

GLOSSARY

Absolute Color: Absolute colors are specified according to NTSC (National Television System Committee) red, green, and blue primaries with illuminant D6500. (see relative color)

Absolute Movement: Motion specified with respect to the coordinate system origin (0,0). The PCL language contains both relative and absolute CAP movement commands. *Relative* motion references the present CAP. *Absolute* motion references (0,0), the intersection of the logical page left edge and the top margin. Absolute moves are specified with unsigned value fields; relative moves are specified with signed value fields.

Addressability: The ability of a device to position a dot. This is different than *resolution*, which refers to the number of dots that can be placed horizontally or vertically in a square inch (dots per inch). For example, a device with 300 dpi resolution may have 600 dpi addressability.

Algorithmic Bolding: A method of bolding characters which is not involved in the font selection process.

Anchor Point: The upper left corner of the picture frame, which is set to the current active position (CAP) in the PCL environment at the time the picture frame anchor point command is executed.

Anisotropic Mapping: A mapping in which the units along each axis are not equal. This term is often used to describe the mapping from user units to plotter units.

ASCII: The acronym for *American Standard Code for Information Interchange*. ASCII is a standard character set mapping for character sets addressable by 7 bits.

Aspect Ratio: The ratio of the height to the width (y to x) of a rectangular area, such as a window.

Auto Macro Overlay: The macro that is executed as the final operation each time a page is printed. The overlay environment is a combination of the user default and the current modified print environments. The modified print environment is saved so it can be restored following completion of the macro overlay.

Baseline: An imaginary line to which most of the characters of a font are aligned.

Baud Rate: The rate at which information is transferred between two devices. To communicate properly, both devices must be configured to the same baud rate.

Big Endian: This byte-ordering method stores the most significant byte in the lowest address. This method is used by Motorola. See *Little Endian*.

Bit: The binary 1's and 0's, i.e., the data that is downloaded to the printer to specify dots or pixels.

Bitmap Character: A character on a dot matrix, consisting of a pattern of dots.

Bitmap Font: A font whose character size (height and pitch) is fixed (static). A static bitmap font is a raster representation of characters. Each character is described in terms of pixels.

Bitmap: A region of memory which is treated as a rectangular array of pixels. Same as raster.

Black Reference: In direct color specification, the black reference represents the minimum output of a primary that a device can produce. See *White Reference*.

Bottom Margin: Distance from the bottom of the text area to the bottom of the logical page. The bottom margin is set indirectly by setting text length when perforation skip mode is enabled.

Bound Font: A bound font is one that is restricted to a single symbol set. See *Unbound Font*.

Cap Height: A percentage of the em of a font used to calculate the distance from the capline to the baseline. For fonts containing no letters (such as collections of clip-art graphic objects), the cap height percentage is 70.87%.

CAP: See *Current Active Position*.

Capline: An imaginary line corresponding to the top dot-row of an unaccented upper-case letter, usually, "H".

Ceiling Function: A mathematical function which yields the least integer greater than or equal to a given real number. For example, a value of 2.1 yields a value of 3 after applying the ceiling function.

Character Cell: Defines the area that holds the character and its required components.

Character Code: An 8-bit binary code that identifies a downloaded character.

Character Definition: Contains all the information necessary to download an individual character. The character definition consists of the *character header*, the *character descriptor*, and the binary data that specifies the character's shape—raster data for bitmap fonts or outline data for scalable fonts.

Character Descriptor: A block of data following the *character header*. It describes the position and size of an individual character, as well as the implied movement after printing the character.

Character Downloading: When downloading a font to the printer, the first stage is the downloading of the font definition. The second stage is the downloading of the individual characters in the font.

Character Header: The first two byte fields, Format and Continuation, of every character definition. The Format field describes the type of character to follow (e.g., bitmap, Intellifont, TrueType, etc). The Continuation field indicates previous blocks in the character definition: zero means none

Character ID: See Character Code.

Character List: An unordered group of characters used to construct symbol sets.

Character Motion Index (CMI): In horizontal text path direction, CMI designates the width of columns used for inter-character movement; in vertical text path direction, CMI designates the height of rows used for inter-character movement.

Character Set: See Symbol Set.

Checksum: A calculation performed on the bytes in a font or character definition to ensure downloading accuracy.

Chord Angle: The angle in degrees through which a chord is drawn. The chord angle determines the number of chords (and thus the smoothness) used to draw a circle or an arc.

Chord: A straight line joining two points on an arc or on the circumference of a circle.

CID: Configure Image Data command (*Esc*v#W*)

Clean Page: A page in which no print command (including a printable space) and no command affecting CAP has been sent.

Clip: The operation of removing any portion of a graphical image which extends beyond a specified boundary.

CMI: See *Character Motion Index*.

CMY: The subtractive primary colors used for printing: Cyan, Magenta, and Yellow.

CMYK: The subtractive primary colors—Cyan, Magenta, and Yellow—plus Black.

Color Depletion: See *Depletion*.

Color Matching: Matching printed colors to other devices, especially a monitor. This may go beyond merely making colors the same; it may involve color modification to satisfy the user's perception, i.e., "color appearance matching".

Color Mode: The PCL language offers four color modes: black and white (default), simple, PCL imaging, and HP-GL/2 imaging.

Color Palette: The set of colors in a device that are currently available for selection.

Color Primaries (Components): The three basic colors in some color models (e.g. RGB or CMY) from which all other colors can be produced. A mixture of any two cannot produce the third.

Color Saturation: See *Saturation*.

Color Space: The color model that is used to specify colors. Examples are: Device RGB, Device CMY, CIE L*a*b*, etc.

Column: Columns are PCL coordinate system units measured along the x-axis of the PCL logical page. The width of a column is defined by the current pitch or horizontal motion index (HMI). HMI is the distance between consecutive fixed-pitch characters. For example, at 12 cpi, one column is 1/12 of an inch, and at 10 cpi, one column is 1/10 of an inch. In a proportionally spaced font, one column is the width of the font's space character.

Compaction: See *Compression*.

Compression: An encoding scheme wherein a single datum represents multiple pieces of the original information thereby reducing the size of the data necessary to represent the original information.

Conditional Formfeed: A conditional page eject that occurs if the page is dirty, i.e., if printable data or a command affecting CAP has been sent. Orientation and Page Size are examples of commands that perform conditional page ejects.

Continuation Block: Used for downloading character definitions whose byte count exceeds 32767.

Control Character: See *Control Code*.

Control Code: A character that typically initiates a device function. For example CR (ASCII decimal value 13), LF (ASCII decimal value 10), and FF (ASCII decimal value 12).

CPI: Characters per inch.

CRD: Configure Raster Data command (*Esc*g#W*).

Current Active Position: Also CAP. The currently active printing position. The position at which the next character will be printed. CAP moves one column right after printing a character and one dot row down after printing graphics. CAP can also be moved explicitly anywhere within the logical page by using PCL control codes and escape sequences. After power on or reset, until printable data or a command affecting CAP is received, CAP is *floating*, which means it moves in accordance with orientation, top margin, left margin, and line spacing commands. However, once a printable character or a command affecting CAP is received, CAP is *fixed*, which means it is not affected by changes to the orientation, top margin, left margin, or line spacing.

Current Unit: In HP-GL/2, if the HP-GL/2 plot size is the same as the picture frame size and no user scaling is specified (IW), current units are plotter units. If the HP-GL/2 plot size is different than the picture frame size but user scaling is not in effect, units are PCL picture frame units; if user scaling is specified, units are user units.

Cursive: Type style that resembles handwriting but has no connecting characters as for example found in script faces. It can be written by pencil, brush, or other writing tools. The cursive style is used for typesetting systems that cannot connect characters.

Cursor: See *Current Active Position*.

Decipoint: A unit of measurement that equals 1/10 of a point or 1/720th of an inch.

Decompression: Decompression is a decoding scheme that expands compressed data into its original form.

Default: A value used in lieu 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 the user or operator. A user default is a default that is selectable via a control panel.

Delta X: HP's term for *escapement*.

Depletion: An ink jet technique that selectively removes pixels from a graphics image to reduce ink placed on the page. Depletion may be used to selectively reduce certain color intensities to achieve a more linear color intensity curve.

Destination Raster: In raster scaling, this is the size of the raster area that will actually be printed, as opposed to the raster size specified by the data that is sent. See *Source Raster*.

Destination: The composite of all primitives currently rendered on the page. Whenever a new page is selected, the destination is set to white.

Device Best: The rendering that HP believes will provide the best output for a particular device.

Device CMY: Device-dependent color space based upon Cyan, Magenta, and Yellow primaries.

Device Coordinates: See HP-GL/2 Coordinate System Units and PCL Coordinate System Units.

Device RGB: Device-dependent color space based upon Red, Green, and Blue primaries.

Device-Dependent Color: Color specified relative to a device's native rendering mode. Each device receiving a device-dependent color specification will produce a different color.

Device-Independent Color: Based upon the tristimulus values of human vision. Such a specification is translated into a device's native space in such a way that the resultant is independent of the device.

Direct Color: Colors are selected by specifying the values of each primary composing a pixel. See *indexed color*.

Dirty Page: A page which has received a print command or a command affecting CAP. CAP is then fixed and any command (such as Orientation or Page Size) that causes a *conditional* page eject will eject the current page and move CAP to the intersection of the left margin and top of form on the next page.

Dither: In this halftoning technique, colored dots are arranged in a matrix pattern that the eye integrates to produce colors other than those available in the printer's default palette. Spatial resolution is traded for color resolution.

Dot: The smallest mark the printer can make. Its size and spacing are device specific (e.g., on the LaserJet III one dot equals 1/300 inch). The number of dots printed per inch is referred to as the printer's *resolution*. The ability of a device to position a dot is its *addressability*, which may be different.

Download: The process of transferring entities such as fonts, characters, symbol sets, macros, graphics, or other data from a host computer to the device's user memory.

Dual Fixed Spacing: In Asian printing, a font may consist of two different spacings, one for Asian characters and one for Latin characters, which are usually half the width of Asian characters.

Edge: The outline of a polygon.

Em: A square unit of typographic measure whose size is equal to the height of the font in decipoints.

En: A unit of typographic measure whose size is equal to one half an em, or half the point size of the font. Approximately equal to the width of the letter "n."

Error Diffusion: A halftoning technique in a pixel is printed at the closest color value that the printer can produce, and the local error is propagated to unprinted neighboring pixels.

Escape Character: ASCII decimal value 27 (identified in this document by "Esc"), which is always the first character of a PCL escape sequence, identifies a character string as a command, not as data to be printed.

Escape Sequence: A combination of characters preceded by ASCII decimal value 27 that represents a device command. When this character appears, the device reads it and its associated characters as a command to be performed and not as data to be printed. (See PCL Commands.)

Escapement: The distance CAP moves after printing a character. HP's term is *Delta X*.

Factory Default Environment: The group of all of the device's factory default configuration settings.

Factory Default: Factory default refers to configuration values that are programmed into a device at the factory. These values or defaults are in use unless they are overridden using either the control panel or PCL commands.

Fill Type: The shading pattern used to fill a polygon.

Fixed Spaced Font: A font whose characters all take up the same amount of space.

Flash: A type of ROM that can be erased and rewritten.

Font Definition: Includes the font descriptor and any subsequent data segments.

Font Descriptor: A block of data which describes font design characteristics. The font descriptor consists of fields defining the height, width, style, typeface, and character set of the font. Although some devices do not use all the data in the font descriptor, a font creator should use valid values in all the font descriptor fields to insure font compatibility in all devices.

Font Downloading: The process of loading a font from the host into the printer. First the font definition is loaded, and then each character is loaded.

Font Header: Another name for *Font Descriptor*.

Font ID: A unique identification number which should be designated prior to downloading a font descriptor. The font ID is used to identify and reference the font. If an existing font is already associated with this ID, the existing font will be deleted during the download of the font descriptor.

Font Operator: A font operation, such as algorithmic bolding or orientation, that is independent of the font selection process.

Font: A font is a set of printable images specified by a collection of attributes. A font has an assigned name and is further described by its attributes: typeface, spacing, height, pitch, posture, stroke weight, character set, and orientation. If one attribute in the set is changed, the font becomes a different font.

Full-Width Character: A character whose escapement equals the font height. For TrueType, a full-width character's escapement in design units equals the font's scale factor.

Glyph: A graphical symbol.

Graphical Image: A graphical image is any item affecting the appearance of a page. Examples include printed characters, rules, area-fill patterns, raster graphics, and vector graphics.

H1, H2: H1 and H2 are the lower left and upper right corners of the Hard-Clip Limits respectively.

Hard-Clip Limits: The hard clip limits are the boundaries of the printing area beyond which the device cannot print, i.e., the mechanical limits of the device. Same as the printable area.

Hatch: Hatch is a particular fill type made of parallel lines.

Header: For downloaded fonts, this is another name for the font *descriptor*, which is the first part of the font definition, excluding data segments; it defines the characteristics common to all the characters in the font. For downloaded characters, the header is the first two byte fields (Format and Continuation) in every character definition.

Height: The height of a font is the measurement of the body of the type in points. A PCL point is 1/72th inch.

Hifipe: A pixel encoding method in which the bits composing a pixel correspond to intensities as well as colors.

Hiragana: Cursive form of Japanese characters representing syllables. See also *Katakana*.

HMI: Obsolete. See *Character Motion Index (CMI)*.

Horizontal Motion Index (HMI): Obsolete. See *Character Motion Index (CMI)*.

HP-GL/2 Coordinate System Units: The units of the HP-GL/2 coordinate system are the units of the x and y axes of the HP-GL/2 coordinate system. These units may be plotter or user. See *Current Unit*.

HP-GL/2 Mode: HP-GL/2 mode is the state during which a PCL device interprets the incoming data stream as HP-GL/2 commands instead of PCL commands.

HP-GL/2: HP-GL/2 is an acronym for *Hewlett Packard Graphics Language*. HP-GL/2 is the command set that HP's graphic devices understand; it defines a standard for printers' and plotters' vector graphics features.

Illuminant: The light source used when measuring or viewing color.

Indexed Color: Indexed color is a method of specifying color wherein a pixel is represented by an index into the programmable color palette.

Ink Jet Printing: A printing process that uses fine jets of ink to reproduce a digital, computer-generated image on paper.

Intellifont: Compugraphic's scalable typeface data system capable of providing bitmap font data on any resolution device and at any point size.

Internal Unit: Internal units are the units used within the device (i.e., they are not user accessible). The device maps all other units (e.g., dots, decipoints, plotter units, etc.) to this unit of measure. All positioning is kept in internal units and converted to physical dot positions when printed.

ISO Character Set: ISO character sets are 7-bit sets containing European versions of the Roman alphabet (e.g., ISO-German contains umlaut vowels, ISO-French contains e accent grave, etc.) based on the standards produced by the *International Standards Organization (ISO)*.

Isotropic Mapping: A mapping in which the units along each axis are equal. This term is often used to describe the mapping from user units to device units.

Join: The point where two line segments connect.

Kanji: The ideographic characters normally used for the Japanese language. Derived from Chinese writing. A Japanese printer commonly uses around 5,500 characters; it requires up to 22,000 different characters for high quality work.

Katakana: One of two sets of Japanese characters representing syllables used to write words for which there are no appropriate Kanji characters. Non-cursive form. See also *Hiragana*.

Kerning: The extension of a character's shape beyond its positioning and escapement points.

Label Mode: The HP-GL/2 mechanism for printing text.

Label Terminator: A label terminator is the final character in an HP-GL/2 label string. This character terminates label mode, so that the device interprets subsequent characters as HP-GL/2 instructions.

Landscape: A rectangular image in which the width is noticeably greater than the height. See *Orientation*.

Laser Printing: A printing process that utilizes a laser to write the image on a drum. Toner particles adhere to the uncharged places on the rotating drum and are transferred from the drum to the paper by a fusing process.

Left Raster (Graphics) Margin: The left raster margin, which may be different than the left text margin, starts at either CAP or the left edge of the logical page.

Left Margin: Distance between the left edge of the logical page and the left edge of the text area. The term "left margin" may also refer to left edge of the text area.

Line Motion Index (LMI): In horizontal text path mode, LMI sets the vertical spacing between lines of print (the vertical distance CAP will move for a linefeed). In vertical text path mode, LMI sets the horizontal distance CAP will move for a linefeed.

Little Endian: This byte ordering method stores the least significant byte at the lowest address. This technique is used by most manufactures other than Motorola. See *Big Endian*.

LMI: See *Line Motion Index*.

Logical Page Coordinate System: The PCL coordinate system used for PCL cursor movement and placement of graphical images. The logical page coordinate system can be changed by defining a new logical page or by changing the print direction. The logical page coordinate system is defined by the

width and height of the logical page. Points on the x-axis (whose origin is at the left edge of the logical page) increase in value across the width of the logical page; points on the y-axis (whose origin is at the top margin) increase in value down the length of the logical page.

Logical Page: The PCL logical page (also referred to as the addressable area) defines the area in which the cursor can be positioned. Logical page size may be changed by PCL commands; and it can be larger than the printable area, which is determined by the technology of the printing device.

LPI: Lines per inch.

Macro: A group of user-created PCL commands and data that can be executed repeatedly by a single command, using an assigned macro ID.

Mask: A single-bit-per-pixel primitive which acts as a stencil; the pattern is pushed through the 1's bits in the mask to form the source.

Mode: In the PCL language, a feature that is defined as a mode remains in effect until an *EscE* reset. Most PCL commands act like modes.

Modified Print Environment: This collection of all the current feature settings is stored in RAM and may be modified by printer language commands.

Munsell Value: A unit of brightness defined in the Munsell Color System with the property that equal changes in value corresponds to equal changes in perceived brightness. For hardcopy, nearly all colors are contained in the value range of 0 to 10. Black and white have Munsell values of approximately 2.5 and 9.5, respectively.

Non-Raster Color: Color that is specified in non-raster mode. The palette must be used.

NTSC: The acronym for *National Television System Committee*. The NTSC developed the standard color model that applies to all government-regulated broadcast systems in the United States.

Orientation: Specifies the position of the logical page on the physical page. Assume, for example, that the physical page is a rectangular sheet of paper with one of the short sides up. Then, *portrait* orientation means the logical page origin (0,0) is toward the top left corner of the physical page, with the X direction to the right and the Y direction downward. Printing is across the "width" of the page. *Landscape* orientation means the origin is rotated counterclockwise by 90 degrees toward the lower left corner of the physical page. Then, the X direction is upward and the Y direction is to the right. Printing is across the "length" of the physical page.

Overlay Environment: A collection of current PCL variables and user-default variables that define the current print environment before the macro overlay is executed.

P1, P2: The points that take on the user unit values specified with the HP-GL/2 scaling instruction, SC. P1 and P2 always represent an absolute plotter-unit location and define opposite corners of a rectangular printing area.

Page: One side of a sheet of paper or other printable media.

Palette ID: A unique identification number assigned to a palette for management purposes.

Palette: See *Color Palette*.

Pantone: A registered trademark name for a system of color matching in designer's and printer's materials such as inks, papers, marker pens, and overlay films. Each color is assigned a specific PMS reference color coding number.

Pattern ID: A unique identification number for user-defined and HP-defined patterns.

Pattern: The pattern is combined with a mask to form a source. The pattern is either a combination of the current foreground color with the selected single-bit-per-pixel texture, or a multi-bit-per-pixel user-defined area fill material (the multi-bit pattern contains the color and texture).

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. (See *Control Code* and *Escape Sequence*.)

PCL Coordinate System Units: The PCL coordinate system units are the units of the x and y axes of the PCL coordinate system. These units may be dots, decipoints, or, columns and rows.

PCL Printer Language: The PCL language is HP's standard language for printer control. The PCL language defines a standard for printer features and feature access by software applications. It provides the highest level of communication between the system and the printer. PCL is designed to be independent of the host system, device drivers, I/O interface, and network communications. Its purpose is to bring together all HP printers under a consistent control structure that provides feature compatibility from printer to printer.

PCL Unit: A user-definable (Unit of Measure command) unit that may be used for CAP moves or rule sizes. The factory default is 1/300". PCL Units were formerly referred to as "dots", but were renamed to prevent confusion with a device's physically printed dots, which are determined by *resolution*.

Pen Position: See *Current Active Position*.

Pen Status: In HP-GL/2, the pen status indicates the (up/down) state of the currently selected pen.

Perforation Region: The distance from the bottom of the text area of one page to the top of the text area of the next page. Enabling (default) perforation skip prints text to print to the end of the text area of the current page and start again at the text area on the next page. Disabling perforation skip prints text to the bottom physical edge of the page, into the unprintable region, and onto the top physical edge of the next page. Text length and margins are ignored, and data may be lost. The remainder of a partial line is not carried over to the next page. This term is used because of the need on many continuous feed devices to avoid printing on an area that may be perforated to aid page separation after printing.

Permanent (font, pattern, palette, macro): A permanent entity is not deleted by an *EscE* reset. It is deleted after a UEL only if a personality other than PCL is entered. It is device-specific whether it is deleted by a control panel reset.

Physical Device Units: See *HP-GL/2 Coordinate System Units* and *PCL Coordinate System Units*.

Physical Page: The actual sheet of paper or media—what the user thinks of as a "page". Physical page size is determined by the size of the installed media.

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

Pixel: The acronym for *picture element*. A pixel is the smallest definable picture element within a bitmap that can be assigned color or intensity. A pixel may consist of one or more dots. In the PCL language a raster image is divided into pixel rows which describe a strip of the image one pixel high.

Plane: A method of organizing raster data in which all the pixels in a row each receive one bit, then they all receive the next bit, etc., until each pixel in the row is completely defined. The corresponding bits for each pixel compose a *plane*. Another method of raster encoding is to send all the bits for each pixel, then send all the bits for the next pixel, etc. This method is called *pixel encoding*.

Plot Size: The plot size defines the dimensions of the area in which an HP-GL plot was originally rendered. When an HP-GL/2 plot is imported into the PCL environment, the plot is scaled to fit within the rectangle known as the picture frame.

Plotter Unit: Plotter units are the default HP-GL/2 units. Each plotter unit is 0.025 mm (1/1016 inch). There are 40 plotter units per millimeter.

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

Polygon: A polygon is a closed figure of arbitrary shape.

Portrait: Orientation of a page with the longest dimension in the vertical direction. See *Orientation*.

Primary (Secondary) Font: The primary font is the font whose attributes most closely correspond to the designated primary font attributes that is accessed via the control code SI (ASCII decimal value 15). The secondary font is the font whose attributes most closely correspond to the designated secondary font attributes that is accessed via the control code SO (ASCII decimal value 14). Two fonts can therefore be designated simultaneously and selected by alternating between them using the control codes SI and SO.

Primitive: A graphical item which is used in the construction of a page. Primitives include characters, rules, raster, underlines, and HP-GL/2 primitives (vectors, polygons, circles, etc.).

Print Direction: See *Logical Page Coordinate System*.

Print Environment: The group of all of the device's current feature settings. The device maintains four print environments: the factory default environment, the user default environment, the modified print environment, and the overlay environment.

Print Mode: Refers to user-selectable or automatic device-chosen print quality modes that are determined by media type, throughput, resolution, etc.

Print Overrun: As data is received by the printer, it is processed and stored in an intermediate format. The intermediate representation of the page is later processed and printed. During the printing of the page, the paper moves through an asynchronous printer (e.g., a laser printer) at a constant speed. A print overrun occurs when a page cannot be printed because the page's intermediate data cannot be processed and printed fast enough to keep up with the page as it moves through the printer.

Printable Area: 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 device (i.e., same as the hard-clip limits). The printable area is usually determined by the technology of the printing device. Note that the text area and logical page may be larger than the printable area. Attempting to print characters outside the printable area results in data loss.

Printer Commands: See *PCL Commands*.

Proportionally Spaced Font: See *Spacing*.

Radix Number: A number which has an assumed radix point between bits 1 and 2 to provide 1/4 units of measure.

Raster Area: Raster margins, which may be different than text margins, are set explicitly or simply clipped at the logical page or printable area boundaries.

Raster Color: Raster color may be specified *directly* or using a palette *index*. A palette must always be used to specify non-raster color.

Raster Mode: A restricted state in which only certain raster commands are allowed; non-raster text commands may end raster mode. Raster margins may differ from text margins.

Raster Scaling: A raster graphic may be scaled if the Start Raster command (*Esc*r#A*) is sent with a value of two or three. The scale factor depends upon the size of the raster area that is sent (*Source Raster*), the size of the raster area actually printed (*Destination Raster*) and the device resolution.

Raster: A raster image is a picture composed of groups of pixels. Pictures in newspapers or on televisions are examples of raster images.

Relative Color: Color specified in a space defined by user-defined white and black reference values for each of the three primaries.

Relative Movement: Movement specified relative to the current active position.

Rendering: Rendering is the process of combining a source with the destination as directed by the selected drawing mode.

Resolution: The resolution of a raster device is a measurement of the maximum number of dots that can be printed in a horizontal inch by the maximum number of dots in a vertical inch.

RGB: Red, green, and blue. The primary, additive colors of light which can be mixed to form all other colors.

Right Margin: The distance between the left edge of the logical page and the right edge of the text area. The term "right margin" may also refer to right edge of the text area.

ROP: Logical operation (AND, OR, etc.) used in the print model process.

Rounding Function: The rounding function is a mathematical function which yields the closest integer to the given real number. For example, 3.49 yields a value of 3 and 3.5 yields a value of 4 when rounded.

Row: Rows are PCL coordinate system units measured along the y-axis of the PCL logical page. The distance between rows is defined by the current line spacing (lpi) or vertical motion index (VMI). VMI is the distance between consecutive lines of text. For example, at 6 lpi, one line is 1/6 of an inch, and at 8 lpi, one line is 1/8 of an inch.

Rule: Also Rectangular Area Fill. In the PCL language, rectangular area fills are a special case of source images, which may be filled by patterns or textures. Source Transparency Mode has no effect on rules, since the rectangular area is conceptually viewed as a solid black (all 1's) source.

Saturated Color: A pure color without any white or black. One of the printer's basic colors, without any halftoning or mixing.

Scalable Font: A font whose character size (height and pitch) can be altered (scaled). Scalable fonts are described in terms of the outlines of the characters. The outlines are represented using vectors, arcs and curves, splines, etc. Scaling is achieved by applying linear transformations to the outlines. Additional information describing the relationships between character shapes and contours may be stored with a font; this information is applied during the scaling process to insure the integrity of the font design.

Secondary Font: See *Primary Font*.

Sheet: A physical piece of paper or other printable media.

Shingling: An ink jet interface technique that uses checkerboard masking to remove banding effects.

Soft Clip Limits: The boundaries of the printing area defined by the HP-GL/2 IW command, beyond which no programmed printing can occur (also referred to as a window).

Soft Font: A font which can be downloaded from a computer to the device's memory .

Source Raster: In raster scaling, this is the size of the raster area specified by the data that is sent, as opposed to the size of the raster area that is actually printed. See *Destination Raster*.

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

Stack: Last-in-first-out (LIFO) data structure. The PCL language has commands which can push (store) or pop (restore) CAP or the color palette.

Static Bitmap Font: See *Bitmap Font*.

Stroke Weight: The thickness of the strokes that compose characters. Medium and bold are examples of stroke weights.

Style: Font style defines the angularity of the strokes of the character with respect to the x-axis. Examples of font styles are "upright" and "italics".

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

Symbol Set Downloading: For *bound* fonts, symbols sets are part of the font specification. For *unbound* fonts, symbol sets may be downloaded separately.

Temporary (font, pattern, palette, macro): A temporary entity is deleted by an *EscE* reset.

Text Area: The area between the four margins. The text area is entirely contained by the logical page; it may be the same size or smaller than the logical page. Text printing may be restricted to a specific area within the logical page using the left margin, right margin, top margin, text length and perforation skip mode commands.

Text Length: Distance from the top margin to the bottom of the text area. Text length has meaning only if perforation skip mode is enabled.

Texture: A single-bit-per-pixel element that is combined with the current foreground color to form the pattern.

Tiling: The process of replicating a selected pattern beginning at a specified point (e.g., the upper left corner of the PCL logical page) to cover the entire page. A mask is then positioned and the tiled pattern passes through the 1's bits in the mask to compose the source used in rendering.

Top Margin: Distance between the top of the logical page and the top of the text area. The term "top margin" may also refer to the top edge of the text area.

Top of Form: After power on or reset, CAP moves to the top of form at the left margin. Top of form is 3/4 of a line below the top margin, or top margin + (3/4 * line spacing). The phrase "move to top of form" means if the CAP is not at top of form, move it to top of form of the next logical page.

Tristimulus Values: Three primary colors (X, Y, Z) that can be combined, with positive weights, to define all sensations we experience with our eyes. Defined in 1931 by the Commission Internationale L'Eclairage (CIE).

TrueType: A font scaling technology like Intellifont, but from a different vendor.

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

UEL: Universal Exit Language command (*Esc-12345X*), which exits the PCL language and turns over control to the PJI language.

Unbound Font: A font which is not restricted to a single symbol set. Bound fonts never contain more than 256 accessible characters, while unbound fonts may contain 400 or more of the symbols in Unicode or HP's Master Symbol List (MSL).

Unconditional Formfeed: A page eject that occurs whether or not printable data or a command affecting CAP has been sent (i.e., whether or not the current page is *dirty* or *clean*). The control code <FF> causes an unconditional page eject.

User Default Environment: Contains the factory default settings modified at the control panel or by the PJI DEFAULT command.

User Default: A feature setting that has been selected at the control panel.

User Units: HP-GL/2 coordinate system units that are defined by the scale instruction SC and the positions of P1 and P2.

Vertical Motion Index (VMI): Obsolete. See *Line Motion Index (LMI)*.

VMI: Obsolete. See *Line Motion Index (LMI)*.

VRC: Vector to Raster Converter.

White Reference: In direct color specification, the white reference represents the maximum output of a primary that a device can produce. See *Black Reference*.

Window: In HP-GL/2, the graphics window is the rectangle on the physical page within which graphics marks may be made. This window is the intersection of three rectangles: the rectangle defined by the hard-clip limits (printable area), the window defined by the current PCL picture frame, and the soft-clip or user window defined by the IW command.