Glossary

Auto-Continue

Auto-Continue mode can be configured using the printer's control panel (refer to the printer *User's Manual*).

Aspect Ratio

The ratio of the width to height of an image.

Baud Rate

Baud rate is the rate at which information is transferred between the computer and the printer. To communicate properly, the computer and printer must both be configured to the same baud rate.

Bound and Unbound Fonts

A bound font is a font which contains a pre-specified set of symbols, such as Roman-8, PC-8, etc. An unbound font (or more accurately, unbound *typeface*) has the capacity to be bound to a set of symbols selected from a complementary **Symbol Index** (such as HP's Master Symbol List - **MSL**, or the **Unicode** symbol list). See Chapter 10, "User-Defined Symbol Set" for more information.

CAP (Current Active Position)

The PCL cursor position refers to the **Current Active Position (CAP),** like the blinking underline character (cursor) used on most computers. This "cursor" identifies the current position on the page; the pointer, where a printing command begins laying out page data. The cursor can be moved anywhere within the logical page using a combination of horizontal and vertical cursor positioning commands and control codes (see Chapter 6, *Cursor Positioning*).

Centronics I/O

An industry standard parallel input/output (I/O) interface. (Also see *Parallel I/O*.)

Character Descriptor

The character descriptor is a block of data that identifies the characteristics for a specific character, such as its position, and the cursor position after printing. The character data which follows, defines the shape of the character. Chapter 11 describes the character definition and descriptor formats for PCL bitmap fonts, as well as Intellifont and TrueType scalable fonts.

Column

The width of a column is defined by the current Horizontal Motion Index (HMI).

Compression (raster graphics)

Raster graphics compression methods reduce the amount of code needed to generate a raster graphic image and improve the efficiency with which the image is printed. The Set Compression Method command allows you to code raster data in one of four compressed formats: Run-length encoding, tagged imaged file format (TIFF) rev. 4.0, delta row compression, and adaptive compression. These techniques are described in detail under “Set Compression Method Command” in Chapter 15.

Configuration

Configuration is the process of changing certain printer settings to allow a computer to communicate properly with the printer. For example, interface selection is part of printer configuration. The printer is configured using the control panel configuration menu.

Configuration Menu

Identifies printer features which are set from the printer’s Operator Control Panel. Configuration menu selections include such features as Auto-Continue, I/O configuration, and Resolution Enhancement setting. The configuration menu includes features which are not part of the print environment (features which can not be selected with printer commands).

Control Code

A control code is a type of PCL language command that initiates a printer function, for example CR (Carriage Return), LF (Line Feed), and FF (Form Feed).

Control Panel

The combination of keys, LEDs, and a display that allows an operator to communicate with a device and allows the device to communicate with an operator.

Current Active Position (CAP)

See CAP.

Cursor

Although the printer does not actually have a cursor, the cursor position refers to the currently active printing position (like the blinking underline character used on most computer terminals). The cursor can be moved anywhere within the logical page using a combination of horizontal and vertical cursor positioning commands and control codes.

Decipoint

A decipoint is a unit of measurement that equals 1/720th of an inch.

Default

A value used instead of a programmatically selected value. A factory default is a value programmed into the device at the factory; this value is stored in read-only memory (ROM) and cannot be changed by a user or operator. A user default is a default which is selectable via the control panel.

Dot

The dot is the smallest printable unit. On HP LaserJet printers, one dot can equal either 1/300th or 1/600 inch. The number of dots printed per inch is referred to as the printer's resolution.

Downloading

The process of transferring soft fonts, macros, or raster data from a host computer to the printer's user memory is called downloading.

DTR Polarity

The configuration of DTR polarity determines whether pin 20, on the serial interface connector, is high or low when the printer is ready. If DTR polarity is HI, pin 20 is high when the printer is ready. If DTR polarity is LO, pin 20 is low when the printer is ready.

Escape Character

The first character of a PCL command (or "escape sequence") is identified by the **?** symbol, (ASCII decimal code 27). This character is a control code used specifically by the printer to identify a string of characters as a printer command. As the printer monitors incoming data from a computer, it is "looking" for this character. When this character appears, the printer reads it and its associated characters as a command to be performed, and not data to be printed.

Escape Sequence (or "PCL Command")

PCL escape sequences consist of two or more characters. The first character is always the escape character, which is identified by the **?** symbol. This character is a control code used specifically by the printer to identify a string of characters as a printer command. As the printer monitors incoming data from a computer, it is "looking" for this character. When this character appears, the printer reads it and its associated characters as a command to be performed, and not as data to be printed. (Also see *PCL commands*.)

Factory Default

These are the settings that are programmed into the printer at the factory. These settings are in use unless you override them using either the control panel or by sending printer commands.

Factory Default Environment

A factory default is a setting programmed into the printer at the factory. The group of all the printer's factory settings is referred to as the factory default environment. The factory default symbol set is selectable from the control panel configuration menu (refer to the printer *User's Manual*).

Font

A font is a set of characters that have similar characteristics. A font has an assigned name, typeface, and is further described by its spacing, height, pitch, style, stroke weight, symbol set, and orientation. For example, the name of the font used for this text is Helvetica; its height is 10 point, its style is upright, and its stroke weight is medium.

Font Cartridge

A removable media containing multiple fonts. When a cartridge is plugged into the printer, the printer has access to the fonts contained in the cartridge.

Font Header

The font header and character definitions contain all the information needed to format a font for use in the HP LaserJet printers.

Every PCL font header begins with a font descriptor, which identifies the basic characteristics common to all characters of a font, such as: font type, baseline position, character cell width and height, character orientation, symbol set, etc. Chapter 11 describes the font header and character definition formats for PCL bitmap fonts, as well as Intellifont and TrueType scalable fonts.

Height

The height of a font is the measurement of the body of the type in points. A PCL point is 1/72nd inch. The body of the type is slightly greater than the distance from the bottom of a descender (such as the tail of lower-case "p") to the top of an unaccented capital letter.

Horizontal Motion Index (HMI)

HMI defines the distance between columns in 1/120 inch increments. When fixed pitch fonts are selected, all printable characters including the space and backspace characters are affected by HMI. When proportional fonts are selected, the HMI affects only the space character.

HMI is defaulted when font orientation, symbol set, pitch, spacing or height is specified and when switching between primary and secondary fonts with Shift In and Shift Out.

The default HMI is equal to the pitch value in the font header. The factory default font's HMI is 12 (which is 12/120 = 1/10 inch per character or 10 characters per inch).

HP-GL/2

PCL 5 printers provide the ability to print vector graphics using the HP-GL/2 graphics language commands. HP-GL/2 graphics may be created within application software or imported from existing applications. For various types of images (many technical drawings and business graphics, for example), it is advantageous to use vector graphics instead of raster graphics. Advantages include faster I/O transfer of large images and smaller storage requirements. See Chapter 17 for more information.

I/O

I/O is an acronym for input/output (I/O) and is used in this document when referring to hardware used to interface printers with computers.

I/O Buffer

The area within the printer's internal random access memory (RAM) where PCL commands and data are stored.

Interface Connector

The LaserJet printer comes with two interface connectors, serial and parallel, located on the lower part of the back panel. The cable that attaches the computer to the printer is connected here. (Also see *Parallel I/O* or *Serial I/O*.)

Internal Fonts

Internal fonts are the fonts resident in the printer when shipped.

Landscape

See *Orientation.*

Logical Page

The PCL logical page (also referred to as the addressable area) defines the area in which the cursor can be positioned. Although the printer does not actually have a cursor (like the blinking underline character used on most computer terminals), the cursor position refers to the currently active printing position (CAP). In other words, the location of the “cursor” is the position on the logical page where the next character is positioned. You can move the cursor to different points on the logical page using the cursor positioning commands; however, the cursor cannot be moved outside of the logical page bounds.

Macro

A macro is a collection of escape sequences, control codes, and data downloaded to the printer, whose execution can be initiated using a single command.

Menu

A list of configurable items. In the nomenclature of this document, an “item” is one particular configurable entity (such as “Copies”); a “value” is an “item’s” particular configuration (such as “Copies=10”).

Modified Print Environment

The current printer feature settings constitute the modified print environment. Whenever a feature setting is altered using escape sequences, the new setting is recorded in the modified print environment.

MSL (Master Symbol List)

This is a group of symbols (a **symbol index**). An unbound font has the capacity to be bound to a set of symbols selected from a complementary symbol index (such as the MSL or Unicode symbol indexes). Each symbol in the index is identified by a unique MSL number. Appendix D of the *PCL 5 Comparison Guide* contains the MSL symbol index.

Negative angle of rotation

An angle used to create a plot in HP-GL/2 which is rotated in the direction of the +X-axis to the –Y-axis. Note that the relationship of the +X-axis to the –Y-axis can change as a result of scaling point or scaling factor changes, thus changing the direction of a negative angle of rotation. See “Drawing Arcs” in Chapter 20 for more information.

Non-volatile RAM

Random Access Memory whose contents are preserved following a power failure (volatile RAM is memory whose contents are not preserved when the device is powered off). Non-volatile RAM is generally used to preserve configured (vs. programmed) device state information.

Off-line/On-line

On-line is a condition when the printer will accept data from the host computer. When the printer is on-line, the ON LINE lamp is lit. When off-line, the printer will not accept data from the host.

Orientation

The orientation of characters on a page; if the print is across the width of the page, it is “portrait-oriented;” if the print is across the length of the page, it is “landscape-oriented.”

Overlay Environment

The overlay environment consists of the current settings for the following features with the remainder of the environment features set to their user default values: Paper source, Page size, Number of copies, Orientation, Cursor position stack.

Parallel I/O

An input/output (I/O) interface that transmits more than one bit of information simultaneously (in a “parallel” mode). Centronics is an industry-wide parallel interface standard. (Also see *Serial I/O*.)

PCL Commands

PCL commands provide access to printer features. Once a PCL command sets a parameter, that parameter remains set until the same PCL command is repeated with a new value, or the printer is reset. There are three types of PCL commands: control codes, two-character escape sequences, and parameterized escape sequences. (Also see *escape sequences*.)

PCL Coordination System Units

The units of the X-axis of the PCL coordinate system may be dots, decipoints, or columns. The units of the Y-axis may be dots, decipoints, or rows.

PCL Units

These are user-definable units of measure which are used in PCL commands affecting various PCL cursor moves. The number of units-per-inch used in PCL cursor moves is determined by the current setting of the **Unit of Measure** command (see “Unit of Measure Command” in Chapter 4).

Note PCL Units were previously referred to as “PCL dots,” but *should not be confused with the printer’s physically printed dots.*

Perforation Region

The perforation region is the distance from the bottom of the text area to the top of the text of the next page. When perforation skip is enabled, a Line Feed or Half-Line Feed, which would move the cursor beyond the bottom of the text area, moves the cursor to the top of the text area on the next page. When perforation skip is disabled, a Line Feed or Half-Line Feed moves to the next line or half-line within the perforation region.

Pitch

Pitch describes the number of characters printed in a horizontal inch. Pitch only applies to fixed-spaced fonts since the number of characters per inch varies for proportionally-spaced fonts.

PJL

PJL (Printer Job Language) commands provide job-level control, such as the ability to switch printer languages (or “personalities” - such as PCL to PostScript) between jobs. PJL also provides two-way communications with the printer. PJL can also be used to change the printer’s control panel settings and modify the message displayed on the control panel.

Point

A PCL point is a unit of measurement that equals 1/72nd inch. Font height is measured in points.

Positive angle of rotation

An angle used to create a plot in HP-GL/2 which is rotated in the direction from the +X-axis to the +Y-axis. Note that the relationship of the +X-axis to the +Y-axis can change as a result of scaling point or scaling factor changes, thus changing the direction of a positive angle of rotation. See “Drawing Arcs” in Chapter 20 for more information.

Primary (Secondary) Font

A PCL convention whereby two fonts can be defined internally simultaneously. The primary font is accessed via the control code “SI” and the secondary font is accessed via the control code “SO.” The factory default state is primary font designated.

Printable Area

The printable area is the area of the physical page in which the printer is able to place a dot. The physical page refers to the size of the media installed in the printer.

The relationship between physical page, logical page, and printable area is defined in Figures 2-2 and 2-3.

Portrait

See *Orientation.*

Print Environment

The group of all the printer's current feature settings, collectively, is referred to as the print environment. The printer identifies four levels of changes of this print environment: the factory default environment, the user default environment, the modified print environment and the overlay environment.

Printer Commands

See PCL Commands and HP-GL/2.

Printing Menu

Identifies a few printer features which can be selected from the printer's Operator Control Panel, [[Menu]] key. Print menu features select the user default items, which are included in the print environment (features which can be selected with printer commands).

Raster Graphics

Images composed of groups of dots are raster images. Pictures in newspapers or on televisions are examples of raster images. PCL includes commands for printing raster images.

Reset

Resets are used to return the printer to a known environment. Depending on the type of reset performed, the printer returns to either the User Default Environment or the Factory Default Environment.

A Printer Reset restores the User Default Environment and deletes temporary fonts, macros, user-defined symbol sets and patterns. A Printer Reset is performed by sending the **?E** command or through the printer's control panel (see the printer *User's Manual*).

Resolution

The high quality output achieved by HP LaserJet printers is due in part to the ability to lay down a fine grid of “dots” on the page. The density of this grid is referred to as the printer’s **resolution.** Resolution is expressed as a value of dots-per-inch. Until recently, all HP LaserJet family printers printed at a resolution of 300 dots-per-inch. In a one inch square, the printer could print a dot anywhere in a grid of up to 300 dots horizontally by 300 dots vertically, for a total of 90,000 possible dot locations per square inch (300 × 300 = 90,000).

The LaserJet 4 printer is capable of printing at either 300 or 600 dpi resolution. At 600 dots-per-inch, it becomes possible to print up to 360,000 dots per square inch (600 × 600 = 360,000).

Robust-Xon

The configuration of ROBUST-XON determines the method by which Xon signals are generated on the interface. If ROBUST-XON is ON, an Xon is transmitted from the printer to the host computer when the printer’s 1 Kbyte I/O buffer has less than 128 data bytes remaining (896 bytes empty). The printer must be in the on-line state and not busy. If no data is received, additional Xon’s are transmitted at one second intervals.

If ROBUST-XON is OFF, the printer sends one Xon signal when the printer is in the on-line state, and is not busy. The printer does not send additional Xon signals.

Row

The distance between rows is defined by the current vertical motion index (VMI).

Rule

A solid-filled rectangular area.

Scalable

PCL 5 printers can use either bitmap or scalable fonts. A bitmap font is available in its one, defined size only. Scalable fonts, on the other hand, provide an “outline” for each character which can be scaled by the PCL 5 printers to produce a large range of character sizes.

Serial I/O

An input/output (I/O) interface that transmits information bit-by-bit (in “serial” mode). RS-232 is an industry-wide standard form of a serial interface.

Soft Font

Soft fonts are fonts stored on disks. These fonts can be transferred to the printer’s memory and used the same way as cartridge or resident fonts.

Spacing

Fonts have either fixed or proportional spacing. Fixed-spaced fonts are those for which the inter-character spacing is constant. In proportionally-spaced fonts, inter-character spacing varies with the natural shape of a character.

Stroke Weight

Stroke weight describes the thickness of the strokes that compose characters. Medium and bold are examples of stroke weights.

Style

Font style is defined by the angularity of the strokes of the characters with respect to the X-axis. Upright, italic, and condensed are examples of font styles.

Symbol Index

This is a grouping of symbols. An unbound font has the capacity to be bound to a set of symbols selected from a complementary Symbol Index (such as the Unicode or the MSL symbol indexes). Each symbol in the index is identified by a unique symbol index number. Appendix D of the *PCL 5 Comparison Guide* contains lists of MSL and Unicode symbol index characters and their numbers (also see *Unicode* or *MSL*).

Symbol Set

A symbol set is a unique ordering of the characters in a font. Each symbol set is defined with a unique set of applications in mind. Symbol sets are created for many purposes, for example, the PC-8 symbol set was designed to support US IBM-PC applications.

Treatment

Treatment is the combination of font style and/or weight. For example, some treatments of Times Roman font include: upright, or bold, or italic.

Typeface

Typeface is a generic name for graphics symbols having common design features. Each typeface has unique and distinguishing characteristics.

UEL (Universal Exit Language) Command

The Universal Exit Language (**UEL**) command (**?%–12345X**) causes the PCL printer language to shut down and exit. Control is then returned to the Printer Job Language (PJL). Both PCL 5 and HP-GL/2 recognize this command.

The UEL Command has the same effect as the **?E** command, and also enters PJL Mode of operation for printers that support PJL (refer to the section, “Universal Exit Language Command” in Chapter 4 for more information).

Unicode

This is a grouping of symbols (a **symbol index**) used by TrueType fonts. An unbound font has the capacity to be bound to a set of symbols selected from a complementary symbol index (such as the Unicode or MSL symbol indexes). Each symbol in the index is identified by a unique Unicode number. Appendix D of the *PCL 5 Comparison Guide* contains the Unicode symbol index.

Unit of Measure

The number of units-per-inch used in PCL cursor moves is determined by the current setting of the **Unit of Measure** command. The current unit of measure setting affects all PCL Unit moves, horizontal and vertical rectangle size, bitmap and scalable font metrics (how the cursor moves after printing a character). See “Unit of Measure Command” in Chapter 4.

User Default

A default selectable through the printer’s control panel. For example, user defaults may be selected for number of copies, manual feed mode, fonts, and vertical form length (VMI).

User Default Environment

The User Default Environment consists of the user default settings (any user default settings selected from the control panel) with the remainder of the environment features set to the factory default values.

User-Defined Pattern

In addition to the eight shading patterns and six cross-hatch patterns, users can design their own patterns (area fill). These **user-defined pattern**s are downloaded to the printer and used in subsequent area fills. See “User-Defined Pattern Graphics” in Chapter 13.

User-Defined Symbol Sets

User-defined symbol sets are supported in some HP LaserJet printers. Symbols are user-selected from a Symbol Index, (such as Unicode or MSL). To specify a user-defined symbol set, use the symbol set ID value as defined by the *Symbol Set ID Code Command.* See Chapter 10 for more information.

Vector Graphics

A method of drawing lines, area fills and other objects which is generally more efficient than “raster graphics.“ Also see “HP-GL/2.”

Vertical Motion Index (VMI)

VMI (vertical motion index)

VMI defines the distance between rows in 1/48th inch increments. This command affects the Line Feed and Half-Line Feed spacing.

The factory default VMI is eight, which corresponds to six lines per inch. A user default VMI can be selected from the control panel using the FORM menu item.