediumItalic
  — Formata-Regular

- Trajan-Bold

- Blackoak

- Carta

- ParkAvenue

- Kaufmann

- Poetica-SuppOrnaments

- WoodtypeOrnaments-Two

- ParisianRegular

Page Device setup

Both Level 1 and Level 2 Postscript provide features to set up a document that meets the requirements of a page description. The Level 1 implementation provides a set of control operators in a dictionary called Statusdict. The Level 2 implementation supports setpagedevice, a device setup operator which specifies the requirements of a page description and controls standard and optional printer features.

When calling the operator setpagedevice, a user can specify parameters such as PageSize and ImageBox for formatting, NumCopies, Duplex, and MediaColor for page processing; InputAttributes and OutputAttributes for Input/Output control; and Policies for handling unsatisfied requirements. Many other Page Device parameters are supported by your printer. Refer to the "Device Setup" section in the *PostScript Language Printer Addendum*, *Xerox 4220/MRP, 4230/MRP*, Adobe Systems Incorporated, for details.

Page Device features

Some of the Page Device features that are unique to the printer are described in this section. Note the Page Device parameter used in each case.

Page Size   Specified by the PageSize parameter. In PostScript mode, paper sizes are supported by commands in the data stream. Each specified size is matched against the available media in the paper trays. If the specified size is found, the media in that tray is used. Failure to match a paper size triggers the current PageSize policy. If paper size is not specified in the data stream, the media is selected from the default tray or any other tray with the same size. Table 1-1 shows the page sizes that are supported by the matching mechanism on the printer.

N   **Note**: The imageable area is the same as the page size.

Table 1-1.   **Papername values, tray numbers, paper sizes, and point sizes**

Equivalent Level 1 *papername*	Physical paper tray supported	Paper tray size	Point size (W by H)
letter (default)	1, 2, 3, 4, 5	8.5 x 11" 216 x 279 mm	612 x 792
a4	1, 2, 3, 4, 5	8.27 x 11.69" 210 x 297 mm	595 x 842
folio	1, 2, 3, 5	8.5 x 13" 216 x 330 mm	612 x 936
legal	1, 2, 3, 4, 5	8.5 x 14" 216 x 356 mm	612 x 1008

Table 1-1. **Papername values, tray numbers, paper sizes and point sizes** (continued)

Equivalent Level 1 *papername*	Physical paper tray supported	Paper tray size	Point size (W by H)
ledger or 11x17	1, 2, 3, 5	11 x 17″ 279 by 432 mm	792 x 1224
a3	1, 2, 3, 5	11.69 x 16.54″ 297 x 420 mm	842 x 1191
postcard	5	3.5 x 5.5″ 89 x 140 mm	252 x 396
statement	1, 2, 3, 5	5.5 x 8.5″ 140 x 216 mm	396 x 612
executivepage	1, 2, 3, 5	7.25 x 10.5″ 184 x 267 mm	522 x 756
a6	5	4.13 x 5.83″ 105 x 148 mm	298 x 420
a5	1, 2, 3, 5	5.83 x 8.27″ 148 x 210 mm	420 x 595
isob5	1, 2, 3, 5	6.93 x 9.84″ 176 x 250 mm	499 x 709
monarcenvelope	5	3.88 x 7.5″ 98 x 190 mm	279 x 540
com10envelope	5	4.13 x 9.5″ 105 x 241 mm	297 x 684
dlenvelope	5	4.33 x 8.66″ 110 x 220 mm	312 x 624
c5envelope	5	6.38 x 9.02″ 162 x 229 mm	459 x 649
other paper	1, 2, 3	5.35 x 5.95″ 136 x 177 mm to 11.0 x 16.54″ 279 x 417 mm	N/A
other paper	5	3.25 x 4.5″ 82 x 114 mm to 11.7 x 17.0″ 297 x 432 mm	234 x 324 to 842 x 1224
other envelopes	5	3.85 x 3.85″ 98 x 98 mm to 7.0 x 10.2″ 178 x 259 mm	277 x 277 to 504 x 734

Input and output trays   Specified by the Input Tray Slot numbers in the InputAttributes dictionary, and by the Output Tray Slot Numbers or the OutputType in the OutputAttributes dictionary.

Auto-tray switching   Specified by the TraySwitch parameter. Auto-tray switching is implemented if TraySwitch is enabled and a tray runs out of paper after the job starts. The order in which auto-tray switching occurs is: 4, 1, 2, 3.

Default tray sequence   PostScript searches the tray selection by paper size and media, as shown in table 1-2. The default sequence in which the size is searched for is: 4, 1, 2, 3, 5.

Table 1-2.   **Paper tray assignments for input and output trays**

Slot number	Input tray	Output tray (OutputType name)
0	Tray 1*	Top Tray*
1	Tray 1	Face-Up Tray
2	Tray 2	High-Capacity Stacker
3	Tray 3	N/A
4	Tray 4 (High-Capacity Feeder)**	N/A
5	Tray 5 (Multi-sheet Bypass Tray)	N/A

*Default
**Default if installed

Duplex mode   Specified by the Duplex parameter. In Duplex mode, Tumble mode can be selected. When Tumble *true* is selected, the image on the reverse side of the page is printed upside-down, making it suitable for top binding. When Tumble *false* is selected, the images on the reverse side are of the same orientation, making the pages suitable for left binding. Top and left can be either the long or short edge.

With most Level 1 implementations, the tumble effect is not the same for landscape and portrait jobs. However, for both orientations, setting Tumble *true* generates short edge binding, and setting Tumble *false* generates long edge binding.

N   **Note:** This differs from the Level 2 use of Tumble or Landscape pages.

For all duplex jobs, the first duplex page is always printed on the front of the physical page. If the last page of a job uses only the first side of the paper, this page is delivered automatically when Duplex mode is deactivated or a timeout occurs.

Since Level 1 statusdict operators which set Duplex and Tumble modes persistently are not implemented, these operators cannot be used in the print data to override the Duplex mode or Tumble defaults. These defaults can be changed with the Level 2 operator setpagedevice.

Line edge enhancement Specified by the PostRenderingEnhance and PostRenderingEnhanceDetails parameters. The image enhancement options and the control panel mapping are shown in table 1-3.

Table 1-3. **Mapping of PostRenderingEnhanceDetails to control panel selection**

Key	Value	Function	Control panel display
Revalue	0	LEE off	Disable
	1	LEE light	Light
	2	LEE medium	Medium (default)
	3	LEE dark	Dark
Type	10	Constant	N/A

Outputfaceup stacking Each output tray accommodates only one method of stacking. Pages are always stacked face up on the face-up tray and face down on the top tray and the high-capacity stacker. The outputfaceup values should correspond to the current output tray (*true* for output to the face up tray, and *false* for output to the top tray and high-capacity feeder).

Paper offset Specified by the Jog parameter, as shown in table 1-4.

Table 1-4. **Mapping of Jog to the printer offset control panel functions**

Integer	Function	Control panel display
0	Do not jog	Disable
1	Jog at device deactivation	Other setting from host is active
2	Jog at end of job	On job
3 (default)	Jog after each set	On job and copy

The value of Jog in the page device dictionary is ignored for the face-up tray. Paper cannot be physically shifted at this output location.

Multiple copies Specified by the NumCopies parameter. Multiple copies are delivered uncollated.

Policies   Specified by the Policies parameter. When a page description makes a request that the printer cannot satisfy (for example, the requested feature is not supported, or the feature is supported but not available at the moment), the interpreter consults the Policies Dictionary to determine further action. For most features, you can specify one of the following policy choices:

- 0—Generate a configuration error.

- 1—Ignore the request.

- 2—Interact with the operator or system administrator to determine the action.

The default for PolicyNotFound is 1. For policies available to unsatisfied page sizes, refer to the "Policies" section in the *PostScript Language Reference Manual*, and the PageSize entry in the policies dictionary in the *PostScript Language Reference Manual Supplement*.

The control panel default can be 2 or 6. The default is 6 for PageSize policy. Use the Paper Loading Pause option to select these two settings on the Printer Setup menu at the control panel. Table 1-5 shows the mapped functions.

Table 1-5.   **Mapping of PageSize functions to the printer Paper Loading Pause option**

Policy	Function	Control panel display
2	Set control panel Paper Loading Pause on, invoke operator message	Enable
6	Set control panel Paper Loading Pause off, select next larger available size	Disable
0/1/3/4/5/7	Other page size policies selected from the data stream	Other setting from the host is active

The default Duplex policy is 2, which automatically turns Duplex printing to Simplex when it is not possible to print Duplex (such as when using media from Tray 5.)

Jam recovery   Specified by the ExitJamRecovery parameter. Jam recovery is always enabled, and the ExitJamRecovery value is always *true*.

Resources

PostScript Level 2 allows you to manage objects such as fonts, patterns, and filters as collections of resources grouped into categories. A resource can be requested by giving the resource category and name. The Resource categories supported by the printer are described in the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP*.

Compatibility operators

A set of compatibility operators is present in the printer for Level 1 compatibility purposes only. Their use in PostScript Level 2 language programs is not recommended. Refer to the *PostScript Printer Language Addendum, Xerox 4220/MRP, 4230/MRP* for more information.

Miscellaneous PostScript features

The PostScript features described in this section are described in detail in the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MR*P, or in the *PostScript Language Supplement.* Please refer to these books for further information.

Communications setup

Communications parameters in the different interfaces can be set from the host. The serial defaults are shown in table 1-6. Refer to the "Device Parameters" section in the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP*, for information on all interfaces, including serial, parallel, LocalTalk, EtherTalk, and Token Ring.

Table 1-6. **Communications defaults for the serial interface**

Communications parameter	Default
Flow control	Robust XON/XOFF
Baud rate (bps)	9600
Data bits	8
Stop bits	1
Parity	None

Fax setup

To set up and control fax operations, refer to the sections on covering fax and device parameters in the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP*.

Timeout features

To obtain and set current timeout values, refer to the sections on Systems, User, and Page Device parameters in the *PostScript*

Language Printer Addendum, Xerox 4220/MRP, 4230/MRP
discussing. The factory defaults are shown in table 1-7.

Table 1-7.   **Factory default timeouts**

Default	Time in seconds
job timeout	0 (disabled)
wait timeout	60
manualfeed timeout	60

Emulator

The only emulator (alternative interpreter) supported by the 4220/MRP or 4230/MRP is %LaserJetIII%. Refer to the description of the Emulator parameter in the "Device Parameter" section of the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP* for details.

Emulation switching

For PostScript Level 2 implementation, refer to the information on the Emulator parameters in the *PostScript Language Supplement.* For PostScript Level 1 implementation, refer to the descriptions of the emulate compatibility operator in the same book.

PostScript password

Refer to the StartJobPassword and SystemParamsPassword descriptions in the "System parameters" section in the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP.* The default is zero.

Error handling

Error messages are always sent to the host if the interface permits. PostScript errors are printed when error sheet printing is enabled in the Printer Setup Menu.

File systems

Two file systems are supported: the integrated drive electronics (IDE) disk option (%disk0%), and the Flash Simm option (%Cartridge1%). Refer to the "System parameters" section of the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP* for details.

Job Scheduling

Refer to the description of Job Scheduling in the "Device parameters" section of the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP.*

Product Strings

Values for Product Strings, including languagelevel, product, revision, serialnumber, and version, are listed in the "Product Strings" section of the *PostScript Language Printer Addendum, Xerox 4220/MRP, 4230/MRP.*

2. HP LaserJet Emulation mode

Your Xerox laser printer supports Hewlett-Packard (HP) LaserJet IIISi printer commands as documented in the *HP LaserJet IIISi Printer User's Reference Manual* and the *HP PCL 5 Printer Language Technical Reference Manual*. In addition, several additional capabilities of the HP LaserJet III and HP LaserJet 2000 are supported, as outlined in this chapter.

This chapter is intended for the advanced user who wants to control the printer directly through commands, or for the programmer writing application software.

The information in this chapter is not a tutorial for HP PCL programming. This chapter only highlights certain features specific to the Xerox HP LaserJet Emulation mode. Because this chapter is only a supplement, the standard information described in Hewlett-Packard documentation has been omitted.

In HP LaserJet Emulation mode, the printer is suitable for a wide range of office graphics and text processing applications, including the following:

*   Word processing
*   Database reporting
*   Financial planning
*   Business graphics
*   Office publishing

HP PCL 5 compatibility

The Xerox HP PCL 5 emulation command interpreter is compatible with the HP LaserJet Series IIISi. The following capabilities of the HP LaserJet Series III and LaserJet Series 2000 are supported:

*   The printer implements the HP LaserJet Series IIISi font set.

*   The printer does not have the capability to emulate HP cartridge fonts.

*   The HP PCL 5 commands do not support any of the available printer options, such as the hard disk and network interface controllers.

For a complete list of supported HP commands, refer to the "HP PCL command quick reference" and "HP-GL/2 command quick reference" appendices.

Job Control commands

Job Separation

Purpose   Use the Job Separation command to offset one print job from others in the output tray.

Syntax   E& #T

where # is on of the following:

0   no offset
1   offset output

More   The control panel setting determines how the printer offsets the output. The following settings are available:

- On Job—Jobs are offset only.

- On Job and Copy (default)—All print jobs and sets of individual copies are offset in the output trays.

- Disable—The output is not offset unless a Job Separation command is received requesting an offset output.

Refer to the *Xerox MRP Family 4220/MRP, 4230/MRP System Administrator Guide* for more information on offset.

Page Control commands

Paper Source

Purpose Use the Paper Source command to designate a paper tray or a paper source sequence as the paper source for printing.

Although the HP IIISi does not support the Paper Source command for Paper Deck, the Xerox printer does support this command.

Syntax E& #H

where # is one of the values listed in table 2-1.

Table 2-1.   **Printer and HP Paper Source commands**

Value #	HP	Printer equivalent	Possible tray assignments
0	Eject Page	Eject Page	N/A
1	Upper Tray	Tray 1	Tray 1* Tray 2 Tray 3 Tray 4 Tray 5
2	Manual Paper Tray	Tray 5	Tray 5 (fixed)*
3	Manual Envelope Tray	Tray 5	Tray 1 Tray 2* Tray 3 Tray 4 Tray 5
4	Lower Tray	Tray 2 or 3	Tray 1 Tray 2 Tray 3* Tray 4 Tray 5
5	Paper Deck (HP 2000 only)	Tray 4 if installed, otherwise Tray 1	Tray 1 Tray 2 Tray 3 Tray 4* if installed Tray 5
6	Envelope Feeder	Tray 5	Tray 5 (fixed)*

*=default setting.

Additional information

When a Paper Source command is sent within a print job, the Input Tray to Command Assignments feature is used. The Input Tray to Command Assignments feature allows you to select which tray is used for the HP Upper Tray, Lower Tray, Manual Envelope Tray, and Paper Deck paper source commands.

When the Xerox printer receives the command E**& #H** in the middle of a job, printing stops, the page is ejected, and the next page feeds as specified by the command.

When the printer receives the paper source command E**& 0H** in the middle of a job, the current page is ejected and the next page feeds as specified by the command.

With Auto-Tray switching enabled, if a document with both paper source and paper size commands requests paper from a tray that contains a different size of paper from that requested, the printer automatically selects a paper tray (from trays 4, 1, and 2) with the correct paper size. If the paper size is not available in any of these trays, a control panel message prompts you to load the correct paper size into tray 5. However, you can also use the control panel to continue printing with the paper size that is already loaded.

If Auto-Tray switching is disabled, only the selected paper tray is examined for the correct size. If the paper size is not correct, a control panel message prompts you to load the correct size. You again have the option of using the control panel to continue printing with the wrong size.

Page Size

Purpose

Use the Page Size command to determine the physical size of paper to use.

Syntax

E& #A

where # is one of the values listed in table 2-2.

Table 2-2.   **Supported paper sizes**

Value #	Paper size	Inches	Millimetres
1	Executive (Monarch)	7.25 x 10.5	184 x 267
2	Letter	8.5 x 11	216 x 279
3	Legal	8.5 x 14	216 x 356
6	Ledger	11 x 17	279 x 432
26	A4	8.27 x 11.69	210 x 297
27	A3	11.69 x 16.54	297 x 420
80	Envelope Monarch	3.875 x 7.5	98 x 191
81	Envelope Commercial 10	4.125 x 9.5	105 x 241
90	Envelope DL	4.33 x 8.66	110 x 220
91	Envelope C5	6.38 x 9.02	162 x 229

Additional information   The printer supports all HP paper sizes, including envelopes. However, not all paper sizes and envelopes can be fed from all trays. Table 2-3 shows the supported paper sizes and feed trays for the printer with the optional tray 4 high-capacity feeder.

Table 2-3.   **Supported paper sizes and feed location**

Paper size	Feed location				
	Tray 1	Tray 2	Tray 3	Tray 4	Tray 5
Executive (Monarch)	•	•	•		•
Letter	•	•	•	•	•
Legal	•	•	•	•	•
A4	•	•	•	•	•
Ledger	•	•	•		•
A3	•	•	•		•
Envelope Monarch					•
Envelope Commercial 10					•
Envelope C5					•
Envelope DL					•

Paper Destination

Purpose
Use this command to specify the paper destination. The printer supports the HP IIISi implementation of the Paper Destination command.

Syntax
E& #G

where # is one of the values listed in Table 2-4.

Table 2-4. **Paper destinations**

#	HP	Printer equivalent
1	Upper Output Bin	Top Tray
2	Lower Output Bin	Face-Up Tray

Additional information
The printer lets you select which output tray is used when the HP Upper Output Bin command is received. You do this with the Output Destination to Command Assignment feature that you can select from the control panel. The Output Destination to Command Assignment feature lets you assign the command to one of the following output trays:

- Top tray
- Face-up tray
- High-capacity stacker (option)

N **Notes**:

- The high-capacity stacker option allows only letter, executive, and A4 paper sizes. For all other sizes the default must be the top tray in this configuration.

- Any job that is fed from tray 5 is always output to the face-up tray.

- The HP Rear Output Bin command is fixed to the face-up tray destination.

Image area

For compatibility with Hewlett-Packard printers, a border area on the outside edges of the paper is unavailable for printing when in HP LaserJet Emulation mode. This space is approximately 0.17 inches (4.2 mm) on each side, as shown in figure 2-1. The shaded area shows the image area.

Figure 2-1.   **Image area**
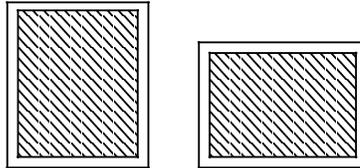
For envelopes with HP PCL, there is a border area of approximately 0.27 inches (7 mm) on the edge toward the front of the printer, as well as 0.17 inches (4.2 mm) along the other three edges, as shown in figure 2-2.

Figure 2-2.   **Envelope and post card edge deletion area**
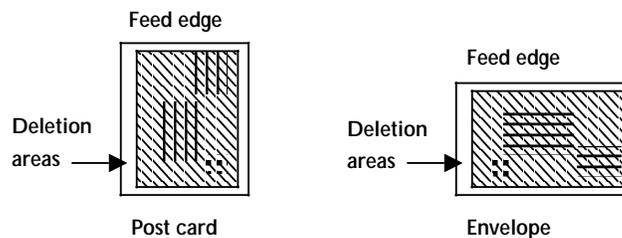
Fonts

The printer implements the internal font set of the HP LaserJet IIISi. For information on fonts, refer to the *Xerox MRP Family 4220/MRP, 4230/MRP Operator Guide.*

Downloading fonts

In addition to the supported fonts listed in the operator guide, the printer can download other bitmap and scalable fonts. Scalable Intellifont soft fonts and TrueType fonts are supported.

Downloadable fonts that are made permanent (E*c5F) or temporary (E*c1F) are not listed on the Font Report, and cannot be stored on the optional hard disk. Permanent fonts remain in memory until you power off the printer or delete them.

N   **Note**: If you are running a 4220 product using a software version lower than V1.54, PCL fonts cannot be stored on flash ROM.

A. HP PCL command quick reference

Your laser printer supports the Hewlett-Packard (HP) PCL 5 commands listed in this appendix. For more information on how to use these commands, refer to the *PCL 5 Printer Language Technical Reference Manual* published by

Table A-2. **Page Control commands**

Syntax	Name	# value
ᴇ& #H	Paper Source	0 Eject page 1 Feed paper from Tray 1 (default) 2 Feed paper from Tray 5 (fixed) 3 Feed paper from Tray 2 (default) 4 Feed paper from Tray 3 (default) 5 Feed paper from Tray 4 6 Feed envelope from Tray 5 (fixed) Without the HCF option, paper source 5 feeds paper from Tray 1.
ᴇ& #O	Page Orientation	0 Portrait 1 Landscape 2 Reverse Portrait 3 Reverse Landscape
ᴇ&a#P	Print Direction	Degrees of rotation (0, 90, 180, 270)
ᴇ&a#G	Page Side Selection	0 Next side 1 Front side 2 Back side
ᴇ& #G	Page Destination	1 Top Tray (default) 2 Face-Up Tray
ᴇ& #A	Page Size	1 Executive (7.25 x 10.5″) 2 Letter (8.5 x 11″) 3 Legal (8.5 x 14″) 6 Ledger (11 x 17″) 26 A4 (210 x 297 mm) 27 A3 (297 x 420 mm) 80 Envelope Monarch (3.875 x 7.5″) 81 Commercial 10 envelope (4.125 x 9.5″) 90 Envelope DL (110 x 220 mm) 91 Envelope C5 (162 x 229 mm)
ᴇ& #P	Page Length	Number of lines on the page, based on current line spacing

Table A-2. **Page Control commands** (continued)

Syntax	Name	# value
E& #E	Top Margin	Number of the line on which the text starts
E& #F	Text Length	Number of lines of text required
E&a#L	Left Margin	Column number at which printing starts
E&a#M	Right Margin	Column number at the end of the line
E9	Clear Horizontal Margins	—
E& #L	Perforation Skip	0 Disable 1 Enable (moves text to the top of the next page)
E&k#H	Horizontal Motion Index (HMI)	Width of a column in units of 1/120nd of an inch; # must be between 0 and 32767
E& #C	Vertical Motion Index (VMI)	Distance between rows in 1/48ths of an inch; # must be between 0 and 32767
E& #D	Line Spacing	1, 2, 3, 4, 6, 8, 12, 16, 24, or 48

Table A-3. **Cursor Positioning commands**

Syntax	Name	# value
E &a#R	Vertical Cursor Position (Rows)	Number of rows to move, or the row to move to
E&a#V	Vertical Cursor Position (Decipoints)	Number of decipoints (1/720th of an inch) to move, or the absolute position to move to
E*p#Y	Vertical Cursor Position (Dots)	Number of dots (1/300th of an inch) to move, or the absolute position to move to
E&a#C	Horizontal Cursor Position (Columns)	Number of columns to move, or the column to move to
E&a#H	Horizontal Cursor Position (Decipoints)	Number of decipoints (1/720th of an inch) to move, or the absolute position to move to
E*p#X	Horizontal Cursor Position (Dots)	Integer representing the number of dots (1/300th of an inch) to move, or the absolute position to move to
E=	Half-Line Feed	—
E&k#G	Line Termination	**Host** **Printer** 0 CR CR LF LF FF FF 1 CR CR+LF LF LF FF FF 2 CR CR LF CR+LF FF CR+LF 3 CR CR+LF LF CR+LF FF CR+LF

Table A-4.   **Raster Graphics commands**

Syntax	Name	# value
E*t#R	Graphics Resolution	75 75 dpi 100 100 dpi 150 150 dpi 300 300 dpi
E*r#F	Graphics Presentation	0 Image printed in current print direction 3 Image printed along width of physical page
E*r#T	Raster Height	Height in raster rows
E *r#S	Raster Width	Width in pixels of the specified resolution
E*r#A	Start Graphics	0 Left edge of Graphic Margin 1 Current cursor position
E*b#Y	Y Offset	Number of raster lines of vertical movement
E*b#M	Set Compression Method	0 Unencoded 1 Run-length encoding 2 Tagged Image File Format (TIFF) encoding 3 Delta Row encoding
E*b#W [raster data]	Transfer Raster Data	Number of bytes in this row; # must be 0 through 32767 (do not enter the brackets)
E*rC	End Graphics Version C	—
E*rB	End Graphics Version B	—

Table A-5.　　**Font　commands**

Syntax	Name	# value
E**(ID** E**)ID**	Primary Symbol Set Secondary Symbol Set	7J　Desktop 0N　ECMA-94 Latin 1 0D　ISO-60 Norwegian 1 0F　ISO-25 French 0I　ISO-15 Italian 0K　ISO-14 JIS ASCII 0S　ISO-11 Swedish 0U　ISO-6 ASCII 1D　ISO-61 Norwegian 2 1E　ISO-4 UK 1F　ISO-69 French 1G　ISO-21 German 1U　Legal 2K　ISO-57 Chinese 2S　ISO-17 Spanish 2U　ISO-2 International Reference Version 3S　ISO-10 Swedish 4S　ISO-16 Portuguese 5M　PS-Math 5S　ISO-84 Portuguese 6J　Microsoft Publishing 6M　Ventura Math 6S　ISO-85 Spanish 8M　Math-8 8U　Roman-8 9L　Ventura ITC ZapfDingbats 9U　Windows 10J　PS-Text 11L　PS ITC ZapfDingbats 10U　PC-8 US 11L　ITC ZapfDingbats Series 100 11U　PC-8 Danish/Norwegian 12L　ITC ZapfDingbats Series 200 12U　PC-850 13J　Ventura International 13L　ITC ZapfDingbats Series 300 14J　Ventura US 15U　Pi Font Other values*
E**(s#P** E**)s#P**	Primary Spacing Secondary Spacing	0　Fixed pitch 1　Proportional spacing
E**(s#H** E**)s#H**	Primary Pitch Secondary Pitch	Real number valid up to two decimal places (characters/inch)

* Any value from table B-1 in the *Hewlett Packard PCL 5 Comparison Guide* may also be used.

Table A-5. **Font commands** (continued)

Syntax	Name	# value
E(s#V E)s#V	Primary Height Secondary Height	Selected height in points (1/72nd of an inch) up to two decimal places
E(s#S E)s#S	Primary Style Secondary Style	0 Upright 1 Italic 4 Condensed 5 Condensed Italic 8 Compressed, Extra Condensed 24 Expanded 32 Outline 64 Inline 128 Shadowed 160 Outline Shadowed
E(s#B E)s#B	Primary Stroke Weight Secondary Stroke Weight	—7 Ultra Thin —6 Extra Thin —5 Thin —4 Extra Light —3 Light —2 Demi Light —1 Semi Light 0 Medium +1 Semi Bold +2 Demi Bold +3 Bold +4 Extra Bold +5 Black +6 Extra Black +7 Ultra Black
E(s#T E)s#T	Primary Font Secondary Font	3 Courier 0 Line Printer 4101 Times 4141 ITC ZapfDingbats 4148 Univers Other values*
E(3@ E)3@	Primary Default Font Secondary Default Font	—
E&p#X [transparent data]	Transparent Data	Number of bytes of transparent data; # must be 0 through 32767 (do not enter the brackets)
E&d#D	Underline	0 Fixed underline 3 Floating underline
E&d@	Underline Off	—
E*c#D	Assign Font ID	ID number ranging from 0 to 32767

* Any value from table B-3 in the *Hewlett Packard PCL 5 Comparison Guide* may be used.

Table A-5. **Font commands** (continued)

Syntax	Name	# value
E*c#F	Font Control	0 Delete all soft fonts 1 Delete all temporary soft fonts 2 Delete the downloaded font specified by the last font ID command 3 Delete character code 4 Make the downloaded font specified by the last font ID command temporary 5 Make the downloaded font specified by the last font ID command permanent 6 Copy/assign the current invoked font as temporary
E(#X E)#X	Primary Font Selection by ID Secondary Font Selection by ID	Font ID number
E)s#W [font descriptor + data]	Font Descriptor	Number of bytes in the font descriptor that follows (do not enter the brackets); the font descriptor is normally 64 bytes long
E*c#E	Character Code	Single-byte decimal character code
E(s#W [character descriptor + data]	Character Descriptor and Data	Number of bytes (up to 32767) in the character descriptor and data following the command (do not enter the brackets)

Table A-6. **Macro commands**

Syntax	Name	# value
E**&f#Y**	Macro ID	0 to 32767
E**&f#X**	Macro Control	0 Start macro definition (last ID specified) 1 Stop macro definition. 2 Execute macro (last ID specified) 3 Call macro (last ID specified) 4 Enable auto-overlay macro (last ID specified) 5 Stop auto-overlay 6 Delete all macros 7 Delete all temporary macros 8 Delete macro (last ID specified) 9 Make macro temporary (last ID specified) 10 Make macro permanent (last ID specified)

Table A-7. **Rectangular Area Fill commands**

Syntax	Name	# value
E*c#G	Area Fill ID	Comprised of six fill patterns and eight densities of shading Each fill pattern is identified by a number between 1 and 6 Each shading density covers a range of values from 1% to 100%.
E*c#P	Fill Rectangular Area	0 Solid black fill 1 Solid white fill 2 Shading 3 Cross-hatch pattern 5 Current pattern
E*c#H	Horizontal Rectangle Size (Decipoints)	Number of up to four decimal places representing the width of the rectangle in decipoints (1/720th of an inch)
E*c#A	Horizontal Rectangle Size (Dots)	Integer representing the width of the rectangle in dots (1/300th of an inch)
E*c#V	Vertical Rectangle Size (Decipoints)	Number up to four decimal places representing the height of the rectangle in decipoints (1/720th of an inch)
E*c#B	Vertical Rectangle Size (Dots)	Integer representing the height of the rectangle in dots (1/300th of an inch)

Table A-8.   **Print   Model   commands**

Syntax	Name	# value
E*v#N	Source Transparency Mode	0 Transparent 1 Opaque
E*v#O	Pattern Transparency Mode	0 Transparent 1 Opaque
E*c#G	Area Fill ID	Shaded Fill 1 through 100=1% through 100%. Cross-Hatch Fill 1 through 6
E*v#T	Select Current Pattern	0 Solid black 1 Solid white 2 Shading pattern 3 Cross-hatch pattern

Table A-9.   **Picture   Frame   commands**

Syntax	Name	# value
E*c#X	Picture Frame Horizontal Size (Decipoints)	Horizontal size in decipoints
E*c#Y	Picture Frame Vertical Size (Decipoints)	Vertical size in decipoints
E*c0T	Set Picture Frame Anchor Point	(Set to PCL Cursor position)

Table A-10.   **Programming Hints commands**

Syntax	Name	# value
E&s#C	End-of-Line Wrap	0 Enable 1 Disable
E&f#S	Push/Pop Cursor Position	0 Push (store cursor position) 1 Pop (recall cursor position)
EY	Display Function On	N/A
EZ	Display Function Off	N/A

B.

HP-GL/2 command
quick reference

Your laser printer supports the Hewlett-Packard Graphics Language/2 (HP-GL/2) graphics language. HP-GL/2 graphics can be created within the application software, or imported from existing applications. This appendix lists the HP-GL/2 commands. For more information on how to use these commands, refer to the *PCL 5 Printer Language Technical Reference Manual* published by Hewlett-Packard.

In order to print with HP-GL/2 you must exit the Printer Control Language (PCL) printer language mode. Switching between modes involves only a few commands, and software applications can easily switch between the two modes as needed without affecting performance.

Table B-1. **HP-GL/2 Configuration Group commands**

Syntax	Name	# value
E*c#K	HP-GL/2 Plot Horizontal Size	Horizontal size in inches
E*c#L	HP-GL/2 Plot Vertical Size	Vertical size in inches
E %#B	HP-GL/2 Mode	0 Uses the previous HP-GL/2 pen position 1 Uses the current PCL cursor position for the HP-GL/2 pen position
E%#A	Enter PCL Mode	0 Returns the cursor to the previous PCL position 1 Uses the current HP-GL/2 pen position for the cursor position
DF [;]	Default Values	
IN [;]	Initialize	
IP [X_{P1},Y_{P1} [,X_{P2},Y_{P2};]] or **IP [;]**	Input P1 and P2	X_{P1}, Y_{P1} = P1 location coordinates X_{P2}, Y_{P2} = P2 location coordinates
IR [X_{P1},Y_{P1}[X_{P2}, Y_{P2};]] or **IR [;]**	Input Relative P1 and P2	X_{P1}, Y_{P1} = P1 location as percentage of PCL Picture Frame X_{P2}, Y_{P2} = P2 location as percentage of PCL Picture Frame
IW [X_{LL}, Y_{LL}, X_{UR}, Y_{UR}] ; or **IW [;]**	Input Window	X_{LL} X coordinate (lower left) Y_{LL} Y coordinate (lower left) X_{UR} X coordinate (upper right) Y_{UR} Y coordinate (upper right)
RO [angle] [;] or **RO [;]**	Rotate Coordinate System	Angle is 0º, 90º, 180º, or 270º
SC [X_1, X_2, Y_1, Y_2[,type[,left, bottom;]] or **SC X_{MIN}, X_{FACTOR}, Y_{MIN}, Y_{FACTOR}, type[;]** or **SC [;]**	Scale	X_1, Y_1 User-unit coordinates for P_1 X_2, Y_2 User-unit coordinates for P_2 type 0 (anisotropic) 1 (isotropic), or 2 (point factor) left, bottom Positions the isometric area within P1/P2 limits, 0 to 100% X_{MIN}, X_{MAX} -2^{30} to $+2^{30}$ -1 Y_{MIN}, Y_{MAX} -2^{30} to $+2^{30}$ -1 X_{FACTOR}, Y_{FACTOR} -2^{30} to $+2^{30}$ -1

Table B-2. **HP-GL/2 Vector Group commands**

Syntax	Name	# value	
AA X_{CTR}, Y_{CTR}, **sweep angle[,chord angle][;]**	Arc Absolute	X_{CTR}, Y_{CTR} sweep angle chord angle	-2^{30} to $+2^{30}$ -1 -32768 to $+32767$ 0.5 to 180
AR X_{INCR}, Y_{INCR}, **sweep angle[,chord angle][;]**	Arc Relative	X_{INCR}, Y_{INCR} sweep angle chord angle	-2^{30} to $+2^{30}$ -1 -32768 to $+32767$ 0.5 to 180
AT X_{INTER}, Y_{INTER}, X_{END}, Y_{END}**[,chord angle][;]**	Absolute Arc Three Point	X_{INTER}, Y_{INTER} X_{END}, Y_{END} chord angle	-2^{30} to $+2^{30}$ -1 -2^{30} to $+2^{30}$ -1 0.5 to 180
CI radius [,chord angle][;]	Circle	radius chord angle	-2^{30} to $+2^{30}$ -1 0.5 to 180
PA [X,Y...[,X,Y]] [;]	Plot Absolute	-2^{30} to $+2^{30}$ -1	
PD [X,Y...[,X,Y]] [;]	Pen Down	-2^{30} to $+2^{30}$ -1	
PE [flag][val] | coord pair... [flag] [val] | coord pair [;] or **PE**;	Polyline Encoded	Encodes common HP-GL/2 commands to increase throughput flag is: < Pen Up > Fractional data = Absolute 7 7-bit data : Select Pen coord pair is -2^{30} to $+2^{30}$ -1 val is flag dependent	
PR [X,Y...[,X,Y]] [;]	Plot Relative	-2^{30} to $+2^{30}$ -1	
PU [X,Y...[,X,Y]] [;]	Pen Up	-2^{30} to $+2^{30}$ -1	
RT $X_{INCR\ INTER}$, $Y_{INCR\ INTER}, X_{INCR\ END}$, $Y_{INCR\ END}$[,chord angle][;]	Relative Arc Three Point	$X_{INCR\ INTER}$, $Y_{INCR\ INTER}$ $X_{INCR\ END}$, $Y_{INCR\ END}$ chord angle	-2^{30} to $+2^{30}$ -1 -2^{30} to $+2^{30}$ -1 0.5 to 180

Table B-3.   **HP-GL/2 Polygon Group commands**

Syntax	Name	# value
EA X,Y[;]	Edge Rectangle Absolute	X,Y are the coordinates of the opposite corner of the rectangle
ER X,Y[;]	Edge Rectangle Relative	X,Y are the coordinates of the opposite corner of the rectangle
EW radius,start angle, sweep angle, [,chord angle][;]	Edge Wedge	radius -2^{30} to $+2^{30}$ -1 start angle -32768 to $+32767$ sweep angle ± 360 chord angle 0.5 to 180
EP [;]	Edge Polygon	
FP [;]	Fill Polygon	
PM polygon definition[;]	Polygon Mode	0 Clears the polygon buffer and enters Polygon mode 1 Closes the current polygon or subpolygon and remains in Polygon mode 2 Closes the current polygon or subpolygon and exits Polygon mode
RA X,Y[;]	Fill Rectangle Absolute	X,Y are the coordinates of the opposite corner of the rectangle
RR X,Y[;]	Fill Rectangle Relative	X,Y are the coordinates of the opposite corner of the rectangle
WG radius,start angle, sweep angle [,chord angle][;]	Fill Wedge	radius -2^{30} to $+2^{30}$ -1 start angle -32768 to $+32767$ sweep angle ± 360 chord angle 0.5 to 180

Table B-4. **HP-GL/2 Line and Fill Attributes Group commands**

Syntax	Name	# value
AC [X,Y][:]	Anchor Corner	Determines the starting point for fill patterns.
FT [fill type[,option 1[,option2]]] [;]	Fill Type	Fill Type Description, option1, option2 1 and 2 Solid black, ignored, ignored 3 Hatched (parallel lines), line spacing, angle 4 Cross-hatched, line spacing, angle 10 Shading, %shading, ignored 11 User-defined, raster-fill index, ignored 21 PCL Patterns, pattern type, ignored

LA [kind, value... [,kind, value]][;]	Line Attributes	Attribute Kind, Value—Description
		Line Ends 1, 1—Butt (default)
		             2—Square
		             3—Triangular
		             4—Round.
		Line Joins 2, 1—Mitered (default)
		             2—Mitered/beveled
		             3—Triangular
		              4—Round
		             5—Beveled
		             6—No join applied.
		Miter Limit 3, 1 to 32,767—Max. length of miter
		            (miter length/pen width ratio)

LT [line type [,pattern length [,mode]]][;]	Line Type	line type -8 to +8
		pattern length >0
		Mode is:
		0 (relative)—Interprets pattern length as percentage
		   of diagonal distance between P1 and P2
		1 (absolute)—Interprets the pattern length parameter
		   in millimetres

PW [width [,pen]][;]	Pen Width	width -32768 to +32767 pen 0 (white), 1 (black)
RF [index [,width, height, pen number [,...pen number]]][;]	Raster Fill Definition	index 1 to 8 width 1 to 255 height 1 to 255 pen number 0 (white), 1 (black)
SM [character] [;]	Symbol Mode	
SP [pen][;]*	Select Pen	Pen is: 0 White 1 Black
SV [screen type[,option 1[,option2]]] [;]	Screened Vectors	Description Screen Type Option 1 Option 2 No screening 0 ignored ignored Shaded fill 1 % shading ignored User defined 2 index no. ignored PCL patterns 21 pattern type ignored

Table B-4. **HP-GL/2 Line and Fill Attributes Group commands**
(continued)

Syntax	Name	# value
TR [n][;]	Transparency Mode	n is: 0 Transparency mode=off 1 Transparency mode=on (default)
UL [index[,gap 1...gapn]][;]	User Defined Line Type	index Line pattern number [1-8] gap Percentage of pattern length for that portion (first gap is a pen-down move)
WU [type][;]	Pen Width Unit Selection	type is: 0 Millimetres 1 Percentage of P1/P2 distance

Table B-5. **HP-GL/2 Character Group commands**

Syntax	Name	# value
AD [kind, value... [,kind, value]][;]	Alternate Font Definition	Kind Attribute Value 1 Symbol Set 2 Font Spacing 0 (fixed); 1 (prop.) 3 Pitch characters per inch 4 Height font point size 5 Posture 0 (upright); 1 (italic) 6 Stroke Weight 0 (medium); 3 (bold) 7 Font
CF [fill mode[,edge pen*]][;]	Character Fill Mode	Fill Mode is: 0 Solid fill and edged 1 Edging with specified pen (or current pen if edge pen parameter not specified); characters filled if not edged 2 Fill with current fill type; characters are not edged 3 Fill with current fill type; edge characters with the specified pen or current pen if edge pen parameter is not specified Edge Pen is: 0 No edging 1 Black edging
CP [spaces, lines][;]	Character Plot	Spaces are -32768 to +32767 lines are -32768 to +32767
DI [run,rise][;]	Absolute Label Direction	run X - component of the label direction or COSINE of the angle rise Y - component of the label direction or SINE of the angle
DR [run,rise][;]	Relative Label Direction	run Percentage of distance between P1X and P2X rise Percentage of distance between P1Y and P2Y

Table B-5. **HP-GL/2 Character Group commands** (continued)

Syntax	Name	# value
DT [lblterm [,mode]][;]	Define Label Terminator	lblterm Any character except: NULL, LF, Esc, and ; (semicolon) mode 0 Print Label Terminator 1 Do not print Label Terminator
DV [path[,line]] [;]	Define Variable Text Path	path is: 0 0° right 1 -90° down 2 -180° left 3 -270° up line is: 0 -90° normal line feed 1 +90° reverse line feed
ES [width [,height]][;]	Extra Space	width Number (or fractional number) of spaces between characters height Number (or fractional number) of spaces between lines
FI font ID[;]	Select Primary Font ID	Font ID number assigned in PCL mode
FN font ID[;]	Select Secondary Font ID	Font ID number assigned in PCL mode
LB text...text lblterm[;]	Label	text is any character lblterm is Label Terminator (default Ext or defined with the DT command)
LO [position][;]	Label Origin	Position is a number indicating the label position relative to the current cursor position
SA [;]	Select Alternate Font	Selects the font designated by AD
SB [n] [;]	Scalable or Bitmap Fonts	n is: 0 Scalable fonts 1 Bitmap and scalable fonts
SD [kind, value... [,kind, value]][;]	Standard Font Definition	Kind Attribute Value 1 Symbol Set 2 Font Spacing (fixed); 1 (prop.) 3 Pitch characters per inch 4 Height font point size 5 Posture 0 (upright); 1 (italic) 6 Stroke Weight 0 (medium); 3 (bold) 7 Font
SI [width, height][;]	Absolute Character Size	width -32768 to +32767 height -32768 to +32767
SL [tangent of angle][;]	Character Slant	Tangent of angle is -32768 to +32767
SR [width, height][;]	Relative Character Size	width -32768 to +32767 height -32768 to +32767
SS [;]	Select Standard Font	
TD [mode][;]	Transparent Data	mode is: 0 Normal 1 Transparent

Table B-6. **Printer Job Language (PJL) commands**

Syntax	Name	# value
E%—12345X	Universal Exit Language/Start PJL	
@PJL ENTER LANGUAGE= {language} [<CR>] <LF>	Enter Language	language is PCL or PostScript
@PCL COMMENT <Words> [<CR>] <LF>	Comment	

Table B-7. **Miscellaneous commands**

Syntax	Name	# Value
EY	Enable Display Functions Mode	
EZ	Disable Display Functions Mode	

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. and Rank Xerox Ltd. publications are available through your local sales representative or analyst.

Xerox MRP Family publications

The Xerox 4220/MRP and 4230/MRP library sets include the following manuals.

Publication	U.S. Number	International Language	Number
4220/MRP, 4230/MRP Operator Guide	720P13940	French Spanish German Italian	
4220/MRP, 4230/MRP System Administrator Guide	720P13950	French	
4215/MRP, 4219/MRP, 4220/MRP, 4230/MRP Twinax Command Reference*	720P12751		

Publication	U.S. Number	International Language	Number
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.

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